International Civil Aviation Organization

Twenty Eighth Meeting of the Communications/ Navigation and Surveillance Sub-group (CNS SG/28) of APANPIRG

Bangkok, Thailand, 01-05 July 2024

Agenda Item 2: Review outcomes of APANPIRG, APAC ANSP Committee, ATM Sub-group, MET Sub-group and other meetings relevant to CNS Sub-group

GLOBAL AND REGIONAL UPDATES RELEVANT TO CNS

(Presented by the Secretariat)

SUMMARY

This paper presents some background information at global and regional level which are deemed relevant to Communications, Navigation, Surveillance and Spectrum, as well as Information Management, for reference and action by the meeting.

1. INTRODUCTION

1.1 The implementation of Communications, Navigation, Surveillance and Spectrum, as well as Information Management infrastructure and services constitutes the critical capability of global air traffic management, ensuring the safety, regularity, and efficiency of air operations. As one of the main forums and expert groups to deal with CNS/ATM related provisions by ICAO and industry in the region, CNS SG of APANPIRG has coordinated the implementation of seamless ANS and encouraged/facilitated experience sharing in the Asia and Pacific Regions to satisfy performance requirements and address relevant implementation issues since its establishment.

1.2 To support the evolving operational requirements with the rapid change of ANS concept and technology, it is deemed necessary to keep CNS SG informed on latest progress in relevant domains to prepare for the emerging new requirements.

2. DISCUSSION

2.1 To promote a better understanding of the challenges and future development tendency in relevant provisions, the Meeting is invited to discuss how to share individual implementation experiences, latest updates at global and regional level, and deliberate on concerned topics/issues among the Asia/Pacific Member States against the Terms of Reference (ToR) of CNS SG. Some background information is provided in the following paragraphs for consideration during the future planning process of the CNS/ATM infrastructure and ANS services.

2.2 The Fourteenth Air Navigation Conference has been scheduled from 26 August to 6 September 2024 in Montreal with the theme "*Performance Improvement Driving Sustainability*". The Conference will discuss Air navigation system performance improvement under Agenda Item 3, including Phasing out legacy systems and the Eighth Edition of the Global Air Navigation Plan (GANP). Under Agenda Item 4: Hyper-connectivity of air navigation system, the Conference will discuss Connected aircraft concept and associated challenges and Cybersecurity and information system resilience. The Conference provides a forum to describe the work that is already prioritized and underway in the ICAO 2023-2025 Business Plan; understand new priorities for ICAO's future work; and offer timely direction to the Organization as it prepares to present a Business Plan to the 42nd Session of the Assembly (A42) in 2025 that sets out a reprioritized work programme and the related resources required.

Outcome of ANW-ATM

2.3 The *Air Navigation World - ATM procedures for Today* was held from 23 to 27 October 2023 in Singapore. The objective of this ICAO event was to facilitate global ATM implementation through focused knowledge sharing of mature, tried and tested ATM procedures in a practical how-to manner. The sessions considered current technologies and procedures to support the evolution of ATM to meet the expectations of the aviation community, with an eye on the future, and in line with the long-term global aspirational goal for international aviation of net-zero carbon emissions by 2050. From the discussion on ATS Data Link during Session 3.4, it was noted that *AIDC will be instrumental in the ATC coordination, until FF-ICE covers all phases of flight.* In closing the event, C/ATM of ANB highlighted some points, for ATS data link, it is *Without A-G data link, there is no TBO; AIDC will still be required even when FF-ICE/R1 is implemented*; for Transition from FPL 2012 to FF-ICE, it is *Without FF-ICE, there is no TBO; Longer duration of mixed mode will delay realization of benefits*. D/ANB reiterated that ATM performance offers better safety measures, aircraft operating cost saving, passenger travel time saving and fuel saving in her closing remarks.

Future Connectivity for Aviation White Paper

2.4 The European Union Aviation Safety Agency, the Federal Aviation Administration, Airbus and Boeing have launched a joint cooperation initiative to rethink aviation connectivity, defining a blueprint for the modernisation and harmonisation of the aviation data communication landscape by 2035. The White Paper by EU/US task force was published in November 2022, which can be accessed at : https://www.easa.europa.eu/en/document-library/general-publications/future-connectivity-aviation The present white paper offers a jointly proposed vision for the future aviation connectivity landscape which is based on the combination of aviation specific solutions (VHF datalink and higher performance L-band SATCOM) - that will offer guaranteed safety and performance - with commercial, non-aviation specific solutions - that are expected to provide for high capacity and economic efficiency.

User Requirements for Air Traffic Services by IATA

2.5 In December 2023, International Air Transport Association (IATA) published its *User Requirements for Air Traffic Services (URATS) Volume 2 Edition 4.0*, which can be accessed at https://www.iata.org/contentassets/badbfd2d36a74f12b021c9dd899ecbad/iata_urats_v2_e4_dec_2023.pdf . This document provides international airline perspectives on Communications, Navigation, and Surveillance (CNS) technologies. In general, the positions reflected in this document seek to maximise existing aircraft capabilities and support implementation of new technologies when and where operationally justified.

2.6 In the "**C**" domain airlines seek to benefit from:

- Broadband communications including some non-traditional options.

- Technological resilience.
- Seamless operations.
  - For example, automated and transparent switching between networks, antennas, technologies and protocols.

2.7 In the "**N**" domain airlines seek:
- The enhanced safety and efficiency associated with 4D trajectories.
- Interoperability between regional implementations of core technologies.

2.8 In the "**S**" domain airlines wish to:
- Derive benefits from more efficient, automated, and precise surveillance, e.g., free route airspace.
- Gain enhanced operational predictability e.g., by avoidance of procedural control.
- See ATS cost reductions due to rationalization of overlapping, redundant surveillance systems (e.g., RADARs and ADS-B covering the same airspace).

Job Cards of CP-DCIWG

2.9 The Communications Panel (CP) - Data Communications Infrastructure Working Group (DCIWG) is known as "specific" working groups within the CP which is tasked to maintain the current ICAO communication provisions and advise the Air Navigation Commission (ANC) and provide the recommendations for future aeronautical communications. As the infrastructure to support aeronautical communications is complex, the DCIWG is supported by a number of Working Groups and Project Teams, which are in turn supported by a number of sub-groups. The working programme of Panels for a given time are mainly defined by Job Cards once they are approved by the ANC. The active Job Cards for DCIWG covered the following global topics: **CP.001.01** Global Data Link Implementation Strategy; **CP-DCIWG.006.04** Provisions on the exchange of information using the aeronautical telecommunication network over the internet protocol suite**; CP-DCIWG.007.05** SARPS and guidance on Air Navigation (Cyber) Resilience; **CP-DCIWG.009.03** Satellite Communication Systems in support of ASBU Blocks 1 and 2; **CP-DCIWG.010.02** Future L-Band Terrestrial Data Link System; **CP-DCIWG.011.01** Aeronautical satellite communication technologies and systems operating in VHF frequency band.

Job Cards of NSP

2.10 The Navigation Systems Panel (NSP) was established in 2003 to define and elaborate on concepts of use, operational requirements and where appropriate technical solutions for aeronautical navigation applications and the infrastructure to support them. The NSP is tasked with developing strategies and plans for global navigation harmonization as per the Global Air Navigation Plan (GANP). The NSP addresses challenges and opportunities of both ground based and satellite based (GNSS) systems. The active Job Cards for NSP covered the following global topics: **NSP.002.03** GNSS Evolution - Multi-constellations; **NSP.003.03** GNSS Evolution – SBAS; **NSP.004.03** GNSS Evolution – Advanced Receiver Autonomous Integrity Monitoring (ARAIM); **NSP.005.03** GNSS Evolution – GBAS; **NSP.006.04** GNSS Radio Frequency Interference; **NSP.007.02** Mitigation of Space Weather Effects.

Job Cards of SP

2.11 The Surveillance Panel (SP) undertakes specific studies and develops technical and operational ICAO provisions for aeronautical surveillance systems, collision avoidance systems and their applications as outlined in the Global Air Navigation Plan (GANP). Rapid technological advances and different rates of adoption have resulted in diverse surveillance capabilities across the globe. The

SP continuously works to attract diverse State participation to ensure that ICAO provisions address the wide range of surveillance capabilities. The active Job Cards for SP covered the following global topics: **SP.008.03** Ensure performance of aeronautical surveillance systems; **SP.009.03** Develop provisions on ACAS-X**; SP.010.03** Interval Management; **SP.012.03** ADS-B based pilot alerting on or near airport runways.

Job Cards of FSMP

2.12 The former Aeronautical Communications Panel Working Group F was transformed into Frequency Spectrum Management Panel (FSMP) in 2014 to manage aeronautical frequency spectrum in order to ensure sufficient access to the resource for the provision of aeronautical communication, navigation and surveillance services (CNS) in an efficient and safe manner. The challenge is to balance managing the finite spectrum resource to support existing and evolving aviation technologies, protecting it from interference, resisting loss to competing industries, and facilitating more efficient usage to meet the growth of existing, and introduction of new, aviation systems. The active Job Cards for FSMP covered the following global topics: **FSMP.001.02** Maintenance and update of the ICAO frequency spectrum strategy and policy; **FSMP.002.02** ITU Radio Regulations (RR) and ITU World Radiocommunication Conferences (WRC); **FSMP.003.02** Maintain ITU Radio-regulatory framework relevant to aviation and keep ICAO provisions and the ITU Radio-regulatory framework in sync; **FSMP.004.03** Address radio frequency interference issues for aviation and the need for action by States, ICAO and international organizations together; **FSMP.005.03** Develop and maintain SARPs and guidance material to facilitate frequency management of communication, navigation and surveillance systems; **FSMP.006.02** Develop radio frequency and interference rejection characteristics for radio altimeters; **FSMP.007.02** (DELIVERED) Develop and maintain SARPs and guidance to prevent WAIC / Radio Altimeter interference.

Job Cards of IMP

2.13 The Information Management Panel (IMP) was established in 2014 to develop a globally harmonized and interoperable approach and elaborate on necessary concepts to ensure effective management of information, including identifying the need for new information exchange formats, on a system-wide basis within the air navigation system. The active Job Cards for IMP covered the following global topics: **IMP.011.01** Information Services for Air/Ground SWIM; **IMP.012.01** SWIM Service Registry Interoperability; **IMP.013.01** Information Service Definition; **IMP.014.01** SWIM Governance enhancements; **IMP.015.01** Information Management Vocabulary; **IMP.002.03** Information Architecture & Management; **IMP.004.03** Information Services under SWIM; IMP.005.03 SWIM Governance; **IMP.006.02** AIM Global Implementation Support; **IMP.007.02** NOTAM; **IMP.008.02** Aeronautical Charts; **IMP.009.02** Digital Data Sets; **IMP.010.02** WGS-84.

Job Cards of ATMRPP

2.14 The Air Traffic Management Requirements and Performance Panel (ATMRPP) undertakes specific studies and develop and/or review technical provisions to support the integration of the Global Air Navigation Plan (GANP) and develop concepts and provisions aimed at the realization of the vision established by the Global ATM Operational Concept. The current areas of work are as follows: Flight and Flow Information for a Collaborative Environment (FF-ICE); Connected Aircraft (Aircraft Access to SWIM); and Trajectory-based Operations (TBO). The active Job Cards for ATMRPP covered the following global topics: **ATMRPP.001.04** Implementation of Flight and Flow Information for a Collaborative Environment (FF-ICE); **ATMRPP.007.03** Connected Aircraft Concept; **ATMRPP.011.02** Accommodation of additional flight plan information in the ICAO flight plan (2012 FPL) while transitioning to FF-ICE; **ATMRPP.012.01** Guidance on transitioning to a

globally interoperable TBO environment; **ATMRPP.013.01** Update to the Global ATM Operational Concept (Doc 9854).

ICNSS project

2.15 The Integrated Communications, Navigation, Surveillance and Spectrum (ICNSS) project focusses on identifying a new and streamlined framework for CNSS standardization and better decision-making processes to achieve consensus and accelerate the development and rollout of state-of-the-art aeronautical CNS services. The goal is to support the medium and long-term evolution of CNS systems by providing an overall systems improvement thus continuing to serve aviation with the high uptime and resilience necessary to maintain aviation's stringent safety record while remaining a responsible user of the spectrum resource. The Technical Commission of the 41st Session of the Assembly (A41) reviewed A41-WP/58, presented by the Council, which contained information on progress achieved by the project. The ICNSS project is to propose a set of recommendations for endorsement by A42. For further information, an initial draft report of the integrated CNS and spectrum global concept can be found at the ICNSS project website.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) nominate/recommend experts, engage industry for required expertise, to share experiences to CNS SG and its contributory bodies; and

c) discuss any relevant matter as appropriate.

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