



ICAO

*International Civil Aviation Organization***Seventh Meeting of the Surveillance Implementation
Coordination Group (SURICG/7)**

Video Teleconference, 24 – 27 May 2022

- 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.

1.1 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 SP/4 and current plans for SP/5 may be useful for consideration by the SURICG.

2. DISCUSSION

2.1 In response to ICAO job card SP.008.02 “Ensure performance of surveillance systems and collision avoidance systems”, task 6 “Develop measurable technical performance specifications for surveillance systems and update information on ADS-B versions 1 and 2 as well as WAM definitions included in Cir 326”, the Surveillance Panel created a Performance-Based Surveillance Sub-Group (PBSSG). The PBSSG was charged to develop a new guidance material containing performance-based surveillance requirements, including updated materials which would replace ICAO Cir 326, which is now outdated. In November 2021, the PBSSG provided an initial draft RSUR Manual to the membership of the Surveillance Panel for comments and feedback. In the future, this draft Manual will be coordinated with the Communications Panel and other Panels or expert groups as appropriate, leading to publication of this new guidance material by about 2025.

2.2 The Fourth Meeting of the Surveillance Panel (SP/4) was held as a virtual meeting from 1000-1400 UTC daily during the weekdays from 28 March 2022 to 8 April 2022. The Surveillance Panel held several Plenary sessions during this period, and the SP-AIRBWG/13 and SP-ASWG/15 meetings were also held as “breakout” sessions during this period. SP/4 was attended by 75 participants (24 members, 50 advisors and 1 observer) from 15 ICAO States and seven International or Standards-Making Organizations. The meeting elected Doug Arbuckle (USA) as the SP/4 Chair. The Secretary of the meeting was Ms. Mie Utsunomiya, technical officer of the Communications, Navigation, Surveillance and Frequency Spectrum Management (CNSS) Section of the Air Navigation Bureau.

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2.3 SP/4 considered and agreed to recommend that the Air Navigation Commission consider a Proposal for Amendment (PfA) to Annex 10 — *Aeronautical Telecommunications, Volume III — Communication Systems*. This proposal will increase the 24-bit aircraft address allocation of all States that currently are allocated 1024 addresses to 2048 addresses and also satisfies specific State requests for an increased allocation of addresses. The proposal was coordinated with and previously agreed to by the Communications Panel (CP) Data Communications Infrastructure Working Group (DCIWG). Additionally, the PfA included the removal of unused definitions for transponder registers F1 and F2.

2.4 SP/4 also considered a proposal for amendment to Annex 10 — *Aeronautical Telecommunications, Volume IV — Surveillance and Collision Avoidance Systems*. The proposal updates technical provisions related to Secondary surveillance radar (SSR) Mode S transponder and 1090 MHz extended squitter (Initial Proposal 1), airborne collision avoidance systems (ACAS) III (Initial Proposal 2), and airborne surveillance applications (Initial Proposal 3).

2.4.1 PfA's initial proposal 1 included a number of updates to existing provisions and clarifications including:

- a) updates to transponder requirements for compatibility with the new 1090 MHz extended squitter ADS-B version 3 format as detailed in RTCA/EUROCAE avionics standards. These RTCA/EUROCAE avionics standards will provide capabilities such as: 1) autonomous distress tracking support; 2) information to support future interval management operations; 3) broadcast of aircraft-based weather data; 4) Lost C2 link state for UAS/RPAS; 5) broadcast of 1030/1090 MHz spectrum monitoring data; and 6) functionality to support commercial space and hypersonic aircraft operations. These capabilities allow for enhancements in areas such as safety, equipment performance, airspace efficiency, and data reporting;
- b) technical provisions for the efficient use of the 1090 MHz radio frequency (RF), providing means and measurements to reduce 1090 MHz RF congestion, ensuring better performance of surveillance systems and continued use of 1090 MHz systems; and
- c) updates to existing provisions, editorial changes and clarifications in light of new developments and operational experience relating to surveillance systems.

2.4.2 The PfA's initial proposal 2 introduced ACAS III technical provisions, based on ACAS Xu (Unmanned Aircraft System) avionics standards developed by RTCA/EUROCAE. ACAS Xu provides RPAS with a Detect and Avoid (DAA) capability including the Collision Avoidance (CA) function that will be the first implementation of an ACAS III. ACAS Xu builds on the ACAS Xa collision resolution technology to overcome vertical maneuvering limitations by also issuing horizontal advisories. ACAS Xu can also use sensors to detect and avoid non-cooperative traffic. In addition to enabling the safe integration of a new class of aircraft, this amendment will support the improvement of the safety performance of all ACAS, especially for operations in uncontrolled airspace.

2.4.3 The PfA's initial proposal 3 provided a proposed revision to Chapter 7 of Annex 10 Volume IV, which specifies technical requirements for airborne surveillance applications utilizing ADS-B IN. Recognizing that ADS-B data can provide substantial benefit when integrated in to the cockpit, the proposal included a clarification of requirements and new requirements defined in recently published RTCA/EUROCAE avionics standards. This included minimum functionalities for the use of currently available and new ADS-B IN capabilities of Airborne Surveillance Applications and the Flight-deck Interval Management (FIM) airborne capability.

2.4.4 Consequential amendments: A note was added under the section about Gilham-encoded pressure altitude (4.3.9.3.2) to inform the reader about the requirement in Annex 6, Part I that *de facto* prohibits Gilham-encoding. In fact, there were two similar such requirements in Annex

6, one with and one without an applicability date. It was proposed to retain the more general one (current 6.20.3). The definition of ACAS was revised to make it broader in Annex 10 Volume IV. The definition of ACAS was lacking in Annex 6; therefore, it was proposed to add the revised definition from Annex 10, Volume IV, and consequentially revise the definition of ACAS in Annex 2, Annex 11, Doc 4444, and Doc 8168 (Volumes I and III).

2.4.5 All chapters but one in Annex 10, Volume IV, are amended by this PfA. SP/4 approved the Panel Secretary to initiate inter-panel coordination with several other expert groups on this PfA, with the intention of further considering this PfA at SP/5 (Q3 2023) for formal approval.

2.5 SP/4 considered and agreed to recommend that Doc 9924, the *Aeronautical Surveillance Manual* be amended to make the following changes proposed by the SP-ASWG.

- a) Introducing guidance material on P2SLS P1 Control Power Level
- b) Removing unused definitions for register F2
- c) Corrections of the information in Tables in Appendix M (these changes also included the addition of waveform diagrams as received and processed by Mode A/C and Mode S transponders)

2.6 SP/4 considered and agreed to recommend a change to the Panel's Terms of Reference (ToR). The new proposed working arrangement is that the ACSG will report to SP-AIRBWG instead of SP-ASWG. SP-AIRBWG is the group developing technical and operational provisions related to airborne surveillance applications based on ADS-B IN capabilities, while ACSG is developing technical requirements for airborne collision avoidance systems (ACAS). Considering that both SP-AIRBWG and ACSG are addressing airborne surveillance applications, with ADS-B as a key source of surveillance data for the recent applications, the SP has been performing a trial of this new working arrangement since 2021.

2.7 The final item of business for SP/4 was to review and propose revisions to the Job Cards assigned by the Air Navigation Commission to the Panel. Recommendations for changes were made to all of these Job Cards. The major change was to the Job Card currently entitled, "Enhanced Traffic Situational Awareness on the surface of airport with indications and alerts (SURF-IA)." This work aims at providing a safety tool using ADS-B IN capability which alerts the flight crew on or near the airport surface about potential runway conflicts to mitigate runway incursions. The current description and title of the SURF-IA job card does not correctly reflect the work under way, in particular with reference to traffic situational awareness brought by the currently defined ADS-B IN SURF capability. SP/4 recommended that the Job Card title be change to "ADS-B based pilot alerting on or near airport runways", to accommodate several potential implementations not limited to SURF-IA.

2.8 Current plans are that SP/5 will consider the significant PfA to Annex 10, Volume IV to align SARPs with the latest EUROCAE/RTCA avionics standards as described in section 2.3 above. Additionally, it is expected that consequential changes to Doc 9871 will accompany the SARPs changes to be considered at SP/5. Consequential changes to other ICAO documents under the purview of the SP, such as Doc 9924 and Doc 9863, may either be presented for consideration at SP/5, or will be prepared for SP/6.

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2.9 SP/4 discussed and agreed with the future meeting schedule listed in the table below, which includes the timeline for the next Panel meeting, SP/5, to be held in September 2023. Note that the Spring 2023 meetings could potentially be held in another location.

Meeting	Date	Venue	Remarks
14th meeting of the AIRB WG (AIRB WG/14)	18-21 October 2022	Conference Room 3, ICAO HQ	ICAO Montreal Canada
16th meeting of the ASWG (ASWG/16)	24-28 October 2022	Conference Room 3, ICAO HQ	ICAO Montreal Canada
15th meeting of the AIRB WG (AIRB WG/15)	21-24 March 2023	Conference Room 5, ICAO HQ	ICAO Montreal Canada
17th meeting of the ASWG (ASWG/17)	27-31 March 2023	Conference Room 5, ICAO HQ	ICAO Montreal Canada
The fifth meeting of the Surveillance Panel (SP/5) including <ul style="list-style-type: none"> • 16th meeting of the AIRB WG (AIRB WG/16) and • 18th meeting of the ASWG (ASWG/18) 	18-29 September 2023	Conference Room 5, ICAO HQ	ICAO Montreal Canada

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
