International Civil Aviation Organization

EIGHTH MEETING OF SPECTRUM REVIEW WORKING GROUP (SRWG/8)

Bangkok, Thailand, 05 – 07 March 2024

Agenda Item 2: Review outcomes of relevant meetings

REVIEW OUTCOMES OF 41ST SESSION OF THE ASSEMBLY RELEVANT TO SPECTRUM

(Presented by the Secretariat)

SUMMARY

This paper briefly summarized the outcomes of the 41st Session of the Assembly related to aeronautical frequency spectrum for review and action by the meeting.

1. INTRODUCTION

1.1 The 41st Session of the Assembly was held at the Montréal Headquarters of the International Civil Aviation Organization (ICAO) from 27 September–7 October 2022. 2,573 Ministers and high-ranking government officials from 184 States gathered in-person and virtually for the launch of the ICAO 41st Assembly at ICAO HQ, the first since the COVID-19 outbreak. The documentation of the meeting, including Resolutions, Assembly Working Papers, Assembly Report and Minutes, Plenary – Action Sheets, Statements, Reference Documents, Presentations, and other materials can be accessed via the following link:

https://www.icao.int/Meetings/a41/Pages/default.aspx

1.2 This paper presents discussions/updates during Assembly 41 which are deemed relevant to aeronautical frequency spectrum utilization for information and reference.

2. DISCUSSION

41st Session of the Assembly and Relevant Agenda Items

2.1 Over 600 Working Papers (WPs) were submitted under 56 Agenda Items during the 41st Session of the Assembly, while the spectrum related topics are mainly discussed by Technical Commission under Agenda Item 30 - *Aviation Safety and Air Navigation Policy*, Agenda Item 31 - *Aviation Safety and Air Navigation Standardization*.

Main Points of Technical Commission Reports

2.2 The Technical Commission had held four meetings between 29 September 2022 and 4 October 2022 and had addressed 219 working papers, as well as five draft reports to the Plenary. Representatives from some 184 Member States and 56 Observer Delegations had attended one or more meetings of the Commission.

2.3 The Commission reviewed the Conference's outcomes on radio frequency spectrum matters and agreed to submit to the Plenary for adoption Resolution 30/2: *Support of the ICAO policy and radio frequency spectrum matters*.

2.4 Rather than presenting each agenda item report in detail, in line with the intention of the Technical Commission to focus on global plans and policy decisions so as to improve the efficiency of the Assemblies, the following Resolution that the Technical Commission had submitted to the Plenary for adoption were highlighted, namely: Resolution 31/1: *Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation and surveillance/air traffic management (CNS/ATM) systems*.

2.5 In the absence of comments, the President of the Assembly declared the following Reports of the Technical Commission approved and Resolutions as indicated adopted:

WP/652 — Agenda Item 30: *Aviation Safety and Air Navigation Policy*
(Resolutions 30/1 and 30/2)

WP/653 — Agenda Item 31: *Aviation Safety and Air Navigation Standardization*
(Resolutions 31/1 and 31/2)

Main Publications of the Assembly

2.6 The Plenary Meetings Minutes for Assembly 41st Session was published as Doc 10182, the Executive Committee Report of Assembly 41st Session was published as Doc 10183, Assembly Resolutions in Force (as of 7 October 2022) was published as Doc 10184.

2.7 A provisional edition of all 33 Resolutions adopted at the 41st Session of the Assembly was also summarized and published on the meeting page.

2.8 The Resolutions indicated in Paragraph 2.5 of this paper were formulated by the Assembly as follows:

WP/652 (Resolutions 30/2)
A41-7: **Support of the ICAO policy on radio frequency spectrum matters**

WP/653 (Resolutions 31/1)
A41-8: **Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation, and surveillance/air traffic management (CNS/ATM) systems**

2.9 The relevant texts of **A41-7** and **A41-8** are extracted and provided in **Attachment A** of this paper.

Updates on ICNSS project

2.10 The 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.

2.11 Under Agenda Item 31: *Aviation Safety and Air Navigation Standardization*, the Technical Commission reviewed A41-WP/58, presented by the Council, which contained information on progress achieved by the Integrated Communications, Navigation, Surveillance and Spectrum (ICNSS) project. Noting that the ultimate objective of the ICNSS project was to propose a set of recommendations for endorsement by the next Assembly, the Commission expressed its satisfaction with the efforts underway and encouraged States, international organizations and other stakeholders to support the continued development and implementation of a medium to long-term roadmap for the evolution of ICNSS and a new streamlined framework for communications, navigation, surveillance (CNS) and frequency spectrum standardization.

2.12 The Commission noted that A41-WP/58, A41-WP/84, A41-WP/107, A41-WP/108 and A41-WP/233 shared the common subject of optimizing and enhancing the current Standard making process, a subject also addressed under Agenda Item 23. Noting the importance of consultation with Member States, the Commission agreed that the efforts to streamline the Standards making process as well as to implement performance-based Standards should continue.

2.13 The A41 working papers, including A41-WP/652, A41-WP/653 and A41-WP/058, are provided in **Attachment B, C** and **D** to this paper respectively for easy reference.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) review the text in **Attachment A**, take follow up actions when appropriate;

c) review **Attachment B** and **Attachment C** for further information;

d) review **Attachment D** and visit Pages - Integrated CNSS Project (icao.int) for the draft report of the integrated CNS and spectrum global concept; and

e) discuss any relevant matter as appropriate.

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Assembly Resolutions in Force Relevant to Spectrum

(as of 7 October 2022)
Extracted from Doc 10184.

A41-7: **Support of the ICAO policy on radio frequency spectrum matters**

Whereas ICAO is the specialized agency of the United Nations responsible for the safety, regularity and efficiency of international civil aviation;

Whereas ICAO adopts international Standards and Recommended Practices (SARPs) for aeronautical communications systems and radio navigation aids;

Whereas the International Telecommunication Union (ITU) is the specialized agency of the United Nations regulating the use of the radio frequency spectrum;

Whereas the ICAO position, as approved by the Council, for ITU World Radiocommunication Conferences (WRCs) is the result of the coordination of international aviation requirements for radio frequency spectrum;

Whereas a comprehensive frequency spectrum strategy is required by aviation to support timely availability and appropriate protection of adequate spectrum;

Whereas a sustainable environment for growth and technology development is required to support safety and operational effectiveness for current and future operational systems and allow for the transition between present and future technologies;

Recognizing that the development and the implementation of the communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and the safety of international civil aviation could be seriously jeopardized unless requirements for appropriate aviation safety spectrum allocations are satisfied and the continued protection of those allocations is achieved;

Recognizing that unresolved spectrum issues relating to aeronautical safety services have resulted in flight cancellations, degradations of air traffic management services and interruptions of flight operations;

Recognizing that to ensure optimal use of the frequency spectrum allocated to aviation, efficient frequency management and use of best practices are required;

Recognizing that support from ITU member administrations is required to ensure that the ICAO position is supported by the WRC and that aviation requirements are met;

Considering the urgent need to increase such support due to the growing demand for spectrum and aggressive competition from commercial telecommunications services;

Considering the increased level of ITU WRC preparation activities associated with the growing demand for bandwidth from all users of the radio frequency (RF) spectrum, as well as the increased importance of the development of regional positions by regional telecommunication bodies, such as APT, ASMG, ATU, CEPT, CITEL and RCC4; and

Considering Recommendations 7/3 and 7/6 of the Special Communications/Operations Divisional Meeting (1995) (SP COM/OPS/95), Recommendation 5/2 of the 11th Air Navigation Conference (2003), and Recommendation 1/12 of the 12th Air Navigation Conference (2012), and Recommendation 5/5 of the High-level Conference on COVID-19 (2021);

The Assembly:

1. *Urges* Member States, international organizations and other civil aviation stakeholders to support firmly the ICAO frequency spectrum strategy and the ICAO position at WRCs and in regional and other international activities conducted in preparation for WRCs, including by the following means:

a) working together to deliver spectrum-efficient aeronautical systems as well as frequency management that meet current best practices;

b) supporting ICAO activities relating to the aviation frequency spectrum strategy and policy through relevant expert group meetings and regional planning groups;

c) undertaking to provide for aviation interests to be fully integrated in the development of their positions presented to regional telecommunications fora involved in the preparation of joint proposals to the WRC;

d) including in their proposals to the WRC, to the extent possible, material consistent with the ICAO position;

e) supporting the ICAO position and the ICAO policy statements at ITU WRCs as approved by Council and incorporated in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718);

f) undertaking to provide civil aviation experts to fully participate in the development of States' and regional positions and development of aviation interests at the ITU; and

g) ensuring, to the maximum extent possible, that their delegations to regional conferences, ITU study groups and WRCs include experts from their civil aviation authorities and other civil aviation stakeholders who are fully prepared to represent aviation interests;

2. *Urges* Member States to consider, as a priority, public and aviation safety when deciding how to enable new or additional services, and to consult with aviation safety regulators, subject matter experts and airspace users, to provide all necessary considerations and to establish regulatory measures to ensure that incumbent aviation systems and services are free from harmful interference.

3. *Requests* the Secretary General to bring to the attention of ITU the importance of adequate radio frequency spectrum allocation and protection for the safety of aviation;

4. *Instructs* the Council and the Secretary General, as a matter of high priority within the budget adopted by the Assembly, to ensure that the resources necessary to support the development and implementation of a comprehensive aviation frequency spectrum

strategy, as well as increased participation by ICAO in international and regional spectrum management activities are made available; and

5. *Declares* that this resolution supersedes Resolution A38-6.

A41-8: Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation, and surveillance/air traffic management (CNS/ATM) systems

APPENDIX C
Ensuring the resilience of ICAO CNS/ATM systems and services

Whereas the CNS/ATM systems are evolving and so are the associated CNS threats and vulnerabilities;

Whereas the occurrences of interferences against satellite-based CNS systems and global navigation satellite system (GNSS), in particular, have significantly increased;

Whereas CNS resiliency to interference needs to be addressed at a global level with a holistic approach, ensuring an efficient and coordinated evolution between the infrastructure architecture, improved technological capabilities, civil and military operational procedures, radio regulatory authorities and civil-military coordination;

Recognizing that resiliency to interference needs to be improved by maximizing the integration of all suitable ground infrastructure, space infrastructure and airborne components in a complementary and cooperative manner to be as robust as possible to cases of satellite-based service disruption or environments where false or deceptive signals are present;

Recognizing that both the aircraft on-board and ground infrastructure complementing the satellite-based CNS systems need to be adapted to include, where appropriate, interference detection, mitigation and reporting functions to support the resolution of operationally encountered performance anomalies;

Believing that, combined with the use of the appropriate legal framework, such capabilities and measures will allow for the relevant authorities to act upon harmful interferences caused by the illegal operation of transmitters and avoid the proliferation and the use of such illegal transmitters and the misuse of test and maintenance equipment;

Believing that, with appropriate coordination and application of best practices, military and State authorities can conduct GNSS-related testing and other interventions using radio equipment as necessary and without causing an undue impact on civil aviation;

Believing that civil-military coordination should facilitate the sharing of relevant information with airspace users, especially when flying in the vicinity of a conflict zone; and

Acknowledging that loss of crew's situational awareness from malicious origin is classified as a cyber-security threat and cannot be tolerated in civil aviation; and that intentionally sending misleading signals to replace the accurate signal is a far more serious threat to flight safety than the loss of this signal.

The Assembly:

1. Encourages States to transition towards optimized, secure CNS systems based on complementary integration of suitable and independent aircraft capabilities, satellite- and ground-based infrastructure which maximize resiliency and robustness to any type of interference;

2. Encourages standardization bodies and industry to develop appropriate interference detection, mitigation and reporting capabilities for the aircraft on-board, satellite- and ground-based CNS system components, in order to ensure higher CNS resiliency, continuity of operations and prevent any cascading effects from the use of compromised position, velocity or time data;

3. Encourages States to ensure that sufficient terrestrial CNS capabilities remain available to ensure safe operations and complement aircraft-level integration of position, velocity and time with independent surveillance information;

4. Invites ICAO to develop high-level principles on how to integrate CNS ground, space and on-board systems and capabilities to obtain more resilient positioning and timing services;

5. Urges States to apply necessary measures to avoid the commercialization/proliferation and the use of illegal transmitters such as jammers and the misuse of test and maintenance equipment which may impact CNS systems;

6. Urges States to ensure close collaboration between aviation authorities, military authorities, service providers, radio regulatory and spectrum enforcement authorities to put in place any special measures required to ensure that spectrum used by all CNS systems, and GNSS in particular, is free from harmful interference;

7. Urges States to refrain from any form of jamming, or spoofing affecting civil aviation;

8. Urges States to coordinate and notify to the maximum extent possible in advance with the air navigation services provider (ANSP) responsible for the affected airspace in case of military or other State-authorized security or defence-related operations or training, potentially causing any form of jamming, or spoofing affecting civil aviation; and

9. Urges States and operators, when assessing the interference risks associated with conflict zones, to consider that the use of satellite-based CNS systems can potentially be impacted beyond those zones.

A41-WP/652
P/48
4/10/22

ASSEMBLY — 41ST SESSION

REPORT OF THE TECHNICAL COMMISSION ON AGENDA ITEM 30

(Presented by the Chairperson of the Technical Commission)

The attached report on Agenda Item 30 has been approved by the Technical Commission. Resolutions 30/1 and 30/2 are recommended for adoption by the Plenary.

Note.— After removal of this covering sheet, this paper should be inserted in the appropriate place in the report folder.

(12 pages)

Agenda Item 30: Aviation Safety and Air Navigation Policy

Global Aviation Safety Plan (GASP), and implementation of regional and national aviation safety plans

30.1 The Commission reviewed A41-WP/46, presented by the Council, which put forward the 2023-2025 (fourth) edition of the *Global Aviation Safety Plan* (GASP, Doc 10004) for endorsement by the Assembly. The revised GASP sets forth the global strategy for the continuous improvement of aviation safety. It provides a framework in which regional and national aviation safety plans (RASP and NASP) are developed and implemented. The Commission recommended that the Assembly endorse the 2023-2025 edition of the GASP.

30.2 The Commission reviewed the following papers regarding the 2023-2025 edition of the GASP: A41-WP/109 presented by Bangladesh; A41-WP/118, presented by Singapore and co-sponsored by Australia, Bangladesh, Canada, China, Malaysia, Papua New Guinea, Thailand, Flight Safety Foundation (FSF) and the International Air Transport Association (IATA), as well as by Fiji, New Zealand, Palau, Samoa, Solomon Islands, Member States[1] of the European Union (EU), the other Member States[2] of the European Civil Aviation Conference (ECAC), European Organisation for the Safety of Air Navigation (EUROCONTROL) and the International Coordinating Council of Aerospace Industries Associations (ICCAIA); A41WP/136 presented by Japan; A41-WP/252 presented by the African Civil Aviation Commission (AFCAC) on behalf of -54 Member States[3]; A41-WP/373 presented by Colombia and supported by Argentina, Bolivia (Plurinational State of), Brazil, Chile, Dominican Republic, El Salvador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of); and A41-WP/94, presented by ICCAIA, the International Federation of Air Line Pilots Associations (IFALPA) and the International Federation of Air Traffic Controllers Associations (IFATCA). Concern was noted about the possible impact of the extension of the GASP target for effective State safety programme (SSP) implementation from 2025 to 2028, as SSP and safety management systems (SMS) are important for States and industry to cope with aviation risks resulting from disruptive events and crisis situations. The Commission agreed on the need for ICAO to continue supporting regions and States in the development and implementation of their RASPs and NASPs, in line with the latest edition of the GASP, by creating and updating tools, guidance and capacity-building efforts to assist all stakeholders in achieving the GASP goals. The Commission further agreed on the need for ICAO, through relevant expert groups, to include consideration of regional aircraft operations, the implementation of new technologies, digitalization, resilience and environment, as well as the need for regulatory cooperation and harmonized policies in support of operational safety improvements in forthcoming editions of the GASP or related documentation.

30.3 Information papers were provided by Oman (A41-WP/116) and the United States (A41-WP/582).

Latest developments related to the Global Air Navigation Plan (GANP)

30.4 The Commission reviewed A41-WP/45, presented by the Council, which called for the endorsement of an update of the *Global Air Navigation Plan* (GANP, Doc 9750 – Seventh Edition), and proposed an outlook for the eighth edition. The seventh edition of the GANP, available via the GANP Portal (https://www4.icao.int/ganpportal), proposed an update to the safety key performance area of GANP performance framework, as well as a maintenance process to keep it current. It also proposed a

mapping of the essential services outlined in the Basic Building Block (BBB) framework to the Protocol Questions (PQs) of the Universal Safety Oversight Audit Programme (USOAP) as well as minor updates to the BBB and the Aviation System Block Upgrade (ASBU) frameworks. The Commission recommended that the Assembly endorse the seventh edition of the GANP. The Commission supported the proposed outlook for the eighth edition of the GANP and proposed to consider making the GANP content available in a portable document format (PDF) for better readability.

30.5 The Commission reviewed A41-WP/131, co-presented by Brazil, China, Japan, Singapore, Thailand and the United States, and agreed that ICAO define new key performance indicators (KPIs) within the GANP performance framework applicable to the Trajectory-Based Operation (TBO) concept. The Commission encouraged the aviation community to consider the use of such indicators, when developed and agreed to, to quantify the TBO benefits.

30.6 The Commission reviewed A41-WP/244 presented by Uruguay, and co-sponsored by Guyana and the Member States[4] of the Latin American Civil Aviation Commission (LACAC), which called for collaboration between safety and air navigation. The Commission reviewed the practical approaches proposed to improve this collaboration at global and regional levels. The Commission noted the work done, as part of the update to the safety key performance area, to define common safety indicators for the GANP and the GASP. To further improve the alignment between the GANP and the GASP, the Commission agreed that ICAO consider, working through the appropriate expert groups, defining a common aspirational safety goal and cross-referencing the GASP high-risk categories, goals and targets in the safety KPA of the GANP performance framework. The Commission agreed to encourage the regional groups to work jointly on cross-cutting GANP and GASP issues, and to consider organizing interactive awareness-raising workshops between the three ICAO global plans, i.e. GANP, GASP and the Global Aviation Security Plan (GASeP).

30.7 The Commission reviewed A41-WP/134, presented by United Arab Emirates, which highlighted the importance of global, regional and national harmonization of performance-based air navigation planning. The Commission urged States as well as planning and implementation regional groups (PIRGs) to establish a performance-based management approach and define performance targets according to their needs.

30.8 The Commission reviewed A41-WP/148, presented by Saudi Arabia on behalf of the Arab Civil Aviation Organization (ACAO)[5] States, which highlighted the importance of national air navigation planning. The Commission agreed with the proposed amendment to the draft resolution proposed in A41-WP/45, as shown in the Appendix to A41-WP/148 and amended by the discussions, which invited ICAO to progress in the development of guidance material related to the national air navigation plan during the upcoming editions of the GANP and to collect and share best practices, lessons learned, and benchmark results related to the implementation of air navigation operational improvements.

30.9 The Commission reviewed the following papers related to the challenges and opportunities of advancing the global aviation system while maintaining the flexibility to integrate innovative concepts and new operations: A41-WP/237 and Corrigendum No. 1, presented by United States, and co-sponsored by Thailand; and A41-WP/87, presented by ICCAIA and the Civil Air Navigation Services Organisation (CANSO) and co-sponsored by Brazil. The Commission noted the ongoing update of the Global ATM Operational Concept and the review of the conceptual roadmap for the eighth edition of the GANP, and agreed that the characteristics for the next era of air traffic and

airspace management system, outlined in A41-WP/87, be brought to the attention of the relevant expert groups. In this regard, the Commission agreed that the proposed Assembly resolution contained in WP/87 was not needed. The Commission highlighted the need to support the work of the ICAO Standards Roundtable and the participation of unconventional (non-aviation) industries, through established mechanisms. With respect to the use of direct submissions, the Commission noted that the Executive Committee was considering such matters under Agenda Item 23.

30.10 The Commission reviewed A41-WP/133, presented by Japan, which emphasized the importance of the environment and in particular of collaboratively improving the air navigation system to address decarbonisation for the sustainable future development of civil aviation. The Commission encouraged Member States to exchange information on measures for sustainable development of aviation and further collaborate for decarbonisation through the improvement of the air navigation system.

30.11 Information papers provided by Brazil (A41-WP/286), Japan (A41-WP/251) and the United States (A41-WP/599) were noted.

30.12 In light of the discussion, the Commission agreed to submit, for adoption by the Plenary, the following resolution to supersede Assembly Resolution A40-1:

Resolution 30/1: ICAO global planning for safety and air navigation

Whereas ICAO strives to achieve the goal of a safe and orderly development of civil aviation through cooperation among Member States and other stakeholders;

Whereas to realize this goal, the Organization has established Strategic Objectives, including objectives for safety and for air navigation capacity and efficiency;

Recognizing the importance of global frameworks and regional and national plans to support the Strategic Objectives of ICAO;

Recognizing the importance of effective implementation of regional and national plans and initiatives based on the global frameworks;

Recognizing that further progress in improving the global safety, capacity and efficiency of civil aviation is best achieved through a cooperative, collaborative and coordinated approach in partnership with all stakeholders under the leadership of ICAO; and

Noting the approval by the Council of the ~~third~~ 2023-2025 edition of the Global Aviation Safety Plan (GASP) and of the ~~sixth~~ seventh edition of the Global Air Navigation Plan (GANP);

The Assembly:

1. *Endorses* the ~~third~~ 2023-2025 edition of the Global Aviation Safety Plan (GASP) and the ~~sixth~~ seventh edition of the Global Air Navigation Plan (GANP) as the global strategic directions for safety and the evolution of the air navigation system, respectively;

2. *Resolves* that ICAO shall implement and keep current the GASP and the GANP to support the relevant Strategic Objectives of the Organization, while ensuring necessary stability;

3. *Resolves* that these global plans shall be implemented and kept current in close cooperation, collaboration and coordination with all concerned stakeholders;

4. *Resolves* that these global plans shall provide the frameworks in which regional, subregional and national plans will be developed and implemented, thus ensuring consistency, harmonization and coordination of efforts aimed at improving international civil aviation safety, capacity and efficiency;

5. *Urges* Member States to develop sustainable solutions to fully exercise their safety oversight and air navigation responsibilities which can be achieved by sharing resources, utilizing internal and/or external resources, such as regional and subregional organizations and the expertise of other States;

6. *Urges* Member States to demonstrate the political will necessary for taking remedial actions to address safety and air navigation deficiencies, including those identified by Universal Safety Oversight Audit Programme (USOAP), through the GASP, the GANP and the ICAO regional planning process;

7. *Urges* Member States, the industry and financing institutions to provide the needed support for the coordinated implementation of the GASP and GANP, as well as regional and national plans, avoiding duplication of efforts;

8. *Calls* upon States and invites other stakeholders to cooperate in the development and implementation of regional, subregional and national plans based on the frameworks of the GASP and GANP;

9. Instructs the Secretary General to promote, make available and effectively communicate the GASP and the GANP; and

10. Declares that this resolution supersedes Resolution ~~A39-12~~ A40-1 on ICAO global planning for safety and air navigation.

APPENDIX A

Global Aviation Safety Plan (GASP)

Reaffirming that the primary objective of the Organization continues to be the improvement of safety and an associated reduction in the number of accidents and related fatalities within the international civil aviation system;

Recognizing that safety is a responsibility involving ICAO, Member States and all other stakeholders;

Recognizing the safety benefits that can be drawn from partnerships between States and industry;

~~*Recognizing* that the High-level Safety Conference (2010) reaffirmed the need for the ICAO safety framework to continuously evolve to ensure its sustained effectiveness and efficiency in the changing regulatory, economic and technical environment;~~

Noting that ~~the expected increase in international civil aviation traffic will result in an increasing number of aircraft accidents unless the accident rate is reduced~~ a safe, resilient and sustainable aviation system contributes to the economic development of States and their industries;

Recognizing the need to maintain the public's confidence in air transport by providing access to relevant safety information;

Recognizing that a proactive approach in which a strategy is established to set ~~priorities~~ goals, targets and indicators to manage organizational challenges and operational safety risks is of paramount importance to the achievement of further improvements in aviation safety;

Recognizing that regional aviation safety groups have been implemented by ICAO, taking into account the needs of the various regions and building on the already existing structures and forms of cooperation;

Noting the intent to apply ~~the safety management principles~~ a risk-based approach to managing safety in the GASP to enhance safety by focusing action where it is most needed;

Noting the development of the global aviation safety roadmap, as an action plan to assist the aviation community in ~~implementing the safety initiatives presented in~~ achieving the GASP goals, through a structured, common frame of reference for all relevant stakeholders; and

Noting the need to assist Member States in ~~implementing safety management principles and mitigate risks on identified operational issues~~ building upon safety oversight systems to adopt a safety management approach under their State safety programme (SSP);

The Assembly:

1. *Stresses* the need for continuous improvement of aviation safety through a reduction in the number of accidents and related fatalities in air transport operations, including regional aircraft operations, in all parts of the world~~, particularly in States where safety records are significantly worse than the worldwide average~~;

2. *Stresses* that limited resources of the international aviation community should be used strategically to support States or regions ~~whose safety oversight maturity is not at an acceptable level~~ seeking assistance to facilitate State safety programme (SSP) implementation, including strengthening safety oversight;

3. *Urges* Member States to implement national aviation safety plans consistent with the GASP to continually reduce fatalities and the risk of fatalities;

4. *Urges* Member States, regional safety oversight organizations (RSOOs), regional aviation safety groups (RASGs) and international organizations concerned to work with all stakeholders to implement regional aviation safety plans consistent with the GASP to continually reduce fatalities and the risk of fatalities;

5. *Urges* States to fully exercise safety oversight of their operators in full compliance with applicable Standards and Recommended Practices (SARPs), and assure themselves that every foreign

operators flying into their territory receives adequate oversight from its own State and take appropriate action when necessary to preserve safety; and

6. *Encourages* ICAO to continue the development of ~~the global aviation safety roadmap, as required~~ guidance material and tools to support the development and implementation of national and regional aviation safety plans.

APPENDIX B

Global Air Navigation Plan (GANP)

Whereas the enhancement of the safety, capacity and efficiency of aviation operations is a key element of the ICAO Strategic Objectives;

Having adopted Resolution ~~A40-4~~ A41-xx, a consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation;

Recognizing the importance of GANP as an operational strategy and part of the basket of measures to achieve ICAO's global aspirational goals on CO2 emissions; and

Recognizing that many States and regions are developing new air navigation plans for their own air navigation modernization and transformation;

Recognizing that sharing of best practices, lessons learned, and provision of guidance material can support States in the introduction of operational improvements in cost-effective manner through the adoption of advanced systems without going through intermediate steps;

The Assembly:

1. *Instructs* the Council to use the guidance in the Global Air Navigation Plan (GANP) to develop and prioritize the technical work programme of ICAO in the field of air navigation;

2. *Urges* the Council to provide States with a standardization and evolution roadmap, as announced in the GANP, as a basis for the work programme of ICAO;

3. *Calls upon* States, planning and implementation regional groups (PIRGs), and the aviation industry to utilize the guidance provided in the GANP for planning and implementation activities which establish priorities, targets and indicators consistent with globally-harmonized objectives, taking into account operational needs;

4. *Calls upon* States to take into consideration the GANP guidelines, for the implementation of operational improvements as part of their national strategy to reduce the environmental impact, including CO_2 emissions, from international aviation

5. *Calls upon* States, PIRGs, and the aviation industry to provide timely information to ICAO, and to each other, regarding the implementation status of the GANP, including the lessons learned from the implementation of ~~its provisions~~ of the operational improvements outlined in the ASBU framework;

6. *Invites* PIRGs to use ICAO standardized tools or adequate regional tools to monitor and, in collaboration with ICAO, analyse the implementation status of air navigation systems;

7. *Instructs* the Council to publish the results of the analysis on the regional performance dashboards ~~and in an annual global air navigation report~~ including, as a minimum, the key implementation priorities and accrued environmental benefits associated with the implementation of the operational improvements outlined in the ASBU framework;

8. *Urges* States that are developing new air navigation plans, for their own air navigation modernization, to coordinate with ICAO and align their plans so as to ensure regional harmonization, and global compatibility and ~~harmonization~~ interoperability; ~~and~~

9. *Instructs* the Council to continue developing the GANP, keeping it current with evolving ~~technology~~ and emerging technologies and operational requirements; and

10. *Invites* ICAO to progress in the development of guidance material related to the national air navigation plan during the upcoming revisions of the GANP and collect and share best practices, lessons learned, and benchmark results related to the implementation of operational improvements.

Relevant Outcomes of the High-level Conference on COVID-19, Safety Stream (HLCC 2021)

Outcomes of HLCC 2021 on operational measures related to the COVID-19 pandemic

30.13 The Commission reviewed A41-WP/41, presented by the Council, which reported on the work accomplished by the High-level Conference on COVID-19 (HLCC 2021) under the Safety Stream. The Commission recognized the importance of convening divisional-type meetings ahead of Assembly sessions as a means to recommend additional technical work for ICAO in due time for budgetary preparation for the following triennium as well as to allow the Technical Commission to focus on global plans and policy decisions, thereby improving the efficiency of Assemblies.

30.14 The Commission, in reviewing A41-WP/104 presented by Bangladesh; A41-WP/188 presented by Japan; A41-WP/230 presented by United Arab Emirates and supported by Bahrain, Kuwait, Oman, Qatar, Saudi Arabia; A41-WP/377 presented by Indonesia; A41-WP/311 presented by AFCAC on behalf of its 54 Member States[3]; and A41-WP/534 presented by the Member States[6] of the Central American Corporation for Air Navigation Services (COCESNA), recalled relevant HLCC 2021 recommendations, and requested ICAO and its Member States to continue taking necessary measures to action these recommendations that could be further informed by the contents of these working papers. The Commission further expressed its strong support for a number of the working papers. In noting some concerns raised with A41-WP/230 and A41-WP/377, the Commission agreed that the content of the working papers should be referred to the appropriate expert groups for further consideration.

30.15 The Commission reviewed A41-WP/193, presented by Canada and co-sponsored by Costa Rica, Côte d'Ivoire, Dominican Republic, Kenya, Mexico, New Zealand, Oman, Senegal,

Member States[1] of the EU, the other Member States[2] of the ECAC, and EUROCONTROL, regarding the need to review Annex 13 to address conflict of interest scenarios in the context of the downing of an aircraft during safety investigations in order to enhance the credibility and transparency of aircraft accident investigations. It was noted that this matter was within the scope of the existing ICAO work programme. The Commission expressed its support to the working paper and agreed that its content should be forwarded to the appropriate expert group.

Outcomes of HLCC 2021 on safety management

30.16 The Commission reviewed A41-WP/246, Revision No. 1 presented by Chile, Costa Rica, Dominican Republic, Panama, Singapore and FSF and co-sponsored by ICCAIA; A41-WP/408 presented by Venezuela (Bolivarian Republic of) and supported by Argentina, Bolivia (Plurinational State of), Colombia, Dominican Republic, Ecuador, El Salvador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname and Uruguay; A41-WP/380 presented by Venezuela (Bolivarian Republic of) and supported by Argentina, Costa Rica, Dominican Republic and Panama; A41-WP/303 presented by AFCAC on behalf of its 54 Member States[3]; A41-WP/218 presented by Brazil and supported by LACAC[4]; A41-WP/187 presented by Ecuador and supported by Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Dominican Republic, El Salvador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of); A41-WP/314 presented by Ecuador and supported by Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, El Salvador, Guatemala, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of); A41-WP/128 presented by Singapore and co-sponsored by Bangladesh, Canada, China, Japan, Malaysia, New Zealand, Papua New Guinea, Republic of Korea, Thailand, United States, Member States[1] of the EU, the other Member States[2] of the ECAC, EUROCONTROL and the FSF; A41-WP/248 presented by India; A41-WP/236 presented by Canada and Japan and co-sponsored by New Zealand; A41-WP/395 presented by Chile and supported by 20 Member States[4] of LACAC, Guyana and Suriname; A41-WP/306 presented by Colombia and supported by Argentina, Bolivia (Plurinational State of), Chile, Dominican Republic, Ecuador, El Salvador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of); and A41-WP/120 and A41-WP/216 presented by China. The Commission noted that the contents of these working papers could further inform the actions to address the HLCC 2021 Recommendations and agreed to refer them to the appropriate expert groups along with concerns raised during the discussions.

30.17 With respect to A41-WP/303, the Commission noted support for the application of safety management systems (SMS) to ground handling service providers, while reinforcing the need for a flexible and balanced approach as reflected by the recommendation from the HLCC. Concerns were expressed regarding A41-WP/306, specifically the need to strike a balance between harmonization and tailoring of safety performance indicators to operational risk. Regarding A41-WP/120 and A41-WP/128, the need to respect the principles for the protection of safety data, safety information and related sources outlined in ICAO Annex 19 was emphasized.

30.18 Information papers provided by Brazil (A41-WP/551), China (A41-WP/460), Iran (Islamic Republic of) (A41-WP/195), Saudi Arabia (A41-WP/522), the United Arab Emirates (A41-WP/537), the United States (A41-WP/378) and the Interstate Aviation Committee (IAC) (A41-WP/72) were noted.

HLCC outcomes on radio frequency spectrum matter

30.19 The Commission reviewed A41-WP/227 presented by Saudi Arabia on behalf of the ACAO States[5]; A41-WP/266 presented by Colombia and supported by Argentina, Bolivia (Plurinational State of), Brazil, Chile, Dominican Republic, Ecuador, Guyana, Panama, Paraguay, Peru, Uruguay and Venezuela (Bolivarian Republic of); A41-WP/406 presented by the Member States[6] of COCESNA and A41-WP/80, presented by the Airports Council International (ACI), CANSO, IATA, ICCAIA, IFALPA,IFATCA, and co-sponsored by the FSF, regarding potential interference from 5G deployment to the radio altimeter. The Commission recalled relevant HLCC 2021 Recommendations, and requested ICAO and its Member States to continue taking necessary measures and efforts to ensure that radio altimeters and other aeronautical systems are free from harmful interference, including implementation of mitigation measures, sharing of best practices, as well as development of relevant provisions and guidance. Furthermore, recognizing the criticality of radio frequency spectrum, the Commission encouraged States and regions to actively participate in spectrum defence activities and to endorse the ICAO position for the twenty-third meeting of the International Telecommunication Union World Radiocommunication Conferences (ITU WRC-23) (State letter E 3/5-21/37).

30.20 Information papers provided by Brazil (A41-WP/536), Oman (A41-WP/410) and United States (A41-WP/561) were noted.

30.21 In light of the discussion, the Commission agreed to submit, for adoption by the Plenary, the following resolution to supersede Assembly Resolution A38-6:

Resolution 30/2: *Support of the ICAO policy on radio frequency spectrum matters*

Whereas ICAO is the specialized agency of the United Nations responsible for the safety, regularity and efficiency of international civil aviation;

Whereas ICAO adopts international Standards and Recommended Practices (SARPs) for aeronautical communications systems and radio navigation aids;

Whereas the International Telecommunication Union (ITU) is the specialized agency of the United Nations regulating the use of the radio frequency spectrum;

Whereas the ICAO position, as approved by the Council, for ITU World Radiocommunication Conferences (WRCs) is the result of the coordination of international aviation requirements for radio frequency spectrum;

Whereas a comprehensive frequency spectrum strategy is required by aviation to support timely availability and appropriate protection of adequate spectrum;

Whereas a sustainable environment for growth and technology development is required to support safety and operational effectiveness for current and future operational systems and allow for the transition between present and future technologies;

Recognizing that the development and the implementation of the communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and the safety of international civil aviation could be seriously jeopardized unless requirements for appropriate aviation safety spectrum allocations are satisfied and the continued protection of those allocations is achieved;

Recognizing that unresolved spectrum issues relating to aeronautical safety services have resulted in flight cancellations, degradations of air traffic management services and interruptions of flight operation;

Recognizing that to ensure optimal use of the frequency spectrum allocated to aviation, efficient frequency management and use of best practices are required;

Recognizing that support from ITU member administrations is required to ensure that the ICAO position is supported by the WRC and that aviation requirements are met;

Considering the urgent need to increase such support due to the growing demand for spectrum and aggressive competition from commercial telecommunications services;

Considering the increased level of ITU WRC preparation activities associated with the growing demand for bandwidth from all users of the radio frequency (RF) spectrum, as well as the increased importance of the development of regional positions by regional telecommunication bodies such as APT, ASMG, ATU, CEPT, CITEL and RCC4; and

Considering Recommendations 7/3 and 7/6 of the Special Communications/Operations Divisional Meeting (1995) (SP COM/OPS/95), Recommendation 5/2 of the 11th Air Navigation Conference (2003), and Recommendation 1/12 of the 12th Air Navigation Conference (2012), and Recommendation 5/5 of the High-level Conference on COVID-19 (2021);

The Assembly:

1. *Urges* Member States, international organizations and other civil aviation stakeholders to support firmly the ICAO frequency spectrum strategy and the ICAO position at WRCs and in regional and other international activities conducted in preparation for WRCs, including by the following means:

a) working together to deliver spectrum-efficient aeronautical systems as well as frequency management ~~and~~ that meet current "best practices" ~~to demonstrate the effectiveness and relevance of the aviation industry in spectrum management~~;
b) supporting ICAO activities relating to the aviation frequency spectrum strategy and policy through relevant expert group meetings and regional planning groups;
c) undertaking to provide for aviation interests to be fully integrated in the development of their positions presented to regional telecommunications fora involved in the preparation of joint proposals to the WRC;
d) including in their proposals to the WRC, to the extent possible, material consistent with the ICAO position;
e) supporting the ICAO position and the ICAO policy statements at ITU WRCs as approved by Council and incorporated in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718);
f) undertaking to provide civil aviation experts to fully participate in the development of States' and regional positions and development of aviation interests at the ITU; and
g) ensuring, to the maximum extent possible, that their delegations to regional conferences, ITU study groups and WRCs include experts from their civil aviation authorities and other civil aviation stakeholders who are fully prepared to represent aviation interests;

2. *Urges* Member States to consider, as a priority, public and aviation safety when deciding how to enable new or additional services, and to consult with aviation safety regulators, subject matter experts and airspace users, to provide all necessary considerations and to establish regulatory measures to ensure that incumbent aviation systems and services are free from harmful interference.

~~2~~3. *Requests* the Secretary General to bring to the attention of ITU the importance of adequate radio frequency spectrum allocation and protection for the safety of aviation;

~~3~~4. *Instructs* the Council and the Secretary General, as a matter of high priority within the budget adopted by the Assembly, to ensure that the resources necessary to support the development and implementation of a comprehensive aviation frequency spectrum strategy as well as increased participation by ICAO in international and regional spectrum management activities are made available; and

~~4~~5. *Declares* that this resolution supersedes Resolution ~~A36-25~~A38-6.

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[1] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom.

[3] Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

[4] Argentina, Aruba (Kingdom of the Netherlands), Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Paraguay, Uruguay, Venezuela (Bolivarian Republic of).

[5] Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen

[6] Belize, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

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ASSEMBLY — 41ST SESSION

REPORT OF THE TECHNICAL COMMISSION ON AGENDA ITEM 31

(Presented by the Chairperson of the Technical Commission)

The attached report on Agenda Item 31 has been approved by the Technical Commission. Resolutions 31/1 and 31/2 are recommended for adoption by the Plenary.

Note.— After removal of this covering sheet, this paper should be inserted in the appropriate place in the report folder.

(15 pages)

Agenda Item 31: Aviation Safety and Air Navigation Standardization

Standardization process

31.1 The Commission reviewed A41-WP/58, presented by the Council, which contained information on progress achieved by the Integrated Communications, Navigation, Surveillance and Spectrum (ICNSS) project. Noting that the ultimate objective of the ICNSS project was to propose a set of recommendations for endorsement by the next Assembly, the Commission expressed its satisfaction with the efforts underway and encouraged States, international organizations and other stakeholders to support the continued development and implementation of a medium to long-term roadmap for the evolution of ICNSS and a new streamlined framework for communications, navigation, surveillance (CNS) and frequency spectrum standardization.

Standards-making process and the Integrated Communications, Navigation, Surveillance and Spectrum (ICNSS) Project

31.2 The Commission reviewed A41-WP/84, presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA), Airports Council International (ACI), International Air Transport Association (IATA), International Federation of Air Line Pilots' Associations (IFALPA), International Federation of Air Traffic Controllers' Associations (IFATCA), the Civil Air Navigation Services Organization (CANSO), co-sponsored by Brazil and the Flight Safety Foundation (FSF). The Commission supported the paper, which highlighted the importance of a mechanism and engagement from industry to ensure the foreseen ICNSS roadmaps and concepts to be addressed across all ICAO activities.

31.3 The Commission reviewed A41-WP/107, presented by New Zealand, which highlighted the effectiveness of developing and applying performance-based regulations in response to rapidly evolving technological innovations in the aviation sector. The Commission expressed support for the paper and recalled the ongoing work at ICAO related to the development and implementation of performance-based Standards and Recommended Practices (SARPs). Recognizing that the implementation of performance based regulatory frameworks required a number of critical elements to be considered, the Commission encouraged ICAO to continue its work on performance-based SARPs as well as on guidance material to promote their implementation in support of innovative and emerging technologies.

31.4 The Commission reviewed A41-WP/108, presented by Bangladesh, which noted challenges faced by States in incorporating complex SARPs and Procedures for Air Navigation Services (PANS) into their national regulations. The Commission agreed with the conclusions of this paper, encouraging States and industry stakeholders to enhance coordination and cooperation in support of the continued development and implementation of their ongoing Integrated CNS/ATM projects, and encouraging ICAO to continue to develop and finalize a new streamlined framework for CNS and frequency spectrum standardization.

31.5 The Commission reviewed A41-WP/233, presented by Brazil, supported by the Latin American Civil Aviation Commission (LACAC) Member States[1] and co-sponsored by ICCAIA, which outlined general principles of regulatory governance to improve regulatory practices under ICAO when developing SARPs and other guidance material. The Commission supported the content of this

paper, which highlighted that the Standards-making process must continue to evolve and improve in order to be aligned with the global best practices, considering a structured, sustainable, and systematic process of improving its regulatory governance.

31.6 The Commission noted that A41-WP/58, A41-WP/84, A41-WP/107, A41-WP/108 and A41-WP/233 shared the common subject of optimizing and enhancing the current Standard making process, a subject also addressed under Agenda Item 23. Noting the importance of consultation with Member States, the Commission agreed that the efforts to streamline the Standards making process as well as to implement performance based Standards should continue.

31.7 The Commission agreed to forward the contents of A41-WP/84, A41-WP/107, A41-WP/108 and A41-WP/233 to the appropriate expert groups with activities on these subjects. Furthermore, the Commission agreed that ICAO should continue its efforts to develop and finalize a new streamlined framework for CNS and frequency spectrum standardization, considering the perspectives expressed during the discussion, including the importance of transparency and consultation with Member States.

SARPs, PANS and guidance material

31.8 The Commission reviewed A41-WP/239, presented by South Africa, regarding the implementation of Article 33 of the *Convention on International Civil Aviation* (Chicago Convention, Doc 7300), where it was noted that the matter was within the scope of the existing ICAO work programme. In further noting the comments raised with respect to the discussion on A41-WP/239, the Commission agreed that the content of the working paper should be referred to the appropriate expert groups for further consideration.

31.9 The Commission reviewed A41-WP/364, presented by Argentina and supported by 19 Member States[2] of LACAC, which proposed to incorporate provisions related to air traffic services contingency plan into the *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) (Doc 10066), Appendix 2. The Commission agreed to refer A41-WP/364 to the relevant expert group for consideration.

31.10 The Commission reviewed A41-WP/235, presented by China, regarding the need to develop in-flight turbulence standards for different aircraft types. The Commission recalled that the Standard in-flight turbulence intensity level had been recently updated and included in Annex 3 — *Meteorological Service for International Air Navigation*, and agreed that A41-WP/235 be referred to the relevant expert group for further consideration.

31.11 The Commission reviewed A41-WP/418, presented by Venezuela (Bolivarian Republic of), which highlighted the activities undertaken by the State for implementing the ICAO Meteorological Information Exchange Model (IWXXM) and the offer to support other States in converting aerodrome routine meteorological report (METAR) and aerodrome forecast (TAF) messages from the Traditional Alpha-numeric Code (TAC) format to XML-based format (IWXXM). The Commission agreed that A41-WP/418 be referred to the relevant expert group for further consideration.

31.12 The Commission reviewed A41-WP/319, presented by the Russian Federation, seeking SARPs to ensure the quality of fuel used in various types of aircraft. The Commission noted that

discussion on the subject was complex, which would involve multiple stakeholders with diverse operational requirements. The Commission therefore agreed to refer the contents of A41-WP/319 to relevant expert groups to identify the need and scope of the work required prior to its inclusion in the ICAO work programme.

31.13 The Commission reviewed A41-WP/190, presented by the Republic of Korea, seeking amendments related to advanced surface movement guidance and control systems (ASMGCS) level 5 implementation in Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* and in the *Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual* (Doc 9830). The Commission noted the ongoing work of ICAO in this area and agreed to refer the proposals to relevant expert groups for further study.

31.14 The Commission reviewed A41-WP/159, presented by the United Arab Emirates, which highlighted the need to develop guidance on managing passenger evacuation at airports. The Commission noted the ongoing work of ICAO in this area and agreed to refer the contents of A41-WP/159 to the relevant expert group for further study.

31.15 The Commission reviewed A41-WP/170, presented by Bangladesh, which highlighted the challenges faced by various States in the provision of safety surveillance in the different areas of air navigation services (ANS). The paper called for ICAO to consider providing guidance on ANS regulatory oversight and certification of ANS providers. Noting the ongoing applicability of Recommendation 3.5/3 – Certification of ANSPs arising from the Thirteenth Air Navigation Conference (AN-Conf/13), the Commission agreed to refer the contents of A41-WP/170 to the appropriate expert group.

31.16 The Commission reviewed A41-WP/127, presented by ICCAIA, which provided a summary of the development of wake energy retrieval operations. The Commission noted the potential for fuel savings and consequent emissions reduction where wake energy retrieval operations were applied, and agreed that the proposal to develop provisions necessary to enable such operations be referred to the Council for further consideration, subject to existing priorities funded through the 2023-2025 Budget and the availability of extra budgetary resources.

31.17 The Commission reviewed A41-WP/197, presented by the United Arab Emirates, which considered the interpretation of the Standards of Annex 6 — *Operation of Aircraft*, relating to terrain clearance requirements. The Commission agreed that a review of said provisions would be beneficial and that this should be referred to the Council for further consideration, subject to existing priorities funded through the 2023-2025 Budget and the availability of extra-budgetary resources.

31.18 The Commission reviewed A41-WP/184, presented by Brazil, requesting guidance material to clarify the boundaries between Mandatory Continuing Airworthiness Information (MCAI) and other manufacturer publications. The Commission recognized the benefit of a common understanding of what information composes MCAI under Annex 8 — *Airworthiness of Aircraft* and agreed to refer recommendations to the appropriate expert group for consideration.

31.19 The Commission reviewed A41-WP/91, presented by ICCAIA and supported by IFALPA, on the multilateral recognition of certification for aerial firefighting aircraft but did not reach consensus on the need to develop provisions for aircraft certification based on the proposed use of the aircraft. Therefore, the Commission agreed that this issue should be forwarded to the Council for further

consideration, subject to existing priorities funded through the 2023-2025 Budget and the availability of extra budgetary resources.

31.20 The Commission reviewed A41-WP/96, presented by the ICCAIA and supported by IFALPA, highlighting the risks associated with the candidate agents to replace halon in aircraft fire suppression systems being subject to the proposed ECHA (European Chemical Agency) per- and polyfluoroalkyl substances (PFAS) regulation. The Commission noted the need to ensure availability of options halon replacement technology for aircraft fire extinguishing agents through consideration of exemptions from regulation for halon replacement technologies. The Commission further noted the need for States and industry to provide their inputs to various decision-making bodies to ensure their needs were considered.

31.21 The Commission reviewed A41-WP/161, presented by China, related to global aircraft dismantling activities and the harmonization of policies for managing them. The Commission highlighted that the removal, disposition and reuse of parts and materials from non-airworthy aircraft might not be consistent with the intent of Annex 8. It was noted that a clear distinction should be made between an aircraft parted out for the scope of reusing components while re-introducing them into the aircraft supply chain, and the recycling of the raw material from decommissioned aircraft due to the safety and environmental impact. The Commission agreed to refer recommendations to the appropriate expert group for consideration.

31.22 The Commission reviewed A41-WP/147, presented by China and co-sponsored by Singapore, which proposed that ICAO develop appropriate airworthiness requirements for electric powered aircraft. The Commission noted the ongoing work of ICAO in this area and recognized that the relevant expert groups were currently addressing these tasks. The Commission agreed that ICAO should continue its work in this area.

Communications, navigation, and surveillance (CNS) resilience and global navigation satellite system (GNSS) interference mitigation

31.23 The Commission reviewed A41-WP/97, presented by Czechia on behalf of the Member States[3] of the European Union, other Member States[4] of the European Civil Aviation Conference (ECAC), the Member States[5] of the African Civil Aviation Commission (AFCAC), the European Organisation for the Safety of Air Navigation (EUROCONTROL), and co-sponsored by Brazil, New Zealand, Singapore and the United States, which provided information on a growing number of occurrences of GNSS radio frequency interference (RFI), notwithstanding the actions agreed by the 40th Session of the Assembly and reiterated in State letter AN 7/5-20/89. Accordingly, the paper called for further action to mitigate GNSS and strengthen CNS system resilience.

31.24 The Commission reviewed A41-WP/196, presented by the United Arab Emirates, which reiterated a strong concern regarding ongoing harmful interference to GNSS and invited the Assembly to urge States to adopt and implement measures as suggested in the *Global Navigation Satellite System (GNSS) Manual* (Doc 9849) to manage and reduce the impacts of such anomalies.

31.25 The Commission reviewed A41-WP/198, presented by Japan, which reported on Japan's activities aiming to mitigate GNSS vulnerabilities. The paper also stressed the importance of monitoring and reporting GNSS RFI and the need to support ICAO activities on the development of an alternative

position navigation and timing (APNT) strategy to maintain air navigation services to the maximum extent possible, in the event of a GNSS signal outage.

31.26 The Commission noted the common aim to strengthen CNS systems resilience and mitigate harmful interference to GNSS as presented in A41-WP/97, A41-WP/196 and A41-WP/198. To this end, the Commission supported the proposed new Appendix to Assembly Resolution 35-15: Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation and surveillance/air traffic management (CNS/ATM) systems as presented in A41-WP/97 and agreed to submit for adoption by the Plenary the following resolution to supersede Assembly Resolution A35-15:

Resolution 31/1: Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation, and surveillance/air traffic management (CNS/ATM) systems

Whereas it is considered desirable to consolidate Assembly resolutions on the Organization's policies and practices related to CNS/ATM in order to facilitate their implementation and practical application by making their text more readily available and logically organized;

The Assembly:

1. *Resolves* that the Appendices attached to this resolution constitute the consolidated statement of continuing ICAO policies and practices related to CNS/ATM, as these policies exist at the close of the ~~35th~~41st Session of the Assembly;

2. *Resolves* to continue to adopt, at each ordinary session of the Assembly for which a Technical Commission is established, a consolidated statement of continuing ICAO policies and practices related to CNS/ATM; and

3. *Declares* that this resolution supersedes ~~A33-15~~A35-15.

APPENDIX A
General policy

[...]

APPENDIX B
Harmonization of the implementation of the ICAO CNS/ATM systems

[...]

APPENDIX C
Ensuring the resilience of ICAO CNS/ATM systems and services

Whereas the CNS/ATM systems are evolving and so are the associated CNS threats and vulnerabilities;

Whereas the occurrences of interferences against satellite-based CNS systems and global navigation satellite system (GNSS), in particular, have significantly increased;

Whereas CNS resiliency to interference needs to be addressed at a global level with a holistic approach, ensuring an efficient and coordinated evolution between the infrastructure architecture, improved technological capabilities, civil and military operational procedures, radio regulatory authorities and civil-military coordination;

Recognizing that resiliency to interference needs to be improved by maximizing the integration of all suitable ground infrastructure, space infrastructure and airborne components in a complementary and cooperative manner to be as robust as possible to cases of satellite-based service disruption or environments where false or deceptive signals are present;

Recognizing that both the aircraft on-board and ground infrastructure complementing the satellite-based CNS systems need to be adapted to include, where appropriate, interference detection, mitigation and reporting functions to support the resolution of operationally encountered performance anomalies;

Believing that, combined with the use of the appropriate legal framework, such capabilities and measures will allow for the relevant authorities to act upon harmful interferences caused by the illegal operation of transmitters and avoid the proliferation and the use of such illegal transmitters and the misuse of test and maintenance equipment;

Believing that, with appropriate coordination and application of best practices, military and State authorities can conduct GNSS-related testing and other interventions using radio equipment as necessary and without causing an undue impact on civil aviation;

Believing that civil-military coordination should facilitate the sharing of relevant information with airspace users, especially when flying in the vicinity of a conflict zone; and

Acknowledging that loss of crew's situational awareness from malicious origin is classified as a cyber-security threat and cannot be tolerated in civil aviation; and that intentionally sending misleading signals to replace the accurate signal is a far more serious threat to flight safety than the loss of this signal.

The Assembly:

1. *Encourages* States to transition towards optimized, secure CNS systems based on complementary integration of suitable and independent aircraft capabilities, satellite- and ground-based infrastructure which maximize resiliency and robustness to any type of interference;

2. *Encourages* standardization bodies and industry to develop appropriate interference detection, mitigation and reporting capabilities for the aircraft on-board, satellite- and ground-based CNS system components, in order to ensure higher CNS resiliency, continuity of operations and prevent any cascading effects from the use of compromised position, velocity or time data;

3. *Encourages* States to ensure that sufficient terrestrial CNS capabilities remain available to ensure safe operations and complement aircraft-level integration of position, velocity and time with independent surveillance information;

4. *Invites* ICAO to develop high-level principles on how to integrate CNS ground, space and on-board systems and capabilities to obtain more resilient positioning and timing services;

5. Urges States to apply necessary measures to avoid the commercialization/proliferation and the use of illegal transmitters such as jammers and the misuse of test and maintenance equipment which may impact CNS systems;

6. Urges States to ensure close collaboration between aviation authorities, military authorities, service providers, radio regulatory and spectrum enforcement authorities to put in place any special measures required to ensure that spectrum used by all CNS systems, and GNSS in particular, is free from harmful interference;

7. Urges States to refrain from any form of jamming, or spoofing affecting civil aviation;

8. Urges States to coordinate and notify to the maximum extent possible in advance with the air navigation services provider (ANSP) responsible for the affected airspace in case of military or other State-authorized security or defence-related operations or training, potentially causing any form of jamming, or spoofing affecting civil aviation; and

9. Urges States and operators, when assessing the interference risks associated with conflict zones, to consider that the use of satellite-based CNS systems can potentially be impacted beyond those zones.

31.27 The Commission reviewed A41-WP/162, presented by Saudi Arabia, co-sponsored by Bahrain, Kuwait, Oman, Qatar and United Arab Emirates, which emphasized the importance of ICAO's leading role in developing new provisions to reduce safety and security hazards, risks and threats related to the public availability and sharing, on the internet, of the automatic dependent surveillance — broadcast (ADS-B) information related to flights. Noting that careful consideration of positive and negative aspects of public availability of ADS-B positioning, including safety, security, performance and cost effectiveness, will be required, the Commission agreed to refer the proposal to the relevant expert groups for further consideration and evaluation.

31.28 The Commission reviewed A41-WP/353 and A41-WP/400, presented by Argentina with the support of 20 LACAC Member States[6]. Both papers recognized the need to improve the descriptions of surveillance radar testing, ADS-B and multilateration, as contained in the Appendices to the *Manual on Testing of Radio Navigation Aids*, Volume III — *Testing of Surveillance Radar Systems* (Doc 8071) and *Aeronautical Surveillance Manual* (Doc 9924). The Commission agreed to refer the proposals to the relevant expert groups.

31.29 The Commission reviewed A41-WP/214, presented by the United Arab Emirates and A41-WP/229, presented by Brazil and supported by LACAC Member States[1], where both highlighted the need for a harmonized international approach on the regulation of light sports aircraft. Working paper A41-WP/229 also pointed to the need to evaluate alternative strategies for product regulation (such as the use of industry consensus standards and declaration models). A consistent approach to the issuance of a Certificate of Airworthiness (or applicable airworthiness standards) and pilot licencing would reduce the limitations currently impacting the development of this sector and simplify the operation of this category of aircraft on international flights. The Commission noted the existence of certification Standards in Annex 8 — *Airworthiness of Aircraft*, and guidance in the *Airworthiness Manual* (Doc 9760), which could be further reviewed to ensure they accommodate the light sport aircraft category authorization and recognition. It further noted that work was already underway with regard to pilot licencing. The

Commission, therefore, agreed to refer the contents of A41-WP/214 and A41-WP/229 to the relevant expert groups.

31.30 The Commission reviewed A41- WP/458, presented by Argentina and supported by 18 Member States[7] of LACAC, which sought amendments related to a runway starter extension in Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*. The Commission noted that the task had been approved by the Air Navigation Commission and work on the matter was in progress. The Commission reviewed A41-WP/285, presented by Uruguay, co-sponsored by Argentina, Brazil, Bolivia, Chile, Colombia, Dominican Republic, Ecuador, El Salvador Guatemala, Guyana, Panama, Paraguay, Peru and Venezuela (Bolivarian Republic of), which described difficulties and obstacles in implementing the processes described in the roadmap for the transition from aeronautical information service (AIS) to aeronautical information management (AIM) and the delay in integrating aeronautical information into a broader approach to aeronautical information management. The Commission underscored the importance of the matter and reiterated its continued support for the transition to digital information management to enable global ATM operations.

31.31 The Commission reviewed A41-WP/123, presented by Iran (Islamic Republic of), which called for the development of a standard phrase for air traffic controllers to use in warning pilots when doubt existed about the aircraft approach or where the possibility of an "unstabilized approach" existed. In noting the concerns expressed that called into question the suitability of advancing this development, the Commission agreed to refer the contents of A41-WP/123 to the appropriate expert groups for evaluation.

31.32 The Commission reviewed A41-WP/250, presented by Indonesia, concerning the challenges encountered by States who use English as a second language in understanding five-letters name codes (5LNC) radiotelephony phonetics. The Commission encouraged States to be aware of linguistic differences in various parts of the world for the sake of improving aviation safety. The Commission agreed to refer the contents of A41-WP/250 to the appropriate expert groups.

31.33 Information papers provided by: Brazil (A41-WP/276, A41-WP/294); Canada (A41-WP/567); China (A41-WP/482, A41-WP/492); New Zealand (A41-WP/576); the United States (A41-WP/507, A41-WP/550, A41-WP/556, A41-WP/573); AFCAC[5] (A41-WP/298, A41-WP/304); the European Organisation for Civil Aviation Equipment (EUROCAE) on behalf of Aeronautical Radio, Incorporated (ARINC) Industry Activities, RTCA and the Society of Automotive Engineers (SAE) International (A41-WP/560); the Interstate Aviation Committee (IAC) (A41-WP/89) and ICCAIA, co-sponsored by Brazil, (A41-WP/320) were noted.

New entrants and advanced air mobility

31.34 The Commission reviewed A41-WP/245, presented by the United States and co-sponsored by Japan, Republic of Korea, Singapore, Thailand and the Flight Safety Foundation (FSF), and A41-WP/160, presented by Japan and co-sponsored by the United States, on the need to establish an appropriate expert group to develop a common vision and concept of operation for advanced air mobility (AAM) and to consider the development of provisions and/or guidance material related to electric vertical take-off and landing (eVTOL) aircraft. The Commission recognized the rapidly evolving AAM ecosystem – a collection of new and emerging technologies being applied to the aviation ecosystem. While the Commission recognized the importance of domestic and regional regulatory developments

related to AAM and eVTOLs – and their potential added value for the development of future global provisions and guidance – it was recognized that international operations may require a globally harmonized framework. Furthermore, the Commission recognized that the leadership role of ICAO was essential to achieve such global harmonization, and therefore the Commission expressed support for the establishment of an expert group to develop a holistic vision, framework, as well as to advise ICAO on activities in this area. The Commission called upon States to support AAM activities through in-kind resources, and expressed broad support for the content of A41-WP/245 and A41-WP/160. The Commission suggested that the expert group conduct a gap analysis on existing practices and provisions and on what might be required, and that States be updated on the outcome of said analysis at the next high-level meeting.

31.35 The Commission reviewed A41-WP/83, presented by Czechia on behalf of the Member States[3] of the European Union, other Member States[4] of ECAC, the Member States[5] of the African Civil Aviation Commission (AFCAC), EUROCONTROL and co-sponsored by Brazil, China, Singapore and the Flight Safety Foundation (FSF), related to flight rules. The Commission recognized that existing flight rules contained in Annex 2 — *Rules of the Air* were limiting States' possibilities to adequately regulate certain unmanned aircraft systems (UAS) operations. The Commission recommended that ICAO consider flight rules when analyzing the applicability of SARPs to UAS and assess the need for additional guidance material in the interim. The evolution of flight rules would allow for a full integration of new entrants, including AAM, while also striving for global harmonization. The Commission encouraged all stakeholders to continue sharing their best practices related to UAS and unmanned aircraft systems traffic management (UTM) regulations.

31.36 The Commission reviewed A41-WP/177, presented by the United Arab Emirates, which discussed the challenges faced in facilitating new entrants in the current ICAO airspace classification system. The Commission noted that this paper was linked to A41-WP/83 with regard to the applicability of current flight rules, and agreed that both papers should be referred to the appropriate expert group.

31.37 The Commission reviewed A41-WP/226, presented by India, which discussed the lack of a common altitude reference between conventional and unmanned aircraft flying at low altitudes, and agreed to refer the issue to the appropriate expert group.

31.38 The Commission reviewed A41-WP/224, presented by Canada, Japan and co-sponsored by New Zealand and the Flight Safety Foundation (FSF), and A41-WP/253, presented by Singapore and the Flight Safety Foundation (FSF), respectively discussing the increasing levels of automation, their impact on the role of the pilots and how to assess the technical and regulatory readiness for increased automation with the goal of future autonomy. The Commission recognized that increased levels of automation and certain autonomous capabilities might significantly impact the role and responsibilities of the pilot, as well as other aviation personnel sharing the responsibilities of flight safety. In noting that an expert group was currently working on the reliance on automation by pilots and the potential impact on pilot skills and proficiency, and welcoming that this activity be continued, the Commission supported that the wider scope of automation and autonomy, and the changing nature of the responsibilities during flight operations, be considered by an appropriate expert group. The Commission, in noting the work of FSF on autonomy, recognized that appropriate processes were needed to develop, regulate and implement increased automation and autonomy in the aviation ecosystem and requested that ICAO work with States, and international organizations, including FSF, when addressing increased automation and autonomy.

31.39 The Commission reviewed A41-WP/85, presented by Czechia on behalf of the Member States[3] of the European Union, other Member States[4] of ECAC, EUROCONTROL and co-sponsored by Singapore, on higher airspace operations (HAO). The Commission noted a number of issues related to HAO and the need for measures to be undertaken to ensure a standardized, globally harmonized approach to address them. In lieu of a new resolution, the Commission noted that higher airspace operations were addressed in Assembly Resolution A40-7: *New entrants* and therefore recommended amendments thereto.

31.40 The Commission reviewed A41-WP/121, presented by China, which highlighted the need for provisions to be developed to support and enable UAS operations in the urban environment and the economic regulations for UAS logistics.

31.41 The Commission reviewed A41-WP/180, presented by Saudi Arabia, calling for ICAO to develop a strategy related to low-level operations of new entrants, and A41-WP/179, presented by Japan, calling for provisions to be developed for high-risk beyond visual line-of-sight (BVLOS) flights.

31.42 The Commission reviewed A41-WP/405 and A41-WP/424, presented by Venezuela (Bolivarian Republic of), supported by the Dominican Republic and Panama, and A41-WP/403, presented by Venezuela (Bolivarian Republic of), supported by Costa Rica, the Dominican Republic and Panama, which respectively highlighted the need for remote identification, tracking and authorizations for UAS, the incorporation of remotely piloted aircraft system (RPAS) in the flight plan (FPL) form, and the need for ICAO to develop guidance material related to UTM.

31.43 The Commission reviewed A41-WP/254, presented by Singapore, United Kingdom, Flight Safety Foundation (FSF) and the World Food Programme (WFP) and co-sponsored by New Zealand, and A41-WP/277, presented by the WFP, discussing challenges related using UAS to provide humanitarian assistance.

31.44 The Commission reviewed A41-WP/249, presented by Canada and co-sponsored by New Zealand, discussing the medical requirements for RPAS operations. The Commission noted that remote pilot licence provisions with regard to medical certificates were already contained in Amendment 175 to Annex 1 — *Personnel Licensing*, which became effective on 16 July 2018 and will become applicable on 3 November 2022.

31.45 The Commission recognized the impact of new entrants for low-altitude airspace, including in urban areas, and the increase in the pace of their development and implementation, thereby underscoring the need to accommodate new airspace users in the lower airspace. Noting the work of ICAO related to the UTM Framework and the UAS model regulations, the Commission agreed that: a regulatory strategy for the integration of new entrants in the lower airspace; further ICAO guidance material (including on UTM); as well as provisions, as appropriate, related to UAS other than RPAS, would facilitate new entrants' operations, bring safety enhancement, support harmonization, and have a significant positive impact on humanitarian assistance. The Commission supported that ICAO, working collaboratively with international organizations, further develop tools and guidance in support of BVLOS operations, as well as fit-for-purpose airworthiness and operational provisions to facilitate the certification and operation of certain UAS categories, and that the proposals warranted further study by appropriate expert groups. The Commission encouraged expert groups, when addressing those items, to leverage external material to avoid duplication of efforts. The Commission noted the on-going survey by FSF and

reaffirmed the importance of harmonized UAS national regulatory frameworks to be established to allow humanitarian stakeholders, such as WFP, to leverage the benefits of UAS during humanitarian assistance operations. The Commission called on States to use the ICAO UAS model regulations and UTM framework and to share their experience regulating UAS operations and UTM implementation, including at regional level. The Commission noted that the incorporation of RPA in the flight plan was already ongoing as part of the work programme of relevant expert groups of ICAO.

31.46 The Commission reviewed A41-WP/287, presented by AFCAC on behalf of 54 Member States[5], discussing the importance of UAS for Africa and how to support its development. In recognizing the benefits brought by UAS to Africa, the Commission supported that further harmonization be undertaken at regional level, ICAO UAS training and implementation activities be continued and potentially be expanded after a gap analysis, and that ICAO, together with industry partners, continue to serve as a forum to exchange information and best practices in the UAS domain. The Commission encouraged States to promote the use of UAS as a means to leverage new mobility and efficiency opportunities, and expressed overall support for the contents of A41-WP/287.

31.47 The Commission expressed broad support for the contents of A41-WP/121, A41-WP/179, A41-WP/180, A41-WP/254, A41-WP/277, A41-WP/287, A41-WP/403, A41-WP/405, A41-WP/424 and the intent of the proposals of A41-WP/249 to develop a lower tier, fit-for-purpose, set of medical provisions for remote pilots, while noting the reservations expressed by several States for ICAO to develop provisions and guidance for non-international operations. The Commission agreed that the proposals warranted further study by appropriate expert groups, subject to existing priorities funded through the 2023-2025 Budget, the availability of extra budgetary resources, and the capacity of the Organization to address the overall demand for activities to be conducted in this domain.

31.48 Information papers were provided by: Brazil (A41-WP/289 and A41-WP/292); China (A41-WP/443, A41-WP/444 and A41-WP/451); India (A41-WP/532); Italy (A41-WP/459); Republic of Korea (A41-WP/531 and A41-WP/547); Saudi Arabia (A41-WP/513); Singapore and the United States, supported by Australia, China, India, Indonesia, Japan, New Zealand, the Republic of Korea (A41-WP/452) and; the United States (A41-WP/552, A41-WP/554 and A41-WP/555).

31.49 In light of the above, the Commission agreed to submit, for adoption by the Plenary, the following resolution to supersede Assembly Resolution A40-7:

Resolution 31/2: New Entrants

Whereas the Preamble of the Convention on International Civil Aviation stipulates that signatories thereto had “agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically”;

Whereas Annex 11 to the Convention requires a Member State to determine those portions of airspace over its territory within which air traffic services will be provided and, thereafter, to arrange for such services to be established and provided;

Recognizing that, for the purposes of this Resolution, the term “New Entrants” refers to higher airspace operations (HAO) and unmanned aircraft system (UAS) traffic management (UTM) operations;

Recognizing that there is an increasing need to facilitate, within a global, harmonized framework, operations by New Entrants and that there is a large disparity in performance in the types of vehicle expected to comprise this new airspace user group;

Recalling resolution A40-26 on Commercial Space Transport (CST);

Recognizing that ICAO provisions may need to be amended or expanded in order to ~~support~~ ensure the safety, regularity and efficiency of operations by "New Entrants" and the integration of such operations into the existing air traffic management framework;

Recognizing that significant progress has been made concerning the facilitation of operations by New Entrants through regional and State initiatives; and

Recalling that the ICAO Global ATM Operational Concept states that all airspace should be a usable resource, any restriction on the use of any particular volume of airspace should be considered transitory, and all airspace should be managed flexibly;

The Assembly:

1. *Directs* ICAO to review Standards and Recommended Practices (SARPs) relating to, inter alia, the rules of the air, air traffic services, certification, licencing, liability and the environment, for amendment or expansion as necessary, and to develop specific concepts and guidance to facilitate the operation of New Entrants within a global, harmonized framework, taking into account regional frameworks and practices;

2. *Calls* on Member States to arrange their regulations and procedures governing the operation of New Entrants as well as the common use by all airspace users of certain facilities and services so as to facilitate the integration of these operations, while not compromising safety and security, duly addressing environmental implications, and, where necessary, ensuring that these new operations comply with the rules of the air in Annex 2 — *Rules of the Air*;

3. *Calls* on Member States to ensure that the common use by all users of airspace and certain facilities and services does not disproportionately affect the regularity, environmental protection and efficiency of civil and military operations; ~~and~~

4. *Recognizes* ICAO's role as an international forum to facilitate improved cooperation, collaboration and the sharing of best practices in support of regional initiatives, and to undertake the necessary follow-up activities that build on those initiatives by encouraging increased dialogue between States, New Entrants, existing aviation stakeholders and the space community~~.~~; and

5. *Declares* that this resolution supersedes A40-7.

Certification and health

31.50 The Commission reviewed A41-WP/70, presented by the International Air Transport Association (IATA), requesting a review of the upper age limit based on the latest scientific evidence due to pilot shortages and age being a potential barrier to pilot employment. The Commission supported the

proposal and requested that a review of the age limit of licensed aviation personnel be conducted. The Commission noted the ongoing work within the relevant expert groups, reviewing the upper age limit on the basis of the risk to aviation safety, within the operational context, by following an evidence-informed approach and considering the most recent scientific studies and State best practices.

31.51 The Commission reviewed A41-WP/256, presented by Australia and co-sponsored by New Zealand, proposing a change in the approach to medical certification due to mental illness, towards a salutogenic model that supports the individual maintaining engagement and accessing support within the aviation community. The Commission agreed that mental health is key to aviation safety and recognized the importance of a trust relationship, just culture and additional measures to support mental health in aviation personnel. The Commission noted the ongoing work of ICAO in the mental health domain and agreed to forward the proposal to consider the salutogenic approach to the relevant expert group.

31.52 The Commission reviewed A41-WP/357, presented by Venezuela (Bolivarian Republic of), supported by Argentina, Bolivia (Plurinational Republic of), Colombia, Ecuador, El Salvador, Guatemala, Guyana, Mexico, Panama, Paraguay, Peru, Surinam and Uruguay. The paper highlighted the need for assessing psychological and physical fitness, including conducting surveys and studies to explore the mental health status of aviation personnel. The Commission noted the ongoing work within the relevant ICAO expert groups, including developing a standardized approach to surveys relating to medical fitness. The Commission reviewed A41-WP/396, presented by the Dominican Republic, which proposed the development and implementation of preventive health programmes for air traffic controllers. The Commission recalled the health promotion Standards in Annex 1 — *Personnel Licensing* (Standards 1.2.4.2 and 1.2.4.3), noted the ongoing work of ICAO and recognized that more data is required to enhance the programmes. The Commission reviewed A41-WP/382, presented by Venezuela (Bolivarian Republic of), supported by Costa Rica, the Dominican Republic and Panama, which highlighted the importance of quality assurance competency training for aircraft maintenance personnel. The Commission noted the proposals, acknowledging that ICAO initiatives were in place to address the issues raised and acknowledged the willingness of certain States to offer support in the matter.

31.53 The Commission reviewed A41-WP/119, presented by China, which proposed to optimize the licensing system for aircraft maintenance personnel. The Commission noted the benefit of the proposal and recommended that the item be referred to the Council for further consideration, subject to existing priorities funded through the 2023 – 2025 Budget and the availability of extra budgetary resources.

31.54 The Commission reviewed A41-WP/165, presented by China, which proposed to take measures to strengthen aircraft type training standards/specification. The Commission evaluated the benefit of the proposition for better standardization, but determined that it warranted further study by the appropriate expert groups. The Commission recommended that the item be referred to the Council for further consideration, subject to existing priorities funded through the 2023 – 2025 Budget and the availability of extra budgetary resources

31.55 The Commission reviewed A41-WP/122, presented by the International Federation of Air Traffic Safety Electronics Associations (IFATSEA), which highlighted the need to update existing air traffic safety electronics personnel (ATSEP) cybersecurity training objectives and development of new ATSEP cybersecurity training objectives. The Commission recognized that cyber hazards were becoming a safety concern to the aviation industry, considering the increasing connectivity of its systems and

components. The Commission agreed to forward the content of A41-WP/122 to the appropriate expert group for further consideration, subject the approved Air Navigation Work Programme and triennial budget of the Organization.

31.56 The Commission reviewed A41-WP/99, presented by ICCAIA, A41-WP/101, presented by Czechia on behalf of the Member States[3] of the European Union, other Member States[4] of ECAC, EUROCONTROL and co-sponsored by New Zealand and A41-WP/323, presented by Costa Rica and the International Federation of Air Line Pilots' Associations (IFALPA), which concerned the potential development of new concepts of extended minimum crew operations (eMCO) and single pilot operations (SiPO). The Commission noted the views expressed on safely integrating new technical developments in automation and the interests of different parties on the issues. It was agreed that further work was needed to develop a structured plan, based on a clear concept of operations, for safely addressing extended minimum crew operations, including potential single pilot operations to achieve at least an equivalent or higher level of safety compared to that achieved in current operations. The Commission recommended that the item be referred to the Council for further consideration, subject to existing priorities funded through the 2023 – 2025 Budget and the availability of extra budgetary resources.

31.57 The Commission noted the information paper provided by the United States (A41-WP/569).

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[1] Argentina, Aruba (Kingdom of the Netherlands), Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela (Bolivarian Republic of).

[2] Aruba (Kingdom of the Netherlands), Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Dominican Republic, Uruguay and Venezuela (Bolivarian Republic of).

[3] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

[4] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom.

[5] Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

[6] Aruba (Kingdom of the Netherlands), Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Uruguay and Venezuela (Bolivarian Republic of).

[7] Aruba (Kingdom of the Netherlands), Belize, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Uruguay and Venezuela (Bolivarian Republic of).

International Civil Aviation Organization

A41-WP/58
TE/5
20/7/22

WORKING PAPER

ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 31: Aviation Safety and Air Navigation Standardization

NEW ICAO STANDARDIZATION INITIATIVES TO IMPROVE THE EFFECTIVENESS OF THE STANDARDS DEVELOPMENT PROCESS – THE INTEGRATED COMMUNICATIONS, NAVIGATION, SURVEILLANCE AND SPECTRUM (ICNSS) PROJECT

(Presented by the Council of ICAO

EXECUTIVE SUMMARY

Today, ICAO manages over 12 000 provisions across the 19 Annexes to the Convention and six PANS. As technology advances at an accelerated rate, the timely development of international standards becomes ever more challenging. To react to this challenge ICAO must explore ways and means to actively improve the ICAO standards development and adoption process. This report presents the experience gained with the existing measures and recent standardization initiatives being implemented or under consideration; and introduces a new initiative, the integrated communications, navigation and surveillance (CNS) and Spectrum (ICNSS) project.

The ICNSS project discussed in this paper 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 ultimate objective of this effort is to propose a set of recommendations for endorsement by the next Assembly.

Action: The Assembly is invited to:
a) note the progress made by ICAO to date, related to the ICNSS project;
b) encourage States, international organizations and industry stakeholders to support the continued development and implementation of a medium to long-term roadmap for the evolution of ICNSS and a new streamlined framework for CNS and frequency spectrum standardization; and
c) task ICAO to continue to develop and finalize a new streamlined framework for CNS and frequency spectrum standardization.

Strategic Objectives:	This report relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.	
Financial implications:	The ICAO activities referred to in this paper are expected to be undertaken within the resources available in the 2023-2025 Regular Budget and/or from extra budgetary contributions, as guided by the ICAO Business Plan 2023-2025.	
References:	Annex 10 Annex 18 Annex 19	Doc 10140, *Assembly Resolutions in Force* (as of 4 October 2019) Doc 10115, *Report of the Thirteenth Air Navigation Conference, Corrigenda Nos. 1 and 2, and Supplement No. 1*

1. INTRODUCTION

1.1 The establishment and maintenance of international Standards and Recommended Practices (SARPs), as well as Procedures for Air Navigation Services (PANS), are fundamental tenets of the Convention on International Civil Aviation (Doc 7300) and a core aspect of ICAO's mission. SARPs and PANS are critical to States and other stakeholders, given that they provide the basis for:

- a harmonized approach towards global aviation safety and efficiency;
- the worldwide standardization of functional and performance requirements of air navigation facilities and services; and
- the orderly development of airspace usage and air transport.

1.2 Today, ICAO manages over 12 000 provisions across 19 Annexes to the Convention and six PANS, many of which are constantly evolving in concert with the latest developments and innovations.

1.3 As a result of the increasing pace of technological advancement, the timely development of SARPs and other materials has become ever more challenging. Due to limited resources, States often face difficulties implementing complex SARPs and PANS into their national regulations. Taking into account the concerns raised by States and the aviation industry, ICAO has actively engaged with all stakeholders to improve the effectiveness in the delivery of ICAO's mission. This report briefly provides an insight to the experience gained with implementing existing standardization measures and presents an additional measure that ICAO is currently contemplating, not only to shorten the process for the development and adoption of CNS and spectrum related SARPs but also to further improve its content.

2. INITIATIVES TO IMPROVE THE SARPS DEVELOPMENT PROCESS

2.1 Improvement of the SARPs development process has been considered on several occasions by the executive bodies of ICAO. As a result, some significant changes have been introduced. The most salient points, as reflected in Resolution A39-22: *Formulation and implementation of Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) and notification of differences* are:

a) SARPs and PANS shall be drafted in clear, simple and concise language. SARPs shall consist of broad, mature and stable provisions specifying functional and performance requirements that provide for the requisite levels of safety, regularity and efficiency. Supporting technical specifications, when developed by ICAO, should be translated in all working languages of ICAO in a timely manner and shall be placed in separate documents to the extent possible; and

b) The utilization of, to the maximum extent appropriate and subject to the adequacy of a verification and validation process, the work of other recognized standards-making organizations in the development of SARPs, PANS and ICAO technical guidance material.

2.2 In the field of aviation safety and air navigation, an increasing emphasis is being placed on achieving an effective implementation that supports improved performance. This has been debated intensely within ICAO, the outcome being a shift in the focus of its resources to prioritize assistance in the implementation of existing Standards, rather than the development of new Standards, and to develop performance-based Standards, where appropriate, rather than detailed technical specifications. Such measures have been implemented in updates to several Annexes and PANS. One example is Annex 19 — *Safety Management*, where a large portion of the provisions are written using a performance-based approach. Similarly, when Annex 18 — *The Safe Transport of Dangerous Goods by Air*, was established, it was agreed that only high-level and stable requirements would be contained in the Annex, complemented by a separate publication of a detailed and prescriptive Technical Instructions.

2.3 Co-operation with standards-making organizations and other external entities has also been considered with the goal of utilizing their work in the ICAO -Standards-making process. Significant achievements include the establishment of the Standards round table (SRT) as a coordination platform between ICAO and the Standard-making organizations (SMOs) and other stakeholders. The SRT has shown some promise in aiming at the best use of available resources and expertise and at intensifying the technical coordination efforts to promote more balanced implementation of the advanced technologies on a global basis. This effort has been further complemented by the document exchange platform established in March 2021, to facilitate access to material developed by SMOs, thereby improving the overall quality and efficiency of the process and supporting the development and implementation of ICAO provisions.

2.4 Another new initiative under consideration is termed “direct submission.” This initiative will allow duly accredited external entities to propose SARPs and PANS amendments directly to ICAO based on detailed evidence of successful implementation, including a documented safety risk assessment and the outcome of research.

2.5 It is expected that these new measures will provide benefits for the aviation community. However, at the same time, the utilization of the work of other organizations has proven to be more complex for several reasons, such as the potentially ambiguous legal status of the material, the frequency of updates, the scope, the intended target audience, and the level of involvement of ICAO in their deliberations.

2.6 In addition to the above and in line with AN-Conf/13, Recommendation 2.2/1 — *Long-term evolution of communication, navigation and surveillance systems and frequency spectrum access*, ICAO has now undertaken a new initiative, the integrated CNS and spectrum project, with the goal being to ensure that aviation can best use the advantages that the rapid pace of technology provides, while continuing to secure access to the frequency spectrum resource it needs. Also, to attain this goal, there is a need to improve the processes for achieving global consensus for future CNS infrastructure requirements, and importantly, for streamlining of the Standards-making framework in order to fulfill these requirements in a timely and efficient manner. This is further discussed in the following paragraphs.

3. INTEGRATED CNS AND SPECTRUM PROJECT

3.1 Innovation in telecommunications and aviation

3.1.1 CNS systems and the services they provide are core enablers for the high level of safety required by aviation. Compared to their equivalents in other industries, existing aeronautical CNS systems are robust with overall uptime and reliability, which are generally orders of magnitude better than those experienced by other users of the frequency spectrum. However, most current CNS system designs are quite old, many of them having been introduced over fifty years ago. Incremental updates to these systems over the years have efficiently accommodated the increasingly complex and busy use of airspace. These systems remain sufficient for most of aviation’s current needs. However, technological innovation within the telecommunications industry is very rapid and is driven by the ever-increasing requirements of a user base consisting of billions of people. Capitalizing on current state-of-the-art radiocommunications technology could result in some remarkable gains in aviation efficiency and sustainability by reducing the size, weight and power required, while increasing the capability and overall performance of the CNS systems and spectral efficiency. This opportunity led to the AN-Conf/13, Recommendation 2.2/1 which challenged ICAO and the whole aviation industry to develop an action plan to evolve with the advancement of technology, while increasing overall performance of CNS systems and spectral efficiency.

3.2 Long-term evolution of CNS systems and frequency spectrum access

3.2.1 Aeronautical CNS has traditionally been seen as three distinct and separate functions but these three functions all rely on the same scarce natural resource – continued and interference-free access to the frequency spectrum. Access to spectrum is managed by the International Telecommunication Union (ITU) through a four-year process of World Radiocommunication Conferences that are the only mechanism

by which the Radio Regulations, that govern international spectrum usage, can be changed. Availability of the necessary protected radio frequency spectrum is a critical prerequisite for the safe and efficient implementation of CNS systems. As demand for radio spectrum from non-aviation users continues to grow, aviation faces an ever-increasing competition for this finite resource, particularly from the mobile and broadband wireless services. A better way forward is to demonstrate excellence in the planning and efficient use of aeronautical spectrum, while ensuring robustness of CNS systems.

3.2.2 Unless aviation can continue to prove that the aeronautical CNS systems are spectrum-efficient, aviation will increasingly be forced to share protected aeronautical frequency allocations with non-aeronautical users, resulting in a reduction in the quality and availability of service of those systems due to potential interference, potentially degrading the safety, regularity and/or efficiency of flight. Due to ever increasing pressures on the precious and finite spectrum resource, aviation could lose access altogether to certain frequency bands critical for the current provision of CNS, ultimately resulting in an overall reduction in the safety and efficiency of airspace operations as a whole. It is therefore critical to facilitate a continuing and timely evolution of the aeronautical CNS systems.

3.3 Need for streamlining of the CNS standards-making framework

3.3.1 The lack of resources and well experienced experts to support the Standards-making process experienced by ICAO and State regulators when attempting to address new requirements such as those necessary to accommodate new entrants using innovative technologies (e.g. advanced or urban air mobility), has already indicated that improvements to the standards-making framework are necessary. Therefore, in order to better align aviation with the high-paced evolution of technologies in other industry sectors and considering Assembly Resolution A40-27: *Innovation in aviation*, the Council has requested the Secretariat to assess the need and the resources required to evolve the processes of the Organization. This is also highly relevant to the ICNSS project. To address the increasing pressure on the spectrum resource and the rapid rate of innovation in telecommunications, the related ICAO CNSS standards framework needs to be streamlined to facilitate the evolution of CNS systems at a faster rate. This includes ICAO's methods of working with aviation and aerospace industries and other standards-making organizations.

3.4 The integrated CNS and spectrum project

3.4.1 To address the challenges described above, the Integrated CNS and Spectrum Task Force (ICNSS-TF) was established in May 2020. Recognizing the need for an overall action plan for technological development (in the form of roadmaps), as well as the streamlining of the CNS standards-making framework itself, including SARPs and detailed specifications, the ICNSS-TF has undertaken the task to produce a report which would include the following deliverables:

a) a roadmap of CNSS evolution including a blueprint for CNS systems evolution; and

b) a new and streamlined framework for CNSS standardization which delivers:

   1) a clear proposal for a minimal, performance-based approach to the SARPs in Annex 10 — *Aeronautical Telecommunications*; and

   2) a clear proposal on how to develop and validate the technical specifications based on industry inputs for global interoperability.

4. PROGRESS OF THE ICNSS-TF

4.1 The ICNSS-TF is currently working on the development of a high-level roadmap of CNSS evolution (which builds on several specialized roadmaps) and a new, streamlined framework for CNSS standardization. Collectively, these outline the necessary strategic milestones and end goals in the medium (2040+) and long term (2050+). The CNS and avionics technology evolutional roadmaps include new

concepts, such as flexible system design, that offer the opportunity to maximize the effectiveness with which aviation uses its allocated frequency spectrum. The result will assist: (a) early identification of spectrum-related issues and technology gaps between aviation and other spectrum related industry; and (b) development of specific technical and performance specifications to support the implementation of future systems in a globally harmonized manner.

4.2 ICAO has prioritized the implementation of existing Standards over the development of new Standards. Performance-based Standards have been favoured over prescriptive Standards and detailed technical specifications, where appropriate. Faced with the rapid advancement of CNSS technology, the related ICAO CNSS standards framework needs to evolve. Otherwise, one cannot ensure that SARPs, industry standards and detailed technical specifications will be developed in a harmonized manner and at the pace necessary to secure global interoperability and continued high safety levels. Achieving this will be a considerable challenge. However, the best approach needs to be defined in a timely manner, by ICAO, States, and the aviation community as a whole, including new entrants.

4.3 With the goal to have a draft Assembly Resolution available for scrutiny by the 42nd Assembly and in order to identify the best methodology to balance “minimal essential CNS SARPs” and “detailed technical specifications”, the ICNSS-TF has undertaken to a) scrutinize and develop potential new standardization frameworks to better support system development by industry and b) to categorize required CNSS standards frameworks for new systems as well as any required validation activity of the resulting industry inputs within ICAO. For further information, an initial draft report of the integrated CNS and spectrum global concept can be found at the ICNSS project website.

5. CONCLUSION

5.1 Modern-day aviation is not the same as a few years ago. Technological innovation and modernization are advancing at an ever-increasing pace. However global consensus as well as timely and harmonized deployment of those new technologies is becoming increasingly difficult to achieve. To avoid unequal and incompatible implementation of new CNS/ATM technologies, ICAO needs to continue improving the process of development/adoption of ICAO regulatory provisions and achieving consensus for timely and effective rollout.

5.2 In line with recent Assembly Resolutions and AN-Conf/13 recommendations, ICAO has undertaken the integrated CNS and spectrum project, focussing on a medium and long-term evolution of CNS systems and spectrum efficiency while improving global harmonization of the CNS infrastructure and identifying a new and streamlined framework for CNSS standardization. While remaining firmly focussed on aviation safety and efficiency, this new framework would utilize input from industry in an effective and fully validated manner, thus ensuring that the aviation sector remains a responsible user of the spectrum resource, while also delivering overall systems improvement.

5.3 Noting the considerable progress already made by the ICNSS project (see ICNSS project website), States, international organizations and industry stakeholders are encouraged to support the continued development and implementation of a medium to long term roadmap for the evolution of ICNSS and a new streamlined framework for CNS and frequency spectrum standardization, with the ultimate objective of this effort being to propose a set of recommendations for endorsement by the next Assembly.

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