

International Civil Aviation Organization

ICAO

Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6)

Video Teleconference, 24 – 27 August 2021

- Agenda Item 8:** Update on surveillance activities and explore potential cooperation opportunity
- b) Updates from ICAO Surveillance Panel, Standards Making Organization

ICAO SURVEILLANCE PANEL ACTIVITIES

(Presented by ICAO Surveillance Panel)

SUMMARY

This paper describes recent and planned activities of the ICAO Surveillance Panel.

1. INTRODUCTION

1.1 The work programme and activities of the ICAO Surveillance Panel (SP) are relevant to the SURICG. Per its charter from the Air Navigation Commission (ANC), the SP consists of two Working Groups: the Aeronautical Surveillance Working Group (SP-ASWG) and the Airborne Surveillance Working Group (SP-AIRBWG).

1.2 Information and discussions from the most recent meetings of the SP-ASWG and the SP-AIRBWG may be useful for consideration by the SURICG, including near-term plans for Surveillance Panel meetings.

2. DISCUSSION

2.1 SP-ASWG/13 was held virtually during April 12-16, 2021, from 1000-1400 UTC daily. The meeting was attended by 66 participants from 16 ICAO States and seven International or Standards-Making Organizations.

2.1.1 SP-ASWG/13 considered a Proposal for Amendment (PfA) to Annex 10 Volume III for Allocation of Additional 24-bit Aircraft Addresses. This proposal increases the 24-bit aircraft address allocation of all States that currently are allocated 1024 addresses and also satisfies specific State requests for an increased allocation of addresses. The proposal was considered sufficiently mature for the ASWG Secretary to present it to the Communications Panel (CP) Data Communications Infrastructure Working Group (DCIWG) at their May 2021 meeting, seeking their comments. It is hoped that SP-ASWG will receive and resolve comments from CP-DCIWG in time to process this PfA at the 4th meeting of the Surveillance Panel (SP/4) planned for Spring 2022.

2.1.2 SP-ASWG/13 considered 17 working papers containing various Proposals for Amendment to Annex 10 Volume IV, to implement the changes in functionality from the new MOPS for Mode S transponders (Subnetwork 6) and Extended Squitter (ADS-B V3) which were approved by RTCA and

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EUROCAE in late 2020. The ASWG Secretary was assigned to work with the ASWG's Technical Sub-Group (TSG) to prepare a consolidated transponder update PfA to Annex 10 Volume IV, which will be considered at SP-ASWG/14 later this year.

2.1.3 SP-ASWG/13 also discussed the plans for creating a consequential Change Proposal to Doc 9871, "Technical Provisions for Mode S Services and Extended Squitter." The same approach will be used as for the Annex 10 Volume IV changes; there will be multiple working papers presented on different topics/sections of Doc 9871, which will later be consolidated into a single Change Proposal for consideration by ASWG at a future meeting.

2.1.4 Multiple working papers were presented at SP-ASWG/13 on 1030/1090 MHz congestion mitigation methods and data from various 1030/1090 MHz measurement campaigns in various ICAO States around the world.

2.1.5 The Meeting Report from SP-ASWG/13 is **Attachment 1** to this paper.

2.2 SP-AIRBWG/11 was held in virtually during April 7-9, 2021, from 1000-1400 UTC daily. The meeting was attended by 44 participants from 12 ICAO States and seven International or Standards-Making Organizations.

2.2.1 SP-AIRBWG/11 considered a Proposal for Amendment (PfA) to Annex 10 Volume IV Relating to Chapter 7: Technical Requirements for Airborne Surveillance Applications. Chapter 7 of Annex 10 Volume IV specifies technical requirements for airborne surveillance utilizing ADS-B IN. The PfA included a clarification of requirements for situational awareness and new requirements supporting a range of ADS-B IN applications defined jointly by EUROCAE and RTCA in ED-194B/DO-317C and ED-236A/DO-361A, Change 1.

2.2.2 As required by the Air Navigation Commission via its Panels working arrangements and as specified in a Surveillance Panel job card, due to the Interval Management (IM) content of this PfA, there is the need to undertake inter panel coordination. As a result, the Secretary was assigned to prepare an inter panel coordination WP including relevant PfAs and timeline as indicated in the Surveillance Panel's IM job card (SP.010.02).

2.2.3 The Meeting Report from SP-AIRBWG/11 is **Attachment 2** to this paper.

2.3 At both AIRBWG/11 and ASWG/13 meetings, a working paper was presented which proposed to move the reporting of the Airborne Collision Sub-Group (ACSG) from the ASWG to AIRBWG, including a proposal for a trial/transition period prior to SP/4. Implementing this change would require a change in the SP TOR that must be proposed to the Air Navigation Commission; therefore, this proposal will be discussed and considered at SP/4.

2.4 Planning for SP/4 was discussed at both Working Group meetings. Although the meetings agreed with the schedule described below in principle, considering the current difficulties due to COVID-19, the meeting suggested that the Surveillance Panel's Strategic Advisory Sub Group (SP-SASG) should decide the feasibility of a face-to-face meeting in Q4 2021. In addition, the meeting suggested that SP-SASG would also discuss the time schedule of SP/4 (and SP/5) and potential 2023 meeting dates. It was also acknowledged that even if a face-to-face meeting were held in Q4 2021, some participants may need to participate virtually.

2.5 The SP-SASG met on 5 Aug 2021 and determined that a face-to-face meeting in Montreal was not possible in Q4 2021. The Secretary also reported that due to revised processing timelines for

ICAO provisions requiring the Air Navigation Commission's approval, a delay in SP/4 until the spring of 2022 would not impact the effective date of any proposed provisions adopted by SP/4. Therefore, the following SP Working Group meeting schedule was proposed by the SP-SASG and sent to SP members and advisors on 10 Aug 2021.

2.6 AIRB WG/12 will be held virtually from 10a-2p UTC daily during 27-29 Oct 2021. ASWG/14 will be held virtually from 10a-2p UTC daily during 1-5 Nov 2021.

2.7 Future SP/Working Group meetings are planned as follows:

1) Q2 2022 - The fourth meeting of the Surveillance Panel (SP/4)

SP/4	28 March - 8 April 2022	CR5 ICAO Montreal Canada
• AIRB WG/13	28 March – 1 April 2022	
• The members only meeting	4 April 2022	
• The first plenary	4 April 2022	
• ASWG/15	4-6 April 2022	
• The second/last plenary	7-8 April 2022	

Note - This is planned as a hybrid meeting (face to face and virtual). Proposed schedule is a completely virtually 1st part: 6:00-8:00 am Montreal time (10a-noon UTC), a long break 8:00-9:00 am Montreal time, 2nd part: 9:00 am-noon Montreal time, lunch break noon-1:00 pm Montreal time and 3rd part: 1:00-3:00 pm Montreal time.

2) Q4 2022

• AIRB WG/14	17-21 October 2022	CR3 ICAO Montreal Canada
• ASWG/16	24-28 October 2022	

3) Q2 2023 – The fifth meeting of the Surveillance Panel (SP/5)

SP/5	20-31 March 2023	Tentative (A conference room booking has been requested and waiting for the confirmation.)
• AIRB WG/15	20-24 March 2023	
• The members only meeting	27 March 2023	
• The first plenary	27 March 2023	
• ASWG/17	27-29 March 2023	
• The second/last plenary	30-31 March 2023	

2.8 Current plans are that SP/5 will consider several PfAs to Annex 10 Volume IV to align SARPs with the latest EUROCAE/RTCA avionics standards for:

- a) Mode S transponders (Subnetwork 6) with Extended Squitter (ADS-B Version 3);
- b) ADS-B IN systems with applications including IM; and
- c) additional variants of ACAS X.

2.9 Additionally, it is expected that consequential changes to Doc 9871, Doc 9924, Doc 9863, and Doc 9994 as a result of these SARPs changes will either accompany the SARPs changes to be considered at SP/5, or may be considered at SP/6.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matter as appropriate.



**SP-ASWG /13 -
REPORT
12-16 April 2021**

SURVEILLANCE PANEL (SP)

13th Meeting of the Aeronautical Surveillance Working Group (SP-ASWG/13)

Web Meeting, from 12 to 16 April 2021

MEETING REPORT

(Prepared and presented by the Secretary)

This document provides the SP-ASWG/13 Meeting Report.

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Introduction

The 13th meeting of the Aeronautical Surveillance Working Group (SP-ASWG/13) was held through virtual meeting platform from 12 to 16 April 2021 (1000 to 1400 UTC every day).

The Rapporteur, Doug Arbuckle (DA), opened the meeting and welcomed the attendees, who actively participated in the virtual meeting from various locations and time zones.

Administrative Matters

DA provided the meeting attendees with the schedule of the meeting and logistics for ASWG /13 using “ASWG13 rapporteur's Opening Remarks” which was posted in the ASWG/13 folder on the SP secure portal. DA provided the meeting attendees with a brief overview of the intended activities for the week. A list of attending members and advisors is provided in Annex A.

Agenda Item 1: Approval of the Agenda

DA introduced the meeting Agenda, [SP-ASWG13-WP/01](#). He proposed that agenda item 4 will be discussed at the end of the meeting as time permits. ASWG/13 agreed with the proposal. The agenda was updated further as the week progressed and the final agenda was uploaded on the SP website as [SP-ASWG13-WP/01R3](#).

Agenda Item 2: Business from previous SP meetings

2.1 Reports on the previous meetings

2.1.1 Final Report of SP-ASWG/12 ([SP-ASWG13-WP/02R1](#))

The Surveillance Panel Secretary, Mie Utsunomiya (MU), asked the meeting to approve the final report of the (virtual) 12th Meeting of the ASWG held between 21 and 25 September, 2020. She explained that this report was revised before the meeting to correct errors found in Appendix Annex D – List of action items. The meeting approved the final report included in [SP-ASWG13-WP/02R1](#).

2.2 Actions from previous meetings

2.2.1 Actions on the Panel Secretary

Description	Assigned To:	Outcome	Status
ACTION ITEM ASWG/12-01 : Secretary to monitor the activities, related to selection of Mode A code for C2 Link loss, and provide outcome to the panel	Secretary	SP-ASWG13-WP/34 addressed this item.	CLOSED
ACTION ITEM ASWG/12-10 : As agreed at ASWG/11, Secretary to process CPs to Doc 9863 (SP-ASWG12-WP22R2), Doc 9871 (SP-ASWG12-WP/15) and Doc 9924 (SP-ASWG12-WP/16R2) for “correspondence” approval	Secretary	SP-ASWG13-WP/34 addressed this item.	CLOSED

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/12-24:</u> MU to coordinate with RPASP secretary and seek a possibility to extend the due date of delivery of DAA SARPs in order for ACSG to develop appropriate guidance on “design assurance and validation process” for ACAS, which is planned to be included as an attachment of the Annex 10 Volume IV Part II	Secretary	SP-ASWG13-WP/34 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-27:</u> MU to inform ASWG members of SASG decision whether ASWG/13 would be held in face-to-face or virtually no later than 1 February 2021	Secretary	SP-ASWG13-WP/34 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-28:</u> MU to coordinate with ATMRPP Secretary regarding surveillance capabilities to be indicated in item 18 SUR in 2012 FPL Format. If necessary, to propose experts for setting a coordination meeting with ATMRPP	Secretary	SP-ASWG13-WP/34 addressed this item.	CLOSED

2.2.2 Actions on the Rapporteur

Nil

2.2.3 Actions on the TSG

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/8-16:</u> TSG to further investigate proposed method and categorizations described in SP-ASWG8-WP/09 and to specify the applicability of requirements added since Amendment 77 together with the introduction of future new requirements in ICAO Annex 10 Volume IV. (Also reference should be made to SP-ASWG9-WP/22)	TSG	SP-ASWG13-WP/04 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/9-11:</u> TSG to investigate receiver protection criteria and other requirements focused on cooperative systems (as the International Telecommunications Union Radiocommunication Sector (ITU-R) is currently focused on protection criteria for non-cooperative systems based on the band they operate in). TSG to report back to ASWG on this topic at least annually	TSG	SP-ASWG13-WP/17 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/11-12:</u> TSG to continue working on updating contents related to surveillance included in Doc 9830 Advanced Surface Movement Guidance and Control Systems (A- SMGCS) Manual	TSG	SP-ASWG13-WP/05 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/11-17:</u> TSG to report back on outcome of WRC-19 agenda item(s) and on potential WRC-23 agenda items related to the Surveillance Panel at ASWG/12	TSG	No updates were provided to this meeting.	OPEN
<u>ACTION ITEM ASWG/11-20:</u> TSG to prepare draft PfA and CP(s) for incorporation of basic level 2 and basic dataflash. TSG could provide these drafts as part of the complete CSC “package” for the next version of ADS-B and Mode S	TSG	SP-ASWG13-WP/27 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/11-21:</u> TSG to continue developing changes due to removal of Mode A/C/S all-call replies and on P4 acceptance criteria, including adaptation of P4 power transmitting by interrogators	TSG	SP-ASWG13-WP/30 addressed this item.	CLOSED

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/12-02:</u> TSG to hold the next TSG meeting for 01 to 05 February, 2021 at the Bahia Mar Hotel in Fort Lauderdale, Florida <i>Note.- Based on current COVID conditions, TSG/12 may have to be conducted as a virtual meeting, in which case it will be held on weekdays from 1 to 12 February 2021.</i>	TSG	The meeting was held.	CLOSED
<u>ACTION ITEM ASWG/12-03:</u> TSG to schedule another meeting for 21 to 25 June 2021 at the ICAO EUR/NAT Regional Office in Paris	TSG	The meeting was scheduled.	CLOSED
<u>ACTION ITEM ASWG/12-09:</u> TSG to check the Information in Tables in Doc 9924, Appendix M and propose appropriate changes	TSG	SP-ASWG13-WP/06 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-11:</u> TSG to start development of PfAs and CPs to reflect the RTCA/EUROCAE MOPS updates	TSG	SP-ASWG13-WP/07 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-12:</u> TSG to look into the overall issue of the 1090 MHz utilisation. (This will include examining techniques and capabilities that could be considered to reduce 1090 MHz congestion such as ADS-B Aircraft Derived Data vs BDS extraction, Extended Hybrid Surveillance, ACAS-X introduction and Passive acquisition) TSG to consider the impact of evolving systems that will potentially share the 1090 MHz link (e.g. RPAS, ACAS-Xu, DAA, Mode 5, Electronic Conspicuity) contributing to the spectrum load	TSG	SP-ASWG13-WP/08 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-13:</u> TSG to continue developing proposed SARPs and guidance material changes to achieve air/ground interoperability for approval NLT SP/4	TSG	SP-ASWG13-WP/31 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-14:</u> TSG to further analyse airborne 1030/1090 MHz Radio Frequency data collected in the US and report significant results to a future ASWG meeting as deemed appropriate	TSG	SP-ASWG13-WP/09 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-15:</u> TSG to further analyse 1030/1090 signal environment in Japan and report significant results to a future ASWG meeting	TSG	SP-ASWG13-WP/10 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-16:</u> TSG to continue development of materials for clarifying assignment of IIS codes for Multilateration and ADS-B, to be included in Annex 10 Volume IV and ICAO guidance material	TSG	SP-ASWG13-WP/11 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-17:</u> TSG to prepare a Doc 9924 CP on I ² SLS P1Σ and P1Ω alignment, (not only focusing on time alignment but also including amplitude of the pulse)	TSG	SP-ASWG13-WP/12 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-18:</u> TSG to include appropriate material from State Letter on “1090MHz spectrum issues and proper management of 24-bit aircraft addresses associated with unmanned aircraft operating exclusively at very low altitudes” (refer to SL 2019/77) to this PfA and present the PfA at the next ASWG meeting	TSG	SP-ASWG13-WP/13 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-19:</u> TSG to develop technical guidance material related to Low-Power 1030/1090 MHz Devices to be included in Doc 9924 and present it to a future ASWG meeting (targeting at NLT SP/4 approval)	TSG	SP-ASWG13-WP/14 addressed this item.	CLOSED FOR THIS MEETING

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/12-21:</u> In coordination with MU, TSG to prepare and present PfA based on SP-ASWG12-WP/21 at the ASWG/13	TSG	SP-ASWG13-WP/15 addressed this item.	CLOSED
<u>ACTION ITEM ASWG/12-22:</u> TSG to investigate the Privacy ICAO Address Program described in SP-ASWG12-WP/28 and to provide relevant information to resolve concerns expressed at the ASWG/12	TSG	No updates were provided to this meeting.	OPEN
<u>ACTION ITEM ASWG/12-29:</u> TSG to include this PfA (refer to SP-ASWG12-WP/20) for Extended Squitter Rate in the ADS-B v3 package of SARPs amendments	TSG	SP-ASWG13-WP/16 addressed this item.	CLOSED

2.2.3.1 TSG Actions Items Status Pending

Description	Assigned To:	Date Suspended	Status	Condition for Reactivation
<u>ACTION ITEM ASP/16-08:</u> TSG to review current work on transponder spurious emissions to see if ASP WP16-27, DF=11 with II=0 concerns are being addressed	TSG	ASP WG/17 Sept 2014	CLOSED This item was included in the Transponder updates package.	Approved EUROCAE and RTCA MOPS revisions for Mode S transponder spurious emissions
<u>ACTION ITEM ASP/16-17:</u> TSG to further investigate reply rate limiting	TSG	ASWG/2 Sept 2015	CLOSED This item was included in the Transponder updates package.	Approved EUROCAE and RTCA MOPS revisions for Mode S reply rate limiting
<u>ACTION ITEM ASWG/11-14:</u> TSG to provide updates on multi-static primary surveillance radar (MSPSR) development and research at a future ASWG meeting	TSG	ASWG/12 Sept 2020	PENDING	Ending of COVID restrictions that are preventing working on improvements to the MSPSR system
<u>ACTION ITEM ASWG/11-26:</u> TSG and Secretary to use the high-level summary of the major MOPS changes in SP-ASWG11-WP/06 for preparation of the PfA, CP package of MOPS changes to be presented at SP/5, 2021	TSG and Panel Secretary	ASWG/12 Sept 2020	ACTIVATED	Completion of CP package of MOPS changes to be presented at SP/5, 2021
<u>ACTION ITEM ASWG/11-27:</u> TSG to use the summary table of the differences between 1090ES Versions of SP-ASWG11-WP/08 in the ES Version 3 revision to be made to Doc 9871	TSG	ASWG/12 Sept 2020	ACTIVATED SP-ASWG13-WP/18 addressed this item.	Completion of ES Version 3 revision to be made to Doc 9871 to be presented at SP/5, 2021

2.2.4 Actions on the Airborne Collision Sub-Group (ACSG)

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/12-04:</u> ACSG to review 4.3.8.4.2.8 included in PfA on ACAS X introduction and provide possible resolutions to address comments from Europe during the ASWG/12	ACSG	The resolution was provided.	CLOSED

<u>ACTION ITEM ASWG/12-05:</u> ACSG and Secretary to continue close coordination with RPAS WG/3 to assist their development of appropriate DAA provisions	ACSG	SP-ASWG13-WP/35 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-06:</u> ACSG to continue development of ACAS Xu provisions in consideration on RTCA/EUROCAE activities	ACSG	SP-ASWG13-WP/35 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-07:</u> ACSG to report back on RTCA DAA activities as they might affect ICAO provisions for DAA	ACSG	SP-ASWG13-WP/35 addressed this item.	CLOSED FOR THIS MEETING
<u>ACTION ITEM ASWG/12-25:</u> ACSG to research relevant documentation of RTCA/EUROCAE Collision Avoidance system development process or equivalent and report back to ASWG	ACSG	SP-ASWG13-WP/35 addressed this item.	CLOSED

2.2.5 Actions on the Performance Based Surveillance Sub-Group (PBSSG)

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/12-08:</u> PBSSG to hold the following WebEx. • PBSSG#15: 28-30 September 2020 • PBSSG to have additional meetings/WebEx as necessary to progress the work programme	PBSSG	The meetings scheduled for the past were held as virtual meetings due to COVID-19.	CLOSED

2.2.6 Actions on all SP Members (interested members)

Nil

2.2.7 Actions on Individuals

Description	Assigned To:	Outcome	Status
<u>ACTION ITEM ASWG/10-11:</u> Japan Civil Aviation Bureau (JCAB) to provide updates on advanced surveillance function evaluation equipment at a future ASWG meeting	JCAB	No WP was presented on this subject during ASWG/13	OPEN
<u>ACTION ITEM ASWG/10-24:</u> ENRI to provide updates on Optical Fiber Connected Surveillance Radar development and research at a future ASWG meeting	ENRI	No WP was presented on this subject during ASWG/13	OPEN
<u>ACTION ITEM ASWG/12-23:</u> XL to provide updates on China Multiple Illuminators Based Passive Radar (MIPAR) development and research at a future ASWG meeting	XL	No WP was presented on this subject during ASWG/13	OPEN
<u>ACTION ITEM ASWG/12-26:</u> JML and CA to develop a joint schedule until SP/4 (October 2021) and to prepare documents which include possible adjustments of Terms of Reference (TOR) and the job cards for approval at SP/4. In addition, explanatory documents should be developed for the next WG meeting (April 2021) to clearly indicate candidates of merging, clear reporting lines, benefit and risk statements of merging and how to process the merging, while paying attention to membership and attendance	JML and CA	SP-ASWG13-WP/33R1 addressed this item.	CLOSED

Agenda Item 3: Reports from ICAO groups

3.1 Report from the panel secretary

3.1.1 [SP-ASWG13-WP/34.0R1](#) –Mie Utsunomiya (MU) presented this paper, which covered the following items.

- a) Introduction of new member nominated by Australia, South Africa, United Kingdom and IFALPA
- b) Action items outcome related to Secretary
- c) Change proposals to guidance materials and
- d) Coordination activities with other panels

3.1.2 This WP included three attachments ([SP-ASWG13-WP/34.1](#), [SP-ASWG13-WP/34.2](#) and [SP-ASWG13-WP/34.3](#)). MU further explained that as presented at the last ASWG/12 meeting, she had provided RPAS Panel with SP comments on the draft SARPs for a new Part IV to Annex 6. RPASP received approximately 1000 comments from several panels, including SP, which were reviewed by RPASP WG-5. Based on the review conducted by RPASP WG-5, the draft Annex 6, Part IV has been updated as presented in Attachment C ([SP-ASWG13-WP/34.3](#)) and a combined comment response matrix has been compiled, presented as Attachment B ([SP-ASWG13-WP/34.2](#)). SP members and advisors are invited to provide their formal endorsement by Friday 17 September 2021 (refer to attached draft WP ([SP-ASWG13-WP/34.1](#))).

3.1.3 Considering SP/4 will be held after the due date, it was agreed to proceed by correspondence which resulted in the following action.

ACTION ITEM ASWG/13-01: All to review [SP-ASWG13-WP/34.1](#), [SP-ASWG13-WP/34.2](#) and [SP-ASWG13-WP/34.3](#) and provide endorsement and/or comments by 12 May 2021.

3.1.4 Regarding the Action Item ASWG/12-01, the meeting asked whether the decision on the use of 7400 for C2 Link loss was communicated to regional offices or not. MU explained that regional offices should be aware of this; however just in case, in addition to the panels indicated in section 4.1.2.2 of this WP, she will provide a coordination package which includes PfAs to Annex 10 Volume IV related to C2 Link Loss to CNS regional officers for information sharing.

3.1.5 In reply to a question raised by the meeting, MU explained that regarding transponder MOPS updates, coordination documents will be produced by her, but she will likely request assistance from the authors of those WPs when coordinating with several panels.

3.1.6 [SP-ASWG13-IP01](#), presented by MU on behalf of ICAO, introduced a new document exchange platform that has been established for Panel members, advisors and observers to access the material developed by standards-making organizations (SMOs) to support the work of the Panel and enhance referencing of such materials in ICAO documentation. Section 2 of the IP's Appendix explained how to get access to this new document platform; SP members and advisors were encouraged to get access to this platform.

3.2 Report from other ICAO groups

3.2.1 Technical Subgroup (TSG) Report

3.2.1.1 TSG Chairperson, Vincent Orlando (VO), presented [SP-ASWG13-WP/03.0R1](#), with its attachment [SP-ASWG13-WP/03.1R1](#). This WP presented a report of the 12th meeting of the TSG, which

was held virtually from 1 to 8 February and from 25 and 26 March 2021. VO also explained its attachment, which indicated the WPs submitted by TSG for this meeting. These WPs will be addressed in Agenda Items 5 and 6 below.

3.2.1.2 In relation to Section 15 (A10V3 PfA to Include the ICAO Privacy Address Program), a question was raised on whether there are any ICAO requirements to 1) develop performance requirement and 2) share performance information included in an ADS-B Exclusion list. Alex Rodriguez (AR) explained that at this moment there are no ICAO requirements for States to develop such a list in SARPs but at the last ASWG meeting, since several concerns were raised on how an ICAO Privacy Address Program might impact an ADS-B exclusion list, TSG has started considering how to deal with this issue. In addition, the meeting was informed that FAA and Eurocontrol are currently sharing such information on their independent lists and both would be happy to assist finding an appropriate platform to exchange such information, which would be also considered under this item.

3.2.1.2 As a result of the presentation of the TSG report, the following action items were assigned to TSG.

ACTION ITEM ASWG/13-02: TSG to hold the next TSG meeting for 21 to 25 June, 2021 the ICAO EUR/NAT Regional Office in Paris, France.

Note.- Based on current COVID conditions, TSG/13 is expected to be conducted as a virtual meeting, held from 14 June to 25 June 2021.

ACTION ITEM ASWG/13-03: TSG to schedule another meeting for 31 January to 4 February as an in-person meeting at the Bahia Mar Hotel in Fort Lauderdale, Florida.

3.2.2 Airborne Collision Subgroup (ACSG) Report

3.2.2.1 Christian Aveneau (CA), ACSG chairperson, presented [SP-ASWG13-WP/35](#), which was the report of the 17th ACSG meeting held in four sessions on 17 November 2020, 9 February, 15 March, and 6 April 2021. This WP described ACSG activities per the subgroup's assigned work areas. Salient points of this WP were as follows.

- 1) Provisions for ACAS Xu
 - o ACSG will develop provisions for ACAS III, considering that the collision avoidance function of ACAS Xu is an example of ACAS III, as currently defined in Annex 10 Volume IV.
 - o Section 2.5 of this WP depicted the schedule of development of ACAS Xu provisions, aiming at approval by SP/5.
- 2) Provisions for RPA detect and avoid capability

ACSG actively coordinate with RPAS Panel DAA group, WG3. This included coordination with WG3 to find appropriate solutions 1) to add notes in relation to a rigorous validation process, to be included in Annex 10 Volume IV part II and 2) to find a way forward regarding section 7.3 of the ACAS manual, 3rd edition.

3.2.2.2 MU raised a question regarding the schedule included in Section 2.5 of this WP. She explained that it might be necessary to change the schedule described in Section 2.5 in order to take into account formal coordination with RPASP, which is required before finalizing the ACAS Xu PfA. This resulted in the following action item.

ACTION ITEM ASWG/13-04: Considering a possible need of formal inter panel coordination, MU to coordinate with ACSG and define the schedule of ACAS III PfA.

3.2.2.4 The following actions were assigned to ACSG.

ACTION ITEM ASWG/13-05: ACSG and Secretary to continue close coordination with RPASP WG/3 to assist RPASP WG/3's development of appropriate DAA provisions

ACTION ITEM ASWG/13-06: ACSG to continue development of ACAS III provisions in consideration on RTCA/EUROCAE activities

ACTION ITEM ASWG/13-07: ACSG to report back on RTCA DAA activities as they might affect ICAO provisions for DAA

3.2.3 Performance-Based Surveillance Sub-Group (PBSSG) Report

3.2.3.1 Eric Potier (EP), the PBSSG chairperson, presented [SP-ASWG13-WP/36](#), which reported on PBSSG virtual meetings that were held from 28 to 30 September 2020 and from 27 to 29 January 2021. The WP described 1) Status updates on PBSSG action items, 2) Development of RSUR Framework, and 3) Circular 326 Status.

3.2.3.2 The meeting was informed that PBSSG has developed much of the contents for an initial RSUR manual. Furthermore, the meeting was informed that since RSUR manual only can contain technical provisions and cannot impose requirements, PBSSG agreed to develop proposed performance requirements for insertion in ICAO Annex 10 Volume IV (reference should be made in SP-PBSSG14-WP07 for more details).

3.2.3.3 The following actions were assigned to PBSSG.

ACTION ITEM ASWG/13-09: PBSSG to hold the following WebEx

- PBSSG#17 in June 2021
- PBSSG#18 in September/October 2021 before the next ASWG meeting
- PBSSG to have additional meetings/WebEx as necessary to progress the work programme.

Agenda Item 4: Reports from other Groups

The following provides brief summaries from the reports presented. The reader is referred to the actual IPs at the Surveillance Panel site on the ICAO Portal for full details.

4.1 International organization report in alphabetical order

4.1.1 [SP-ASWG13-IP/06](#) – EUROCONTROL Report on Surveillance and ACAS Activities in Europe as prepared and presented by Eric Potier

4.1.1.1 EP presented [SP-ASWG13-IP/06](#). This IP provided an update on European surveillance regulatory (SPI IR) activities. The IP also reported on the monitoring of the 1030/1090 MHz frequencies, including the deployment of a regional monitoring tool providing the situation in real time. In addition, the IP provided information on the Interrogator code allocation cycle 34 performed on the behalf of ICAO regional office and the need to perform a close coordination with the APAC ICAO region. The IP reported on airborne ADS-B implementation status and explained some surveillance issues. The IP reported on the

progress of a validation of ACAS X CP1 being performed in Europe and on the start of a programme (EUDASS) related to the development of DAA for big RPAS in Europe. The paper also provided information on a new programme named Operational Excellence Programme that intends to deliver a number of operational and technical solutions with the aim to contribute to harmonisation across the European network, including surveillance.

4.2 State reports in alphabetical order

4.2.1 [SP-ASWG13-IP/03](#) – Preliminary Research on Probability of Update (PU) Application by ADS-B Data of China, as prepared by Jin Kaiyan and Zuo Di and presented by Jin Kaiyan

4.2.1.1 [SP-ASWG13-IP/03](#), presented by Jin Kaiyan (JK), provided the applications of the concept of Probability of Update (PU) to ADS-B data in China; the results of the evaluation showed that the setting of Update Interval (UI) has a significant influence on PU. And, the number of samples increases, the evaluation level of PU becomes stable and fixed. In general, PU calculation can be used to test the performance of ground station coverage and aircraft equipment. The result from this WP concluded that the PU evaluation can effectively reflect the continuity of each calculation range. Through the setting of UI and evaluation range, the specific area and reason for the failure level of PU can be further determined. In different application scenarios, it can effectively reflect the coverage of the ground system and the performance of airborne equipment within the calculation range. The meeting was informed that further analysis will be investigated the “very high fail” areas to improve the ADS-B Surveillance performance of China.

4.2.2 [SP-ASWG13-IP/04](#) – The Update Activity of Surveillance System in China, as prepared by Zhenfei Huo and XinLi and presented by Xin Li

4.2.2.1 This IP, presented by Xin Li (XL), provided updates on surveillance activity in China. The information provided in this IP were activities related to 1) surveillance technology and application roadmap; 2) ADS-B project; 3) Mode S DAPS data application; 4) 24-bit aircraft address management; 5) Surveillance radar; 6) surface movement radar; 7) Multilateration; and 8) advanced surface movement guidance and control system (A-SMGCS). XL explained this WP focussed on changes made from [SP-ASWG10-IP/06R1](#). Those are sections 3.2.3.3, 3.2.5.4, 4.4, 6 (6.1 to 6.3), 8.1 and 9.1. During the presentation of this IP, XL recognized a need to correct numbers described in section 6, which resulted in revision of this IP as [SP-ASWG13-IP/04R1](#).

4.2.3 [SP-ASWG13-IP/02](#) – Recent ADS-B Avionics Issues observed in the United States as prepared and presented by Alejandro Rodriguez

4.2.3.1 Alejandro Rodriguez (AR) presented this IP, which provided a description of recent ADS-B avionics issues observed in the U.S. with DO-260B/ED-102A systems. The following three issues were reported in this IP.

- Embraer 17x track jumping issue
This IP reported the occurrence of the issue is rare, as FAA did not observe an occurrence of this issue between November 2018 and March 2020, even though over 500 E17x aircraft were operated daily in the U.S. during this period. The root cause for this issue remains unknown.
- B787 DO-260B/ED-102A track extrapolation issue
The meeting was informed that with regard to the second issue, no B787 aircraft remain on the FAA No Services Aircraft List (NSAL); therefore, the FAA will not further report on this issue. The FAA thanked the various ICAO States in the meeting for their assistance in this matter.

- Honeywell Primus II RCZ issue.
The meeting was informed that in December 2019, Honeywell released Service Bulletin (SB) Publication Number A21-2254-148 providing required modifications for the Radio Management Unit (RMU) to correct the ON/OFF logic for the ADS-B Out functionality. Recently, the FAA has been working with Honeywell to update the existing SIL to emphasize the importance of updating the RMU with the latest SB, to include implementing the option of configuring the ADS-B Out installation through a strap setting to provide indication of the ON/OFF control of ADS-B to the flight crew. The latest revision of this SIL will be referenced as part of an FAA Special Airworthiness Information Bulletin (SAIB) currently in process for release. The SAIB will bring further awareness to the problem, its impacts, and inform the aviation community of the resolutions available to ensure aircraft compliance when operating in ADS-B required airspace.

4.2.4 SP-ASWG13-IP/05 –ADS-B Equipage and Quality Performance in the U.S., as prepared and presented by Doug Arbuckle

4.2.4.1 DA submitted this IP, which provided a summary of observed NIC/NACp performance compared to the requirements of the U.S. ADS B mandate, as well as ADS-B equipage trends in the U.S. In addition to several outcomes of the analysis included in the section 2 of this IP, the IP also noted that the impact of COVID-19 on U.S. air traffic operations in April 2020 can be clearly observed, along with the recent increase in operations during March 2021.

Agenda Item 5: Review Change Proposals Related to SARPs and Docs

5.1 Proposal for Amendments (PfAs) to Annex 10 Volume VI relevant to transponder MOPS updates

The meeting reviewed WPs referred in the following subsections (from 5.1.1 to 5.1.13, 5.5 and 5.6) and agreed with following action items.

ACTION ITEM ASWG/13-10: All to review the following WPs and provide comments to TSG by **NLT 14 May 2021**

- SP-ASWG13-WP/20R1
- SP-ASWG13-WP/21R1
- SP-ASWG13-WP/22
- SP-ASWG13-WP/23R1
- SP-ASWG13-WP/24
- SP-ASWG13-WP/25
- SP-ASWG13-WP/26R1
- SP-ASWG13-WP/27R1
- SP-ASWG13-WP/28R1
- SP-ASWG13-WP/29R1
- SP-ASWG13-WP/30
- SP-ASWG13-WP/31R1
- SP-ASWG13-WP/32R1
- SP-ASWG13-WP/15
- SP-ASWG13-WP/16

ACTION ITEM ASWG/13-12: In coordination with TSG, Secretary to prepare the transponder update PfA, which should be submitted to the next ASWG meeting, which will consolidate the content of the following WPs.

- [SP-ASWG13-WP/20R1](#)
- [SP-ASWG13-WP/21R1](#)
- [SP-ASWG13-WP/22](#)
- [SP-ASWG13-WP/23R1](#)
- [SP-ASWG13-WP/24](#)
- [SP-ASWG13-WP/25](#)
- [SP-ASWG13-WP/26R1](#)
- [SP-ASWG13-WP/27R1](#)
- [SP-ASWG13-WP/28R1](#)
- [SP-ASWG13-WP/29R1](#)
- [SP-ASWG13-WP/30](#)
- [SP-ASWG13-WP/31R1](#)
- [SP-ASWG13-WP/32R1](#)
- [SP-ASWG13-WP/15](#)
- [SP-ASWG13-WP/16](#)

ACTION ITEM ASWG/13-11: Taking into account comments received, TSG to update and finalize the PfA produced by MU ([ACTION ITEM ASWG/13-12](#)), which should be presented at the next ASWG meeting.

5.1.1 [SP-ASWG13-WP/20](#) – A10V4 Proposal for Amendment (PfA) Relating to Task Number 23, as prepared and presented by Alex Rodriguez

5.1.1.1 AR presented [SP-ASWG13-WP/20](#), which described a PfA relating to New Version 3 Extended Squitter Messages. The PfA added the additional extended squitter messages introduced as part of ADS-B Version 3.

5.1.1.2 Current ADS-B versions 0 through 2 provide basic position data along with additional data elements that support various applications, which range from basic situational awareness to separation services. ADS-B version 3 will provide additional capabilities beyond those supported by earlier versions. These capabilities allow for enhancements in areas such as safety, equipment performance, airspace efficiency, and data reporting. ADS-B version 3 includes new capabilities such as: 1) Autonomous Distress Tracking support; 2) information to support future Interval Management operations; 3) broadcasting aircraft-derived weather data; 4) Lost C2 Link State for UAS/RPAS; and 5) functionality to support commercial space and hypersonic aircraft operations.

5.1.1.3 The meeting was informed that the ADS-B version 3 avionics standards also include several optional functions which lay the groundwork for future ADS-B improvements. Also, it was emphasized that a key requirement for ADS-B version 3 is that it is designed to be backward compatible, to the extent possible, with ADS-B version 2.

5.1.1.4 The meeting started review of the WP and, with an error found, this WP was revised, [SP-ASWG13-WP/20R1](#).

5.1.1.2 MU explained that requirements in SARPs cannot refer directly to other documents in the “shall” statement, including guidance materials such as Doc 9871. Therefore, some proposed requirements which refer to Doc 9871 in this PfA and other PfAs need to be modified. This resulted in the following action.

ACTION ITEM ASWG/13-13: MU to review all WPs related to transponder MOPS updates and modify references related to Doc 9871 which need to be in Notes, if Doc 9871 is referred to directly in requirements of SARPs.

5.1.2 [SP-ASWG13-WP/21](#) – A10V4 PfA Relating to Task Number 16 and 29, as prepared by Stephen Darr and Martin Gray and presented by Stephen Darr

5.1.2.1 [SP-ASWG13-WP/21](#) presented by Steve Darr (SD) described an Annex 10 Volume IV PfA relating to air/ground determination and emitter category encoding. For Mode S transponders and 1090 MHz extended squitter ADS-B messages, certain fields and formats are based on whether the aircraft is assessed to be on the ground or in the air. The terms used to refer to whether the aircraft is on the ground or in the air, as determined by the transponder and/or ADS-B device, differed in various RTCA/EUROCAE standards and ICAO Annex 10 Volume IV. This PfA attempted to clarify terminologies used and resolve inconsistencies among those documents.

5.1.2.2 Furthermore, this PfA deals with changes to emitter category, which was included in the extended squitter version 3. Due to concerns raised by users that many of the version 2 emitter categories are conceived as misleading and if those are misused, those may cause safety issue, the updated reporting of emitter category in version 3 includes modifications to address these concerns.

5.1.2.3 The meeting reviewed the contents and an error was noted in the formatting of a recommendation, which resulted in a revision of this WP ([SP-ASWG13-WP/21R1](#)).

5.1.3 [SP-ASWG13-WP/22](#) – A10V4 PfA Relating to Task Number 9, as prepared and presented by Matt Haskin

5.1.3.1 Matt Haskin (MH) presented [SP-ASWG13-WP/22](#), a PfA relating to P4 amplitude tolerance (interrogation). Review of the P4 acceptance/rejection criteria was performed to attempt to address observed behaviour that shows there are occurrences of Mode S transponders replying Mode A/C to short P4 interrogations, causing dual Mode S and Mode A/C tracks on systems utilizing Mode A/C Only All Call interrogation. The pulse amplitude and timing cases that potentially lead to transponder problems in detecting the short P4 pulse and replying ATCRBS were analysed. It was pointed out that interrogation signal levels in the transponder receiver minimum triggering level (MTL) region most commonly contribute to unwanted replies. To improve the issue, this PfA changes the P4 amplitude tolerance requirement, which allows an interrogator to transmit the P4 pulse with an increased amplitude, relative to the rest of the interrogation, to aid in transponder detection of the pulse.

5.1.4 [SP-ASWG13-WP/23](#) – A10V4 PfA Relating to Task Number 24, 47, 49 and 50, as prepared by Matt Haskin and Jack Field and presented by Matt Haskin

5.1.4.1 [SP-ASWG13-WP/23](#) presented by MH introduced Annex 10 Volume IV PfA including the following items.

- Version 3 Extended Squitter Message Rates
- Message Initiation/Termination and
- Message Broadcast Rates

5.1.4.2 Requirements related to initiation and termination of 1090 extended squitter messages have been modified to correct conflicting and ambiguous requirements in relevant MOPS. Also, initiation and termination requirements for new version 3 messages are necessary. Instead of including the new requirements in SARPs, detailed existing technical specifications related to squitter rates and initiation

messages are proposed to move to Doc 9871. The requirements for squitter rates for ADS-B Version 3 messages will be also placed in Doc 9871.

5.1.4.3 ADS-B version 3 includes optional High Velocity and/or Altitude (HVA) messages in support of commercial space vehicles and hypersonic vehicles that operate at velocities above the current maximum reporting capability of 1090 extended squitter. Current position and velocity messages cannot support vehicles operating at the high speeds of such vehicles, so new HVA messages were developed and incorporated into the MOPS. Additionally, these messages support altitude reporting for vehicles that operate above the normal reportable maximum altitude. The PfA included in this WP also specified that the airborne and velocity squitters are not transmitted when the HVA squitters are active.

5.1.4.4 Several text improvements were discussed which resulted in revision of this WP (SP-ASWG13-WP/23R1)

5.1.5 **SP-ASWG13-WP/24 – A10V4 PfA Relating to Task Number 07, as prepared by by Eric Potier and Martin Gray and presented by Eric Potier**

5.1.5.1 SP-ASWG13-WP/24, presented by Eric Potier (EP), incorporated the requirements associated with the Mode S Reply Rate Limiting. The proposed amendment contained changes to include the technical performance requirements for a Mode S reply rate limiting function in new Mode S transponders to protect against complete loss of surveillance in areas where Mode S interrogations are high. This condition was experienced in 2014 in central Europe.

5.1.6 **SP-ASWG13-WP/25 – A10V4 PfA Relating to Task Number 04 and 06, as prepared and presented by Tom Pagano**

5.1.6.1 This WP, presented by Tom Pagano (TP) contained the proposal for amendment to the SARPs to incorporate phase overlay capability. Optional phase overlay provisions were added to provide increased 1090ES capacity without the need to increase the extended squitter rate. This would provide three additional 112-bit message segments per 1090ES transmission in addition to the 112-bit segment provided by the existing pulse-position modulation (PPM).

5.1.6.2 This technology has matured and phase overlay messages in extended squitter version 3 have been defined. In addition, technical performance requirements for the Phase Overlay capability on Mode S replies has been developed. Phase overlay provisions includes the following.

- Phase Overlay Transmit Signal Characteristics, which provides signal characteristics to support phase overlay; and
- Provisions to support Phase Overlay on Mode S Replies

5.1.7 **SP-ASWG13-WP/26 – A10V4 PfA Relating to Task Number 01, 12, 15, 21, 22, 48, and 51, as prepared and presented by Jack Field**

5.1.7.1 SP-ASWG13-WP/26, presented by Jack Field (JF), incorporated the requirements associated with the following.

1) Reduction of Transponder Dead Time

It was pointed out that the current requirement related to transponder dead time is based on old technology and current transponders are much more capable than the dead time limit allowed by SARPs. Therefore, a change in the dead time (time interval from the end of a reply transmission

to when the receiver has regained its sensitivity to within 3 dB of MTL) requirement for a Mode S transponder from 125 μ s to 20 μ s is proposed. This applies to regaining sensitivity from both Mode S and Mode A/C replies. The change in the dead time requirement does not trigger a change to the dead time requirement for Mode A/C-only transponders. A consequential change proposal to Doc 9924 is expected.

2) Removal of RCS/TCS/SAS Interrogation Controls for Extended Squitter

Removal of the rate control subfield (RCS), type control subfield (TCS), and surface antenna subfield (SAS) are proposed. All are used within the special designator (SD) field used in UF=4,5,20,21 messages in which the designator identification (DI) equals 2. These Mode S interrogation commands affecting airborne/surface format selection and transmission control (RCS, TCS, SAS) were considered undesirable controls of extended squitter and transponder operation. With the existing provisions, such controls could manipulate behaviour and operation of extended squitter and transponders in unintended ways. Additionally, removal of requirements related to Register 07 {HEX}, which contains two subfields related to altitude reporting and surface squitter rate, are proposed.

3) Surface Squitter high/low rate transition

Surface squitter broadcast rate is reduced when aircraft/vehicles are not moving. However, tracking issues result when aircraft/vehicles are broadcasting at the low rate and begin moving. In these situations, position updates are not sufficient to reliably track aircraft/vehicles and existing transition criteria tends to result in the low broadcast rate being selected. As a result, the requirements to transition from high rate to low rate have been changed. The time interval for switching from high broadcast rate to low rate when the vehicle is not moving is changed to 15 minutes.

4) UAS Lost Link 7400 Emergency

The integration of RPAS into non-segregated airspace poses several challenges, among which is lost command and control (C2) Link procedures. During a lost C2 Link event, the remotely piloted aircraft (RPA) is flying in a state where it is not under the command of the remote pilot. Accordingly, it is necessary to define mitigations allowing for all stakeholders, whether air traffic control (ATC), or other airspace users, to be made aware in a timely manner of this degraded state. Setting a special Mode A code to indicate that an RPA is operating without a functional C2 Link between the RPA and the RPS has been discussed in the aviation community. Addition of Mode A code 7400, indicating aircraft in a lost C2 link state, to the list of emergency codes (along with 7500, 7600, and 7700) is proposed in this PfA.

5) Aircraft Identification Register 20

This change is required to reflect a change in handling of Aircraft Identification data to not zero-out Aircraft ID in the transponder if the interface providing Aircraft ID is lost.

6) Extended squitter messages removed from Event Driven Squitter

ADS-B version 3 no longer uses the event driven squitter concept. The majority of changes needed to remove the event driven squitter were made in SP-ASWG13-WP/20. However, one section was not included in that WP/20 and is therefore covered in this paper.

5.1.7.2 The meeting was informed that “Updates to the definition of the CA field” were presented in [SP-ASWG13-WP/21R1](#). ASWG/13 began review of the WP and several improvements were proposed, which resulted in the revision of this WP ([SP-ASWG13-WP/26R1](#)). Furthermore, recognizing the importance of consistent use of terminology related to RPAS, the following action was assigned to the Secretary.

ACTION ITEM ASWG/13-14: In coordination with TSG, Secretary to investigate a way of adding its definition or referencing other Annex regarding the terminology, C2 Link State, and to include it in the transponder update PfA (**ACTION ITEM ASWG/13-12**).

5.1.8 [SP-ASWG13-WP/27](#) – A10V4 PfA Relating to Task Number 02, 03 and 19, as prepared and presented by Eric Potier

5.1.8.1 This WP, presented by EP, incorporated the requirements associated with the following.

1) New Level 2 Transponder, Comm-A Option, AICB Option

Discussions have been held within the Mode S community for many years in an attempt to remove various data-link protocols that are not used today in the Mode S environment such as Comm-A and Air-Initiated Comm B (AICB) protocols. In addition, such requirements are not expected to be needed in the foreseeable future. As a result, it was decided to define requirements for a basic level 2 transponder without Comm-A and AICB that will become the basis for minimum international Mode S transponder carriage.

2) The basic dataflash option

In order to reduce the usage of the 1 090 MHz frequency, a simple basic protocol has been added to announce the changes of some transponder registers that are not changing very often. This is known as the basic dataflash protocol.

3) Level 1 revoked

With the development of services such as the Extended Squitters for ADS-B and the use of registers to support elementary surveillance and enhanced surveillance, all transponders need to manage transponder registers and associated protocols. These capabilities are not supported in a level 1 transponder. Considering such improved capabilities and advancement of technology, level 1 transponders are no longer expected to be developed.

5.1.8.2 In reply to a question raised by the meeting, EP confirmed that there is no difference between “level 1 transponder” and “Legacy level 1 transponder” and EP will correct the text to make consistent use of the level 1 terminology in this WP. Also the meeting proposed several text improvements which resulted in a revision of this WP ([SP-ASWG13-WP/27R1](#)).

5.1.8.3 This WP reported a potential omission in SARPS of a connecting requirement for level 2 transponders (para 2.1.5.1.2) and platforms supporting ACAS. TSG believes that such a requirement or a note needs to be inserted at the beginning of 4.3.6.3 in chapter 4 of Annex 10 Volume IV, pointing to 2.1.5.1.2.2 to support Comm A for SLC for all existing ACAS versions and to 2.1.5.1.2.1 for ACAS X that is no longer using the SLC command. The meeting was informed that this proposal was not included in this WP but further coordination should be performed between ACSG and TSG, which resulted in the following action item.

ACTION ITEM ASWG/13-15: TSG and ACSG to coordinate and identify possible changes required in Chapter 4 of Annex 10 Volume IV in line with several PfAs and CPs transponder update package produced by TSG. (Refer to section 2.14 of [SP-ASWG13-WP/27R1](#) and [SP-ASWG13-WP/07](#))

5.1.9 [SP-ASWG13-WP/28](#) – A10V4 PfA Relating to Task Number 11, as prepared and presented by Tom Pagano

5.1.9.1 TP presented [SP-ASWG13-WP/28](#). Since existing ACAS II (including ACAS X) depend on the acquisition squitter, the legacy recommendation which provides the capability to disable acquisition squitters is no longer necessary. Therefore this WP proposed deletion of such a recommendation.

5.1.9.2 In reply to a request, TP refined the rationale of this PfA and provided the revision of this WP ([SP-ASWG13-WP/28R1](#)).

5.1.10 [SP-ASWG13-WP/29](#) – A10V4 PfA Relating to Task Number 26, 61 and 62, as prepared by Tom Pagano and Tim Steiner and presented by Tom Pagano

5.1.10.1 This WP presented by TP included the requirements associated with the following.

- 1) Invoking Version 3 ADS-B
This provides an update to ES version introductory language in section 3.1.2.8.6 in order to add version 3 ADS B.
- 2) Mode S ES Transmitting System Characteristics
This contains changes to address modifications to the ADS-B transmitting subsystem characteristics introduced with version 3.
- 3) Mode S ES Receiving System Characteristics
This proposed amendment contains changes to address modifications to the ADS-B receiving subsystem characteristics introduced with version 3

5.1.10.2 A question related to the last line of the Note1 under 5.2.3.3 was raised. Although it said “applicable mapping....can be found in Doc 9871”, existing Doc 9871 does not have such provisions or it is difficult to find such provisions in Doc 9871. Therefore it may be worth deleting reference to Doc 9871 from this Note 1. The meeting agreed with the deletion of reference to Doc 9871, which resulted in a revision of this WP ([SP-ASWG13-WP/29R1](#)).

5.1.11 [SP-ASWG13-WP/30](#) – A10V4 PfA Relating to Task Number 59, as prepared and presented by Eric Potier

5.1.11.1 [SP-ASWG13-WP/30](#), presented by EP, contained a PfA to remove the capability from a Mode S transponder to reply to Mode A/C/S all-call interrogations (i.e. Long P4), while keeping minimum SARPs information to cover old legacy transponders. Since it was recognized that an important source of Mode S RF pollution on 1090 MHz is the DF=11 all call replies generated in response to wrongly detected inter-mode A/C/S all-call interrogations (long P4), amendment 89 of Annex 10 Volume IV introduced changes to eliminate the reply to Mode A/C/S all-call interrogations. However, such provisions were complicated by the impact that the changes have on detection of the Mode A/C-only all-call interrogation (short P4) and the lack of clarity in detection criteria for this type of interrogation created confusion. This PfA provided clarification on such provisions. In addition, it also covered the adaptation of P4 pulse detection criteria to reduce mis-detections of short P4, which could result in unexpected Mode A/C detection generating STCA alerts in some ATC centres.

5.1.12 [SP-ASWG13-WP/31](#) – A10V4 PfA Relating to Task Number 20, as prepared and presented by Eric Potier

5.1.12.1 This WP, presented by EP, proposed changes to ICAO Annex 10 Volume IV to ensure an acceptable level of transmissions before, between and after the pulses of a Mode A/C reply, a Mode S reply or an extended squitter in order to ensure the interoperability between transmitters and receivers of messages on the 1090MHz frequency. The proposal is based on the requirement introduced in the new transponder MOPS, but also took into account the previous discussions held at previous TSG and ASWG meetings following an interoperability issue detected in Europe between certain new transponders and existing radars. Furthermore, this WP included both the PfA and a CP to introduce new guidelines on this topic in Doc 9924.

5.1.12.2 The meeting was informed that during the review of related PfAs, TSG also questioned the value -70 dBW currently defined in the existing 3.1.2.10.2.2 section to limit spurious emissions. TSG's preliminary analysis concluded that if the transponder is considered as an AM(R)S the limit on spurious transmission should be -70dBc; i.e., 70 dB below the peak pulse power, and if it is considered as an ARNS it should be 60 dB below the peak pulse power. This second option seems consistent with the spectrum defined in SARPs and Mode S transponder MOPS, where we can see a level of -60dB below carrier power of the emission at +/- 78MHz (see spectrum figure 3-5 in ICAO Annex 10 Volume IV). However, TSG also sees the need for a clarification on the frequency limit to be used to define spurious emissions. TSG concluded that this should be further investigated; therefore, this WP did not propose such modifications. This resulted in the following action item.

ACTION ITEM ASWG/13-16: TSG to continue its investigation on spurious transmission limits included in 3.1.2.10.2.2 of Annex 10 Volume IV (refer to [SP-ASWG13-WP/31R1](#)), and propose PfA at a future ASWG meeting.

5.1.12.3 In reply to a question, EP explained that 2.1.8.1.2 is a recommendation, which includes an “operational range” indicating it as one recommended way to comply with requirement 2.1.8.1.1. Furthermore, the meeting raised a question regarding reference to 3.1.2.10.2.1 Unwanted output power. Although the updated MOPS indicates “terminals of the antenna shall not exceed – 50 dBm”, the PfA to Annex 10 Volume IV seems to be missing these reference points. EP explained that such reference may be useful to include in the PfA, which resulted in the revision of this WP ([SP-ASWG13-WP/31R1](#)).

5.1.12.4 Since this WP includes not only PfA to Annex 10 Volume IV but also CP to Doc 9924, the following action was assigned to TSG.

ACTION ITEM ASWG/13-17: TSG to continue development of Doc 9924 CPs to reflect the RTCA/EUROCAE MOPS updates and air/ground interoperability

5.1.13 [SP-ASWG13-WP/32](#) – A10V4 PfA Relating to Task Number 13, as prepared and presented by Jack Field

5.1.13.1 [SP-ASWG13-WP/32](#), presented by JF, introduced a PfA associated with Data Link Capability Register Changes. Due to additional capabilities included in the revisions to the transponder and extended squitter MOPS, there are needed changes in the Data Link Capability Report to announce these new capabilities. Furthermore, the PfA included clarification of Bit 33 in the Data Link Capability Report. The description seemed to indicate that bit 33 is set differently if the Aircraft Identification Data is through a separate interface or the ADLP interface, which needed to be clarified.

5.1.13.2 A question was raised by the meeting regarding the intent of the note under table 3-6. JF modified the note to clarify that both previous and current information are included in Doc 9871, which resulted in the revision of this WP ([SP-ASWG13-WP/32R1](#)).

5.2 [SP-ASWG13-WP/06](#) – Doc 9924 Change Proposal (CP) to Correct Information in Tables, as prepared by Matt Haskin and Miles Bellman and presented by Miles Bellman

5.2.1 This WP presented by Miles Bellman (MB) included an examination of information contained in ICAO Doc 9924, Appendix M, Tables M-1, M-2, and M-3 with change proposals as appropriate. At a previous ASWG meeting, [SP3-ASWG8-WP/04R2](#) was presented to provide guidance to account for Identification, Friend or Foe (IFF) interrogation activity in estimating transponder occupancy. During the research for that WP, it was discovered that there were some errors in table M-3 of Doc 9924.

5.2.2 TSG checked the information included in table M-3 (Examples of total transponder occupancy times in microseconds (μ s)) of Doc 9924 and proposed appropriate changes. Furthermore it was decided that additional review was needed along with some accompanying diagrams to clarify the information. This WP fulfilled these prior action items. Additionally, errors were found in Tables M-1 and M-2, which were also addressed in this WP. Section 2 of this WP summarized the proposed changes and Appendix A of this WP included the suggested corrections to Tables M-1, M-2, and M-3 in the CP format.

5.2.3 ASWG/13 started its review but since a lack of appendices B and C was recognized, MB submitted appendices B and C during the meeting. The contents of the CP in this WP were agreed by the meeting. The WP was accepted as follows.

- **[CP ASM/23-SP-ASWG13- WP/06R1](#)**

5.3 [SP-ASWG13-WP/12](#) – Proposed Doc 9924 CP for Guidelines on I²SLS P1 Control Power Level, as prepared and presented by Anne Demers

5.3.1 This WP, presented by Anne Demers (AD), described a Doc 9924 CP regarding I²SLS guidelines for P1 Control power level. Nav Canada is dealing with a wide variety of radar generations and different suppliers. Due to siting complications, some radar sites are using the MSSR anti-reflection method I²SLS. New radar procurement and acceptance testing brought conflict with suppliers on the coincidence of P1 Σ and P1 Ω and allowed tolerances in the I²SLS control functionality.

5.3.2 In replying to a request from ASWG/10, pulse amplitude was also investigated and a draft Doc 9924 CP for P1 Control power level was developed and included in this WP. The meeting was informed that this CP was presented to ASWG/12 and the only differences from the original WP were additions of Appendix B and Appendix C. ASWG/13 reviewed the paper and the contents of the CP were agreed by the meeting. The WP was accepted as follows.

- **[CP ASM/24-SP-ASWG13- WP/12R1](#)**

5.3.3 Since [SP-ASWG13-WP/12R1](#) did not include time alignment, the meeting recognized the necessity of continuation of the action item. However due to resource issues and COVID constraints, the following action was placed on the pending action item list.

ACTION ITEM ASWG/13-18: TSG to prepare a Doc 9924 CP on I²SLS P1 Σ and P1 Ω time alignment.

5.4 [SP-ASWG13-WP/13](#)– Proposal for Amendment to Annex 10 Volume III for Allocation of Additional 24-bit Aircraft Addresses, as prepared by Vince Orlando and Randy Wiken and presented by Vince Orlando

5.4.1 This WP, presented by Vince Orlando, proposed a PfA to Annex 10 Volume III Chapter 9 for increasing the 24-bit aircraft address allocation of all States that currently are allocated 1024 addresses as well as satisfying specific State requests for an increased allocation of addresses. Requests from States have been made to ICAO for additional allocations of 24-bit aircraft addresses. These requests were from Columbia, Qatar and two other States from the Middle East (MID) Region. All of these States have been allocated 1024 addresses, except for Colombia which has been allocated 4096 addresses. No additional addresses have been allocated to requesting States as yet. In a second request, Qatar contacted ICAO to further increase their request for an allocation of additional addresses and indicated that even further requests for an allocation of additional addresses would be forthcoming in the near future.

5.4.2 The provisions included in A10V3 only provided an increase in aircraft address allocation to meet the needs of a requesting State. Given the potential future increase in address requirements for all States for surface vehicles and Remotely Piloted Aircraft System (RPAS), it is likely that one or more States would require an increase for each SARPs update cycle. This could lead to a need for frequent revisions to Table 9-1. For this reason, the ASWG preferred a proactive approach as contained in section 3.2 of this WP. In addition, at the ASWG/12, in reply to a comment about the possibility to incorporate material from the ICAO State Letter on “1090MHz spectrum issues and proper management of 24-bit aircraft addresses associated with unmanned aircraft operating exclusively at very low altitudes” (refer to SL 2019/77) in this PfA, this WP proposed an addition of a section 5.3 “guidance on assignment of 24-bit addresses to unmanned aircraft (UA)” and notes referring to Doc 9924. ASWG/13 reviewed this paper and the contents of the PfA in this WP were agreed by the meeting. The WP was accepted as follows.

- **[CPA10V3/03–SP-ASWG13- WP/13R1](#)**

5.4.3 A question was raised about inter-panel coordination with CP. MU explained her intent to submit and present a WP at the Communications Panel (CP) Data Communications Infrastructure Working Group (DCIWG), which will meet in May this year, seeking their comments. The Secretary is assuming that SP-ASWG will get some comments back from CP-DCIWG around the June time frame, which can be discussed at the next TSG meeting to resolve those comments before processing to the 4th meeting of the Surveillance Panel (SP/4). Considering the limited time available of CP-DCIWG, CP-DCIWG may have difficulty to understanding and digesting this PfA at their meeting, therefore in order to promote awareness of this PfA, following action was assigned to all.

ACTION ITEM ASWG/13-19: All to communicate with CP-DGIWG members nominated by their States/organizations in order to promote awareness of the PfA included in [SP-ASWG13-WP/13R1](#).

5.5 [SP-ASWG13-WP/15](#) –PfA to Annex 10 Volume IV for Correction of the Metric Altitude Field Encoding, as prepared by Eric Potier

5.5.1 EP presented this WP, which included a PfA to correct an error in the description of the altitude metric field in ICAO Annex 10 Volume IV. While incorporating new transponder MOPS revisions in SARPs, it was discovered that Annex 10 Volume IV has incorrect bit numbering of the altitude field when encoded in metric units.

5.5.2 ASWG/13 reviewed the paper and agreed with the PfA in principle.

*Note.- The relevant action, **ACTION ITEM ASWG/13-20**, was assigned to the Secretary under the agenda item 5.6.*

5.6 [SP-ASWG13-WP/16](#) – Revised PfA to Annex 10 Volume IV for Extended Squitter Rate, as prepared and presented by Tom Pagano

5.6.1 This WP, presented by TP, included a draft PfA to increase the Extended Squitter rates as originally agreed by ASWG10 and modified by ASWG12 to support extended squitter version 3, which will include the transmission of additional messages for Weather information, Interrogation Reply Monitoring and UAS contingency data. Additionally, this PfA was modified as a result of coordination with other PfAs produced and reviewed at TSG12 as part of the MOPS update package.

5.6.2 The original proposal to modify the current maximum extended squitter rate requirements in the SARPs included splitting the current section 3.1.2.4.1.3.2.1 into two subsections in order to have clear reference to the capabilities of old transponders and new transponders. Specifically, the ability to reply or not reply to the Mode A/C/S/ All-Call interrogation determines if the transponder is eligible for the increased 1090ES rate. This is necessary to adhere to the ASWG agreement that any increase in extended squitter rate is balanced by a reduction in transponder replies that result from transponder decoding of Mode A/C/S All-Call interrogations.

5.6.3 The meeting reviewed this WP, agreed to include this WP in the transponder MOPS update package, and the following action was assigned.

ACTION ITEM ASWG/13-20: MU to include the PfAs (refer to [SP-ASWG13-WP/15](#) and [SP-ASWG13-WP/16](#)) in the transponder MOPS update PfA (**ACTION ITEM ASWG/13-12**).

Agenda Item 6: Mode S and Extended Squitter

6.1 [SP-ASWG13-WP/04](#) –Mode S Transponder Non-compliance with SARPs, as prepared and presented by Eric Potier

6.1.1 EP presented [SP-ASWG13-WP/04](#), which provided a status update on the investigation of how to approach SARPs change to clarify what is required from existing and new surveillance sub-systems such as transponders. Several amendments produced by SP were introduced in Annex 10 Volume IV in the past ten years. An investigation conducted by the TSG identified that States and industry faced difficulties with the applicability of new SARPs requirements to already deployed systems, more particularly to airborne systems such as transponders that could require modification. This issue was discussed at the past ASWG meetings and it was requested for TSG to continue investigation on how this could be improved and also address how to better introduce the forthcoming updates of the transponder and 1090 MHz ADS-B MOPS. This WP further elaborated method one, which was described in section 2.4 of this WP for additional feedback from the group.

6.1.2 TSG also investigated the structure of Chapter 2 and Chapter 3 of Annex 10 Volume IV, where mainly transponder MOPS updates will be reflected. Chapter 2 may be considered as the top level chapter defining the transponder capability. This chapter is pointing to the different sections on Chapter 3 where the detailed protocols are defined. The WP explained that ideally it would be good if all new requirements with dates would be introduced in Chapter 2, which would refer to the detailed requirements in Chapter 3. This could be envisaged for transponders and for interrogators. This should facilitate the use of the SARPs by providing the interoperability and performance requirements in Chapter 2.

6.1.3 Many members expressed their support for the intent of this WP. However, some members expressed concerns on the difficulty of understanding a restructure of Annex 10 Volume IV without seeing a real example implementation of this proposal, which resulted in the following action item.

ACTION ITEM ASWG/13-22: Using the transponder update PfA produced by MU (**ACTION ITEM ASWG/13-12**), TSG to implement the proposals of categorizations of requirements and reorganization of Annex 10 Volume IV described in **SP-ASWG13-WP/04** and to present the consolidated transponder update PfA at the next ASWG meeting, ASWG/14. (In this proposal, the table of contents also needs to be updated and expanded to reflect lower level of contents and propose additions of hyper link to the table of contents and within the document).

6.2 SP-ASWG13-WP/05 –Surveillance Material in Doc 9830 A-SMGCS Manual, as prepared and presented by Hiromi Miyazaki

6.2.1 This WP, presented by Hiromi Miyazaki (HM), provided a status report on updating contents related to surveillance in Doc 9830 Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual. This report was prepared in response to Action Item ASWG/11-12.

6.2.2 Doc 9830 has not been updated for a long time and because of outdated contents, the meeting was informed that many States are using other documents as guidance materials instead of Doc 9830. In order to resolve this situation, the ASWG/6 tasked the TSG to start working on updating contents related to surveillance information included in Doc 9830. Originally the Doc 9830 update was planned to be performed from wider perspective including operational information. This WP explained changes from the original work programme, due to COVID-19 pandemic impact and resource constraints. The new work programme will focus on updating technical information regarding the surveillance systems described in this manual. The meeting agreed with this revised work programme. Furthermore, many members expressed their appreciation for HM's effort to continue this work.

ACTION ITEM ASWG/13-23: TSG to continue working on updating contents related to surveillance included in Doc 9830 Advanced Surface Movement Guidance and Control Systems (A- SMGCS) Manual.

6.3 SP-ASWG13-WP/07 –RTCA/ EUROCAE Combined Surveillance Committee (CSC) Related PfA and CP Development for ICAO Material, as prepared and presented by Tom Pagano

6.3.1 TP presented this WP, which included a summary of the work activity to update SARPs and Doc 9871 to reflect RTCA/EUROCAE Mode S Transponder and 1090 MHz Extended Squitter MOPS updates. The table in the WP enumerated the topics addressed by the CSC, and indicated the assignees and status of topics in progress by the TSG. TP further explained that the column task # indicated the status of each task; task # coloured in green is in progress or completed and coloured in white will be started in due course. He also explained that task # 8 is coloured in yellow since TSG recognized that this task must be coordinated with ACSG. The meeting was informed that TP and CA will start coordination regarding this item together with other PfAs as discussed in agenda item 5.1.8.

6.3.2 In reply to questions, the following were clarified.

- The timing of the first installation of DO-260C/ED-102B avionics is currently unknown, but not expected for several years. FAA is planning to update their ground systems to be able to receive/decode ADS-B Version 3 before 2024 (except implementation of Phased Overlay).
- In reply to a question on backwards-compatibility, it was confirmed that ADS-B version 3 is largely backwards-compatible. Therefore, decoding the version 3 message should not be a problem for the

version 2 receiver. However, it will depend on how the version 2 receiver deals with a received version number above 2. Also since there are new squitters and new message fields in version 3, it would be expected that a version 2 receiver will ignore such new information in version 3 messages.

6.3.3 The meeting expressed appreciation for the work already conducted and to be conducted by volunteers. The meeting was informed that a relevant WP, [SP-ASWG13-WP/07](#), would be presented under agenda item 6.11 and decided to assign an action item, [ACTION ITEM ASWG/13-32](#), under agenda item 6.11.

6.3.4 In addition, the meeting expressed some concern about the ICAO documents, beyond those documents under SP cognizance, which may be affected by new terminologies or changes in terminologies in the PfA transponder MOPS update package. This resulted in the following action items.

[ACTION ITEM ASWG/13-24](#): TSG to produce a list of new or amended terminologies to be introduced in Annex 10 Volume IV and SP-related guidance materials and to provide this list to MU.

[ACTION ITEM ASWG/13-21](#): Based on the list produced by TSG, MU to investigate ICAO documents to identify the need for potential consequential amendments to those documents, and to provide the results to TSG.

6.4 [SP-ASWG13-WP/08](#) – Estimate of Overall 1090 MHz Future Utilization, as prepared and presented by Steffen Marquard

6.4.1 Steffen Marquard (SM) presented this WP, which identified and summarized areas of concern in the use of 1090 MHz spectrum and, where appropriate, discussed proposals to reduce 1090 MHz congestion. Such proposals will be discussed in the TSG and, following agreement, will be developed into proposed amendments to SARPs and guidance materials.

6.4.2 The utilization of the 1030/1090 MHz frequencies has greatly increased in certain areas of the world and if no action is taken, the situation will reach an unacceptable level that will result in the corruption or loss of information from aircraft surveillance and collision avoidance systems. There are a number of applications competing for bandwidth on the 1030/1090 MHz frequencies. It must be ensured that the bandwidth is being utilized in the most efficient way and consider future applications that may require increased bandwidth.

6.4.3 The TSG is already tasked to look into the overall issue of 1090 MHz utilization, including the impact of evolving systems that share or will potentially contribute to utilisation of 1090 MHz. The current TSG tasking also covers the examination of techniques and capabilities that could reduce 1030/1090 MHz congestion. Annex A of this WP provided a table listing all identified issues related to 1030/1090 MHz spectrum load and possible mitigations. Annex A also contained information on affected ICAO documents and existing regulations and standards. All this material was considered as a basis to formulate appropriate provisions for ICAO SARPs and guidance materials. The following action was assigned to TSG.

[ACTION ITEM ASWG/13-25](#): TSG to look into the overall issue of the 1090 MHz utilisation. (This will include examining techniques and capabilities that could be considered to reduce 1090 MHz congestion such as ADS-B Aircraft Derived Data vs BDS extraction, Extended Hybrid Surveillance, ACAS-X introduction and Passive acquisition) TSG to consider the impact of evolving systems that will potentially share the 1090 MHz link (e.g. RPAS, ACAS-Xu, DAA, Mode 5, Electronic Conspicuity) contributing to the spectrum load.

6.5 SP-ASWG13-WP/09 – Analysis of US Airborne 1030/1090 MHz RF Data, as prepared and presented by Jack Field

6.5.1 This WP, presented by JF, provided results of analysis performed on collected airborne 1030/1090 MHz Radio Frequency (RF) data, collected from June 2018 through October 2019 across the United States, which were converted into Interrogation/Reply Monitor (IRM) format. The recently released Minimum Operating Performance Standards (MOPS) for Mode S and ADS-B, DO-181F/ED-73F and DO-260C/ED-102B included provisions for an optional capability known as IRM. This paper expands on the results presented in prior ASWG meetings by reformatting data collected by the 1030/1090 MHz RF Monitor into IRM format. The intent is to demonstrate characteristics of the data that will be available over IRM in comparison to other data recording systems.

6.5.2 For the purposes of this analysis, 1030/1090 MHz RF Monitor data were converted into IRM format. This required averaging the RF Monitor data (which is nominally at 1 Hz) over 15 seconds and then binning the data according to the resolution of each subfield. In some cases, it was also necessary to combine multiple RF Monitor data fields to equate to an IRM subfield. As seen in the figures in this WP, the core IRM messages are representative of the true 15-second average rates. The addition of the Phase Overlay messages with 1-second minimum and maximum rates would further allow the IRM data to approximate the raw data. The following action was assigned to TSG.

ACTION ITEM ASWG/13-26: TSG to further analyse airborne 1030/1090 MHz Radio Frequency data collected in the US and report significant results to a future ASWG meeting as deemed appropriate.

6.6 SP-ASWG13-WP/10 – Analysis of the 1030/1090 MHz Signal Environment in Japan, as prepared by Takuya Otsuyama, Junichi Honda and Hiromi Miyazaki and presented by Takuya Otsuyama

6.6.1 This WP was presented by Takuya Otsuyama (TO). This WP analysed the number of messages at 1090MHz using recorded data from multiple years of flight experiments. As with the signal occupancy rate analysis, the recorded data was replayed and processed by SDR analysis system. To validate the flight experimental data, a fixed receiver station experiment was conducted. The input signal was not a playback signal but real-time data received by the antenna at the ENRI. The outcome of this analysis concluded that the developed SDR system used to process the flight data is correctly working. The four DFs shown in the figure of the WP have almost the same number of occurrences in 10-seconds, although there were differences depending on the time of day. The meeting was informed that a detailed study has not yet been conducted. In the future, the same process will be performed using the playback signals obtained in the flight experiments, and the number of signals in each region will be analysed. The results of the ground and airborne measurements will be reported in a future meeting.

ACTION ITEM ASWG/13-27: TSG to further analyse 1030/1090 signal environment in Japan and report significant results to a future ASWG meeting.

6.7 SP-ASWG13-WP/11 –II/SI Codes for Lockout Override, Supplementary and Non All Call Acquisition, as prepared and presented by Jack Field

6.7.1 This WP, presented by JF, provided proposed changes to the SARPs related to lockout override and supplementary acquisition. Lockout override should be permitted on any interrogator code (IC), as the transponder will disregard the IC. Supplemental acquisition, which is limited by definition, should also be allowed on any IC. Finally, an interrogator not using all-calls (e.g. MLAT) should also be able to insert any IC in the surveillance interrogation. Section 2.1 to 2.5 in this WP described the detailed changes proposed

to Annex 10 Volume IV. In addition, this WP included a draft Change Proposal to Doc 9924 (refer to section 2.6 and 2.7 of this WP).

6.7.2 The meeting agreed with proposals described in this WP in principle and the following action was assigned to TSG.

ACTION ITEM ASWG/13-28: TSG to prepare PfA and CP for clarifying assignment of IIS codes for Multilateration and GICB interrogations.

6.8 SP-ASWG13-WP/14– Guidance for Reduced Performance Devices on 1090 MHz, as presented by Steffen Marquard

6.8.1 TSG was tasked to develop technical guidance on the use of 1090 MHz devices with reduced performance/capability on aircraft not equipped with transponders. Reduced performance devices are intended for situational awareness enhancement in General Aviation aircraft, gliders, drones/UA, balloons etc. in VFR operation in uncontrolled airspace. Reduced performance devices have specific characteristics which are different from ADS-B systems utilized for civil aviation operations. For example, these devices are usually non-transponder systems, utilizing ADS-B for provision of air-to-air traffic information. These devices are mainly self-contained and portable with no interface to other on-board systems. Despite the claimed conformance to MOPS, ICAO documents and national or international frequency allocations, reduced performance devices in general do not have an airworthiness certificate. It is not guaranteed that they would pass the tests to achieve that certificate, which is a prerequisite to ensure interference-free operation in an ATC environment. Beside the risk of unwanted interference due to non-conformant device behaviour, there also exists a potential risk of 1090 MHz congestion due to massive use of these devices and possible depletion of the 24-bit aircraft address block allocated to a State. This WP, presented by SM, contained a Change Proposal to Doc 9924 to include material describing Low-Power 1030/1090 MHz Devices, their performance specifications, shortcomings, benefits and impact on the RF environment from those devices.

6.8.2 The meeting provided many comments on specific text used in this CP. This included a request for using standard terminology rather than specific terminology such as “reduced capabilities”, for clarifying the meaning of “appropriate quality filtering” used in the CP, and for deletion of the last line in Section 2.5, “only be used for the provisions of flight information service” in order to avoid confusion. SM explained that those comments would be taken into account for finalizing this CP, which will be provided at the next meeting.

ACTION ITEM ASWG/13-29: TSG to finalize technical guidance material related to Low-Power 1030/1090 MHz Devices to be included in Doc 9924 and present it to a future ASWG meeting (targeting at NLT SP/4 approval).

6.9 SP-ASWG13-WP/17 –Interference Protection Criteria for Systems under the Purview of the ICAO SP, as prepared and presented by Chris Tourigny and Tom Pagano

Note: CP-DCIWG members joined the ASWG meeting for presentation and discussion of this paper and also to present and discuss Flimsy 2, which is described in agenda item 6.14.

6.9.1 Chris Tourigny (CP) presented this WP, which provided perspectives on receiver protection and measurement data to help facilitate the discussion of interference protection criteria focused on cooperative systems under the purview of the Surveillance Panel.

6.9.2 The perspectives provided in this working paper on receiver protection and measurement data is intended help facilitate the discussion of interference protection criteria (IPC) focused on the ICAO-standardized systems under the purview of the ICAO SP. There are two commonly used approaches to IPC, the C/I and I/N methods. The information presented may be useful to either method; however a general principle is provided that states the average “I” in C/I or I/N may not be greater than the average “N” in I/N, as that would redefine the noise floor of the receiver and likely use all of the margin the manufacturer designed into the receiver minimum signal-to-noise ratio (SNR). It’s important to note that this principle is straightforward to apply to continuous interference sources, however for pulsed interference sources or sources with less than 100% duty cycle, further analysis of the specific waveforms and duty cycle may be necessary to apply this IPC method.

6.9.3 The interim IPC of -20 dB I/N was recommended by the TSG and the work in this WP is intended to facilitate a review and potential update of that interim guidance. Theoretical calculations are provided to test if an IPC of -10 dB I/N would be sufficient. The determination of an updated minimum I/N IPC needs additional discussion in the TSG and may require measurements of receiver performance in the presence of interference.

6.9.4 The meeting noted information on this WP and asked TSG and CP-DCIWG to continue discussion of the LDACS-to-SP system interference analysis in the June 2021 TSG meeting to achieve agreement on the protection of systems under the purview of the SP.

6.9.5 Questions were raised by CP-DCIWG members regarding past analysis when UAT was introduced (UAT operates on 978 MHz). TP explained that there were no interference protection criteria at that time, therefore -20 dB I/N was not used. However, extensive tests to validate compatibility and interoperability were conducted, which resulted in introduction of some measures to protect transponder systems from UAT interference. In reference to this WP, CT further stated that -20 dB I/N is assumed to be used for all ICAO standardized and non-ICAO standardised systems, but in case of ICAO standardized systems that fail to meet this, additional analysis should be performed on a case-by-case basis.

ACTION ITEM ASWG/13-30: TSG to investigate receiver protection criteria and other requirements focused on cooperative systems (as the International Telecommunications Union Radiocommunication Sector (ITU-R) is currently focused on protection criteria for non-cooperative systems based on the band they operate in). TSG to report back to ASWG on this topic at least annually.

6.10 SP-ASWG13-WP/18 –Update to Table of Differences between 1090ES Versions, as prepared and presented by Tom Pagano

6.10.1 In response to Action Item ASWG/11-27, this WP, presented by TP, provided a summary of the parameters that are contained in 1090ES along with the ADS-B messages that convey the parameter and which versions provide the information. Version 3 MOPS has been completed and this version as well as previous versions have incorporated changes from the previous version. For the most part, the basic horizontal and vertical position data has remained intact throughout each version to maintain backward compatibility. Version 3 provides additional horizontal and vertical position reporting capability beyond what was possible in previous versions. Limitations in reporting higher altitudes and velocities existed prior to version 3.

6.10.2 The meeting was informed that the table was modified based on comments received during TSG meeting in January 2020 and after the ASWG meeting held in March 2020. In addition, the updated table reflects comments from the discussion at TSG/11 of TSG WP 11-26 as well as changes that resulted from RTCA/EUROCAE Combined Surveillance Committee final MOPS changes.

6.11 SP-ASWG13-WP/19 –Updating ICAO Doc 9871, as prepared and presented by Tom Pagano

6.11.1 In reply to action item/12-11, this WP, presented by TP, provided a discussion on the high level approach to updating Doc 9871. The TSG is expected to begin updating Doc 9871, which involves incorporating 1090ES version 3 as well as Mode S transponder updates that conform to Mode S subnetwork version number 6. The attached briefing reviewed the current Doc 9871 structure and the options to modify the current edition to reach edition 3.

6.11.2 This WP also explained options for inserting some new material associated with version 3 in Doc 9871 considered by the TSG. The addition of ADS-B version 3 can be added in the manner that version 2 was incorporated into Doc 9871 Edition 1 to update to Doc 9871 Edition 2. Utilizing RTCA/EUROCAE 1090 MHz Extended Squitter MOPS Appendix A provides a working basis for updating Doc 9871 and will facilitate the development of Doc 9871 Edition 3.

ACTION ITEM ASWG/13-32: TSG to continue development of Doc 9871 CPs to reflect the RTCA/EUROCAE MOPS updates

6.12 SP-ASWG13-WP/37- Resolution of Conflicting Text in Doc 8071 Vol III regarding Flight Inspections, as prepared and presented by Ho Wee Sin

6.12.1 This WP, presented by Ho Wee Sin (HWS), highlighted that there were conflicting provisions in Doc 8071 Vol III regarding flight inspections and proposed some amendments. Section 2.8 of Appendix A of Doc 8071 Vol III states that periodic flight inspections are not required after commissioning, unless there is specific problem investigation. However, section 2.5 of Appendix B of Doc 8071 Vol III states that there must be flight inspections every 120 days. These two provisions are in conflict and some States might be forced to adopt the more stringent requirement. Based on surveying several ANSPs, the WP explained that section 2.8 of Appendix A is being used as guidance by those ANSPs instead of section 2.5 of Appendix B. Therefore, correction of section 2.5 in Appendix B is recommended.

6.12.2 A question was raised on the proposed change of section 2.5 in Appendix B, especially in regards to changing “routine” to “periodic”. The meeting started discussion on this terminology but concluded that inputs from States/ANSPs would be welcome to determine in the proper course of action regarding this CP. This resulted in the following action items.

ACTION ITEM ASWG/13-08: All to investigate national situation of routine flight inspection referred to in Para 2.5 of Appendix B of Doc 8071 Vol III (refer to [SP-ASWG13-WP/37](#)) and report the outcome to TSG by end of May 2021.

ACTION ITEM ASWG/13-35: Taking into account comments provided by All ([Action item ASWG/13-08](#)), TSG to investigate text in Doc 8071 Vol III regarding Flight Inspections (refer to [SP-ASWG13-WP/37](#)) and report the outcome to a future ASWG meeting.

6.13 SP-ASWG13-WP/38- Guidance Material for Assignment of Interrogator Codes in a Mixed Environment, as prepared and presented by Ho Wee Sin

6.13.1 This WP, presented by HWS, discussed the current limitation in the ICAO documentation on the assignment of Interrogator Codes (IC) in an environment with the presence of non SI-capable transponders.

6.13.2 Although ICAO Annex 10 Vol 4 required that all Mode S transponders must be SI-capable by 1 January 2005, in practice, not all Mode S transponders in operation are SI-capable. Only SI-capable transponders will be able to recognize the full SI in the roll-call (lock out) message. Non SI-capable

transponders will only be able to recognize the last 4 bits, and hence will mistakenly lock out to other radars with different SI codes, but which have SI codes with the same last 4 bits. To deal with this issue, Europe employed a special mode of operation known as the II/SI Code Operation when migrating from II to SI codes.

6.13.3 The meeting was informed that the WP was prepared due to the discussion happening in the Asia Pacific region where due to the expected shortage of II codes, they are now looking to migrate to SI code operation. Considering such a transition, appropriate guidance is required and ASWG was requested to develop ICAO guidance based on Eurocontrol's documents.

6.13.4 The meeting expressed support to develop such guidance which should be included in Doc 9924. The following action was assigned to TSG.

ACTION ITEM ASWG/13-33: TSG to develop guidance material for assignment of interrogator II/SI Codes including II/SI Code Operation in a mixed environment (refer to [SP-ASWG13-WP/38](#)).

6.14 SP-ASWG13-Flimsy 02- LDACS Transmission Spectrum Mask, as prepared by Project Team Terrestrial Data Link (PT-T) of the ICAO Communications Panel

6.14.1 This WP was presented by Bernhard Haindl (BH) on behalf of PT-T of ICAO Communication Panel. BH explained that slide sets included in this flimsy 02 focus only on comparison between LDACS transmission spectrum masks and UAT spectrum masks to make an assumption on compatibility between LDACS and SSR. Slide 4 of the Attachment (SP-ASWG13-Flimsy02.1) showed a comparison of out of band emission of UAT and LDACS. It indicated LDACS out of band emission is 42 dB lower than one from UAT at the 4 MHz off set. If there is no interference from UAT to 1030 MHz, this should be considered as indicating that no interference should be expected from LDACS to 1030 MHz, although it should be noted some difference between UAT and LDACS, LDACS duty cycle is 9% but UAT has much lower duty cycle 1%.

6.14.2 It was noted that at the last TSG, a more comprehensive presentation was made which indicated a possible impact to a 1090 MHz receiver. Many TSG members raised concerns about this. To clarify the intent of this flimsy, Noppadol Pringvanich (NP) explained that this flimsy was presented to continue discussion between PT-T and TSG but also to note past experience. Noting the similarities between UAT and LDACS and no issues of interference to SSR/ADS-B caused by UAT, PT-T assumes it will have a similar outcome between LDACS and SSR/ADS-B. However, TP explained that UAT did have impact on 1030 MHz, therefore requirements to mitigate such impacts were introduced. The UAT community accepted a requirement to activate the mutual suppression bus during transmissions to prevent UAT interference with transponder operations. TP explained that this requirement is not reflected in SARPs, but documented in a technical manual (refer to ICAO Doc 9861, Manual on the Universal Access Receiver (UAT)).

6.14.3 The rapporteur expressed appreciation regarding the presentation to ASWG, but concluded that PT-T and TSG should continue their discussion to carefully and appropriately protect existing systems to be operated in the same band of 960-1215 MHz.

6.15 SP-ASWG13-Flimsy 03- Interference of ICAO-defined systems on systems operation at 1030 MHz and at 1090 MHz (A liaison statement from ETSI), as prepared and presented by the Panel Secretary

6.15.1 This flimsy was presented by MU. ICAO received a liaison statement from TG AERO of the European Telecommunications Standards Institute (ETSI), seeking ICAO's guidance on the expected level

of interference or false processing that is expected to be generated by future ICAO-defined systems (e.g. LDACS) over the current systems operating in the 1030MHz and 1090 MHz band.

6.15.2 Considering the nature of the guidance they are seeking, the Secretary believed that this is related to SP's on-going work currently performed by TSG (related to SP-ASWG13-WP/17). Therefore SP-ASWG and TSG are invited to provide information relevant on the subject described above. Furthermore, since this issue is deeply related to spectrum management, it is essential to have a proper coordination with and assistance from the Frequency Spectrum Management Panel (FSMP); therefore the Secretary would like to seek a proper coordination with FSMP regarding this topic. However she also explained that the LS received from ETSI did not provide enough information on the purpose and background of their request, therefore she feels that it might be impossible for TSG and ASWG to draft a useful reply. Therefore as an intermediate solution, the following action was assigned to MU.

ACTION ITEM ASWG/13-34: In coordination with SP chairperson and chairpersons and secretaries of FSMP and CP-DCIWG, MU to draft a brief reply e-mail to ETSI to get more information on their request (seeking ICAO's guidance on interference protection criteria from future ICAO-defined systems (e.g. LDACS) over the current systems operating in the 1030MHz and 1090 MHz). If additional information were provided by ETSI, those should be provided to TSG (copy to FSMP and CP-DCIWG) so that TSG can start considering the reply liaison statement to ETSI.

Agenda Item 7: Airborne Collision Avoidance Systems (ACAS) and Detect and Avoid (DAA)

Note.- This agenda was discussed under Agenda Item 3.2.2.

Agenda Item 8: Any Other Business

8.1 Element of Discussion for the ACSG and AIRB WG work arrangement (SP-ASWG13-WP/33R1), as prepared by Jean-Marc Loscos and Christian Aveneau and presented by Jean-Marc Loscos

8.1.1 **SP-ASWG13- WP/33R1**, presented by Jean-Marc Loscos (JML), proposed to change the current SP working arrangements, to place ACSG under AIRB WG, aiming at providing potential benefits by broader expertise, while assessing risks of impact on each group. This WP also identified the administrative changes required (including a ToR change in Appendix A) and proposed a timeline for a trial/transition to the new configuration.

8.1.2 The meeting was informed that similar WPs were also presented to ACSG and AIRB WG/11. The meeting was informed that some ACSG members expressed their concerns that new arrangements and new members would slow down their pace of work. To reply to those concerns, this WP included section 2.4 indicating those risks should be manageable and in the end this arrangement will bring more benefits to the entire SP. Some SP members expressed strong support for this new working arrangement noting the benefits described in section 2.3.3.

8.1.3 To reply to questions raised by the meeting, JML clarified that Appendix A is not any SP working group's TOR but is the Surveillance Panel's TOR, which was developed and agreed by the ANC. Except for a deletion of the note in the TOR, he does not expect any changes required for this working arrangement.

With deletion of the note, the revised TOR will give SP more freedom on the work arrangements of the work programmes associated with the entire SP.

8.1.4 The meeting was informed that following AIRB WG and ACSG joint meetings are scheduled until SP/4. ASWG /13 agreed with actions proposed in this WP and expressed support for the transition plan.

- *Ad-hoc* ACSG drafting meetings
- June 2021: normal ACSG meeting (1 day) with AIRB-WG invited followed by *ad-hoc* AIRB-WG meeting (1 day focusing on IM procedure) with ACSG invited
- *Ad-hoc* ACSG drafting meetings
- 27-29 October 2021: AIRB WG/12 with an ACSG slot

8.1.5 The meeting recognized the need to explain this new working arrangement and that changes of the SP TOR must be proposed to the ANC through SP/4, which resulted in the following action item.

ACTION ITEM ASWG/13-31: In coordination with MU, AIRB-WG and ACSG Chairpersons to organize the related meetings described in [SP-ASWG13-WP/33R1](#) and report back to SP/4 (as well as submit any relevant WP on this subject to SP/4).

8.2 Future meetings

8.2.1 ASWG/13 reviewed the following schedule of future meetings. It was noted that newly added or modified information were highlighted in grey. Furthermore, although the meeting agreed with the schedule described below in principle, considering the current difficulties due to COVID-19, the meeting suggested that the Strategic Advisory Sub Group should decide the feasibility of a face-to-face meeting in Q4 2021. In addition, the meeting suggested that SASG would also discuss the time schedule of SP/4 (and SP/5) and potential 2023 meeting dates. The secretary agreed with this proposal and confirmed that she would consult SASG, then would inform ASWG members/advisors of SASG decisions by 1 August 2021. The following actions were assigned to Secretary. It was also acknowledged that even if a face-to-face meeting were held in Q4 2021, some participants may need to participate virtually.

ACTION ITEM ASWG/13-36: MU to organize SASG meeting to discuss 1) feasibility of face to face SP/4 meeting in 2021; 2) time schedule of SP/4 (and SP/5); and 3) discussion of potential 2023 meeting dates by no later than end of July 2021.

ACTION ITEM ASWG/13-37: MU to inform ASWG members of SASG decision whether ASWG/14 would be held in face-to-face or virtually no later than 1 August 2021.

1) Q4 2021 – The fourth meeting of the Surveillance Panel (SP/4)

SP/4	27 October -5 November 2021	CR3 ICAO Montreal Canada
• AIRB WG/12	27-29 October 2021	
• The members only meeting	1 November 2021	
• The first plenary	1 November 2021	
• ASWG/14	1-3 November 2021	
• The second/last plenary	4-5 November 2021	

2) Q2 2022

AIRB WG/13	28 March -1 April 2022 (5 days booked to accommodate ACSG)	CR5 ICAO Montreal Canada
ASWG/15	4 – 8 April 2022	

3) Q4 2022 – The fifth meeting of the Surveillance Panel (SP/5)

SP/5	17-28 October 2022	CR3 ICAO Montreal Canada
• AIRB WG/14	17-21 October 2022 (5 days booked to accommodate ACSG)	
• The members only meeting	24 October 2022	
• The first plenary	24 October 2022	
• ASWG/16	24-26 October 2022	
• The second/last plenary	27-28 October 2022	

8.3 SP-ASWG13-Flimsy/01 – List of action items ASWG/13.

8.3.1 The meeting reviewed the list of action items, which items are still open or which are arising from ASWG/13, made appropriate revisions, as recorded in [SP-ASWG13-Flimsy/01R2](#).

Annex A – Attending Members and Advisors (ASWG/13)

State/IO	Status	Full Name (Last name, first name)	Email
AUSTRALIA	MEMBER	Cook, David	David.Cook@casa.gov.au
	ADVISER	Bollard, Jeffrey	jeffrey.bollard@airservicesaustralia.com
AUSTRIA	ADVISER	Haindl, Bernhard (CP-DCIWG PT-T)	Bernhard.HAINDL@frequentis.com
BRAZIL	MEMBER	Apolinario, José Izidro	izidroja@decea.gov.br ; izidroja@hotmail.com
	ADVISER	Souza, Victor	santannavss@decea.gov.br
	ADVISER	Fagundes, Marcelo Mello	fagundesmmf@decea.gov.br
CANADA	MEMBER	Demers, Anne	Demeran@navcanada.ca
CHINA	MEMBER	Li, Xin	lixin@atmb.net.cn ; lixin_caac@163.com
	ADVISER	De, Zhang	zdcaac@163.com
	ADVISER	Huo, Zhenfei	huozhenfei@atmb.net.cn
	ADVISER	Kaiyan, Jin (Jacky)	jin.kaiyan@yahoo.com ; jinky@adcc.com.cn
	ADVISER	Li, Gang	13801316550@163.com
FRANCE	MEMBER	Aveneau, Christian	christian.aveneau@aviation-civile.gouv.fr
	MEMBER	Loscos, Jean-Marc	Jean-marc.loscos@aviation-civile.gouv.fr
	ADVISER	Jauny, Éric	eric.jauny@aviation-civile.gouv.fr
GERMANY	MEMBER	Marquard, Steffen	Steffen.marquard@dfs.de
	ADVISER	Schnell, Michael (CP-DCIWG PT-T rapporteur)	Michael.Schnell@dlr.de
INDIA	MEMBER	Kant, Ravi	gmnschqnad@aai.aero ; rkant@aai.aero
	ADVISER	Rajan K. Soundara	ksrajan@aai.aero
	ADVISER	Parihar, Pawan	pawanparihar@aai.aero ; parihar_pawan@rediffmail.com
	ADVISER	Gupta , Ajay	ajaygupta@aai.aero
	ADVISER	Acharjee , Sekhar	sekhar@aai.aero
JAPAN	MEMBER	Otani, Yasuhiro	ohtani-y48ae@mlit.go.jp
	ADVISER	Uehara, Kenji	uehara-k46qj@mlit.go.jp
	ADVISER	Miyazaki, Hiromi	hiro@mpat.go.jp
	ADVISER	Otsuyama, Takuya	otsuyama@mpat.go.jp
	ADVISER	Honda, Junichi	j-honda@mpat.go.jp
	ADVISER	Fujimori, Takeo	fujimori-t183@jrnsa.or.jp
	ADVISER	Ozeki, Shigeru	ozeki-s200@jrnsa.or.jp
KENYA	MEMBER	Nyambaka, Joel	janyambaka@kcaa.or.ke
SINGAPORE	MEMBER	Ho, Wee Sin	HO_Wee_Sin@caas.gov.sg
	ADVISER	Kwek Chin Lin	kwek_chin_lin@caas.gov.sg
	ADVISER	Lee , Suk Leng	LEE_Suk_Leng@caas.gov.sg
SOUTH AFRICA	MEMBER	Gersbach, Carel HB	carelg@atns.co.za
	(MEMBER)	Nhlakanipho Mnguni	nhlakaniphom@atns.co.za
SWEDEN	MEMBER	Sundell, Morgan	morgan.sundell@lfv.se

State/IO	Status	Full Name (Last name, first name)	Email
THAILAND	MEMBER	Phrukumwong, Chanyut	chanyut.ph@aerorhai.co.th
	ADVISER	Phankrawee, Pattharasit	pattharasit.ph@aerorhai.co.th
	OBSERVER	Kulsawate Yuthapong	yuthapong.ku@aerorhai.co.th
	OBSERVER	Wattayatin Ponlawat	ponlawat.wa@aerorhai.co.th
	OBSERVER	Jilao Faruk	faruk.ji@aerorhai.co.th
UNITED KINGDOM	(MEMBER)	McKay, Stuart	Stuart.Mckay@caa.co.uk
UNITED STATES OF AMERICA	MEMBER	Suchy, Neal	neal.suchy@faa.gov
	MEMBER	Arbuckle, Doug	Doug.Arbuckle@faa.gov
	ADVISER	Tourigny, Chris	chris.tourigny@faa.gov
	ADVISER	Bellman, Miles	miles.e.bellman@faa.gov
	ADVISER	Haskin , Matt	Matthew.D.Haskin@faa.gov
	ADVISER	Rodriguez J, Alex	Alejandro.Rodriguez@faa.gov
	ADVISER	Orlando, Vincent	orlando@ll.mit.edu
	ADVISER	Pagano, Thomas	thomas.ctr.pagano@faa.gov
	ADVISER	Field , Jack	jmfield@mitre.org
	ADVISER	Darr, Steve	darr@dynamiccaerospace.com
	ADVISER	Olson, Wesley	wes.olson@ll.mit.edu
	ADVISER	Wiken, Randy	wiken@ll.mit.edu
	ADVISER	Von Hoene, Paul	Paul.VonHoene@faa.gov
CANSO	MEMBER	Nzyoka, Julius	jnzyoka@kcaa.or.ke
EUROCONTROL	MEMBER	Potier, Eric	eric.potier@eurocontrol.int
IATA	MEMBER	Pringvanich, Noppadol	pringvanin@iata.org
ICCAIA	MEMBER	Capezzuto, Vincent	vincent.capezzuto@aireon.com
IFALPA	MEMBER	Bürger, Moritz	moritz.buerger@vcockpit.de
	ADVISER	Couchman Carole	carolecouchman@ifalpa.org
IFATCA	MEMBER	Baca , Ignacio	ignacio.baca@ifatca.org
	ADVISER	Akpore , Samson	scooakpore@gmail.com; samson.akpore@ifatca.org
RTCA	OBSERVER	Secen, Al	asecen@rtca.org
ICAO	Secretary	Gulam, Raza	RGulam@icao.int
	Secretary	Utsunomiya, Mie	MUtsunomiya@icao.int

**Annex B – Agenda for the 13th Meeting of the Surveillance Panel
Aeronautical Surveillance Working Group (SP-ASWG13),**

Web Meeting, From 12 April to 16 April 2021

Agenda Item 1: Approval of the Agenda

- [SP-ASWG13-WP/01R3](#) – Proposed Meeting Agenda

Agenda Item 2: Business from previous meetings

2.1 Reports on the previous meetings

- [SP-ASWG13-WP/02R1](#) – Final Report of the 12th Meeting of the Aeronautical Surveillance Working Group (SP-ASWG/12) which was held through WebEx from 21 to 25 September 2020

2.2 Actions from previous meetings

2.1.1 Actions on the Panel Secretary

2.1.2 Actions on the Rapporteur

2.1.3 Actions on the TSG

2.2.3.1 (TSG action items status pending)

2.1.4 Actions on the Airborne Collision Sub-Group (ACSG)

2.1.5 Actions on the Performance Based Surveillance Sub-Group (PBSSG)

2.1.6 Actions on all SP Members

2.1.7 Actions on Individuals

Agenda Item 3: Reports from ICAO groups

3.1 Report from the panel secretary

- [SP-ASWG13-WP/34R1](#) – Report and update from the Surveillance Panel Secretary
- [SP-ASWG13-IP/01](#) – New document exchange platform to facilitate access to material developed by standards-making organizations (SMOs)

3.2 Report from other ICAO groups

3.1.1 Technical Subgroup (TSG) Report

- [SP-ASWG13-WP/03R1](#) –TSG Virtual Meeting Report 12 to 16 February 2021

3.1.2 Airborne Collision Subgroup (ACSG) Report

- [SP-ASWG13-WP/35](#) –ACSG Meeting Report

3.1.3 Performance-Based Surveillance Sub-Group (PBSSG) Report

- [SP-ASWG13-WP/36](#) –PBSSG Meeting Report

Agenda Item 4: Reports from other Groups

4.1 International organization report in alphabetical order

- 4.1.1** [SP-ASWG13-IP06](#) – Eurocontrol Report on Surveillance and ACAS activities in Europe

4.2 State reports in alphabetical order

- 4.1.2** [SP-ASWG13-IP/03](#) – Preliminary Research on Probability of Update (PU) Application by ADS-B Data of China, as prepared by Mr. Jin Kaiyan and Ms. Zuo Di and presented by Mr. Jin Kaiyan
- 4.1.3** [SP-ASWG13-IP/04R1](#) – The Update Activity of Surveillance System in China, as prepared by Zhenfei Huo and XinLi and presented by Xin Li
- 4.1.4** [SP-ASWG13-IP/02](#) – Recent ADS-B Avionics Issues Observed in The United States, as prepared by Alejandro Rodriguez
- 4.1.5** [SP-ASWG13-IP/05](#) – ADS-B Equipage and Quality Performance in the United States, as prepared and presented by Doug Arbuckle

Agenda Item 5: Review Proposed Change Proposals for SARPs and Docs

5.1 PfAs to Annex 10 Volume VI relevant to transponder MOPS updates

Note.- The PfAs in section 5.1 will be initially presented to ASWG as listed below for ease of understanding by ASWG members. However, for final ASWG consideration and approval of these proposed changes, one consolidated PfA will be created by the Secretary. Task numbers and their details are included in Appendix B of this WP.

- 5.1.1** [SP-ASWG13-WP/20R1](#) – A10V4 PfA Relating to Task Number 23, as prepared and presented by Alex Rodriguez
- 5.1.2** [SP-ASWG13-WP/21R1](#) – A10V4 PfA Relating to Task Number 16 and 29, as prepared by Stephen Darr and Martin Gray and presented by Stephen Darr
- 5.1.3** [SP-ASWG13-WP/22](#) – A10V4 PfA Relating to Task Number 9, as prepared and presented by Matt Haskin
- 5.1.4** [SP-ASWG13-WP/23R1](#) – A10V4 PfA Relating to Task Number 24, 47, 49 and 50, as prepared by Matt Haskin and Jack Field and presented by Matt Haskin
- 5.1.5** [SP-ASWG13-WP/24](#) – A10V4 PfA Relating to Task Number 07, as prepared and presented by Eric Potier and Martin Gray
- 5.1.6** [SP-ASWG13-WP/25](#) – A10V4 PfA Relating to Task Number 04 and 06, as prepared and presented by Tom Pagano
- 5.1.7** [SP-ASWG13-WP/26R1](#) – A10V4 PfA Relating to Task Number 01, 12, 15, 21, 22, 48, and 51, as prepared and presented by Jack Field

- 5.1.8 [SP-ASWG13-WP/27R1](#) – A10V4 PfA Relating to Task Number 02, 03 and 19, as prepared and presented by Eric Potier
- 5.1.9 [SP-ASWG13-WP/28R1](#) – A10V4 PfA Relating to Task Number 11, as prepared and presented by Tom Pagano
- 5.1.10 [SP-ASWG13-WP/29R1](#) – A10V4 PfA Relating to Task Number 26, 61 and 62, as prepared by Tom Pagano and Tim Steiner and presented by Tom Pagano
- 5.1.11 [SP-ASWG13-WP/30](#) – A10V4 PfA Relating to Task Number 59, as prepared and presented by Eric Potier
- 5.1.12 [SP-ASWG13-WP/31R1](#) – A10V4 PfA Relating to Task Number 20, as prepared and presented by Eric Potier
- 5.1.13 [SP-ASWG13-WP/32R1](#) – A10V4 PfA Relating to Task Number 13, as prepared and presented by Jack Field
- 5.2 [SP-ASWG13-WP/06R1](#) – Doc 9924 Change Proposal (CP) to Correct Information in Tables, as prepared by Matt Haskin and Miles Bellman and presented by Miles Bellman
- 5.3 [SP-ASWG13-WP/12R1](#) – Doc 9924 CP for Guideline on I²SLS P1 Control Power Level, as prepared and presented by Anne Demers
- 5.4 [SP-ASWG13-WP/13R1](#) – Proposal for Amendment to Annex (PfA) 10 Volume III for Allocation of Additional 24-bit Aircraft Addresses, as prepared by Vince Orlando and Randy Wiken and presented by Vince Orlando
- 5.5 [SP-ASWG13-WP/15](#) – PfA to Annex 10 Volume IV for Correction of the Metric Altitude Field Encoding, as prepared and presented by Eric Potier
- 5.6 [SP-ASWG13-WP/16](#) – Revised PfA to Annex 10 Volume IV for Extended Squitter Rate, as prepared and presented by Tom Pagano

Agenda Item 6: Mode S and Extended Squitter

- 6.1 [SP-ASWG13-WP/04](#) – Transponder Non Compliance with SARPs, as prepared and presented by Eric Potier
- 6.2 [SP-ASWG13-WP/05](#) – Surveillance Material in Doc 9830 A SMGCS Manual, as prepared and presented by Hiromi Miyazaki
- 6.3 [SP-ASWG13-WP/07](#) – RTCA/ EUROCAE Combined Surveillance Committee (CSC) Related PfA and CP Development for ICAO Material, as prepared and presented by Tom Pagano
- 6.4 [SP-ASWG13-WP/08](#) – Estimate of Overall 1090 MHz Future Utilization, as presented by Steffen Marquard

- 6.5 [SP-ASWG13-WP/09](#) – Analysis of US Airborne 1030/1090 MHz RF Data, as prepared and presented by Jack Field
- 6.6 [SP-ASWG13-WP/10](#) – Analysis of the 1030/1090 Signal Environment in Japan, as prepared by Takuya Otsuyama, Junichi Honda, and Hiromi Miyazaki and presented by Takuya Otsuyama
- 6.7 [SP-ASWG13-WP/11R1](#) – II/SI Codes for Lockout Override, Supplementary and Non All Call Acquisition, as prepared and presented by Jack Field
- 6.8 [SP-ASWG13-WP/14](#) – Guidance for Reduced Performance Devices on 1090 MHz, as presented by Steffen Marquard
- 6.9 [SP-ASWG13-WP/17](#) – Interference Protection Criteria for Systems under the Purview of the ICAO SP, as prepared and presented by Chris Tourigny and Tom Pagano
- 6.10 [SP-ASWG13-WP/18](#) – Update to Table of Differences between 1090ES Versions, as prepared and presented by Tom Pagano
- 6.11 [SP-ASWG13-WP/19](#) – Updating ICAO Doc 9871, as prepared and presented by Tom Pagano
- 6.12 [SP-ASWG13-WP/37](#) – Resolution of Conflicting Text in Doc 8071 Vol III regarding Flight Inspections, as prepared and presented by Ho Wee Sin
- 6.13 [SP-ASWG13-WP/38](#) – Guidance Material for Assignment of Interrogator Codes in a Mixed Environment, as prepared and presented by Ho Wee Sin
- 6.14 [SP-ASWG13-Flimsy 02](#)- LDACS Transmission Spectrum Mask, as prepared by Project Team Terrestrial Data Link (PT-T) of the ICAO Communications Panel
- 6.15 [SP-ASWG13-Flimsy 03](#)- Interference of ICAO-defined systems on systems operation at 1030 MHz and at 1090 MHz (A liaison statement from ETSI), as prepared and presented by Secretary

Agenda Item 7: Airborne Collision Avoidance Systems (ACAS) and Detect and Avoid (DAA)

Agenda Item 8: Any Other Business

- 8.1. [SP-ASWG13-WP/33R1](#) – Elements of discussion for the ACSG and AIRB-WG work arrangements, as prepared by Christian Aveneau and Jean-Marc Loscos and presented by Jean-Marc Loscos
- 8.2. Future meetings
- 8.3. Summary of results and preparation for next meeting - [SP-ASWG13-Flimsy 01R2](#)-List of action items ASWG13

PfA to Annex 10 Volume VI relevant to transponder MOPS updates

Task #	MOPS Change	Applicable ICAO Document	Section(s)	Source Material(s)	Assignee	Applicable MOPS	ASWG/13 WP#
1	Dead Time	SARPS	3.1.2.10.3.2		Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/26R1
2	New Level 2 Transponder Comm-A Option AICB Option	SARPS	Various	TSG WP10-19	Eric Potier	DO-181F/ED-73F	SP-ASWG13-WP/27R1
3	Basic Dataflash	SARPS		TSG WP10-19	Eric Potier	DO-181F/ED-73F	SP-ASWG13-WP/27R1
4	Phase Overlay Transmit Signal Characteristics	SARPS			Tom Pagano Doug Guetter	DO-181F/ED-73F	SP-ASWG13-WP/25
5	Phase Overlay Reception	SARPS	New		Tom Pagano Doug Guetter	DO-260C/ED-102B	
6	Phase Overlay on Mode S Replies	SARPS Doc 9871			Tom Pagano	DO-181F/ED-73F	SP-ASWG13-WP/25
7	Mode S Reply Rate Limiting	SARPS	3.1.2.10.3.6		Eric Potier Martin Gray	DO-181F/ED-73F	SP-ASWG13-WP/24
8	Transponder ACAS X Support	SARPS				DO-181F/ED-73F	
9	P4 amplitude tolerance (interrogation)	SARPS			Matt Haskin	DO-181F/ED-73F	SP-ASWG13-WP/22
10	Mode A/C-Only All-Call Accept/Rejection Criteria	SARPS			Matt Haskin	DO-181F/ED-73F	
11	Removal of Provision to Disable Acquisition Squitter Transmission	SARPS	2.1.5.4.2		Tom Pagano	DO-181F/ED-73F	SP-ASWG13-WP/28R1
12	Removal of RCS/TCS/SAS Interrogation Controls for Extended Squitter	SARPS	3.1.2.6.1.4.1 3.1.2.6.1.4.2 3.1.2.6.1.4.3		Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/26R1
13	Data Link Capability Register Changes	SARPS			Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/32R1
14	Mode S Subnetwork Version 6 and Version 3 extended squitter linkage	SARPS				DO-181F/ED-73F	
15	UAS Lost Link 7400 Emergency	SARPS			Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/26R1
16	Air/Ground Determination Airborne/Surface Format Selection	SARPS			Martin Gray Steve Darr	DO-181F/ED-73F	SP-ASWG13-WP/21R1
59	Removal of Mode A/C/S All-Call Interrogation	SARPS			Eric Potier	DO-181F/ED-73F	
19	Level 1 Revoked	SARPS		TSG WP10-19	Eric Potier	DO-181F/ED-73F	SP-ASWG13-WP/27R1

Task #	MOPS Change	Applicable ICAO Document	Section(s)	Source Material(s)	Assignee	Applicable MOPS	ASWG/13 WP#
20	Baseline Power Limits	SARPS		TSG WP 11-09R2	Eric Potier	DO-181F/ED-73F DO-260C/ED-102B	SP-ASWG13-WP/31R1
21	Aircraft Identification Register 20	SARPS	3.1.2.9	DO-181F/ED-73F	Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/26R1
22	Capability (CA) Field Update	SARPS	3.1.2.5.2.2.1		Jack Field	DO-181F/ED-73F	SP-ASWG13-WP/26R1
23	New Version 3 Extended Squitter Messages	SARPS	3.1.2.8.6.3 3.1.2.8.7.3.2		Alex Rodriquez	DO-260C/ED-102B	SP-ASWG13-WP/20R1
24	Version 3 Extended Squitter Message Rates	SARPS	3.1.2.8.6.4 3.1.2.8.7.3.3		Matt Haskin Jack Field	DO-260C/ED-102B	SP-ASWG13-WP/23R1
26	Invoking Version 3 (Intro, etc)	SARPS	Chapter 5 Various		Tom Pagano Matt Haskin Tim Steiner	DO-260C/ED-102B	SP-ASWG13-WP/29R1
27	Maximum Squitter Rate	SARPS		CPA10V4/35	Tom Pagano	DO-260C/ED-102B	
29	Emitter Category Encoding Updates	SARPS			Steve Darr	DO-260C/ED-102B	SP-ASWG13-WP/21R1
47	Added 1090ES Position Data Timeout modifications						SP-ASWG13-WP/23R1
48	Removed Extended squitter messages from the Event Driven Squitter.						SP-ASWG13-WP/26R1
49	Message Initiation/Termination	SARPS			Matt Haskin Jack Field	DO-260C/ED-102B	SP-ASWG13-WP/23R1
50	Message Broadcast Rates	SARPS			Matt Haskin Jack Field	DO-260C/ED-102B	SP-ASWG13-WP/23R1
51	Surface Squitter High/Low Rate Transition	SARPS			Jack Field		SP-ASWG13-WP/26R1
59	Removed Mode A/C/S All Call Interrogation.						SP-ASWG13-WP/30
61	Modified Mode S ES Transmitting System Characteristics.	SARPS	5.1 Mode S Extended Squitter Transmitting System Characteristics		Tom Pagano Matt Haskin Tim Steiner		SP-ASWG13-WP/29R1
62	Modified Mode S ES Receiving System Characteristics	SARPS	5.2 Mode S Extended Squitter Receiving System Characteristics (ADS-B IN and TIS-B IN)		Tom Pagano Matt Haskin Tim Steiner		SP-ASWG13-WP/29R1

Annex C – Information Papers and Working Papers

Working Paper
SP-ASWG13-WP01R3-Agenda for the 13th Meeting of the SP ASWG.pdf
SP-ASWG13-WP02R1-ASWG12 Meeting Report Sep 2020 Web Meeting.pdf
SP-ASWG13-WP03.0R1-TSG-12 Virtual Meeting Report.pdf
SP-ASWG13-WP03.1R1-Att-TSG WPs for ASWG13 .pdf
SP-ASWG13-WP04-Transponder Non Compliance with SARPs.pdf
SP-ASWG13-WP05-Surveillance Material in Doc 9830 A SMGCS Manual.pdf
SP-ASWG13-WP06R1-Doc 9924 CP to Correct Information in Tables in Appendix M.pdf
SP-ASWG13-WP07-Status on PfA and CP Developments of RTCA-EUROCAE MOPS Revisions.pdf
SP-ASWG13-WP08-Estimate of Overall 1090 MHz Future Utilization.pdf
SP-ASWG13-WP09-Analysis of US Airborne 1030-1090 MHz RF Data.pdf
SP-ASWG13-WP10-Analysis of the 1030-1090 Signal Environment in Japan.pdf
SP-ASWG13-WP11R1-II-SI Codes for Lockout Override Supp and Non All Call Acquisition.pdf
SP-ASWG13-WP12R1-Doc 9924 CP for Guideline on I2SLS P1 Control Power Level.pdf
SP-ASWG13-WP13R1-A10V3 PfA for Allocation of Additional 24 bit Addresses.pdf
SP-ASWG13-WP14-Guidance for Reduced Performance Devices on 1090 MHz.pdf
SP-ASWG13-WP15-A10V4 PfA for Correction of the Metric Altitude.pdf
SP-ASWG13-WP16-Revised PfA for Extended Squitter Rate.pdf
SP-ASWG13-WP17-Interference Protection Criteria for Systems under the Purview of the ICAO SP.pdf
SP-ASWG13-WP18-Update to Table of Differences between 1090ES Versions.pdf
SP-ASWG13-WP19-Updating ICAO Doc 9871.pdf
SP-ASWG13-WP20R1-A10V4 PfA Relating to Task Number 23.pdf
SP-ASWG13-WP21R1-A10V4 PfA Relating to Task Numbers 16 and 29.pdf
SP-ASWG13-WP22-A10V4 PfA Relating to Task Number 9.pdf
SP-ASWG13-WP23R1-A10V4R1 PfA Relating to Task Numbers 24 47 49 and 50.pdf
SP-ASWG13-WP24-A10V4 PfA Relating to Task Number 07.pdf
SP-ASWG13-WP25-A10V4 PfA Relating to Task Numbers 04 and 06.pdf

Working Paper
SP-ASWG13-WP26R1-A10V4 PfA Relating to Task Numbers 01 12 15 21 22 48 and 51.pdf
SP-ASWG13-WP27R1-A10V4 PfA Relating to Task Numbers 02 03 and 19.pdf
SP-ASWG13-WP28R1-A10V4 PfA Relating to Task Number 11.pdf
SP-ASWG13-WP29R1-A10V4 PfA Relating to Task Numbers 26 61 and 62.pdf
SP-ASWG13-WP30-A10V4 PfA Relating to Task Number 59.pdf
SP-ASWG13-WP31R1-A10V4 PfA Relating to Task Number 20.pdf
SP-ASWG13-WP32R1-PfA Relating to Task Number 13.pdf
SP-ASWG13-WP33R1-Elements of discussion for the ACSG and AIRB-WG work arrangements.pdf
SP-ASWG13-WP34.0R1-Report and update from the Surveillance Panel Secretary up.pdf
SP-ASWG13-WP34.1-Att A Final Draft Annex 6 Part IV SARPs - Final Endorsement Request.pdf
SP-ASWG13-WP34.2-Att B RPASP WG5Annex6PtIV-round7 Comment Response Matrix.pdf
SP-ASWG13-WP34.3-Att C Annex 6 Part IV - Final Draft version K - for Formal Endorsment.pdf
SP-ASWG13-WP35-Report of the 17th ACSG meeting.pdf
SP-ASWG13-WP36-PBSSG report v1.1.pdf
SP-ASWG13-WP37-Resolution of Conflicting Text in Doc 8071 Vol III regarding Flight Inspections.pdf
SP-ASWG13-WP38-Guidance Material for Assignment of Interrogator Codes in a Mixed Environment.pdf

Flimsy
SP-ASWG13-Flimsy01R2-List of action items.pdf
SP-ASWG13-Flimsy02.0-LDACS Transmission Mask.pdf
SP-ASWG13-Flimsy02.1-Att-LDACS transmission mask.pdf
SP-ASWG13-Flimsy03-Interference of ICAO-defined systems on systems operation at 1030MHz and at 1090 MHz.pdf

Information Paper
SP-ASWG13-IP01-Document exchange platform.pdf
SP-ASWG13-IP02-Recent ADS-B Avionics issues in the United States.pdf
SP-ASWG13-IP03-Preliminary Research on Probability of Update Application by ADS-B Data of China.pdf
SP-ASWG13-IP04R1-Update Activity of Surveillance System in China.pdf
SP-ASWG13-IP05-USA ADS-B Equipage and Quality Performance.pdf
SP-ASWG13-IP06-Eurocontrol Report on Surveillance and ACAS activities in Europe.pdf

Annex D – List of action items

D1 Summary of Action Items Status Open

Description	Assigned To:	Status
<u>ACTION ITEM ASWG/10-11:</u> Japan Civil Aviation Bureau (JCAB) to provide updates on advanced surveillance function evaluation equipment at a future ASWG meeting.	JCAB	
<u>ACTION ITEM ASWG/10-24:</u> ENRI to provide updates on Optical Fiber Connected Surveillance Radar development and research at a future ASWG meeting	ENRI	
<u>ACTION ITEM ASWG/11-17:</u> TSG to report back on outcome of WRC-19 agenda item(s) and on potential WRC-23 agenda items related to the Surveillance Panel at ASWG/12	TSG	
<u>ACTION ITEM ASWG/12-22:</u> TSG to investigate the Privacy ICAO Address Program described in SP-ASWG12-WP/28 and to provide relevant information to resolve concerns expressed at the ASWG/12	TSG	
<u>ACTION ITEM ASWG/12-23:</u> XL to provide updates on China Multiple Illuminators Based Passive Radar (MIPAR) development and research at a future ASWG meeting	XL	

D2 Summary of Action Items Status Pending

Description	Assigned To:	Date Suspended	Status	Condition for Reactivation
<u>ACTION ITEM ASWG/11-14:</u> TSG to provide updates on multi-static primary surveillance radar (MSPSR) development and research at a future ASWG meeting	TSG	ASWG/12 Sept 2020	PENDING	Ending of COVID restrictions that are preventing working on improvements to the MSPR system
<u>ACTION ITEM ASWG/13-18:</u> TSG to prepare a Doc 9924 CP on I ² SLS P1Σ and P1Ω time alignment.	TSG	ASWG/13 April 2021	PENDING	Ending of COVID restrictions that are preventing relevant tests. (It is expected around April 2022 to resume the tests).

D3 Summary of New Assigned Action Items by ASWG/13

Description	Assigned To:	Status
<u>ACTION ITEM ASWG/13-01:</u> All to review SP-ASWG13-WP/34.1 , SP-ASWG13-WP/34.2 and SP-ASWG13-WP/34.3 and provide endorsement and/or comments by 12 May 2021.	All	OPEN
<u>ACTION ITEM ASWG/13-02:</u> TSG to hold the next TSG meeting for 21 to 25 June, 2021 the ICAO EUR/NAT Regional Office in Paris, France. <i>Note.- Based on current COVID conditions, TSG/13 is expected to be conducted as a virtual meeting, held from 14 June to 25 June 2021.</i>	TSG	OPEN
<u>ACTION ITEM ASWG/13-03:</u> TSG to schedule another meeting for for 31 January to 4 February as an in-person meeting at the Bahia Mar Hotel in Fort Lauderdale, Florida.	TSG	OPEN
<u>ACTION ITEM ASWG/13-04:</u> Considering a possible need of formal inter panel coordination, MU to coordinate with ACSG and define the schedule of ACAS III PFA.	Secretary	OPEN
<u>ACTION ITEM ASWG/13-05:</u> ACSG and Secretary to continue close coordination with RPASP WG/3 to assist RPASP WG/3's development of appropriate DAA provisions	ACSG and Secretary	OPEN
<u>ACTION ITEM ASWG/13-06:</u> ACSG to continue development of ACAS III provisions in consideration on RTCA/EUROCAE activities	ACSG	OPEN
<u>ACTION ITEM ASWG/13-07:</u> ACSG to report back on RTCA DAA activities as they might affect ICAO provisions for DAA	ACSG	OPEN
<u>ACTION ITEM ASWG/13-09:</u> PBSSG to hold the following WebEx • PBSSG#17 in June 2021 • PBSSG#18 in September/October 2021 before the next ASWG meeting • PBSSG to have additional meetings/WebEx as necessary to progress the work programme.	PBSSG	OPEN
<u>ACTION ITEM ASWG/13-10:</u> All to review the following WPs and provide comments to TSG by NLT 14 May 2021 • SP-ASWG13-WP/20R1 • SP-ASWG13-WP/21R1 • SP-ASWG13-WP/22 • SP-ASWG13-WP/23R1 • SP-ASWG13-WP/24 • SP-ASWG13-WP/25 • SP-ASWG13-WP/26R1 • SP-ASWG13-WP/27R1 • SP-ASWG13-WP/28R1 • SP-ASWG13-WP/29R1 • SP-ASWG13-WP/30 • SP-ASWG13-WP/31R1 • SP-ASWG13-WP/32R1 • SP-ASWG13-WP/15 • SP-ASWG13-WP/16	All	OPEN

Description	Assigned To:	Status
<u>ACTION ITEM ASWG/13-12:</u> In coordination with TSG, Secretary to prepare the transponder update PfA, which should be submitted to the next ASWG meeting, which will consolidate the content of the following WPs. • SP-ASWG13-WP/20R1 • SP-ASWG13-WP/21R1 • SP-ASWG13-WP/22 • SP-ASWG13-WP/23R1 • SP-ASWG13-WP/24 • SP-ASWG13-WP/25 • SP-ASWG13-WP/26R1 • SP-ASWG13-WP/27R1 • SP-ASWG13-WP/28R1 • SP-ASWG13-WP/29R1 • SP-ASWG13-WP/30 • SP-ASWG13-WP/31R1 • SP-ASWG13-WP/32R1 • SP-ASWG13-WP/15 • SP-ASWG13-WP/16	Secretary	OPEN
<u>ACTION ITEM ASWG/13-11:</u> Taking into account comments received, TSG to update and finalize the PfA produced by MU (<u>ACTION ITEM ASWG/13-12</u>), which should be presented at the next ASWG meeting.	TSG	OPEN
<u>ACTION ITEM ASWG/13-13:</u> MU to review all WPs related to transponder MOPS updates and modify references related to Doc 9871 which need to be in Notes, if Doc 9871 is referred to directly in requirements of SARPs.	Secretary	OPEN
<u>ACTION ITEM ASWG/13-14:</u> In coordination with TSG, Secretary to investigate a way of adding its definition or referencing other Annex regarding the terminology, C2 Link State, and to include it in the transponder update PfA (<u>ACTION ITEM ASWG/13-12</u>).	Secretary	OPEN
<u>ACTION ITEM ASWG/13-15:</u> TSG and ACSG to coordinate and identify possible changes required in Chapter 4 of Annex 10 Volume IV in line with several PfAs and CPs transponder update package produced by TSG. (Refer to section 2.14 of SP-ASWG13-WP/27R1 and SP-ASWG13-WP/07)	TSG and ACSG	OPEN
<u>ACTION ITEM ASWG/13-16:</u> TSG to continue its investigation on spurious transmission limits included in 3.1.2.10.2.2 of Annex 10 Volume IV (refer to SP-ASWG13-WP/31R1), and propose PfA at a future ASWG meeting.	TSG	OPEN
<u>ACTION ITEM ASWG/13-17:</u> TSG to continue development of Doc 9924 CPs to reflect the RTCA/EUROCAE MOPS updates and air/ground interoperability.	TSG	OPEN
<u>ACTION ITEM ASWG/13-19:</u> All to communicate with CP-DGIWG members nominated by their States/organizations in order to promote awareness of the PfA included in SP-ASWG13-WP/13R1	All	OPEN
<u>ACTION ITEM ASWG/13-20:</u> MU to include the PfAs (refer to SP-ASWG13-WP/15 and SP-ASWG13-WP/16) in the transponder MOPS update PfA (<u>ACTION ITEM ASWG/13-12</u>).	Secretary	OPEN
<u>ACTION ITEM ASWG/13-22:</u> Using the transponder update PfA produced by MU (<u>ACTION ITEM ASWG/13-12</u>), TSG to implement the proposals of categorizations of requirements and reorganization of Annex 10 Volume IV described in SP-ASWG13-WP/04 and to present the consolidated transponder update PfA at the next ASWG meeting, ASWG/14. (In this proposal, the table of contents also needs to be updated and expanded to reflect lower level of contents and propose additions of hyper link to the table of contents and within the document).	TSG	OPEN

Description	Assigned To:	Status
<u>ACTION ITEM ASWG/13-23:</u> TSG to continue working on updating contents related to surveillance included in Doc 9830 Advanced Surface Movement Guidance and Control Systems (A- SMGCS) Manual.	TSG	OPEN
<u>ACTION ITEM ASWG/13-24:</u> TSG to produce a list of new or amended terminologies to be introduced in Annex 10 Volume IV and SP-related guidance materials and to provide this list to MU.	TSG	OPEN
<u>ACTION ITEM ASWG/13-21:</u> Based on the list produced by TSG, MU to investigate ICAO documents to identify the need for potential consequential amendments to those documents, and to provide the results to TSG.	Secretary	OPEN
<u>ACTION ITEM ASWG/13-25:</u> TSG to look into the overall issue of the 1090 MHz utilisation. (This will include examining techniques and capabilities that could be considered to reduce 1090 MHz congestion such as ADS-B Aircraft Derived Data vs BDS extraction, Extended Hybrid Surveillance, ACAS-X introduction and Passive acquisition) TSG to consider the impact of evolving systems that will potentially share the 1090 MHz link (e.g. RPAS, ACAS-Xu, DAA, Mode 5, Electronic Conspicuity) contributing to the spectrum load.	TSG	OPEN
<u>ACTION ITEM ASWG/13-26:</u> TSG to further analyse airborne 1030/1090 MHz Radio Frequency data collected in the US and report significant results to a future ASWG meeting as deemed appropriate.	TSG	OPEN
<u>ACTION ITEM ASWG/13-27:</u> TSG to further analyse 1030/1090 signal environment in Japan and report significant results to a future ASWG meeting.	TSG	OPEN
<u>ACTION ITEM ASWG/13-28:</u> TSG to prepare PfA and CPs for clarifying assignment of IIS codes for Multilateration and GICB interrogations.	TSG	OPEN
<u>ACTION ITEM ASWG/13-29:</u> TSG to finalize technical guidance material related to Low-Power 1030/1090 MHz Devices to be included in Doc 9924 and present it to a future ASWG meeting (targeting at NLT SP/4 approval).	TSG	OPEN
<u>ACTION ITEM ASWG/13-30:</u> TSG to investigate receiver protection criteria and other requirements focused on cooperative systems (as the International Telecommunications Union Radiocommunication Sector (ITU-R) is currently focused on protection criteria for non-cooperative systems based on the band they operate in). TSG to report back to ASWG on this topic at least annually.	TSG	OPEN
<u>ACTION ITEM ASWG/13-32:</u> TSG to continue development of Doc 9871 CPs to reflect the RTCA/EUROCAE MOPS updates.	TSG	OPEN
<u>ACTION ITEM ASWG/13-08:</u> All to investigate national situation of routine flight inspection referred in Para 2.5 of Appendix B of Doc 8071 Vol III (refer to SP-ASWG13-WP/37) and report the outcome to TSG by end of May 2021.	All	OPEN
<u>ACTION ITEM ASWG/13-35:</u> Taking into account comments provided by All (Action item ASWG/13-08), TSG to investigate text in Doc 8071 Vol III regarding Flight Inspections (refer to SP-ASWG13-WP/37) and report the outcome to a future ASWG meeting.	TSG	OPEN
<u>ACTION ITEM ASWG/13-33:</u> TSG to develop guidance material for assignment of interrogator II/SI Codes including II/SI Code Operation in a mixed environment (refer to SP-ASWG13-WP/38).	TSG	OPEN
<u>ACTION ITEM ASWG/13-34:</u> In coordination with SP chairperson and chairpersons and secretaries of FSMP and CP-DCIWG, MU to draft a brief reply e-mail to ETSI to get more information on their request (seeking ICAO's guidance on interference protection criteria from future ICAO-defined systems (e.g. LDACS) over the current systems operating in the 1030MHz and 1090 MHz). If additional information were provided by ETSI, those should be provided to TSG (copy to FSMP and CP-DCIWG) so that TSG can start considering the reply liaison statement to ETSI.	Secretary	OPEN

Description	Assigned To:	Status
<u>ACTION ITEM ASWG/13-31:</u> In coordination with MU, AIRB-WG and ACSG Chairpersons to organize the related meetings described in SP-ASWG13-WP/33R1 and report back to SP/4 (as well as submit any relevant WP on this subject to SP/4).	AIRB-WG and ACSG chairpersons	OPEN
<u>ACTION ITEM ASWG/13-36:</u> MU to organize SASG meeting to discuss 1) feasibility of face to face SP/4 meeting in 2021; 2) time schedule of SP/4 (and SP/5); and 3) discussion of potential 2023 meeting dates by no later than end of July 2021.	Secretary	OPEN
<u>ACTION ITEM ASWG/13-37:</u> MU to inform ASWG members of SASG decision whether ASWG/14 would be held in face-to-face or virtually no later than 1 August 2021.	Secretary	OPEN

Note.- ACTION ITEM Number, ASWG/13-18, was not used.

Annex E– List of websites of interest

No.	Title	Address	Details
1	ICAO SP secure portal site	https://portal.icao.int/SP/Pages/Copyright.aspx	Requires User ID and Password
2	Global Air Navigation Plan (GANP) - Sixth Edition	https://www4.icao.int/ganpportal/	
3	EUROCONTROL Surveillance	http://www.eurocontrol.int/articles/surveillance	
4	Enhanced General Aviation Operations by ADS-B (EGOA)	http://www.egoa.se	
5	UK CAA details on UK registered aircraft	www.caa.co.uk	Select G-INFO database from the short cuts on the right hand side of the page
6	USA ADS-B Final Rule	https://www.regulations.gov/document?D=FAA-2007-29305-0289	
7	USA Equip ADS-B	https://www.faa.gov/nextgen/equipadsb	

Annex F – Agreed Change Proposals to ICAO SARPs, Guidance Material, and Manuals

Annex 10 Volume IV SARPs Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 89 (Closed)	CPA10V4/01	SARPs CP to clarify that there is no requirement for a separate ADS-B ON/OFF switch however if implemented it requires that the ADSB out state shall be separately provided to the crew.	WP ASP06-06R1	WP ASP06-06
Amendment 89 (Closed)	CPA10V4/02	SARPs CP to clarify GICB extraction when SI code is used. Message format and protocols to be used with SI codes are correctly defined in Annex 10 Volume IV however GICB protocol description has not been updated when SI code was introduced. The change proposal proposes the necessary modification to keep consistency between the different sections of ICAO Annex 10 Volume IV.	WP ASP06-07R1	WP ASP06-07
Amendment 89 (Closed)	CPA10V4/03	The purpose of using bit 69 is to indicate that hybrid surveillance is fitted to enable ground systems to monitor the operation of hybrid surveillance. This purpose would not be met were TCAS to report “TCAS fitted” when it is incapable of operation because the aircraft installation does not provide the information required by hybrid surveillance. Change proposal proposes to utilise bit 37 to provide operational status and serviceability of hybrid surveillance capability.	WP ASP06-25R1	WP ASP06-25
Amendment 89 (Closed)	CPA10V4/04	The change proposal is intended to provide ground control of aircraft on-the-ground status and is intended primarily for aircraft without a squat switch.	WP ASP07-03R1	WP ASP07-03
Amendment 89 (Closed)	CPA10V4/05	In the process of reviewing State Letter 57e, two editorial errors were noted in the proposed revision to 4.3.2.2.2.2. This change proposal proposes to correct these editorial errors.	WP ASP07-08R1	WP ASP07-08
Amendment 89 (Closed)	CPA10V4/06	In the process of reviewing State Letter 57e, several instances were detected of what appeared to errors in the ACAS SARPs Interference Limiting (IL) requirements. These errors were not in proposed changes to the ACAS SARPs but rather in existing material of the paragraphs containing the propose changes. A review of all of the IL material was performed by comparing the SARPs requirements with those in the TCAS MOPS. A few additional errors were detected as a result of this more thorough review. This change proposal proposes to correct the detected errors in the IL requirements.	WP ASP07-07 R2	WP ASP07-07 R 1

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 89 (Closed)	CPA10V4/07	Belgocontrol reported instances of Mode S surveillance failure. This was traced to the inadvertent ground request for the readout of a register not supported by the aircraft installation. Ground request for downlink of an unsupported register should have resulted in a long reply with an MB field of all zeroes. Instead, the aircraft involved did not reply to the request for an unsupported GICB register. Change proposal was developed to revise the GICB protocol specification to clearly state the need to reply if a request to readout an unsupported register is received.	WP ASP09-04 R1	WP ASP09-04
Amendment 89 (Closed)	CPA10V4/08	A requirement was identified to provide a means to control the on-the-ground condition for aircraft operating without a squat switch to inhibit Mode A/C and Mode S all-call replies for surface aircraft. The TSG developed a SARPs CP to provide ground control of the on-the-ground (OTG) status via modification to commands in the TCS subfield. The original solution was revised in response manufactures objections to ground control of the OTG status due to ACAS safety concerns. The revised change proposal proposes a simpler technique for inhibiting unnecessary replies that does not affect the reported OTG status	WP ASP09-06 R1	WP ASP09-06
Refer to CPA10V4/12	~~CPA10V4/09~~	~~Alternative Approach for Surface Control~~ Refer to CPA10V4/12	~~WP ASP09-10 Rev 1, Appendix B~~	~~WP ASP09-10~~
Amendment 89 (Closed)	CPA10V4/10	Multiple instances of transponder replies containing data from Registers other than those interrogated for have been reported. A solution was developed and published in the Transponder MOPS documents, RTCA DO-181E and EUROCAE ED-73E in March 2011. This change proposal proposes that the agreed upon method is incorporated into SARPs. In an effort to minimize impact to current transponders and interrogators in the field, the method also provides for the transponder to annunciate capability to support the DP field.	WP ASP09-08 R 2	WP ASP09-08
Amendment 89 (Closed)	CPA10V4/11	1090 MHz Extended Squitter (1090ES) equipped aircraft without an automatic means for surface determination will continue to broadcast the airborne type ES messages while on the airport surface. The Mode S protocol provides commands in the Type Control Field (TCS) to enable the ground to command the broadcast of the surface type ES messages if required by airport applications. A recent review of the specification of these TCS commands in the Mode S MOPS (DO-181D/ED-73C) by RTCA and EUROCAE revealed that they do not explicitly cover all of the 1090ES surface messages and that a clarification was needed. A Transponder MOPS revision has been implemented. Change proposal serves to harmonize the ICAO SARPs with the approved language in the newly published Transponder MOPS (RTCA DO-181E and EUROCAE ED-73E).	WP ASP10-06R1	WP ASP10-06

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 89 (Closed)	CPA10V4/12	It may not be clear that the transponder should interpret multisite lockout in an interrogation where DI = 1, 7 and non-selective lockout in the same interrogation where PC = 1, and set the TD and appropriate TL timers accordingly from that single interrogation. This function is useful as a means of providing transponder lockout to ATCRBS/Mode S All-Call in a netted interrogator configuration using multisite lockout for network coordination. This can curtail nuisance replies to ATCRBS-Only All-Call interrogations that seem to be the result of misinterpretation of a garbled narrow P4 pulse. Change proposal is a clarification option that would change the processing of ATCRBS interrogations with a P4 pulse (narrow or wide) so that the transponder will not reply to these interrogations.	WP ASP10-09R1	WP ASP10-09
Amendment 89 (Closed)	CPA10V4/13	New technology makes the use of a certain type of phase modulator easier to implement. An interoperability issue has been found between such interrogators and specific transponders both claiming compliance with ICAO SARPs and transponder MOPS. This change proposal (CPA10V4/14) seeks to clarify that different phase modulation techniques can be used to generate the phase reversal whilst generating different side effects on the signal. Those specific side effects must be foreseen but receivers cannot rely on these to ensure the interoperability with the different types of phase modulators.	WP ASP10-10R1	WP ASP10-10
Amendment 89 (Closed)	CPA10V4/14	An interoperability issue has been found between interrogators using new generation modulators and specific transponders both of which claim compliance with ICAO SARPs and transponder MOPS. Some specific material is to be removed from the SARPs to avoid misinterpretation. This change proposal (CPA10V4/15) proposes to reuse the material removed from the SARPs as an example in the Aeronautical Surveillance Manual (Doc 9924).	WP ASP10-11R1	WP ASP10-11
Amendment 89 (Closed)	CPA10V4/15	This change proposal (CPA10V4/16) proposes to correct the specification of the Mode S transponder MTL for Mode A/C interrogations in order to have the same value for both Mode A/C transponders and Mode S transponders and to have a consistent requirement between SARPs and MOPS.	WP ASP10-12R1	WP ASP10-12

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 89 (Closed)	CPA10V4/16	Ongoing research has identified that the DF=18 TYPE Code 2, Aircraft Identification message, may have been implemented by surface surveillance systems in a manner which conflicts with the intended use of the message. The use of this message for system control and status of surveillance systems is not consistent with the RTCA DO-260B MOPS and introduces 1090 MHz interference in ADS-B receivers. A change proposal presented to the ASP Working Group during the October 2010 meeting in Brussels recommended: restricting surface surveillance systems from using extended squitter messages that have been allocated for the purpose of surveillance of aircraft, vehicles, and/or obstacles, and to using just the DF=18 TYPE Code 24 Subtype 1 surface system status message for surface system control and status reporting. The initial proposal was discussed during the WG meeting and concerns were raised that a restriction at that time was too aggressive of a change because multiple civil aviation authorities, including the U.S. FAA, have fielded systems that utilize the aircraft ID transmitted from surveillance system reference equipment for multilateration system synchronization. The proposal was reviewed and the change proposal (CPA10V4/17) proposes that the aircraft ID should not be used for surveillance system functionality and may be restricted in the future	WP ASP10-13R1	WP ASP10-13
Amendment 89 (Closed)	CPA10V4/17	The 1090 Extended Squitter Version 2 MOPS have been published both by RTCA and EUROCAE, RTCA DO-260B and EUROCAE ED-102A, respectively, in December 2009. Most MOPS changes from Version 1 to Version 2 were captured in the draft update to Doc 9871, Edition 2. There are some MOPS changes that impact the SARPs and these were reviewed at the January and June 2010, and February 2011 TSG meetings in TSG WP08-06, TSG WP09-02R1 and TSG WP10-02R1, respectively.	WP ASP10-8R1	WP ASP10-8
Amendment 89 (Closed)	CPA10V4/18	Change proposal CPA10V4/18 proposes changes to ensure consistency with the changes made in the 1090ES Transponder MOPS, DO-260B and ED-102A, to incorporate Version 2 Extended Squitter.	WP ASP10-05R1	WP ASP10-05
Amendment 89 (Closed)	CPA10V4/19	Prior to the ICAO ASP TSG meeting at Fort Lauderdale in January/February 2011, there was a question from a TCAS manufacturer, requesting clarification on the setting of Bits 39 and 40 in Register 1016. Indications were that the standards documents do not match in their descriptions of these bits. This proposed change will bring the Annex 10 Volume IV text into harmonization with the newly published text in the Transponder MOPS and the draft of ICAO Doc 9871, Edition 2.	WP ASP11-11R1	WP ASP11-11

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 89 (Closed)	CPA10V4/20	High levels of DF11 on II=0 have been measured at different places. This due to the wrong detection of long P4 pulses within signal at low amplitude or suffering of multipath. The long P4 is used to recognize Mode A/C/S All-Call interrogations. The long-term solution is to discontinue the reply to Mode A/C/S interrogations (P1P3P4long). This can be done only if the interrogators are no more using the Mode A/C/S interrogations. This working paper presents a SARPs CP to prohibit the use of the Mode A/C/S interrogations by 2020 and to indicate that new transponders will no more reply to Mode A/C/S interrogation by the same date.	WP ASP11-13R1	WP ASP11-13
Amendment 89 (Closed)	CPA10V4/21	The pollution on the 1090 MHz RF band is a critical phenomenon for the performance of existing surveillance systems, anti collision systems, and the deployment of new applications. One of the main sources of Mode S replies pollution is the All-Call replies generated by the radars on aircraft not within the radar lockout coverage. Radars generating up to 12 All-Call replies per scan beam have been detected. This Working paper proposes a new SARPs requirement to prohibit radar triggering too many All Call replies in their beam.	WP ASP11-14R2	WP ASP11-13
Amendment 89 (Closed)	CPA10V4/22	This CP proposes SARPs revision to indicate that transponder used for Mode S site monitor may not be identical to a normal Mode S transponder	WP ASP11-15R1	WP ASP11-15
Amendment 89 (Closed)	CPA10V4/23	From its initial design, all Mode S scanning beam interrogators have used an active approach (all-call plus lockout) to acquire Mode S aircraft. While very effective, this approach has two disadvantages: (1) unwanted all-call fruit is generated by aircraft beyond the interrogator's lockout range and (2) use of active acquisition requires the assignment of an interrogator II or SI code. At the WGW/1 meeting, the ASP was tasked to investigate the use of passive acquisition techniques by Mode S interrogators to overcome the above disadvantages. This Change Proposal allows for the passive acquisition approach that incorporates the comments received at the previous TSG meetings.	WP ASP11-19R1	WP ASP11-19
Amendment 89 (Closed)	CPA10V4/24	Change Proposal for clarification on the understanding of the meaning, of how a Multilateration (MLAT) system set of interrogators shall be considered with respect to interrogation rates.	WP ASP11-17R1	WP ASP11-17
Amendment 90 (Closed)	CPA10V4/25	Change Proposal proposes definitions for transponders and transponder occupancy for use in ICAO material.	WP ASP14-12R1	WP ASP14-12
Amendment 90 (Closed)	CPA10V4/26	Aircraft Identification is used as the sole means of identification for some flights in Europe. Some flights start with a wrong Aircraft Identification. In this case controllers must request the pilot to change the Aircraft Identification when the aircraft is airborne. However it has been found that the Aircraft Identification change is not always correctly detected by all ground interrogators. This Change Proposal proposes a SARPs CP to clarify the Mode S Comm-B Broadcast protocol.	WP ASP14-10R1	WP ASP14-10

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 90 (Closed)	CPA10V4/27	CP to clarify Comm-B Broadcast protocol when using an SI code or II=0 Current ICAO Annex 10 Volume IV does not cover the extraction of Comm-B broadcast by interrogator using an SI code or II=0, although such systems must have access to the same data. ICAO Annex 10 Volume IV must be corrected to allow such protocol to be used with Si code and II=0.	WP ASP15-05R1	WP ASP15-05
Amendment 90 (Closed)	CPA10V4/28	CP to reduce the number of Mode AC Replies A requirement was inserted in ICAO Annex 10 Amdt 85 in 2010 to limit the transmission of spurious mode A/C replies in presence of low level mode S interrogations on the new transponder designs. However, the way the requirement is worded in Annex 10 could result in requiring existing transponder designs to be retrofitted when a major upgrade takes place and a new certification is required such as implementation of the new version of ADS-B. The ICAO Annex 10 text must therefore be clarified to avoid such confusion. In addition it is also necessary to avoid adding more RF pollution by adding more transponders transmitting high rate of spurious Mode A/C and therefore the installation of such equipment must be prohibited at a future date.	ASP16-13R2	ASP 16-13
Amendment 90 (Closed)	CPA10V4/29	Section 3.1.2.11.1.2 defines the maximum number of Mode S All Call replies that can be triggered by a Mode S radar. However the current wording of this section could be misinterpreted for some people as it includes not only Mode S but also Mode A/C all call replies. To keep original intent and avoid confusions, the wording improvement was proposed.	WP17-20 R1	WP ASP17-20
Amendment 90 (Closed)	CPA10V4/30	Based on industry feedback regarding confusion related to Mode S transponder minimum reply rate requirements when the transponder operates with ACAS, a change is required to clarify the conflicting requirements in the SARPs.	WP17-21 R1	WP17-21
Amendment 90 (Closed)	CPA10V4/31	Industry and RTCA have developed a new Hybrid Surveillance standard allowing the reduction of the use of the 1030/1090 MHz frequencies. This new standard introduced a new mode named Extended Hybrid Surveillance, which allows a pure passive tracking of aircraft using ADS-B under certain conditions.	SP1-ASWG1-WP/22R1	SP1-ASWG1-WP/22
Amendment 90 (Closed)	CPA10V4/32	Every year there are incidents and accidents involving aircraft and surface vehicles at airports that have potentially serious consequences. This CP addresses the need for creating a harmonized approach for ADS-B equipment on airport ground vehicles by adding requirements for extended squitter surface vehicle transmitting equipment in Annex 10 Volume IV SARPs.	SP1-ASWG1-WP/15	SP1-ASWG1-WP/15

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 90 (Closed)	CPA10V4/33	CP for clarification on the definition of Wide Area Multilateration. Multilateration techniques have been successfully deployed for airport surveillance for quite some time and presently, these same techniques are used for larger areas such as en-route or approach areas, which are called WAM systems. Although the Aeronautical Surveillance Manual (Doc 9924) includes a general description of WAM, WAM does not have an accepted dictionary meaning and therefore its definition should be included in Annex 10 Volume IV. Since future growth of WAM implementations and operations is expected globally, the addition of an Annex 10 definition is proposed to promote a better understanding of WAM.	SP-ASWG3-WP/19R2	SP- ASWG2-WP/22
Amendment 90 (Closed)	CPA10V4/34	The interoperability between airborne platforms and ground systems is important to ensure safe operation. As indicated in the Note to 3.1.1.6.2.1, the position of the X pulse is not used in replies to Mode A or Mode C interrogations, but was only reserved for future use. Different local uses of the X pulse have been implemented, resulting in interoperability issues among civil and military SSR systems. This proposal is to clarify the current note and to specify the responsibility of X pulse users, who need to perform a safety assessment, in order to avoid safety impacts and ensure interoperability of those systems.	SP2-ASWG4-WP/08R1	SP-ASWG2-WP/04
For ~~SP/4~~ SP/5 Approval	CPA10V4/35	Based on Action item ASWG/5-12, this amendment proposal will be included in the amendment package due to revised RTCA/EUROCAE standards indicated in Annex G.	SP-ASWG5-WP/05.1R1	SP-ASWG5-WP/05.1
Amendment 91 (In progress)	CPA10V4/36	A continuing series of spurious RAs disturbing and (sometimes degrading safety of) aircraft operations when using hybrid surveillance has been shown to result from a hybrid surveillance implementation that was not robust enough to intruder ADS-B position report jumps. Requiring protection against unnecessary RAs that may be caused by residual ADS-B position data during transition from passive to active surveillance was included in the hybrid surveillance MOPS to increase robustness and should be introduced in the SARPS to protect all possible ACAS implementations.	SP-ASWG7-WP38R2	SP2-ASWG4-WP29
Amendment 91 (In progress)	CPA10V4/37	ACAS Xa/Xo will be available as collision avoidance system in 2020. To accommodate the use of ACAS Xa/Xo for collision avoidance, some of the ACAS-related items in Annex 10 have to be modified and extended. This proposal accommodates the TCAS 7.1 compliant as well as the ACAS Xa/Xo compliant system as airborne collision avoidance system (ACAS). The benefit to introduce ACAS X provisions will be to be able to have a collision avoidance system that offers an improved safety and alert rate and offers future growth options regarding airspace improvement and extension of collision avoidance to other classes of aircraft.	SP3-ASWG8-WP/21R4	ASWG 07-26

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For ~~SP/4~~ SP/5 Approval	CPA10V4/38	This amendment proposal will be included in the amendment package due to revised RTCA/EUROCAE standards indicated in Annex G.	SP-ASWG10-WP/11R1	

Annex 10 Volume III SARPs Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For SP/4 Approval	CPA10V3/01	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveies revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F1 ₁₆ and F2 ₁₆ from A10V3 (as well as Doc 9871 and Doc 9924) was proposed.	ASWG9-WP/06R1	ASWG 07-27
For SP/4 Approval	CPA10V3/02	Air ground and air-air surveillance systems as well as airborne collision avoidance systems are heavily relying on a (24-bit) aircraft address configured on board aircraft. Therefore, the allocation of an aircraft address and its correct configuration in aircraft is a key element for a safe operation of aircraft and associated communication protocols used to support CNS systems. If two aircraft use the same address in the same area, exchanges will interfere and create unsafe situation. It is therefore necessary that States ensure allocate aircraft address appropriately through a well defined process and put in place the necessary means to ensure that the aircraft addresses are correctly configured in aircraft.	ASWG9-WP/08R2	ASWG2-WP/18
New For SP/4 Approval	CPA10V3/03	The current procedure in A10V3 only provides an increase in allocation to meet the needs of a requesting States. Given the future increase in address requirements for all States for surface vehicles and unmanned aircraft systems, it is likely that one or more States would require an increase for each SARPs update cycle. This could lead to a requirement for frequent revisions to Table 9-1. For this reason, the ASWG preferred a proactive approach as contained in this proposal. In addition, it also provides guidance to States on the operation of certain unmanned aircraft.	SP-ASWG13-WP/13R1	SP-ASWG11-24R1

Doc 9871 Technical provisions for Mode S services and extended squitter Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2nd edition, 2012 (Closed)	CP9871/01	MSP Uplink Channel 5 is reserved for the ACAS Sensitivity Level Control. There is no guidance on whether to set or clear this capability bit in BDS 1.D. The TSG consensus is that this bit should be cleared regardless of whether the radio supports ACAS Sensitivity Level Control. Change Proposal clarifies this point.	WP ASP06-04R1	WP ASP06-04
2nd edition, 2012 (Closed)	CP9871/02	The purpose of using bit 69 to indicate that hybrid surveillance is fitted is to enable ground systems to monitor the operation of hybrid surveillance. This purpose would not be met were TCAS to report “TCAS fitted” when it is incapable of operation because the aircraft installation does not provide the information required by hybrid surveillance. This change proposal proposes the adoption of the same change detailed in CP A10V4/3.	WP ASP06-25R1	WP ASP06-25R1
2nd edition, 2012 (Closed)	CP9871/03	Multiple instances of transponder replies containing data from Registers other than those interrogated have been reported in RTCA SC-209/EUROCAE WG-49 and ICAO ASP and TSG meetings. A preliminary proposal to rectify the situation was presented and was subsequently refined and agreed. This solution has been published in the Transponder MOPS documents, RTCA DO-181E and EUROCAE ED-73E in March 2011. This change proposal proposes the method published by RTCA/EUROCAE. In an effort to minimize impact to current transponders and interrogators in the field, the method also provides for the transponder to announce capability to support the DP field.	WP ASP10-07R1	WP ASP10-07
2nd edition, 2012 (Closed)	CP9871/04	This proposed Change Proposal offers Register definitions for Edition 2 of Doc 9871, which have been accepted by the RTCA and EUROCAE Working Groups in response to requests from States and Manufacturers for a maintenance register to provide a means for ground-stations to extract general transponder operating conditions.	WP ASP11-12R1	WP ASP11-12
Amendment 1 2017 (Closed)	CP 9871/05	Different organizations are trying to develop application using the data provided in transponder registers; however they have difficulty to understand which registers defined in Doc 9871 are really implemented therefore the need to provide an indication of the implementation status of the different transponder registers. To assist implementation, this CP is to provide a table in Doc 9871 showing which registers are commonly implemented. Furthermore, the table indicates whether a register is required, optional, recommended, or not required.	WP ASP16-09R1	WP ASP16-09
Amendment 1 2017 (Closed)	CP 9871/06	Every year there are incidents and accidents involving aircraft and surface vehicles at airports that have potentially serious consequences. This CP is to improve situational awareness for ATC by showing the location of ground targets which would reduce the likelihood of a surface vehicle interfering with normal aircraft operations. The use of internationally harmonized requirements for surface vehicles is critical so that ADS-B applications operating on aircraft and flying internationally	SP1-ASWG1-WP/14	WP ASP16-10

		are able to utilize the data from surface vehicles broadcasting ADS-B position data, and meet two important goals: 1) the equipment should be designed to provide position data that adheres to a minimum quality and accuracy to support ADS-B surface applications. 2) the equipment broadcasting the information should be developed and tested using standards and processes that are at least equivalent to those used on avionics equipment tested, certified and installed on aircraft.		
Amendment 1 2017 (Closed)	CP 9871/07	CP to ICAO Doc 9871 regarding the use of Minimum Sea Level (MSL) referenced altitude. Currently, the requirement for monitoring height-keeping performance associated with RVSM is contained in ICAO Annex 6 (paragraph 7.2.7) and to do so, a need exists to modify the requirements in ICAO Doc 9871 to explicitly require the use of GNSS HAE altitude as the only acceptable reference frame for altitude reporting. Therefore, the proposal harmonizes the requirements on altitude reporting in ICAO Doc 9871 with the FAA and EASA published guidance, which would allow the use of ADS-B data as a viable source of information for the continued safe-use of RVSM.	SP-ASWG3-WP/04	ASP WP17-17
For ~~SP/4~~ SP/5 Approval	CP 9871/08	Based on Action item ASWG/5-12, this amendment proposal will be included in the amendment package due to revised RTCA/EUROCAE standards indicated in Annex G.	SP-ASWG5-WP/05.2	SP-ASWG5-WP/05.2
This item was approved by the SP/3	CP 9871/09	There is a need to identify equipment being designed to meet a subset of the standards of surveillance equipment noted in ICAO Annex 10 Volume IV, SARPs, ICAO Document 9871, Edition 2, RTCA DO 181E / EUROCAE ED 73E, and RTCA DO 260B / EUROCAE ED 102A. This proposal defines the changes required to accommodate the identification of these Reduced Capability Equipment (RCE) devices	SP-ASWG7-WP/28	SP-ASWG1-WP/12
For ~~SP/4~~ SP/5 Approval	CP 9871/10	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveies revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F1 ₁₆ and F2 ₁₆ from Doc 9871 (as well as A10V3 and Doc 9924) was proposed.	ASWG WP/9-05R1	ASWG07-WP/27
This item was approved by “correspondence”	CP 9871/11	Different questions have been received from industry on how to fill the different fields of register 4016 and 6216 associated to selected altitude and associated modes of flight. In order to clarify those, this CP provides more examples of selected altitude and target altitudes during different phases of flight.	SP-ASWG12-WP/15R1	ASWG04-WP/04

Doc 9863 ACAS Manual Change Proposals

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2nd edition, 2012 (Closed)	CP9863/01	Changes to the ACAS Manual (Doc 9863) in relation with RA reversal as modified in the TCAS MOPS by EUROCAE/RTCA known as TCAS Version 7.1. The change ensure that an ACAS unit will now monitor the compliance of its own aircraft manoeuvre with the sense of its Resolution Advisory (RA), and may allow a sense reversal in case of non-compliance. Other editorial changes	WP ASP07-09R1	WP ASP07-09
2nd edition, 2012 (Closed)	CP9863/02	Changes to the ACAS Manual (Doc 9863) in relation with Level Off RAs as modified in the TCAS MOPS by EUROCAE/RTCA. The text in the ACAS manual describing the reference logic (TCAS II logic) relating to vertical speed limit RAs must reflect the MOPS changes.	WP ASP07-10R1	WP ASP07-10
2nd edition, 2012 (Closed)	CP9863/03	This change proposal (CP 9863/3) proposes to amend the ACAS Manual sections related to displays. The colour of the symbols used for the display of ACAS advisories are now defined in the SARPs. Other minor editorial changes were made to clarify the text.	WP ASP07-13R1	WP ASP07-13
2nd edition, 2012 (Closed)	CP9863/04	This change proposal (CP 9863/4) proposes the addition of a section to describe operational experience on the compatibility of ACAS with RVSM. Several States have been reported their operational experiences on the compatibility of ACAS with RVSM airspace operation. ICAO ACAS is designed to be compatible and it is confirmed by the statistics data of reported RAs.	WP ASP07-21R1	WP ASP07-21
2nd edition, 2012 (Closed)	CP9863/05	The ACAS manual refers other ICAO documents, for example, to explain the iterations with other equipment including ATC transponders and their test facilities. Amending the ACAS manual will provide the guidance for the control of phantom RAs caused by the transponder test facilities. Change proposal CP 9863/5 proposes to provide the information for the implementation of safe and effective ACAS operation by explaining the potential false interactions between ACAS and other equipment.	WP ASP07-21R1	WP ASP07-21
2nd edition, 2012 (Closed)	CP9863/06	It had been reported that the installation of ACAS to helicopters and their subsequent operations should be investigated carefully. The cluster operation of equipped helicopters has been shown to degrade the surveillance performance of other ACAS in vicinity via the ACAS interference limitation function. . However, operational needs for ACAS on helicopter are also reported. This change proposal proposes to provide the information detailing the considerations to be considered for ACAS installations in helicopters. There are important suggestions and issues left for future considerations on how to avoid the degradation of ACAS performance by installing ACAS to helicopters.	WP ASP07-21R1	WP ASP07-21
2nd edition, 2012 (Closed)	CP9863/07	Proposal to amend the ACAS manual to make it consistent with other ICAO documents in its references. Proposed CP for ACAS Manual Related to Operational Experience	WP ASP07-22R1	WP ASP07-22

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2nd edition, 2012 (Closed)	CP9863/08	Proposal to amend the ACAS manual to introduce SI unit for parameters as required by ICAO. Proposed CP for ACAS Manual Related to Operational Experience	WP ASP07-22R1	WP ASP07-22
2nd edition, 2012 (Closed)	CP9863/09	Proposal to amend the ACAS manual to correct a number of minor editorial errors.	WP ASP07-22R1	WP ASP07-22
2nd edition, 2012 (Closed)	CP9863/10	Proposal to clarify potential confusion. While the statement “except as provided in 4.3.2.2.2.1” is included at the end of the first sentence of 4.3.2.2.2, the definition of “i _t ” as revised is incorrect as written without the additional text. A reader only looking for the definition of “i _t ” could miss the exception in the first sentence, or be uncertain as to whether it applied to the definition.	WP ASP08-8R1	WP ASP07-08
2nd edition, 2012 (Closed)	CP9863/11	Proposal to ensure the consistency between the ICAO documents, i.e., the ACAS manual and the ACAS SARPs. The definition of a parameter is clarified by adding lines to explain how to count ACAS interrogations for interference limitation functions. In addition some editorial corrections are proposed for section numbering.	WP ASP08-24R1	WP ASP08-24
2nd edition, 2012 (Closed)	CP9863/12	Proposed Change Proposal to add a new paragraph to the ACAS manual which includes descriptions of available data to be monitored and examples of ACAS monitor infrastructure and basic requirements to be covered by such a system.	WP ASP11-27R1	WP ASP11-27
Amendment 1 2017 (Closed)	CP9863/13	Proposed change proposals to the ACAS Manual (Doc9863) related to ACAS new features, i.e., new altitude capture laws to reduce the occurrence of unnecessary RAs and automatic following of ACAS resolution advisories.	WP ASP14-19R1	WP ASP14-19
Amendment 1 2017 (Closed)	CP9863/14	A new version of hybrid surveillance including an Extended Hybrid Surveillance mode was developed to even further reduce the RF pollution generated by TCAS active interrogation. This new version of Hybrid Surveillance is documented in RTCA DO-300A and contains a function named Extended Hybrid Surveillance mode, which allows a track to be maintained with qualified Airborne Position Messages without using active interrogations to validate it. This CP introduces material to update the current Hybrid surveillance requirements in the ACAS manual and changes to include the new Extended Hybrid Surveillance mode defined in RTCA DO-300A.	SP1-ASWG-WP/22R1	SP1-ASWG-WP/22
Amendment 1 2017 (Closed)	CP9863/15	This CP amends the ACAS Manual (Doc 9863) to align terminology with current practices and provide complementary information.	SP1-ASWG-WP28R2	SP1-ASWG-WP28R1
Amendment 1 2017 (Closed)	CP9863/16	WP ASP ACSG01-01 was submitted and recommended that operational guidance on unnecessary RAs caused by false aircraft proximity would be useful in pilot training. It was considered that this guidance would be appropriate in the ACAS Manual.	SP1-ASWG1-WP/29	SP1-ASWG1-WP/29

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
3rd edition (in preparation)	CP9863/17	A continuing series of spurious RAs disturbing and (sometimes degrading safety of) aircraft operations when using hybrid surveillance has been shown to result from a hybrid surveillance implementation that was not robust enough to intruder ADS-B position report jumps. Requiring protection against unnecessary RAs that may be caused by residual ADS-B position data during transition from passive to active surveillance was included in the hybrid surveillance MOPS to increase robustness and should be introduced in the SARPS to protect all possible ACAS implementations.	SP-ASWG7-WP38R2	SP2-ASWG4-WP29
3rd edition (in preparation)	CP9863/18	The Surveillance Panel has been tasked to develop provisions on ACAS X (SP Job card SP.009.01 (ENB-CNS -2022-9 Element #1219)). Provisions allowing to recognize ACAS Xa/Xo as an ACAS II have already been proposed for Annex 10 volume IV and approved at SP/3. ACAS Xa/Xo can be available as a collision avoidance system from 2020. In order to assist States to understand ACAS X PfA described above, the ACAS manual must now be updated to provide information and guidance related to the new system, to support industry and states awareness of ACAS Xa/Xo and their preparedness for implementation / certification / operation of the system.	SP-ASWG12-WP/22R2	WP ASWG07-36

Doc 9924 ASM Change Proposals

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
Amendment 2012 (Closed)	CPASM/01	New technology makes easier the use of a certain type of phase modulator. An interoperability issue has been found between interrogator using such modulator and a specific transponder both claiming compliance with ICAO SARPs and transponder MOPS. Some specific material is therefore removed from the SARPs to avoid misinterpretation. Proposal is to reuse the material removed from the SARPs as an example in the ASM (Doc 9924).	WP ASP10-12R1	WP ASP10-12
Amendment 2012 (Closed)	CPASM/02	Mode S has a number of advantages and is becoming the default type of surveillance system that can be found on the market. However it is a complex system and a number of points must be considered before being able to fully benefit of it. Proposal is to incorporate high level guidance material for Mode S implementation in the ASM.	WP ASP10-19R1	WP ASP10-19
Amendment 2012 (Closed)	CPASM/03	From its initial design, all Mode S scanning beam interrogators have used an active approach (all-call plus lockout) to acquire Mode S aircraft. While very effective, this approach has two disadvantages: (1) unwanted all-call fruit is generated by aircraft beyond the interrogator's lockout range and (2) use of active acquisition requires the assignment of an interrogator II or SI code. At the WGW/1 meeting, the ASP was tasked to investigate the use of passive acquisition techniques by Mode S interrogators to overcome the above disadvantages. This Change Proposal allows for the passive acquisition approach that incorporates the comments received at the previous TSG meetings.	WP ASP11-19R1	WP ASP11-19
2nd edition, 2017 (Closed)	CPASM/04	Guidance Material on Flight Testing of New Surveillance Systems have been presented and reviewed during TSG and ASP WG meetings in 2010 and 2011 and the draft of a Change Proposal was presented during WGW/2 and accepted for inclusion into the next update to Doc 9924. Working Paper ASP12-05 finalizes the Change Proposal specific to Guidance Materials on ADS-B Flight Testing as originally agreed to during WGW/2.	WP ASP12-05	WP ASP12-05
2nd edition, 2017 (Closed)	CPASM/05	To limit the number of all-call interrogations per beam dwell, the new SARPs requirements for the all-call reply rate were adopted in the 2nd WGW meeting. This paper provides a draft guidance material for measurement of all-call reply rates in Doc 9924	WP ASP14-15R1	WP ASP14-15
2nd edition, 2017 (Closed)	CPASM/06	CP for the development of ICAO provisions for typical transponder occupancy characteristics	WP ASP15-09R1	WP ASP11-16
2nd edition, 2017 (Closed)	CPASM/07	In order to assist member States their implementations of new surveillance systems, ASP has been tasked to develop guidance material on flight testing of new surveillance systems such as multilateration systems (MLAT). This guidance material was developed after mature experience was available from flight testing and operating wide area multilateration systems. The material was accepted by the WG and it was agreed to include it into Doc 9924.	WP ASP17-06R1	WP ASP16-06

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2nd edition, 2017 (Closed)	CPASM/08	New terrestrial communications systems have been proposed for authorization for use in the United States and potentially worldwide. Those that operate in-band or in an adjacent frequency band have the potential to cause RFI to aeronautical surveillance systems. Following the presentation of WP ASP12-16 and discussion by ASP members, WG began its work on an amendment to Doc 9924 that informs ICAO Member States about this potential for interference and the different mechanisms to evaluate. CP provides additional guidance to be inserted into Appendix M of Doc 9924, in order to discuss potential interference to surveillance systems from terrestrial communications systems, specifically co-channel and adjacent-channel interference. This guidance would complement the existing information provided in Section 11 (RF Interference from Other Systems).	WP ASP17-14R1	WP ASP12-16
2nd edition, 2017 (Closed)	CPASM/09	Different working papers presented to the TSG indicated that the minimum Mode S transmission capabilities defined in ICAO Annex 10 Volume IV and transponder MOPS (50/s for normal installations and 60/s for TCAS capable installations) are exceeded from time to time in high density RF environment. The reported 1090 MHz RF measurements indicate that the main sources of transmission are made up of DF0 and DF11 replies. In addition recent events in Europe have also shown the impact of high rate extraction of transponder registers This CP revises the ASM to provide guidance on ways to reduce DF0, DF11 and DF20/21 reply activity.	SP1-ASWG1-WP/19	SP1-ASWG1-WP/19
2nd edition, 2017 (Closed)	CPASM/10	At ASPWG12 a Working Paper was submitted that contained the description of an assignment planning criteria for SSR Mode S II codes. These criteria are considered necessary to enable States and ICAO to comply with the requirements in Annex 10 Volume IV for international coordination of II codes. The TSG performed a review of the planning criteria and presented to ASP WG 13. After WG review and revision the agreed planning criteria the Panel Secretary arranged for the dissemination of this material to all ICAO Regional Offices. At the ASP WG17 the Panel Secretary presented WP ASP17-24 which proposed adding the II code planning criteria to Doc 9924 and contained a draft CP. TSG reviewed the draft CP and submitted it SP1-ASWG1 for approval.	SP1-ASWG1-WP/21R1	WP ASP12- WP ASP13-16 WP ASP13-16R1 WP ASP17-24 SP1-ASWG-WP/21
2nd edition, 2017 (Closed)	CPASM/11	In association with the CP for the definition of WAM, the ASWG recognized a need to amend Doc 9924 Appendix L in order to define additional applications for WAM (including HME and PRM).	SP2-ASWG4-WP/09R2	
2nd edition, 2017 (Closed)	CPASM/12	Change Proposal for Inter-regional IC Allocation Coordination More and more Mode-S radars are deployed, resulting in overlapping between different radars operated in different ICAO regions. This proposal presents an inter ICAO region coordination of Interrogator Codes, which is required to ensure safe operation of SSR Mode S.	SP2-ASWG4-WP/17R1.	SP-ASWG2-WP/14

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2nd edition, 2017 (Closed)	CPASM/13	CP on Passive Acquisition There is a description that can lead to a misunderstanding in the material on the short baseline MLAT. In addition, the guidance material of short baseline MLAT has included only simulation results, whereas the guidance material of angle of arrival antenna has included evaluation results with a real environment. From these situations, some clarification is needed and evaluation results should also supplement the guidance material.	SP2-ASWG4-WP/21R1	ASWG3-WP/18
2nd edition, 2017 (Closed)	CPASM/14	CP on Security Aspects of Surveillance Systems Although ICAO amended Annex 17 to include considerations of cyber threats, ASWG recognized that there is no practical guidance for dealing with malicious threats for ADS-B and other surveillance systems. In order for States to be able to deal with this issue in an appropriate manner, the ASWG initiated work to propose guidance as part of the ongoing work programme.	SP2-ASWG4-WP/25R1	SP-ASWG3-WP/24R1
For ~~SP/4~~ SP/5 Approval	CPASM/15	Based on Action item ASWG/5-12, this amendment proposal will be included in the amendment package due to revised RTCA/EUROCAE standards indicated in Annex G.	SP-ASWG5-WP/05.3R1	
3rd edition, 2020 (Closed)	CPASM/16	CP to Include Examples of Past Uses of the X pulse The interoperability between airborne platforms and ground systems is important to ensure safe operation. Different local uses of the X pulse have been implemented resulting in interoperability issues among civil and military SSR systems. Although SP/2 agreed with the related amendment proposal to Annex 10 Volume IV, TSG started recognized needs to update Doc 9924 (Appendix D, SSR System Techniques, Section 3.3.3 Transmission of the “X” Pulse) to include better descriptions of how the “X” Pulse is currently used in operation.	SP-ASWG5-WP/06R1	
3rd edition, 2020 (Closed)	CPASM/17	CP for Clarification of Military Use of 1030 MHz/1090 MHz It was recognised that current description of IFF usage in Doc 9924 was not accurate enough. Therefore, more accurately depicted IFF usage is proposed to clarify that IFF needs to be considered when conducting performance studies of 1030/1090 MHz.	SP-ASWG5-WP/07 and SP-ASWG6-WP/05	
3rd edition, 2020 (Closed)	CPASM/18	The ASWG deemed it important to provide guidance to account for IFF interrogation activity in estimating transponder occupancy. Mode 5 guidance is based on results of bench testing of Mode 5 impact on civil Mode A/C and Mode S transponders presented and reviewed within the ASWG. The results indicate that Mode 5 signals do not directly cause transponder suppression or reply but depending on relative Mode 5 signal level to a desired civil interrogation at a transponder receiver, reply to a desired interrogation could be disturbed. A conservative and simplified approach to representing Mode 5 impact to transponder occupancy was developed and is proposed to be included in Doc 9924.	SP3-ASWG8-WP/04R2	SP-ASWG5-WP24R1

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
3rd edition, 2020 (Closed)	CPASM/19	Results of flight test measurements have been presented to the ASWG in the past that were independently taken in Europe and the United States in some of the highest density airspace in the world. Although the measurements agreed in some aspects, there were differences that existed and difficult to resolve. It was recognized that making measurements of the RF environment is a complex activity and results are highly dependent on measurement methodologies and reporting results in a consistent way is critical to deriving meaningful conclusions and accurately assessing the RF environment. As a result, it was agreed by the AWSG that providing guidance in Doc 9924 would benefit future measurement activities.	SP3-ASWG8-WP/08R1	SP-ASWG1-WP17
For ~~SP/4~~ SP/5 Approval	CP ASM/20	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveys revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F1 ₁₆ and F2 ₁₆ from Doc 9924 (as well as A10V3 and Doc 9871) was proposed.	ASWG WP/9-05R1	ASWG 07-WP/27
3rd edition, 2020 (Closed)	CP ASM/21	Air ground and air-air surveillance systems as well as airborne collision avoidance systems are heavily relying on a (24-bit) aircraft address configured on board aircraft. Therefore, the allocation of an aircraft address and its correct configuration in aircraft is a key element for a safe operation of aircraft and associated communication protocols used to support CNS systems. If two aircraft use the same address in the same area, exchanges will interfere and create unsafe situation. It is therefore necessary that States ensure allocate aircraft address appropriately through a well defined process and put in place the necessary means to ensure that the aircraft addresses are correctly configured in aircraft.	ASWG WP/9-08R2	ASWG02-WP/18
3rd edition, 2020 (Closed)	CP ASM/22	Passive surveillance systems employing a Radio-over-Fiber (RoF) technology have been developed. The (RoF) technology enhances MLAT systems compared with general microwave links using a coaxial cable and wireless communication, from the viewpoint of stability and surveillance performance. The RoF technology provides several advantages including more simplified receiver stations, better target detection, better common clock architecture and extension of service range.	ASWG/12-WP16R3	ASWG08-WP/23
New For SP/4 Approval	CP ASM/23	This CP provided proposed corrections to Appendix M, Tables M-1, M-2, and M-3. Furthermore, this CP included some accompanying diagrams to clarify the information.	SP-ASWG13-WP/06R1	SP3-ASWG8-WP04R2
New For SP/4 Approval	CP ASM/24	It was recognized that recommendation about the power level for P1 Control, while using the I ² SLS rejection technique, was missing from Doc 9924. The CP provides better guidance in the usage of I ² SLS rejection technique.	SP-ASWG13-WP/12R1	SP-ASWG11 WP23

Doc 8071 Manual on Testing of Radio Navigation Aids (Volume III – Testing of Surveillance Radar Systems)

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
2 nd edition of Volume III, 2020 (Closed)	CP8071/01	With Task No 2 of the ASP current work program, ASP has developed guidance material on flight testing of new surveillance systems (ADS-B and Multilateration). Although the ASP had concluded that its deliverable (guidance material on flight testing of new surveillance systems) should be placed in Doc 9924 but the ASP has agreed the need to amend Doc 8071 in order to make a clear demarcation between Doc 9924 and Doc 8071, which includes flight test guidance for existing systems.	WP ASP17-23R1	WP ASP16-33
2 nd edition of Volume III, 2020 (Closed)	CP8071/02	ICAO Doc 8071 Volume III "Testing of Surveillance Radar Systems" issued 1998 has not been considerably updated for 20 years and describes to some extent obsolete radar technology, superseded test tools and test methods not applicable any more in modern radars. In terms of avoiding problems in understanding test methodologies and produce unintended results using the document for testing of state of the art radar systems, but also satisfying the need to cover existing older radars, ICAO Doc 8071 Volume III needs to be updated.	SP3-ASWG8-WP/11R1	SP-ASWG3-WP05

**Annex G – Package due to revised RTCA/EUROCAE standards
Agreed Change Proposals to ICAO SARPs, Guidance Material, and Manuals**

Annex 10 Volume IV SARPs Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
<i>For ~~SP/4~~ SP/5 Approval</i>	CPA10V4/35	PfA for Correction of Military Use of DF=19 and Register F2 There are inconsistencies in 1) how DF=19 is defined between ICAO and RTCA/EUROCAE documentation and 2) how the application field is defined. Furthermore, some requirements are ambiguous and causing confusions. In order to clarify those requirements, it is required to indicate that DF=19 is not an extended squitter or an ADS-B message and DF=19 cannot be used in lieu of DF=17 or DF=18.	SP-ASWG5-WP/05.1R1	
<i>For ~~SP/4~~ SP/5 Approval</i>	CPA10V4/38	PfA for Extended Squitter Rate Additional messages for Weather information, Interrogation Reply Monitoring and UAS contingency data are required to be transmitted by ADS-B version 3. In order to provide the 1.1 ES/s rate required to accommodate the transmission of those additional messages, the average Extended Squitter rate needs to be increased by 0.5/s. This proposal is agreed based on a study conducted by SP ASWG that the increase in extended squitter rate will be balanced by a reduction in transponder transmission of replies that result from transponder decoding of Mode A/C/S All-Call interrogations.	SP-ASWG10-WP/11R1	

Annex 10 Volume III SARPs Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
<i>For ~~SP/4~~ Approval (combined with other PfAs to A10V III)</i>	CPA10V3/01	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveies revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F ₁ ₁₆ and F ₂ ₁₆ from A10V3 (as well as Doc 9871 and Doc 9924) was proposed.	ASWG9-WP/06R1	ASWG 07-27

Doc 9871 Technical provisions for Mode S services and extended squitter Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For ~~SP/4~~ SP/5 Approval	CP 9871/08	CP for Correction of Military Use of DF=19 and Register F2 Doc 9871 defines the format to be used for BDS Code F,2 in Table A-2-242. The current definition includes references to DF-19, but BDS F,2 is not solely for use with DF=19. The proposed changes remove references to DF=19 in the definition of BDS F,2.	SP-ASWG5-WP/05.2	
For ~~SP/4~~ SP/5 Approval	CP 9871/10	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveys revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F ₁₁₆ and F ₂₁₆ from Doc 9871 (as well as A10V3 and Doc 9924) was proposed.	ASWG9-WP/05R1	ASWG 07-27

Doc 9924 ASM Change Proposals

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For ~~SP/4~~ SP/5 Approval	CPASM/15	CP for Correction of Military Use of DF=19 and Register F2 Doc 9924 Appendix K lists the registers that are considered ADS-B Out Extended Squitters. BDS Code F,2 is included in the list of registers, but BDS F,2 should not be considered an ADS-B Out Extended Squitter. The proposed changes remove references to BDS F,2 in the list of ADS-B Out Extended Squitter registers.	SP-ASWG5-WP/05.3R1	
For ~~SP/4~~ SP/5 Approval	CP ASM/20	F,1 and F,2 are defined in Annex 10 Volume III for military applications. Register F,1 contains the Mode 1 and 2 codes, while Register F,2 contains the Mode 1, 2, and A codes. Since surveys revealed that no NATO nation nor SP non-NATO members are currently populating these registers in transponders or extracting these registers, the proposal of removal of definitions of Registers F ₁₁₆ and F ₂₁₆ from A10V3, Doc 9871 and Doc 9924 was proposed.	ASWG WP/9-05R1	ASWG 07-27

Annex H –SP-ASWG Work Programme

ANC Job Cards

The table below shows the relationships between ASWG tasks and the job cards that SP has been assigned which were allocated to ASWG

New job card	Tasks details	Status update	ASP job card
SP.008.02 Ensure performance of Surveillance and ACAS systems	1. Update and maintain Annex 10 Volume IV and Volume III (relating to 24-bit aircraft addresses) and other ICAO documents based on operational experience.	On-going	None
	2. Develop provisions aimed at lowering interference levels on 1030/1090 MHz.	On-going	ASP001
	3. Ensure compatible operation of civil and military surveillance, and collision avoidance systems. (compatibilities and interoperability), including compatibilities between new ACAS and existing ACAS	On-going	ASP005
	4. Investigation of new surveillance technologies for air traffic management use	On-going	ASP002
	5. Updated information related to surveillance systems included in the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual.	On-going	None
	6. Develop measurable technical performance specifications for surveillance systems	On-going	None
SP.009.02 ACAS-X	New generation of collision avoidance systems	On-going	None
Supporting task (RPASP job card)	Develop technical provisions for RPA Detect and Avoid capabilities	On-going	ASP003
Supporting task (CP-OPDLWG job card)	Performance-Based Surveillance (PBS)	On-going	None

SP-ASWG tasks

SP-ASWG WORK PROGRAMME TASKS								
Job card	Task	Description	Assigned to	Papers Submitted after SP/3		Documents to be amended after SP/3 and ASWG/12	Target Date	Status
SP.008.02	1	The development of updates to existing materials in light of operational experience	TSG/ACSG	SP-ASWG9-WP/08R2 SP-ASWG9-WP/07 SP-ASWG9-WP/09 SP-ASWG9-WP/16 SP-ASWG9-WP/18 SP-ASWG9-WP/22 SP-ASWG9-WP/27 SP-ASWG10-WP/04 SP-ASWG10-WP07 SP-ASWG10-WP/08 SP-ASWG10-WP/19 SP-ASWG10-WP/16 SP-ASWG10-WP/26 SP-ASWG10-WP/29 SP-ASWG10-WP/32 SP-ASWG10-Flimsy 01 SP-ASWG11-WP/10 SP-ASWG11-WP/04 SP-ASWG11-WP/05 SP-ASWG11-WP/06 SP-ASWG11-WP/08 SP-ASWG11-WP/09 SP-ASWG11-WP/12 SP-ASWG11-WP/20 SP-ASWG11-WP/21	SP-ASWG11-WP/22 SP-ASWG11-WP/23 SP-ASWG11-WP/24 SP-ASWG11-WP/27 SP-ASWG11-WP/28 SP-ASWG12-WP/04 SP-ASWG12-WP/05 SP-ASWG12-WP/06 SP-ASWG12-WP/11 SP-ASWG12-WP/12 SP-ASWG12-WP/13 SP-ASWG12-WP/15 SP-ASWG12-WP/17 SP-ASWG12-WP/21 SP-ASWG12-WP/28 SP-ASWG13-WP/06R1 SP-ASWG13-WP/12R1 SP-ASWG13-WP/13R1 SP-ASWG13-WP/15 SP-ASWG13-WP/04 SP-ASWG13-WP/11R1 SP-ASWG13-WP/14 SP-ASWG13-WP/37 SP-ASWG13-WP/38	CP A10V3/02 CP A10V3/03 CP 9871/11 CP ASM/23 CP ASM/24 (Note. –CP ASM/21 was included in the 3 rd edition of Doc 9924.)	2023 (Annex) 2025 (other guidance materials)	Ongoing task

SP-ASWG WORK PROGRAMME TASKS

Job card	Task	Description	Assigned to	Papers Submitted after SP/3		Documents to be amended after SP/3 and ASWG/12	Target Date	Status
	2	Develop provisions aimed at lowering interference levels on 1030/1090 MHz.	TSG/ACSG	SP-ASWG9-WP/12R1 SP-ASWG9-WP/13 SP-ASWG9-WP/15R1 SP-ASWG9-WP/28 SP-ASWG10-WP/13 SP-ASWG10-WP/14 SP-ASWG10-WP/17 SP-ASWG10-WP/18 SP-ASWG10-WP/20 SP-ASWG10-WP/33 SP-ASWG11-WP/14 SP-ASWG11-WP/18 SP-ASWG11-WP/19 SP-ASWG11-WP/25	SP-ASWG11-WP/26 SP-ASWG12-WP/07 SP-ASWG12-WP/09R1 SP-ASWG12-WP/10R1 SP-ASWG12-WP/14 SP-ASWG12-WP/19 SP-ASWG12-WP/20 SP-ASWG13-WP/16 SP-ASWG13-WP/08 SP-ASWG13-WP/09 SP-ASWG13-WP/10 SP-ASWG13-WP/17 SP-ASWG13-Flimsy 02 SP-ASWG13-Flimsy 03		2023 (Annex) 2025 (other guidance materials)	Ongoing task
	3	Investigation of new surveillance technologies for air traffic management use	TSG	SP-ASWG9-WP/10 SP-ASWG9-WP/11 SP-ASWG9-WP/24 SP-ASWG9-WP/25 SP-ASWG10-WP/09 SP-ASWG10-WP/10 SP-ASWG10-WP/15 SP-ASWG10-WP/21 SP-ASWG10-WP/22R1 SP-ASWG10-WP/27 SP-ASWG11-WP/13 SP-ASWG11-WP/16 SP-ASWG12-WP/16R2 SP-ASWG12-WP/18 SP-ASWG12-WP/30	SP-ASWG13-WP/20R1 SP-ASWG13-WP/21R1 SP-ASWG13-WP/22 SP-ASWG13-WP/23R1 SP-ASWG13-WP/24 SP-ASWG13-WP/25 SP-ASWG13-WP/26R1 SP-ASWG13-WP/27R1 SP-ASWG13-WP/28R1 SP-ASWG13-WP/29R1 SP-ASWG13-WP/30 SP-ASWG13-WP/31R1 SP-ASWG13-WP/32R1 SP-ASWG13-WP/07 SP-ASWG13-WP/18 SP-ASWG13-WP/19	(Note. –CP ASM/22 was included in 3 rd edition of Doc 9924.)	2025	Ongoing task

SP-ASWG WORK PROGRAMME TASKS

Job card	Task	Description	Assigned to	Papers Submitted after SP/3		Documents to be amended after SP/3 and ASWG/12	Target Date	Status
	4	Ensure compatible operation of civil and military surveillance, and collision avoidance systems. (compatibilities and interoperability)	TSG/ ACSG	SP-ASWG9-WP/05R1 SP-ASWG9-WP/06R1 SP-ASWG9-WP/04 SP-ASWG9-WP/14 SP-ASWG10-WP/11R1 SP-ASWG11-WP/15 SP-ASWG12-WP/08R1		CP A10V4/35 CP A10V4/38 CP A10V3/01 CP 9871/08 CP 9871/10 CP ASM/15 CP ASM/20	2023 (Annex) 2025 (other guidance materials)	Ongoing task
	5	Updated information related to surveillance systems included in the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual.	TSG	SP-ASWG10-WP/05R1 SP-ASWG11-WP/11 SP-ASWG13-WP/05			2025	New
	6	Develop measurable technical performance specifications for surveillance systems	PBSSG	SP-ASWG9-WP/21 SP-ASWG9-WP/23R1 SP-ASWG9-WP/26 SP-ASWG10-WP/25 SP-ASWG10-WP/31 SP-ASWG10-WP/30 SP-ASWG11-WP/07 SP-ASWG11-WP/33 SP-ASWG12-WP/25 SP-ASWG12-WP/31 SP-ASWG13-WP/36			2025	New

SP-ASWG WORK PROGRAMME TASKS

Job card	Task	Description	Assigned to	Papers Submitted after SP/3		Documents to be amended after SP/3 and ASWG/12	Target Date	Status
SP.009.02	7	New generation of collision avoidance systems	ACSG	SP-ASWG9-WP/20 SP-ASWG9-WP/29 SP-ASWG10-WP/24 SP-ASWG10-IP/10R1 SP-ASWG11-WP/32 SP-ASWG11-WP/29 SP-ASWG11-WP/31 SP-ASWG12-WP/24 SP-ASWG12-WP/22R2 SP-ASWG13-WP/35		<i>(Note. – CP9863/18 will be included in 3rd edition of Doc 9863.)</i>	2020 (ACAS Xa) 2022 (ACAS Xu)	Ongoing task
RPASP	8	Develop technical provisions for RPA Detect and Avoid capabilities	TSG/ ACSG	SP-ASWG9-WP/20 SP-ASWG9-WP/17 SP-ASWG10-WP/06 SP-ASWG10-WP/28 SP-ASWG12-WP/27			2020	Ongoing task
CP- OPDLWG	9	Performance-Based Surveillance (PBS)	PBSSG	Based on the future outcome from task 6, actions will/may be assigned to Secretary.		Not applicable	2025	Supporting task



SP-AIRB WG/11 -
REPORT
07-09 April 2021

SURVEILLANCE PANEL (SP)

Eleventh meeting of the Airborne Surveillance Working Group (AIRB WG/11)

Web Meeting, from 07 to 09 April 2021

MEETING REPORT

Drafted by the Secretary

This document provides the SP-AIRB/11 Working Group Meeting Report.

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AGENDA ITEM 1: OPENING REMARKS & INTRODUCTION OF THE PARTICIPANTS

1.1. The Eleventh meeting of the Airborne Surveillance Working Group (SP-AIRB WG/11) was held through virtual meeting platform from 07 to 09 April 2021 (6 am to 10 am (EDT) everyday).

1.2. The Chairperson of the Airborne Surveillance (AIRB) Working Group, Mr. Jean-Marc Loscos (JML), opened the meeting and gave the welcome address to attendees. He expressed his special appreciations to all attendees, who actively participated to the virtual meeting from various locations and time zones.

1.3. JML provided the members with schedule of the meeting and logistics for AIRB WG/11 using “AIRB-WG-11 chairperson's Opening Remarks” which was posted in the AIRB WG/11 folder on the SP secure portal. He then asked that the meeting attendees briefly introduce themselves. A list of attendees is given in Appendix 1.

AGENDA ITEM 2: APPROVAL OF THE AGENDA

2.1. Approval of the Agenda

2.1.1 The agenda (Refer to [SP-AIRB11-WP01](#)) was presented by the chairperson and approved by the meeting. Some WPs/IPs were updated during the meeting, which resulted in revision of agenda (refer to [SP-AIRB11-WP01R2](#)). The agenda is given in Appendix 2.

2.2 The report of the 10th AIRB WG meeting

2.2.1 The report of the 10th AIRB WG meeting (Refer to [SP-AIRB11-WP02](#)) was presented by the Surveillance Panel Secretary, Mie Utsumomiya (MU). The AIRB WG/10 Final Report was approved by the meeting without modification.

2.3 Status updates of Action Items

2.3.1 The meeting reviewed the status of Action Items arisen from the past meetings (AIRB WG/5 AIRB WG/8, AIRB WG/9 and AIRB WG/10). While most of action items were closed during the review of the actions, status updates of some actions were further discussed by the meeting. The outcome of this review was included in [SP-AIRB11-WP03R1](#).

2.3.2 Regarding the Action Item AIRB/10-5, a question was raised on the terminology, “advanced Interval Management (IM)”, included in a note of the new edition of Doc 10037 (not yet published by ICAO, so only available to AIRB WG members/advisors who also participate in the Communications Panel). In reply to this question, Doug Arbuckle (DA) clarified points as follows.

- Different use of the terminology, “Advanced” IM, can be found in several documents but it evolved over the years. When this terminology was introduced, it was then envisioned that IM operations would have begun by now, but that didn’t happen.
- It is now considered that [initial implementations of] “IM” can be supported by voice communications while more “complex [implementations of] IM” would be supported by datalink communication capability. This terminology has been used in the GANP in order to reflect a different timeline. In particular, IM is associated to Block 1 while more complex geometries of IM using datalink for transmission of such clearances would be available in Block 3.

- Similarly, the availability of IM message set is not considered necessary for the time being and this is consistent with the presence of IM message set in the new edition of Doc 10037 as well as DO-350A/ED-228A - Safety and Performance Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 SPR Standard). However it is uncertain if this IM message set will be fit for purpose since these messages were developed years before the IM SPR (DO-328B/ED-195B) was completed.
- Though it was not discussed in the meeting, it is noted here that the Communications Panel did not request any interpanel coordination or consultations with the Surveillance Panel regarding Doc 10037.

2.3.3 Although the meeting considered the benefits of adding some notes to clarify this terminology, which can be included in future version of Doc 10037, the meeting concluded this should be discussed further with Communication Panel OPDLWG, when AIRB WG will start coordination with other panels.

2.4 Report and update from the Surveillance Panel Secretary

2.4.1 MU presented [SP-AIRB11-WP04.0](#), which covered the following items:

- a) Introduction of new members nominated by Australia, South Africa, United Kingdom and IFALPA
- b) Change proposals to guidance material which includes new edition of Doc 9994 and
- c) Coordination activities with other panels

2.4.2 This WP included three attachments ([SP-AIRB11-WP04.1](#), [SP-AIRB11-WP04.2](#) and [SP-AIRB11-WP04.3](#)). MU further explained that as presented at the last AIRB WG meeting, Secretary provided RPAS panel with SP comments on the draft SARPs for a new Part IV to Annex 6. RPASP received approximately 1000 comments from several panels including SP which were reviewed by RPASP WG-5. Based on these comments, the draft Annex 6, Part IV document has been updated as presented in Attachment C ([SP-AIRB11-WP04.3](#)) and a combined comment response matrix has been compiled, presented as Attachment B ([SP-AIRB11-WP04.2](#)). SP is invited to provide their formal endorsement by Friday 17 September 2021 (refer to attached draft WP ([SP-AIRB11-WP04.1](#))).

2.4.3 Considering SP/4 will be held after the due date, it was agreed to proceed by correspondence which resulted in the following action.

ACTION ITEM AIRB/11-01: all to review [SP-AIRB11-WP04.1](#), [SP-AIRB11-WP04.2](#) and [SP-AIRB11-WP04.3](#) and provide endorsement by **12 May 2021**.

2.4.4 The meeting expressed concerns of the “coordination with other panels” regarding PfA to Annex 10 Volume IV relating to Chapter 7, Technical requirements for airborne surveillance applications. MU explained that in the current practice, inter panel coordination should be made **before** approving PfA by own panel. SP Job card (SP.010.02) indicates several supporting expert groups; therefore the PfA which related to interval management needs to be coordinated with other panels indicated in the job card.

2.4.5 It is also important to note that it is not possible to proceed with sequential PfAs and it might be necessary to reconsider the timeline for the development of PfAs for SP/4 and/or SP/5. A meeting of the Strategic Advisory Sub Group (SASG) is **probably necessary in 2021**.

2.5 New document exchange platform to facilitate access to material developed by standards-making organizations (SMOs)

2.5.1 The **SP-AIRB11-IP01**, presented by MU on behalf of ICAO, which introduced a new document exchange platform which has been established for Panel members, advisors and observer to access the material developed by other standards-making organizations (SMOs) to support the work of the Panel and enhance referencing of such material in ICAO documentation. Section 2 of Appendix of this IP explained how to get an access to this new document platform and SP members and advisors were encouraged to get an access to this platform.

2.6 FF-ICE updates and future flight plan, as prepared and presented by ATMRPP Secretary

2.6.1 In reply to a coordination request made by SP WGs, **SP-AIRB11-WP07** was presented by ATMRPP Secretary, Ms Crystal Kim, which provided an update on FF-ICE and future flight plan. The presentation described several points such as an update on FF-ICE provisions, specific areas of interest to SP and next steps. The meeting was informed that pending alignment with SWIM provisions, ATMRPP has completed final quality checks and refinements to FF-ICE provisions. The final proposed provisions are planned to be circulated to several panels for coordination around October/November 2021.

2.6.2 Ms Kim explained the outcome of coordination between ATMRPP and SP, in which SP provided requests to add several flight information needs including ADS-B OUT and ADS-B IN capabilities. ATMRPP decided to add ADS-B OUT capabilities in FPL2012 (and FF-ICE) as a short term need, but ATMRPP believes ADS-B IN capabilities require more analysis/coordination. Also the meeting was informed that in order to provide those short-term improvements to current flight plan, ATMRPP decided to use ICAO website to provide additional information such as ADS-B OUT capabilities to be included in “Item 18 SUR”.

2.6.3 In reply to some concerns on handling SP inputs regarding ADS-B IN capabilities (one ANSP is spending millions of dollars to modify its ATC automation systems based on the ANSP/State’s perception of ICAO agreement), ATMRPP Secretary explained that an additional coordination meeting with ATMRPP and SP would be helpful to promote a discussion and ease those concerns. Based on this request, a following action was assigned to the Secretary.

ACTION ITEM AIRB/11-02: MU to organize a joint meeting (before July 2021) between some SP experts and ATMRPP, to discuss further surveillance capabilities to be indicated in item 18 SUR in 2012 FPL Format.

AGENDA ITEM 3: REVIEW OF REPORTS FROM EXTERNAL GROUPS ON RECENT DEVELOPMENTS

3.1 Report from States and Organizations

3.1.1 Status of RTCA/EUROCAE Standards Development

3.1.1.1 **SP-AIRB11-IP02** was presented by DA and Bogdan Petricel (BP). This IP provided a status summary of ADS-B avionics standards development activities underway or recently completed by RTCA/EUROCAE. Furthermore, this IP also provided information as available about the invocation of these standards in various Technical Standard Orders from FAA and EASA.

3.1.2 Update on ADS-B-IN Retrofit Spacing (AIRS) Project

3.1.2.1 DA presented **SP-AIRB11-IP03**, which provided a summary of updates on the ADS-B-IN Retrofit Spacing (AIRS) Evaluation. The ADS-B IN Retrofit Spacing evaluation project was kicked off

in September 2017, with the aim of conducting a large-scale operational evaluation of two ADS-B In applications: Cockpit Display of Traffic Information (CDTI)-Assisted Visual Separation (CAVS) and Interval Management (IM). The project engaged the FAA with ACSS and American Airlines (AAL) in a public-private partnership to equip several hundred American AAL A321 aircraft with an ADS-B-IN retrofit solution supporting the CAVS and IM applications (ACSS calls this SafeRoute). This IP provided an update to the information provided in [SP-AIRB10-IP02](#); changes from that paper were highlighted in yellow in this IP.

3.1.2.2 As of March 2021, 33 AAL A321 aircraft have been equipped. The number of equipped A321s needed to initiate IM spacing operations depends on the expected ratio of equipped aircraft to non-equipped aircraft in the airspace. Prior to the downturn in commercial air traffic due to COVID-19, it was expected that approximately 120 aircraft needed to be equipped. The prior analysis is currently being revisited, but for planning purposes, IM operations are tentatively expected to begin in the first half of 2022.

3.1.2.3 FAA and AAL are also planning to conduct an operational trial, on KDFW airport in 2022, using CAVS avionics functionality in ceiling and visibility conditions that would not currently qualify for “pilot-applied visual separation” in the U.S. under FAA Order 7110.65, “Air Traffic Control.” FAA and AAL refer to this new operation as “CDTI-Assisted Separation” (CAS). For more details, reference should be made to [SP-AIRB11-IP04](#).

3.1.2.4 In reply to some questions raised by the meeting, DA explained that:

- FAA is not considering expanding these trials (IM and CAS) to any other locations at this moment.
- Benefit evaluation will be made by comparisons of data between the baseline period and the trial period (one year). One of the expected benefits, which already appeared with some confidence, is lowering the rate of unnecessary missed approaches (due to ‘too close’ spacing on final with the preceding traffic).
- It was noted that although CAVS arrival operations do not require ATC involvement and can be performed at any airport, IM spacing operations are limited to airspace where controllers know which aircraft are equipped with IM and have methods to assign spacing goals. In this evaluation, the controllers will not have any automation supporting tools for IM but they will be provided manually with required information (which aircraft are capable to perform IM and what spacing goals should be assigned to the aircraft). Introduction of automation tools will be after the trial (after 2025), and
- It is evident that operations of IM will be in an environment with partial IM equipage for quite some time. Several simulations have indicated operational benefits in this mixed environment. Ignacio Baca (IFATCA) expressed some concerns on the increase of ATCO workload associated with partial IM equipage. DA confirmed this shared concern and it is planned to implement IM operations when the rate of IM equipage is considered enough to support controller proficiency with the operation.

3.1.3 DRAFT Operational Description for CDTI-Assisted Separation (CAS)

3.1.3.1 DA presented [SP-AIRB11-IP04](#) which provided a Draft Operational Description for CDTI-Assisted Separation (CAS), an operation proposed to be conducted using CAVS avionics functionality in meteorological conditions where out-the-window pilot-applied visual separation cannot be used.

3.1.3.2 CAS trial operations are tentatively planned to commence in 2022 for AAL A321 aircraft arriving at the KDFW airport. In preparation for the safety risk management work to enable the CAS trial, the FAA, MITRE and AAL have developed a draft operational description of CAS. Reference should be made to Attachment 1 of this IP. As the project progresses, this initial draft is expected to undergo further revisions and refinement.

3.1.3.3 The meeting expressed their interest in this draft. Some clarifications were made that in this trial, the flight crew does not need to identify aircraft via the out-the-window view, but presuming ATC will identify traffic by radio communications and the flight crew will identify and track the preceding aircraft through ADS-B In systems on board, to include a traffic display.

AGENDA ITEM 4: INTERVAL MANAGEMENT (IM)

4.1 Operational procedure for interval management

4.1.1 JML presented [SP-AIRB11-WP/08](#), which is revision of [SP-AIRB WG10-WP06R1](#) taking into account additional comments provided by members (refer to [SP-AIRB11-IP05](#)). This WP including its appendices, was reviewed and discussed.

- Appendix A - draft material for PANS-OPS
- Appendix B - draft material for PANS-ATM(phraseology)

4.1.2 In reply to questions raised by the meeting, the following points were clarified.

- Considering required time to develop mature materials and in order to facilitate discussion at the AIRB WG, draft proposals for PANS-OPS and PANS-ATM were developed. However, it is realized that these are still working documents not aiming at endorsement nor coordination with other panels.
- It was recalled that there are still validation trials under way including Human In the Loop simulations (IP05 sample of communications) with diverse phraseologies being assessed. These tests will also contribute to the usability of voice or data communications for the IM procedure. In any event, it seemed preferable to wait for the results before proposing phraseology provisions.
- It was noted that it was not practical to discuss details of phraseology before having developed general overview of the IM procedure, in a similar way as in Appendix A. The meeting highlighted that text from published operational, Safety and Performance Requirements (SPR) (ED-195B/DO-328B) could be used.
- The meeting recognized the need to work on terminology regarding how Interval Management is referenced, to include any difference(s) between IM and flight deck interval management (FIM). This terminology issue was previously discussed to some degree in section 2.3.2 of this meeting report. This was necessary not only for the draft PANS but also for Doc 9994. As a general rule, IM is used to refer to the operational procedure while FIM is used to refer to the on-board avionics. However the meeting agreed that a thorough review is required and definitions should be developed.
- Several improvements were suggested by the meeting and those were reflected in the drafts. In addition, JML confirmed that additional comments would be welcome, which will be reflected into those working documents.

4.1.3 The meeting discussed the way forward including the need for an ad-hoc meeting (in June 2021) to progress specifically on an “IM presentation package” in preparation for AIRB/12+SP/4.

Several members expressed their support for such a meeting aiming at starting preparation of the briefing slides, allocating work related to revising the IM section of the Manual on Airborne Surveillance Applications (Doc 9994), and developing a timeline for next steps.

4.1.4 As a result, the following actions were assigned by the meeting.

ACTION ITEM AIRB/11-03: NP, JF, DA and JML to develop definitions, clarifications and/or categorizations in terminology of Interval management and flight deck interval management for the Manual on Airborne Surveillance Applications (Doc 9994), which should be presented at AIRB WG/12.

ACTION ITEM AIRB/11-04: Interested members/advisors to contact JML indicating their interest and participations to the ad-hoc group by **12 May 2021**. In reply to those, JML to set the Ad-hoc group meeting to be held on **1 June 2021**.

Note. –following members/advisors expressed their interest of joining the ad-hoc group.

(Jean-Marc Loscos, Samson Akpore, Ignacio Baca, Moritz Bürger, Bogdan Petricel, Carole Couchman, Christian Aveneau, Noppadol Pringvanich, Paul Von Hoene, Julien Frard, Doug Arbuckle, Raza Gulam and Mie Utsunomiya). Eri Itoh, Takuya Otsuyama, and Nico De Gelder, expressed their interest just after the meeting closure.

ACTION ITEM AIRB/11-05: All to review [SP-AIRB WG11-WP08](#) and provide comments to JML and ad-hoc group members by **31 May 2021**.

ACTION ITEM AIRB/11-06: taking into account comment provided by members, Ad-hoc group to review and update the working documents included in [SP-AIRB WG11-WP08](#).

ACTION ITEM AIRB/11-07: Ad-hoc group to start developing a set of slides which should include some detailed explanation of IM such as IM description, overview, objectives and benefit statements. This presentation package should be submitted to the next AIRB WG meeting together with a high level timeline of Interval management standardisation.

4.1.5 JML also introduced [SP-AIRB11-IP/05](#), which provided not only comments provided by Randy Bone but also samples of IM communications used in the validation trials. It was further explained that those samples were used in the most recent simulation analysis to identify the usability of voice communications in anticipation of possible use of data communications.

4.1.6 [SP-AIRB11-WP/10R1](#) was presented by JML. As a result of the ACTION ITEM AIRB/10-08, this WP proposed some requirements to address issues regarding safety risk assessment, which could be introduced in the Manual on Airborne Surveillance Applications (Doc 9994) to support implementation of IM application.

4.1.7 Several comments were made during the discussion of this WP and the meeting re-confirmed a need of clarifying the terminologies, i.e., complex Interval management and interval management. Refer to Action Item AIRB/11-03 above. As a result of the discussion, the following action was assigned to JML.

ACTION ITEM AIRB/11-08: JML to refine [SP-AIRB11-WP/10R1](#) and to prepare a change proposal to Doc 9994, which should be presented at the AIRB WG/12 for approval.

4.1.8 [SP-AIRB11-WP/06](#) was prepared by Noppadol Pringvanich (NP) and Paul Von Hoene (PVH) and presented by PVH. This WP provided proposed text relevant to operational approval of Interval

Management (IM) for inclusion in Chapter 4 of the Manual on Airborne Surveillance Applications (Doc 9994). The text included recommended items of documentation to support operational approval of operators to conduct IM. The proposed text was intended to provide a harmonized, minimum set of requirements by which each State regulator would evaluate an operator's qualification to conduct IM. This WP also contained in an appendix a sample checklist that regulators may use to guide their evaluation for an operator's qualification to conduct IM.

4.1.9 Many members expressed their support and interest in the proposals. It was recognized that this kind of guidance material was suitable not only for IM but also for other ADS-B IN applications such as In-Trail Procedure (ITP) and CDTI-Assisted Visual Separation (CAVS). AIRB WG/11 agreed with the change proposal included in this WP in principal. However, considering several comments expressed during the meeting and several members/advisors expressed their willingness to provide additional comments to improve the contents of this WP, following actions were assigned by the meeting.

ACTION ITEM AIRB/11-09: Interested members/advisors to review [SP-AIRB11-WP/06](#) and provide their comments to NP and PVH by **31 May 2021**.

ACTION ITEM AIRB/11-10: Taking into account comments provided through **ACTION ITEM AIRB/11-09** and **ACTION ITEM AIRB/11-03**, NP and PVH to update the [SP-AIRB11-WP/06](#) and to prepare change proposal to Doc 9994 at the AIRB WG/12.

4.2 Technical requirements

4.2.1 [SP-AIRB11-WP/05](#) was prepared by Greg Comstock, Christine Haissig and Doug Arbuckle and presented by Doug Arbuckle. This paper provided a proposed revision to Chapter 7 of Annex 10 Volume IV, which specifies technical requirements for airborne surveillance utilizing ADS-B IN. The proposed revision includes a clarification of requirements for situational awareness and new requirements supporting a range of applications defined jointly by RTCA and EUROCAE in ED-194B/DO-317C and ED-236A/DO-361A, Change 1.

4.2.2 The updated Chapter 7 proposed in this WP was divided into seven subsections as follows.

- Section 7.1 – System requirements necessary for any of the applications, requirements for basic surveillance and situational awareness, and basic recommendations.
- Section 7.2 - New requirements for “Visual Separation on Approach” (VSA)
- Section 7.3 - New requirements for “ADS-B Traffic Advisory System” (ATAS)
- Section 7.4 - New requirements for “In-Trail Procedure” (ITP)
- Section 7.5 - New requirements for “CDTI-Assisted Visual Separation” (CAVS)
- Section 7.6 – New requirements for “Flight-deck Interval Management” (FIM)

4.2.3 This WP included the following appendices.

- Appendix A – draft PfA to Annex 10 Volume IV Chapter 7
- Appendix B – Proposed change to Annex 10 Volume IV, Chapter 7
- Appendix C – 1) Cost benefit statement, 2) Impact assessment and 3) Implementation task list and outline of Guidance material.

4.2.4 AIRB/11 started its review and several improvements of the words were proposed especially related to Impact Assessments, which resulted in revision of this WP. The contents of the PfA in this revised WP were agreed by the meeting. The WP was accepted as follows.

- **[AIRB CPA 10V4/01–SP-AIRB11- WP/05R2](#)**

4.2.5 As required by the ANC Panels working arrangements and specified in each SP job card, due to the IM content of this PfA, there is the need to undertake inter panel coordination (as explained in

Section 2.4.4 and 2.4.5 of this meeting report). As a result, the following action was assigned to Secretary.

ACTION ITEM AIRB/11-11: In coordination with DA, MU to prepare inter panel coordination WP including relevant PfAs and timeline (resulting from action AIRB/11-07) as indicated in the IM job card.

AGENDA ITEM 5 ENHANCED TRAFFIC SITUATIONAL AWARENESS ON THE SURFACE OF AIRPORT WITH INDICATIONS AND ALERTS (SURF- IA)

5.1 **SP-AIRB11-IP/06.0** and its annex, **SP-AIRB11-IP06.1**, presented by Julien Frard, Michael Nathanson and Michael McDowell, provided information about the aircraft industry's on-going projects related to on-board runway surveillance in order to reduce risk of runway incursions. The Global Aviation Safety Plan (GASP) (Doc 10004) identified runway safety as a global safety priority and in this context, SP AIRB WG has been tasked the Job card **SP.012.02** Enhanced traffic situational awareness on the surface of airport with indications and alerts (SURF- IA) by the ANC.

5.2 This IP provided a status as of March 2021 from several aircraft manufacturers (Airbus, Boeing) and avionics suppliers (ACSS, Collins Aerospace and Honeywell) on their on-going work to better assist the flight crew and provide additional safety nets during airport operations (taxi-out, take-off, landing, taxi-in). This IP highlighted the industry's various strategies to address the improvement of surface operations, which include assessment of SURF and SURF-IA and development of an alternative solution, known as Surface Alert (SURF-A). As explained in this IP, an early internal assessment based on technical feasibility and a cost/benefit analysis related to SURF and SURF-IA led to study of an alternate solution. SURF-A is proposed to have an alerting function providing warning and advisory alerts only, based on the PFD & audio HMIs, without any traffic depiction on an airport moving map.

5.3 In reply to questions raised by the meeting, the following points were clarified.

- SURF-A/IA functions appear to be technically feasible (based on existing systems and mainly software modifications). SURF-A/IA functions can bring benefits in safety improvement. The information on the CDTI should significantly improve traffic awareness, which would result in better and earlier reaction to possible conflicting situation. However, the alternative concept without the information on the CDTI (SURF-A) still should allow pilots to detect and resolve a conflicting situation in a timely manner.
- JF further explained that it was decided that SURF-A only identified conflicts with aircraft and did not take into account surface vehicles, due to recognized difficulties of predicting movement of vehicles as the first step. It was noted that vehicle presence on runways is very rare.
- SURF-A is a standalone on-board application. Although no specific procedures were developed for this application, the outcome of that latest assessment indicated that SURF-A correctly resolved safety-related incidents, without providing any contradictions/disruptions to the ATC instructions. This could be "integrated" in ATC surface operations as an additional safety net for equipped aircraft, transparent to ATC.

- The performance of the SURF-A/IA functions strongly depends on the ADS-B OUT equipment level and data quality, which highlights the importance of DO-260B mandates in the different world regions.
- In relation to ADS-B data quality, JF explained that although there are possibilities of “spoofing” of ADS-B data, the project includes analysis of not only false alerts but also nuisance alerts deriving from ADS-B data. At this moment, there has been no evidence of spoofing of ADS-B data in the aviation context, and technical/airworthiness requirements related to ADS-B IN do not address specifically the spoofing of the ADS-B. However, the industry continues assessment on GPS and ADS-B security not only by this project but also by other projects involving other stakeholders of the aviation. In order to avoid such security issues, for example, data correlation of ACAS and ADS-B OUT data in the hybrid surveillance as per DO-289 or DO-317 definitions, or rejection of close traffic with only ADS-B OUT data, are implemented on airborne applications. On the ground, such principles may be used but ADS-B ONLY traffic with sufficient quality level are considered. ADS-B spoofing is considered in the risk assessment including the potential impacts such as rejected take-off. The airport multiple source of data (e.g. PSR, SSR, multilateration) should also be considered as mitigation means.
- The meeting raised a question about a possible RTCA/EUROCAE standardization of SURF-IA or SURF-A. JF explained that the projects have been progressed step-by-step and will start its next evaluation in real operational environments to further mature and refine algorithms to identify conflicts in a timely manner. It is still uncertain when the standardization activities could be initiated.

5.4 In relation to the last bullet point described above, the meeting was reminded there is an open action item **ACTION ITEM AIRB9/09** and the meeting decided to change the due date from AIRB WG/11 to AIRB WG/12. JML and JF confirmed that with additional information provided by **SP-AIRB11-IP/06.0** and its annex, **SP-AIRB11-IP06.1**, they will be able to prepare a progress report on SURF-IA or SURF-A standardization.

AGENDA ITEM 6: UPDATE TO MANUAL ON AIRBORNE SURVEILLANCE APPLICATIONS (DOC 9994)

Note. -This agenda item was discussed under agenda item 4.

AGENDA ITEM 7: ANY OTHER BUSINESS

7.1 Element of Discussion for the ACSG and AIRB WG work arrangement (SP-AIRB11-WP/09), as prepared by Jean-Marc Loscos and Christian Aveneau and presented by Christian Aveneau

7.1.1 **SP-AIRB11-WP/09**, presented by Christian Aveneau (CA), proposed to change the current SP working arrangements, to put ACSG under AIRB WG aiming at providing the potential benefits of increased expertise for mutual support in respective activities, while reducing risks of delaying deliveries of expected provisions. This WP also identified the administrative changes required (including a ToR change in Appendix A) and proposed a timeline for a trial / transition to the new configuration. This WP is a response to the **ACTION ITEM AIRB/10-12**.

7.1.2 The meeting was informed that a similar WP was also presented to ACSG (on the 6th of April) and it was explained that the concerns expressed by the ACSG would be discussed further at

ASWG/13. JML explained that no changes to the TOR of AIRB WG or ACSG is expected since the proposal is just changing the ACSG reporting line. However as indicated in the Appendix A, a small change to the SP's TOR, a deletion of a note, is expected.

7.1.3 AIRB WG/11 reviewed the WP and proposed some changes which resulted in the revision of this WP (**SP-AIRB11-WP/09R1**). The document presented a schedule of AIRB WG and ACSG joint meetings until SP/4 which was agreed by the meeting as a transition plan.

- *Ad-hoc* ACSG drafting meetings
- June 2021: normal ACSG meeting (1 day) with AIRB-WG invited followed by *ad-hoc* AIRB-WG meeting (1 day focusing on IM procedure) with ACSG invited
- *Ad-hoc* ACSG drafting meetings
- 27-29 October 2021: AIRB WG/12 with an ACSG slot

7.2 FUTURE MEETINGS

7.2.1 AIRB WG/11 was informed of the following schedule of future meetings.

Note.- new information is highlighted in grey.

7.2.2 Although the meeting agreed with the schedule described below in principle, considering the current difficult situation of COVID-19, the meeting suggested that Strategic Advisory Sub Group should be held to decide the feasibility of a face-to-face meeting in Q4 2021. In addition, SASG would discuss whether the meeting will be held as a panel or not. The Secretary agreed with this proposal and confirmed that she would consult SASG to determine if a face-to-face meeting would be possible or not and inform accordingly AIRB WG members/advisors by August 2021.

ACTION ITEM AIRB/11-12: MU to inform AIRB WG members whether AIRB WG/12 would be held in face to face or virtually by August 2021.

1) Ad-hoc meeting

Ad-hoc AIRB-WG meeting (1 day focusing on IM procedure) with ACSG invited	1 June 2021	Virtual meeting
<i>Ad-hoc</i> ACSG drafting meetings	TBD	Virtual meeting

2) Q4 2021 – The fourth meeting of the Surveillance Panel (SP/4)

SP/4	27 October -5 November 2021	CR3 ICAO Montreal Canada
• AIRB WG/12	27-29 October 2021	
• The members only meeting	1 November 2021	
• The first plenary	1 November 2021	
• ASWG/14	1-3 November 2021	
• The second/last plenary	4-5 November 2021	

3) Q2 2022

AIRB WG/13	28 March -1 April 2022 (5 days booked to accommodate ACSG)	CR5 ICAO Montreal Canada
ASWG/15	4 – 8 April 2022	

4) Q4 2022 – The fifth meeting of the Surveillance Panel (SP/5)

SP/5	17-28 October 2022	CR3 ICAO Montreal Canada
• AIRB WG/14	17-21 October 2022 (5 days booked to accommodate ACSG)	
• The members only meeting	24 October 2022	
• The first plenary	24 October 2022	
• ASWG/16	24-26 October 2022	
• The second/last plenary	27-28 October 2022	

APPENDIX 1 – LIST OF ATTENDEES

AIRB WG11 Web Meeting 07-09 April 2021

State/IO	Status	Full Name (Last name, first name)	Email
AUSTRALIA	MEMBER	Cook, David	David.Cook@casa.gov.au
	ADVISER	BOLLARD, Jeffrey	jeffrey.bollard@airservicesaustralia.com
BRAZIL	MEMBER	APOLINARIO, JOSÉ IZIDRO	izidroja@decea.gov.br ; izidroja@hotmail.com
	ADVISER	Souza, Victor	santannavss@decea.gov.br
CHINA	MEMBER	Li, Xin	lixin@atmb.net.cn ; lixin_caac@163.com
	ADVISER	De, Zhang	zdcaac@163.com
	ADVISER	Huo, Zhenfei	huozhenfei@atmb.net.cn
	ADVISER	Kaiyan, Jin (Jacky)	jin.kaiyan@yahoo.com ; jinky@adcc.com.cn
	ADVISER	Li, Gang	13801316550@163.com
FRANCE	MEMBER	Loscos, Jean-Marc	Jean-marc.loscos@aviation-civile.gouv.fr
	MEMBER	Aveneau, Christian	christian.aveneau@aviation-civile.gouv.fr
GERMANY	MEMBER	Dalitz, Yvonne	yvonne.dalitz@dfs.de
INDIA	MEMBER	Kant, Ravi	gmschqnad@aai.aero ; rkant@aai.aero
	ADVISER	Rajan K. Soundara	ksrajan@aai.aero
	ADVISER	Parihar, Pawan	pawanparihar@aai.aero ; parihar_pawan@rediffmail.com
	ADVISER	Gupta , Ajay	ajaygupta@aai.aero
	ADVISER	Acharjee , Sekhar	sekhar@aai.aero
JAPAN	ADVISER	Otsuyama, Takuya	otsuyama@mpat.go.jp
	ADVISER	Fujimori, Takeo	fujimori-t183@jrnsa.or.jp
	ADVISER	OZEKI, Shigeru	ozeki-s200@jrnsa.or.jp
KENYA	MEMBER	Nyambaka, Joel	ianyambaka@kcaa.or.ke
SINGAPORE	ADVISER	Kwek Chin Lin	kwek_chin_lin@caas.gov.sg
SOUTH AFRICA	MEMBER	Gersbach, Carel HB	carelg@atns.co.za
THAILAND	MEMBER	Phrukumwong, Chanyut	chanyut.ph@aerorhai.co.th
	ADVISER	Sujaritthammakun, Sutham	sutham.tae@gmail.com
UNITED STATES OF AMERICA	MEMBER	Arbuckle, Doug	Doug.Arbuckle@faa.gov
	ADVISER	Rodriguez J, Alex	Alejandro.Rodriguez@faa.gov
	ADVISER	Von Hoene, Paul	Paul.VonHoene@faa.gov
CANSO	MEMBER	Nzyoka, Julius	<a href="mailto:Julius.Nzyoka<jnzyoka@kcaa.or.ke>">Julius.Nzyoka<jnzyoka@kcaa.or.ke>
EUROCONTROL	MEMBER	Petricel, Bogdan	bogdan.petricel@eurocontrol.int
	ADVISER	De Gelder, Nico	Nico.de.Gelder@nlr.nl
IATA	MEMBER	PRINGVANICH, Noppadol	pringvanin@iata.org
ICCAIA	MEMBER	Capezzuto, Vincent	vincent.capezzuto@aireon.com
	MEMBER	Frard Julien	julien.frard@airbus.com
	ADVISER	Michael McDowell	michael.mcdowell@collins.com
	ADVISER	Michael Nathanson	Michael.Nathanson@j3harris.com
IFALPA	MEMBER	Bürger, Moritz	moritz.buerger@vcockpit.de
	ADVISER	Couchman Carole	carolecouchman@ifalpa.org
IFATCA	MEMBER	Baca , Ignacio	ignacio.baca@ifatca.org
	ADVISER	Akpore , Samson	scooakpore@gmail.com ; samson.akpore@ifatca.org
RTCA	OBSERVER	Secen, Al	asecen@rtca.org
ICAO	Secretary	Gulam, Raza	RGulam@icao.int
	Secretary	Kim, Crystal	CKim@icao.int
	Secretary	Utsunomiya, Mie	MUtsunomiya@icao.int

APPENDIX 2 – AGENDA FOR THE 11TH MEETING OF THE SURVEILLANCE PANEL AIRBORNE SURVEILLANCE WORKING GROUP (SP-AIRB WG/11)

Web Meeting, From 07 to 09 April 2021

Agenda item 1: Opening remarks & introduction of the participants

Agenda Item 2: Approval of the agenda

- [SP-AIRB WG/11-WP/01R2](#): Agenda
- [SP-AIRB WG/11-WP/02](#): The report of the 10th AIRB WG meeting
- [SP-AIRB WG/11-WP/03R1](#): Action item review

Reports from ICAO groups

- [SP-AIRB WG/11-WP04.0](#): Report and update from the Surveillance Panel Secretary (This WP has three attachments, [SP-AIRB WG/11-WP04.1](#), [SP-AIRB WG/11-WP04.2](#) and [SP-AIRB WG/11-WP04.3](#).)
- [SP-AIRB WG/11-IP/01](#): New document exchange platform to facilitate access to material developed by standards-making organizations (SMOs)
- [SP-AIRB WG/11-WP/07](#): FF-ICE updates and future flight plan

Agenda Item 3: Review of reports from external groups on relevant developments

3.1 Reports from States and Organizations

- [SP-AIRB WG/11-IP/02](#): Status of RTCA/EUROCAE Standards Development
- [SP-AIRB WG/11-IP/03](#): Update on AIRS Project
- [SP-AIRB WG/11-IP/04](#): DRAFT Operational Description for CDTI-Assisted Separation

Agenda Item 4: Interval Management

4.1 Operational procedure for interval management

- [SP-AIRB WG/11-IP/05](#): Comments on AIRB10-WP06R1
- [SP-AIRB WG/11-WP/08](#): Proposals for Amendment to PANS-OPS and PANS-ATM for Interval Management Procedure
- [SP-AIRB WG/11-WP/10R1](#): Safety-Risk Assessment considerations for IM Procedure

4.2 Phraseology and message sets for interval management

- [SP-AIRB WG/11-IP/05](#): Sample of communications used in the US operational trials

4.3 Technical requirements

- [SP-AIRB WG/11-WP/05R2](#): Proposal for Amendment (PfA) to Annex 10 Volume IV relating to Chapter 7: Technical Requirements for Airborne Surveillance Applications
- [SP-AIRB WG/11-WP/06](#): Proposal for Revision to Manual on Airborne Surveillance Applications (Doc 9994)

Agenda Item 5: Enhanced traffic situational awareness on the surface of airport with indications and alerts (SURF- IA)

- [SP-AIRB WG/11-IP/06.0](#): On-board Airport Surveillance Projects
(This IP has an annex, [SP-AIRB WG/11-IP06.1](#))

Agenda Item 6: Update to Doc 9994 (Manual on Airborne Surveillance Applications)

- (SP-AIRB WG/11-WP/06: Proposal for Revision to Manual on Airborne Surveillance Applications (Doc 9994))

Agenda Item 7: Any other business

- [SP-AIRB WG/11-WP/09R1](#): Elements of Discussion for the ACSG and AIRB WG Work Arrangements

APPENDIX 3 –WPS AND IPS FOR THE 11TH MEETING OF AIRB WG

SP-AIRB WG/10 WPs and IPs were uploaded on the SP website:

List of Working Papers

SP-AIRB11-WP01R1-Agenda for the 11th meeting of the AIRB.pdf
SP-AIRB11-WP02.0-AIRB 10 Meeting report Sep 2020.pdf
SP-AIRB11-WP03R1-Action item review.pdf
SP-AIRB11-WP04.0–Report and update from the Surveillance Panel Secretary up.pdf
SP-AIRB11-WP04.1-Att A Final Draft Annex 6 Part IV SARPs - Final Endorsement Request.pdf
SP-AIRB11-WP04.2-Att B RPASP WG5Annex6PtIV-round7 Comment Response Matrix.pdf
SP-AIRB11-WP04.3-Att C Annex 6 Part IV - Final Draft version K - for Formal Endorsment.pdf
SP-AIRB11-WP05R1-Updating ICAO Standards Resulting from ADS-B In MOPS Development.pdf
SP-AIRB11-WP05-Updating ICAO Standards Resulting from ADS-B In MOPS Development v1.pdf
SP-AIRB11-WP06-Proposal for Revision to Manual on Airborne Surveillance Applications(Doc 9994).pdf
SP-AIRB11-WP07-FF-ICE updates and future flight plan.pdf
SP-AIRB11-WP08-IM-Procedure-PANS.pdf
SP-AIRB11-WP09-ACSG-AIRBWG-working arrangements.pdf
SP-AIRB11-WP10R1-SAFETY-RISK-ASSESSMENT-FOR-IM-R1.pdf

List of Information Papers

SP-AIRB11-IP01-Document exchange platform.pdf
SP-AIRB11-IP02-RTCA-EUROCAE Stds Development Status v1.pdf
SP-AIRB11-IP03-AIRS project update.pdf
SP-AIRB11-IP04-CDTI-Assisted Separation Operational Description.pdf
SP-AIRB11-IP05-IM-procedure-US-comments.pdf
SP-AIRB11-IP06.0-Onboard airport surveillance.pdf
SP-AIRB11-IP06.1-Annex ICCAIA - Status On-board Runway Surveillance. annex IP06.pdf

APPENDIX 4 –ACTION ITEMS ARISEN FROM PREVIOUS MEETINGS (OPEN)

Action Item Description	Due date	Status	Action Taken	Assigned to
<u>ACTION ITEM AIRB/9-09:</u> JF/JML to prepare a progress report on SURF-IA standardization including a tentative timeline for SARPS development to be used to update the job card	AIRB WG/12 + SP/4	OPEN	SP-AIRB WG/11-IP06 provided additional information but the AIRB WG/11 decided to keep open this action.	Julien Frard, and Jean-Marc Loscos
<u>ACTION ITEM AIRB/9-12:</u> all to monitor airborne surveillance activities in their States/region and report as appropriate		OPEN		All
<u>ACTION ITEM AIRB/11-01:</u> all to review SP-AIRB11-WP04.1, SP-AIRB11-WP04.2 and SP-AIRB11-WP04.3 and provide endorsement by 12 May 2021 .	By 12 May 2021	OPEN		All
<u>ACTION ITEM AIRB/11-02:</u> MU to organize a joint meeting (before July 2021) between some SP experts and ATMRPP, to discuss further surveillance capabilities to be indicated in item 18 SUR in 2012 FPL Format.	By end of June 2021	OPEN		Mie Utsunomiya
<u>ACTION ITEM AIRB/11-03:</u> NP, JF, DA and JML to develop definitions, clarifications and/or categorizations in terminology of Interval management and flight deck interval management for the Manual on Airborne Surveillance Applications (Doc 9994), which should be presented at AIRB WG/12.	AIRB WG/12	OPEN		Noppadol Pringvanich, Doug Arbuckle and Jean-Marc Loscos
<u>ACTION ITEM AIRB/11-04:</u> Interested members/advisors to contact JML indicating their interest and participations to the ad-hoc group by 12 May 2021 . In reply to those, JML to set the Ad-hoc group meeting to be held on 1 June 2021 .	By 12 May 2021 and By 1 June	OPEN		Jean-Marc Loscos, Samson Akpore, Ignacio Baca, Moritz Bürger, Bogdan Petricel, Carole Couchman, Christian Aveneau, Noppadol Pringvanich, Paul Von Hoene Julien Frard, Doug Arbuckle, Eri Itoh, Takuya Otsuyama, Nico De Gelder, Raza Gulam and Mie Utsunomiya
<u>ACTION ITEM AIRB/11-05:</u> All to review SP-AIRB WG11-WP08 and provide comments to JML and ad-hoc group members by 31 May 2021 .	By 31 May 2021	OPEN		All
<u>ACTION ITEM AIRB/11-06:</u> taking into account comment provided by members, Ad-hoc group to review and update the working documents included in SP-AIRB WG11-WP08.	AIRB WG/12	OPEN		Ad-hoc group

Action Item Description	Due date	Status	Action Taken	Assigned to
<u>ACTION ITEM AIRB/11-07:</u> Ad-hoc group to start developing a set of slides which should include some detailed explanation of IM such as IM description, overview, objectives and benefit statements. This presentation package should be submitted to the next AIRB WG meeting together with a high level timeline of Interval management standardisation.	AIRB WG/12	OPEN		Ad-hoc group
<u>ACTION ITEM AIRB/11-08:</u> JML to refine SP-AIRB11-WP/10R1 and to prepare a change proposal to Doc 9994, which should be presented at the AIRB WG/12 for approval.	AIRB WG/12	OPEN		Jean-Marc Loscos
<u>ACTION ITEM AIRB/11-09:</u> Interested members/advisors to review SP-AIRB11-WP/06 and provide their comments to NP and PVH by 31 May 2021 .	By 31 May 2021	OPEN		Interested members/advisors
<u>ACTION ITEM AIRB/11-10:</u> Taking into account comments provided through <u>ACTION ITEM AIRB/11-09</u> and <u>ACTION ITEM AIRB/11-03</u> , NP and PVH to update the SP-AIRB11-WP/06 and to prepare change proposal to Doc 9994 at the AIRB WG/12.	AIRB WG/12	OPEN		Noppadol Pringvanich and Paul Von Hoene
<u>ACTION ITEM AIRB/11-11:</u> In coordination with DA, MU to prepare inter panel coordination WP including relevant PfAs and timeline (resulting from action AIRB/11-07) as indicated in the IM job card.		OPEN		Mie Utsunomiya
<u>ACTION ITEM AIRB/11-12:</u> MU to inform AIRB WG members whether AIRB WG/12 would be held in face to face or virtually by August 2021.	By August 2021			Mie Utsunomiya

Appendix 5 – Agreed Change Proposals to ICAO SARPs, Guidance Material, and Manuals

Annex 10 Volume IV SARPs Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For SP/5 approval (TBD)	AIRB CPA 10V4/01	<i>Integration of recently standardized ADS-B In capabilities into Annex 10</i>	SP-AIRB11-WP/05R2	SP-AIRB9-WP05

Manual on Airborne Surveillance Applications (Doc 9994) Changes

Action taken by the Secretary	Change Number Assigned by Rapporteur	Title of Change	Final Working Paper	Originating Working Paper
For SP/5 approval (TBD)	AIRB CPM 9994/x	<i>Operational approval considerations section 7.3</i>	SP-AIRB12-	SP-AIRB11-WP06
		<i>Safety risk assessment considerations section 7.3</i>	SP-AIRB12-	SP-AIRB11-WP10R1