



*International Civil Aviation Organization*

**FIRST MEETING OF THE SURVEILLANCE IMPLEMENTATION  
COORDINATION GROUP (SURICG/1)**

Bangkok, Thailand, 21 - 22 April 2016

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**Agenda Item 3:     Review of outcomes of relevant meetings**

**THE THIRD MEETING OF THE AERONAUTICAL SURVEILLANCE  
WORKING GROUP OF SURVEILLANCE PANEL (ASWG/3)**

(Prepared by the Secretariat & presented by the Rapporteur of ASWG)

**SUMMARY**

This paper highlights the relevant outcome of SP-ASWG/3 meeting held in London, United Kingdom, 11 – 14 April 2016.

**1.     INTRODUCTION**

1.1             The work programme and some activities of the Aeronautical Surveillance Working Group of the Surveillance Panel are relevant to the SURICG.

1.2             The discussions on some topics at the third Meeting of the Aeronautical Surveillance Working Group (SP-ASWG/3) may be useful for consideration by the SURICG.

**2.     DISCUSSIONS**

2.1             Doug Arbuckle (DA) was the Rapporteur of the working group.

2.2             The meeting reviewed and updated a list of action items.

*Outcomes of SP-ASWG/3 at global level that may be relevant for the work programme of SURICG at regional level are highlighted below:*

***Technical Subgroup (TSG) Report***

2.3             TSG Chairperson, Vincent Orlando (VO), presented [SP-ASWG3-WP/03.0](#) - report of the TSG meeting that was held in Fort Lauderdale from 25 to 29 January 2016. It may be noted that TSG meets twice a year for a week, alternating between Europe in June or July and in the US (Florida) in late January or early February.

***Airborne Collision Sub-Group (ACSG)***

2.5 Christian Aveneau (CA), ACSG chairman, presented **SP-ASWG3-WP/25**, the Report on the second ACSG Meeting on 12th February 2016. This WP describes ACSG activities which are as per the following.

- Updates to existing material relating to surveillance and collision avoidance systems
- Provisions aimed at lowering interference levels on 1030/1090 MHz
- Provisions on ACAS-X
- Interoperability between any collision avoidance system both current and proposed
- Provisions for RPA Detect and Avoid capabilities

In reply to questions, the following points are confirmed that:

- Intent that ACAS-X provisions developed for Doc 9863 will not duplicate RTCA/EUROCAE materials but will refer to technical examples included in those materials.
- Current scope of ACAS-Xu provisions focuses on development of the provisions for larger RPAS (in excess of 55 pounds) and a mature concept of operations was provided. MOPS are targeted for completion in 2020.
- ACSG believes that provisions for smaller RPAS (55 pounds and below) will be included in separate MOPS and may require minimum equipage. However, those are depending on regional / state regulatory approval and not globally requirement.

***SP-ASWG2-IP/01 – B787 Avionics Issue***

2.6 This IP was presented by Ho Wee Sin (HWS) nominated by Singapore with inputs from Greg Dunstone (Airservices Australia). This paper provides information on the Boeing 787 aircraft deficiency and the status of the rectification plans. The paper also shares with the meeting the measures to deal with aircraft with such deficiency.

2.8 In order to solve this issue, Boeing service bulletin B787-81205-SB340005-00 for the upgrade to DO-260B was released in Dec 2015 for operators to install. This service bulletin is issued at no cost to the operators. States with ADS-B operations such as Singapore and Australia immediately contacted their airlines to commence the installation of the service bulletin.

2.9 It has been reported that airlines with large B787 fleets may take up to August 2016 to complete the upgrade. HWS requested ASWG members' assistance in order to get their State regulators to urge the State-registered operators to apply the service bulletin for their B787s as early as possible.

**ACTION ITEM ASWG/3-17:** All members to urge the State registered operators to apply the service bulletin for B787 as early as possible.

***SP-ASWG2-IP/01 – Status of ACAS X Activities in the United States***

2.10 The salient points from this were as follows:

- a) The development of MOPS for ACAS X<sub>A</sub> and X<sub>O</sub> is expected to complete in 2018.
- b) The final ACAS X<sub>A</sub>/X<sub>O</sub> developmental flight test was conducted in August 2015 and operational evaluation is planned for 2017.
- c) Following MOPS completion, associated regulatory guidance related to avionics certification and operational approval for ACAS X<sub>A</sub>/X<sub>O</sub> are expected to be complete by 2020. In January 2016, RTCA SC-147 also began work on MOPS for ACAS X<sub>u</sub> with a target completion date of 2020.

***SP-ASWG2-IP/02 – Status of ADS-B Implementation in the United States***

2.11 This was essentially the same IP as presented at ADS-B SITF/15.

**Review Proposed Change Proposals for SARPs and Documents. Some discussion papers presented are as follows:**

***SP-ASWG3-WP/04: Change Proposal for Doc 9871 for Height above Ellipsoid (HAE) Reporting in Extended Squitter (ES) Geometric Altitude Subfield***

2.12 This working paper provides information about the use of ADS-B Out data and the ongoing aircraft height-keeping performance monitoring undertaken globally. The paper proposes a change to ICAO Doc 9871, Technical Provisions for Mode S Services and Extended Squitter, regarding the use of Minimum Sea Level (MSL) referenced altitude. The change proposal outlines the areas of DO-260B/ED-102A and ICAO Doc 9871 that are inconsistent with current FAA and EASA published guidance (FAA AC 20-165B and EASA CS-ACNS).

2.13 Separation and Airspace Safety Panel (SASP) had strongly encouraged work to assess the viability of using Automatic Dependent Surveillance – Broadcast (ADS-B) geometric height data as a means of estimating aircraft height-keeping performance. In comparison to the other existing ground-based monitoring systems, such as the Height Monitoring Units (HMU) and Aircraft Geometric Height Monitoring Element (AGHME) that have a coverage area of 40-NM, the defined coverage area of the monitoring system utilizing ADS-B data is much larger (The coverage area for one ADS-B ground station is typically 250 NM). The ADS-B ground station potentially could serve two purposes; providing information needed for air traffic control and aircraft height-keeping performance monitoring. The results of this work determined that geometric height data obtained from ADS-B sources is sufficient to estimate aircraft height-keeping performance if the Extended Squitter geometric altitude subfield contains only HAE.

2.14 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 DO-260B/ED-102A and ICAO Doc 9871 to explicitly require the use of GNSS HAE altitude as the only acceptable reference frame for altitude reporting. Therefore, this WP proposes the harmonization of 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. These changes will also be included in DO-260C/ED-102B, when published in the future.

2.15 There were comments on the wording and structure of this paper and minor changes were made to this WP. With this modification, the proposed amendment was accepted and led to the following CP.

**SP-ASWG3-WP/04R1** containing the revised Change Proposal as presented, and the CP was accepted by the ASWG/3 and assigned **CP 9871/07**.

***SP-ASWG3-WP/08: Revised Annex 10 Volume 4 Change Proposal for X-Pulse Note in Paragraph 3.1.1.6.2***

2.16 This paper indicated the need to change the text associated with the X pulse in ICAO annex 10 Volume IV.

2.17 The X pulse in Mode A code replies has never been defined by ICAO and is reserved for future use in ICAO annex 10 Volume IV. However, in reality, some States' military authorities indicated their use of the X pulse in Mode A code replies to identify unmanned aircraft, which raised a problem of interoperability with civil SSR systems, that may have used the absence of this pulse as an additional means to validate Mode A code replies or may have used this pulse to support SSR ground station built-in test.

2.18 TSG investigated the development of a new wording of the existing note in Annex 10 Volume IV in order to indicate the limitations associated with the use of the X pulse in the Mode A code replies. This WP contained the updated proposal which consisted of new recommendation associated with note on the X pulse in Annex 10 Volume IV paragraph 3.1.1.6.2, which is response to action item ASWG/2-09.

2.19 ASWG/3 reviewed the proposals in this WP and agreed on its intent. However, considering the importance of the text included in the proposed note, MU commented that it might be better to include that text in the recommendation itself. This resulted in the following action item.

**ACTION ITEM ASWG/3-05:** EP and MU refine the text in this CP without changing the intent and propose final CP at the next TSG.

***SP-ASWG3-WP/19: Draft Annex 10 Volume 4 Change Proposal for the Definition and Performance Requirements for Wide Area Multilateration (WAM)***

2.20 This paper described the need for a definition of Wide Area Multilateration system (WAM) to be included in the Annex 10 Volume IV.

2.21 ASWG/3 supported the intent of this proposal. However the meeting recognized that terms of Height monitoring equipment (HME) and Precision Runway Monitor (PRM) included in the proposed are not used in Annex 10 Volume IV. Under this circumstance, replacement of the terms "HME and PRM" by "other applications" and an addition of the reference to an appropriate part of Doc 9924 were proposed.

2.22 The meeting concluded that Doc 9924 Appendix L, MLAT, should be referred to in the definition. With those modifications, the proposed amendment was accepted and led to the following CP.

**SP-ASWG3-WP/19R2** containing the revised Change Proposal as presented, and the CP was accepted by the ASWG/3 and assigned **CPA10V4/33**.

2.23 However because of the modifications made above, the meeting also recognized a need to amend Doc 9924 Appendix L in order to provide explicit explanations of other applications (including HME and PRM), which resulted in a following action item.

**ACTION ITEM ASWG/3-06:** TSG to investigate and propose brief explanations of “other applications” to be included in Doc 9924 Appendix L.

**Mode S and Extended Squitter, some points are as follows:**

***SP-ASWG3-WP/05- Proposal for updating Doc 8071 Volume III, as prepared and presented by Steffen Marquard***

2.24 This paper provides an update on the proposed changes to ICAO Doc 8071 Volume III "Testing of Surveillance Radar Systems" introduced with working paper ASWG TSG WP01-21. This WP proposes an alternative proactive approach in order to make Doc 8071 still available and provide information to users of modern radar and surveillance systems, while deleting obsolete or now incorrect information.

2.25 This approach would retain all valuable information of Doc 8071 without demanding much effort to update the document and Appendix A of this WP comprises a table with a draft proposal of changes for each chapter of Doc 8071 Volume III.

2.26 Taking into account the discussion results conducted at ASWG/2 and TSG, this new approach has been developed and was agreed to by ASWG/3. In reply to a question about timeline, VO confirmed that this is not urgent task but he assumed it would take at least one year to prepare a CP. Based on this timeline, following action was assigned to TSG.

**ACTION ITEM ASWG/3-07:** TSG initiate this proposed task to amend Doc 8071 Volume III and report back to ASWG within the expected timeframe (by next April 2017.)

2.27 MU also informed that this WP has been shared with Navigation System Panel (NSP) and she is waiting for comments from them. Outcome of this coordination with NSP would be provided to the future ASWG meeting.

***SP-ASWG3-WP/06– Aireon Spaced Based ADS-B Implementation Status***

2.28 Steve Bellingham (SB) presented ***SP-ASWG3-WP/06***, which summarized an update on the status of Space-Based ADS-B from NAV CANADA’s perspective. The salient points described in this WP were:

- a) The first launch of ten Iridium NEXT satellites, carrying Aireon ADS-B payloads, is now scheduled for 3rd Quarter 2016. The full constellation is to be completed by the end of 2017, to support commencement of operational ADS-B services in 2018.
- b) Aireon is working with the European Aviation Safety Agency (EASA) to define a path for safety certification of the Aireon system, using as a basis the new EUROCAE ED-129B Technical Specification for a 1090 MHz Extended Squitter ADS-B Ground System.
- c) The ICAO Separation and Airspace Safety Panel (SASP) is working to finalize reduced new longitudinal and lateral procedural separation minima that use Air Traffic Services (ATS) surveillance for the position information. It was stated that the SASP will complete this work by November 2016, in time for November 2018 applicability of the new procedural minima.
- d) In relation to the development of new ATS surveillance minima, the SASP has completed the Operational Requirement for ATS surveillance separation (target to target separation) in non-VHF environments. These minima will be generic ATS surveillance minima, not applicable only to ADS-B. The Operational Requirement recognizes that a Performance-Based Navigation (PBN) specification will not be required in order to apply ATS surveillance separation between aircraft. It was stated that SASP will complete the development of these ATS surveillance minima by November 2018, in time for November 2020 applicability.

In reply to several questions raised by the meeting, SB confirmed that:

- System design incorporates some position validation measures to increase capabilities of anti-spoofing.
- Capacity design was built based on full implementation of equipage growth curve.
- The current system is not designed to receive and process the phase-modulated data messages that may be added to the 1090ES format in ADS-B Version 3, but the introduction of phase modulation is not expected to have any negative impact on reception of the “core” message stream. The system will be adaptable to process new Data Items which may be defined within the current message structure.
- Although Draft SASP Job card indicates that SP needs to develop technical requirements for space based ADS-B, this is just a place holder. At this moment NavCanada doesn't expect to define any additional technical requirements specifically to enable space-based ADS-B. If this changes, SB will inform and coordinate with ASWG.

2.29 The meeting was informed that some ANSPs, managing also high-density airspace, are planning to optimize surveillance coverage coming from ground sensors with the usage of Space-based ADS-B.

***SP-ASWG3-WP/07- Report on the Outcome of World Radiocommunication Conference – 2015 (WRC-15) Agenda Items related to the Surveillance Panel***

2.30 This paper summarised the outcome of the World Radiocommunication Conference – 2015 (WRC-15) Agenda Items that may be of interest to the Surveillance Panel (SP). Several civil aviation systems remain protected from harmful interference from other radiocommunication services and new spectrum was gained for civil aviation applications. The information contained in this WP satisfies the Surveillance Panel Action Item ASWG/2-10.

2.31 Reference should be made to section 3 of this WP, which indicates summary of WRC-15 outcomes relevant to the Surveillance Panel. The meeting strongly agreed with the importance of WRC activities (especially related to agenda of WRC-19).

***SP-ASWG3-WP/09 - Performance of the Expanded Forward Error Correction (FEC) with Mode S Interference***

2.32 The results from this paper, and those from TSG WP16-22 and SP1-ASWG1-WP/20, show the improvement in phase decoding using the extended FEC is not significant. After discussion at the TSG, it is recommended that the structure of the phase encoded 1090ES message continue to use the original RS(54,34) FEC. Results are recommended to be presented to the RTCA/EUROCAE Combined Surveillance Committee (combined group working on ADS-B Version 3 and corresponding Mode-S transponder MOPS) as information for the phase modulation requirements development activity.

***SP-ASWG3-WP/10 – Outstanding Tasks for Phase Coded Mode S, as prepared and presented by Thomas Pagano***

2.33 This paper contains a summary of the phase modulation (PM) technique development including previous work, current status and remaining work to standardize the capability. This was an action item assigned at the last TSG to provide a basis for transitioning to MOPS requirements development within RTCA/EUROCAE.

2.34 A question was raised by the meeting with regard how much capacity increase is expected from this PM. ASWG/3 was informed that three additional bits are added for each existing bit, recognizing that there is overhead for error detection and correction.

***SP-ASWG3-WP/11- Status Update on Development of Meteorological Data Requirements,***

2.36 This paper provided a status update on the development of meteorological data requirements for BDS Registers 44<sub>16</sub> and 45<sub>16</sub> being developed by RTCA SC-206. Due to some questions raised by the meeting, following action was assigned to TSG.

***SP-ASWG3-WP/12- Status Update on RTCA/ EUROCAE MOPS Development***

2.37 This paper provides an update to the RTCA/EUROCAE MOPS development activity underway in the Combined Surveillance Committee. At the last ASWG meeting, it was announced that there was an intention to open the Mode S Transponder and 1090ES MOPS and that activity has now commenced with the first meeting held in February 2016.

2.38 The first meeting covered many potential updates that are under consideration in this revision cycle of the MOPS. One of the reasons for opening the 1090ES MOPS is to support future

applications currently under development that require additional messages and/or message fields in extended squitter. Of interest to the SP, there are changes that have already been agreed to in the ICAO ASP/SP that were intended to be brought to RTCA/EUROCAE that are already reflected in the ICAO standards or are approved and due to be published by ICAO. Also, there have been issues that have been discussed within ASP/SP that are currently open but identified as items to be resolved by MOPS changes/updates. Conversely, as changes are agreed to and matured at RTCA and EUROCAE, any required ICAO provision changes/updates resulting from those agreements would be brought to the SP.

2.39 With regard to the list of potential updates included in this WP, a suggestion was made that this list should include “clean up” of the MOPS which includes eliminating capabilities no longer utilized. Also comment was made that security consideration should be included in the list.

#### ***SP-ASWG2-WP/13- Draft Guidance Material relating to II Code Coordination Procedures***

2.40 This paper includes draft proposal of a guidance material on the inter-regional IC allocation coordination to be inserted in Doc 9924. The proposal included in this paper was produced based on the consultation outcome with ICAO CNS regional officers, which was agreed at the last TSG.

2.41 ASWG/3 supported the inclusion of this proposal in the guidance manual. This resulted in the following action item.

**ACTION ITEM ASWG/3-14:** TSG to prepare Change Proposal for Doc 9924 on the inter-regional IC allocation coordination and submit it to the next ASWG.

#### ***SP-ASWG3-WP/14- Status Update on Multi Static Primary Surveillance Radar (MsPSR) Development***

2.42 This WP provided an overview of the Multi Static Primary Surveillance Radar Development in Japan which utilizes Digital Terrestrial Television Broadcasting (DTTB), one of the expected signals for MSPSR. This working paper provides the method of aircraft positioning by using signal delays of DTTB whose signal type is ISDB-T. The proposed system concept is based on the passive bistatic radar and uses ISDBT signal delays.

2.43 This paper provided the evaluation method of aircraft positioning by using ISDB-T signal delays and indicated that the proposed method would be useful for aircraft positioning. ENRI would continue to evaluate the positional accuracy in comparison with SSR/ADS-B data.

2.44 A comment was made by UK, who has been involved similar project and experienced frequent data drop off of small aircraft in its evaluation (reference should be made IP08.2). TO replied that this evaluation was conducted in near Tokyo and it is not easy to provide analysis outcome of comparison with radar data. However he informed that he would like to provide its update at the next ASWG meeting.

#### ***SP-ASWG3-WP/15- Unmanned Aircraft Systems (UAS) Detect and Avoid (DAA) Provisions Development***

2.45 This paper contains an update to information discussed at the last ASWG meeting as well as the TSG meeting in January 2016 regarding surveillance requirements to support the UAS DAA MOPS development currently in progress in RTCA SC-228.



Key points from this paper are:

- 1) The Phase 1 DAA MOPs currently under development is targeted for larger UAS that can support an ACAS installation. This does not necessarily include the resolution advisory capability of ACAS, although this is not precluded, but does include the active surveillance capability provided by the ACAS installation.
- 2) The RTCA SC-228 DAA MOPs development is assuming three major surveillance sources. Although others were considered, additional sensors such as optical systems lacked technical maturity to be feasible for the timeframe of the Phase 1 MOPs development. The three surveillance sources included are ADS-B 1090ES, active surveillance and airborne radar.

Following action was assigned to TSG.

**ACTION ITEM ASWG/3-16:** TSG to report back to ASWG in approximately one year and provide strategy for development of ICAO provisions for DAA.

*Note.- Reference should be made to an ongoing ACSG action item, [ACTION ITEM ASWG/2-19](#) (ACSG to report back to ASWG in approximately one year and provide strategy for development of ICAO provisions for DAA).*

#### ***SP-ASWG3-WP/16- Monitoring of 1030/1090 RF Measurement Activities***

2.46 This WP presents initial results of some specific RF measurements performed in Europe in 2015 including the assessment of transponder occupancy, the extraction of aircraft registers and the investigation of new simple parameters to assess the level of activity on 1030/1090 MHz frequencies.

*Note.- this issue was also explained and presented by SP-ASWG3-IP/10*

#### ***SP-ASWG3-WP/17- Proposal of the Inclusion of the 24-bit Aircraft Address in Registration Certificate***

2.47 This paper proposed a recommendation to be added in ICAO Annex 7 for the inclusion of the aircraft address into the ICAO certificate of registration template in order to reduce the number of incorrect 24 bit aircraft addresses encountered on aircraft after re-registration. It clarifies the initial proposal as requested by ASWG Action Item ASWG/2-21. This resulted in a following action item:

**ACTION ITEM ASWG/3-19:** Secretary to start coordination on this subject (Inclusion of 24-bit aircraft address in registration certificate) with OPS section and report back its outcome to the TSG and ASWG.

#### ***SP-ASWG3-WP/18- Revision to Doc 9924 Guidance Material on Passive Acquisition***

2.48 This WP described a need to refine the guidance on Short baseline MLAT included in Doc 9924.

2.49 Passive acquisition is an effective technique to be able to solve some issues of SSR Mode S, such as excessive Mode S all-call replies and interrogator code shortage. Doc 9924 includes guidance materials on two passive acquisition techniques, short baseline MLAT and angle of arrival antenna. This WP indicated that there is a description on the Short baseline MLAT which can lead to a misunderstanding for external readers.

2.50 In addition, this paper provides a result of initial analysis conducted by ENRI using Short baseline MLAT experimental system from January 2016. ENRI recognized that more analysis is needed to provide reliable performance values for the guidance, since initial analysis results were derived from only one target. In addition, more calibration is required for the experiment system. Therefore, ENRI plans to continue the evaluation tests and to provide analysis results in the next TSG meeting in June. This led to a following action item.

**ACTION ITEM ASWG/3-20:** TSG to evaluate the analysis provided by ENRI, refine the guidance on passive acquisition included in Doc 9924 and prepare a CP.

### ***SP-ASWG3-WP/22- On the Non-Stop Surveillance to Monitor Aircraft Globally***

2.51 **SP-ASWG3-WP/22** proposed to use the reports of the airborne automatic dependent surveillance - broadcast (ADS-B) system as a data source in the system to monitor aircraft globally. It is considered to operate ADS-B equipment as well as the secondary surveillance radar (SSR) transponder in a non-stop mode from the take-off till landing thus providing for the solution of surveillance tasks in the interests of ATM and global monitoring. It is proposed to ICAO to determine the periodicity of ADS-B messages for the sake of monitoring (taking into account the speed and the accuracy of aircraft positioning for possible consequent search and rescue operations).

2.52 **SP-ASWG3- IP/05.0** provides additional and supplemental information to the WP/22. Disappearance of Malaysia Airlines MH370 flight in March 2014 has demonstrated the need to monitor aircraft globally. High-orbit (Inmarsat) and low-orbit (Iridium) satellites may provide communications to deliver messages to ATC/airlines. The key issue is the provision of global satellite coverage for surveillance and its cost for airlines. The supplementary/alternative approach described in this IP is the use of self-organized airborne networks (SOAN). Some key features of SOAN approach are provided in the IP.

In reply to questions raised by the meeting, EF further explained that;

- Its prototype of self-organized airborne networks (SOAN) has been produced and its flight test is planned to be conducted by end of 2016.
- SOAN will be used to transmit data receiving from aircraft on network, which supported by VDL Mode-4. SOAN will provide for the self-organizing exchange of data and storing all the data on board each aircraft.
- Security measurement would be covered by using non-stop surveillance and SOAN.
- This WP and IP are making two separate proposals, a) Non-stop surveillance capabilities and b) use of SOAN to support those capabilities.

ASWG/3 provided many comments and some concerns. Salient points from this are as followed.

- 1) Similar past research conducted in Europe indicated unreliability (such as overload) of airborne network at that time (10 to 20 years ago). While the advanced technologies currently used may lead to different results, the flight test planned should provide useful results. ASWG would like to be advised when this work is completed.

**ACTION ITEM ASWG/3-10:** EF to provide flight test result of SOAN in approximately one year.

- 2) A concern was raised about minimum number of aircraft needed to build SOAN in low density airspace. EF answered that several scenarios were simulated using SOAN and is expecting to have some outcome from flight test.
- 3) There are several security measures already introduced in aircraft. Non-switch off ADS-B transmitter or transponder is just one of those measures and aircraft level security measures should be considered.
- 4) Furthermore, in order to introduce “non-stop surveillance” into aircraft, there are also many ways to do it but some may be very complex, since consideration must be given to not only security but also safety, and cost and benefit analysis.
- 5) SM informed that Annex 10 Volume IV had a potentially appropriate text which inhibited switch off transponder/ADS-B transmitter. However due to some other issues, this requirement was deleted in 2011. Since ASWG confirmed that there has been growing demands on “non-stop surveillance”, many participants feel that prior deletion of this wording in Annex 10 Volume IV should be revisited.
- 6) Many participants feel that the first proposal described in this paper, consideration of “Non-stop surveillance”, should be discussed further and TSG should lead the research on this feasibility.
- 7) With regard to the second proposal described in this paper, ASWG/3 feels that original proposal seems to be into the category of the ICAO communication panel, given the network and communication focus. On the other hand, security issue of the information (ADS-B air-to-air) is under SP’s responsibility as it belongs to surveillance capabilities. Therefore, ASWG/3 believes that this proposal should be modified focusing on ADS-B IN security for further consideration by the SP.

Based on the discussion described above, following action items were assigned to TSG.

**ACTION ITEM ASWG/3-22:** TSG to investigate the several possibilities of non-stop surveillance and report back to a future ASWG meeting.

**ACTION ITEM ASWG/3-23:** TSG to examine use of ADS-B IN for countermeasures against spoofing or other security issues and possible independent source of surveillance data, and report back to a future ASWG meeting.

***SP-ASWG3-WP/23- Security Issues Associated with Surveillance Systems***

*Note- this paper was discussed under agenda 6.17.*

***SP-ASWG3-WP/24- Clarification of Proposed Guidance Material regarding Security of Surveillance Systems***

2.53 **SP-ASWG3-WP/23** proposed changes to ICAO Doc 9924 to provide general guidance related to cyber security concerns with ADS-B. A team of ATS and Engineering staff at NAV CANADA reviewed contents included in **SP-ASWG3-WP/23** and proposed the slightly modified version, **SP-ASWG3-WP/24**

2.54 ASWG/3 reviewed and agreed with the proposal included in **SP-ASWG3-WP/24** with some modifications. Because of this modification, WP was revised as **SP-ASWG3-WP/24R1**. Following action item was assigned.

**ACTION ITEM ASWG/3-24:** RD with input from HWS and AD to draft CP on security concerns with surveillance systems and present at the next ASWG meeting.

***Global surveillance roadmap and protection of ATS surveillance and ACAS frequency bands***

2.54 Since JM and EP indicated the concerns that current SP job cards may not include SP's essential work recognized in this meeting (i.e global surveillance roadmap and protection of ATS surveillance and ACAS frequency bands), ASWG/3 decided to review SP's Job cards approved by the Air Navigation Commission. A gap was identified for the required surveillance performance transition steps to implement the GANP. ASWG/3 confirmed that:

- “PBCS” job card already allows us to work on required surveillance performance, which was allocated to CP-OPDLWG (SP is indicated as a supporting group in their job card), and
- Protection of ATS surveillance and ACAS frequency bands is covered by SP Job card (SP 008.01).

2.55 However, ASWG/3 also recognized that those job cards don't indicate the details which may be too general to define the scope of those essential tasks. Therefore, this discussion was resulted in following action items.

**ACTION ITEM ASWG/3-25:** JM and EP to draft terms of reference (TOR) for “Performance Based Surveillance” Sub-group and to propose it at the next ASWG.

**ACTION ITEM ASWG/3-26:** TSG to prepare appropriate WPs to define the task(s) for protection of frequency bands for cooperative and non-cooperative ATS surveillance and ACAS systems. This scope should include an investigation of receiver protection criteria and other requirements.

***Future meetings schedule of ASWG***

2.56 ASWG/3 reviewed the following schedule of the meetings and updated some of the information. Text in red was updated at this meeting.

Meeting	Date	Venue	Remarks
<b>2nd meeting of the Surveillance Panel (SP/2) including ASWG/4 and AIRB/2</b>  <i>Note.- Plenary meeting will be held on 11 October 2014 to nominate chairperson and on 13 or 14 October 2016 to review amendment proposals.</i>	<b>11-19 October 2016</b>	Montreal Canada	Agreed at the ASWG/2
4th meeting of the ASWG (ASWG/4)	(11-14 Oct 2016)		(Agreed at the ASWG/2)
2nd meeting of the AIRB WG (AIRB/2)	(17-19 Oct 2016)		(Agreed at the chairperson meeting on 2 Nov 2015)
5th meeting of the ASWG (ASWG/5)	27 – 30 March, 2017	Tokyo Japan	(Agreed at the ASWG/3)
6th meeting of the ASWG (ASWG/6)	25 – 29 Sep, 2017	TBD	(Its dates was agreed at the ASWG/3)

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to note information provided in this paper.

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