Council of the European Union

Brussels, 8 July 2019
(OR. en)

10227/1/19
REV 1

AVIATION 124
CLIMA 156
ENV 573
RELEX 610

'I/A' ITEM NOTE

From:	General Secretariat of the Council
To:	Permanent Representatives Committee/Council
Subject:	Preparation of the 40th ICAO Assembly (Montreal, 26 September - 4 October 2019) First batch of European working papers – Endorsement

On the basis of a draft presented by the Commission services, and following consultation of the European Civil Aviation Conference (ECAC), the Aviation Working Party examined the text of eight Working Papers to be submitted by Finland on behalf of the European Union and its Member States to the 40th Assembly of the International Civil Aviation Organisation (ICAO), which will be held from 26 September to 4 October 2019 in Montréal.

At its meeting on 11 June 2019, the Working Party reached agreement on the text of the papers as set out in the **Attachments A, B, C, E, F, G, H** in the Annex to this note, and decided to submit them to COREPER and Council for final endorsement. **Attachment D is still under consideration.**

In the light of the above COREPER is invited:

– to confirm the text of the Working Papers as set out in the Annex to this note;

– to authorise the Presidency to submit these papers on behalf of the European Union and its Member States to the 40th Assembly of ICAO.

ANNEX

Attachment A

International Civil Aviation Organization

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WORKING PAPER

ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other issues to be considered by the Technical Commission

INTERFERENCE-RESILIENT SATELLITE-BASED CNS SYSTEMS

(Presented by Finland on behalf of the European Union and its Member States[1], the other Member States of the European Civil Aviation Conference[2]; and by EUROCONTROL)

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, Sweden and United Kingdom.

2 Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

The ATM/CNS systems are evolving and so are the associated CNS threats and vulnerabilities. While satellite-based CNS systems take a growing part in the overall ATM system, the occurrences of interferences against those systems have significantly increased. CNS resiliency to interference needs to be addressed at global level with a holistic approach, ensuring an efficient and coordinated evolution between the infrastructure architecture, new technological capabilities, operational procedures, radio regulatory authorities and civil-military coordination.

Any lack of resiliency to interference needs to be compensated and can use a combination of an independent Minimum Operational Networks (MON), based on ground and airborne components and ATC procedural methods, which provide contingency of the CNS services in case of satellite-based service unavailability.

In addition, both the on-board and ground segments of the satellite-based CNS systems need to be adapted to potentially increasing threats by developing interference detection and reporting capabilities and mitigation measures to ensure flight safety. Combined with an appropriate legal framework, it will allow for the relevant authorities to act upon harmful interferences caused by illegal transmitters or other sources of electromagnetic radiation and avoid the proliferation and the use of such illegal transmitters. A civil military coordination should facilitate the sharing of relevant information with airspace users either during civil or military testing activities or when flying in the vicinity of a conflict zone.

Action: The Assembly is invited to:

1) Urge States to:
   a) transition from a CNS system-based concept towards secure CNS services, mainly based on a satellite-based infrastructure while addressing its resiliency to interference through independent Minimum Operational Networks based on ground and/or airborne components.
   b) apply necessary measures to avoid the commercialisation / proliferation and the use of illegal transmitters such as jammers which may impact satellite-based CNS systems.
   c) ensure, considering that the use of radio frequency spectrum by aeronautical safety services requires special measures, close collaboration between aviation authorities, service providers, radio regulatory and spectrum enforcement authorities to ensure that this spectrum is free from harmful interference.
   d) reinforce civil-military collaboration regarding GNSS testing and other activities, which may impact satellite-based CNS systems, with the ANSP responsible for the affected airspace.
   e) consider, when assessing the interference risks associated with conflict zones, that the use of satellite-based CNS systems can potentially be impacted beyond that zone.
2) Direct ICAO to develop guidelines and best practices for use at the State, regional and global levels to mitigate safety risks related to any civil or military GNSS testing activities or other activities which may impact CNS systems (e.g. intentional jamming).
3) Call upon industry standardization bodies and industry to develop appropriate interference detection, mitigation and reporting capabilities for both the on-board and ground segments of the satellite-based CNS systems, in order to ensure higher CNS resiliency.

Strategic Objectives:	This working paper relates to Strategic Objectives of Safety and Air Navigation Capacity and Efficiency.
Financial implications:	The activities referred to in this paper will continue subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions
References:	A32-19, A32-20, A39-11 Appendix F

1. GLOBAL CNS RESILIENCY

1.1 The traditional Communication, Navigation & Surveillance (CNS) system, which is currently organised around the 3 C, N and S pillars, relies on the logic that while one pillar can have a complete failure, the two others enable, as a minimum, the safe landing of aircraft. Resulting from the transition to performance-based concepts and the introduction of Global Navigation Satellite System (GNSS) as an integral enabler in multiple areas of CNS, the traditional, single system CNS safety concept needs to evolve.

1.2 An Integrated CNS concept is being developed to manage this CNS concept evolution and to address the existing and upcoming CNS challenges: Global CNS resiliency is to be achieved by defining a future CNS infrastructure based on two layers:

- a backbone of recently standardised or being standardised and global technologies, mainly satellite-based (including SatCOM, GNSS, ADS-B and ADS-B satellite-based), supporting resilient CNS services, complemented by
- a Minimum Operating Network (MON) composed of legacy ground and/or airborne components (e.g. Inertial Reference System - IRS) independent from the backbone which provide continuity of the CNS services in case of satellite-based CNS service interruptions.

1.3 Any lack of resiliency to interference needs to be compensated. This compensation can be built with a combination of an independent MON, based on ground and airborne components and ATC procedural methods, which provide contingency of the CNS services in case of satellite-based service unavailability.

2. CNS INTERFERENCE, DETECTION AND REQUIRED ACTIONS

2.1 Interference can degrade civil satellite-based CNS signals (e.g. GNSS) and services which are the main enablers of Integrated CNS, and in some cases results in unusual system behaviour. Satellite signals are by nature very weak when they arrive at the receiver and thus vulnerable to interference, both natural or artificial, intentional (including jamming and spoofing) or unintentional.

The subsequent discussion illustrates the issues already encountered by Navigation, being the first CNS domain moving to satellite-based services. However, Surveillance and Communication may suffer from comparable threats with a need to define actions to address CNS as a whole.

2.2 The aviation community is well-aware of the threats due to the proliferation of interference capable equipment including portable electronic devices (PEDs), personal privacy devices (PPDs), incorrectly operated GNSS repeaters, miss-operated test equipment and the foreseeable proliferation of sophisticated spoofing devices in the future. Improved protection against such interference is under consideration in the development of next-generation avionics and CNS system standards.

2.3 An increasing number of partial or complete loss of GNSS services are reported by pilots (several hundred of occurrences with interruption from generally 10 to 20 minutes were reported by 60 airlines in 2018). This represents a significant increase compared to previous years. IATA member airlines and other aircraft operators are experiencing and reporting unavailability of GNSS equipment on a regular basis today. In most cases, the likely cause was ground-originated jamming. So far, no spoofing event was identified. A limited number of those events were caused by low power PPDs. Whilst illegal, these devices intend to jam GNSS signals only closely around the user, but might still interfere with aircraft or airport Ground Based Augmentation System (GBAS) and ADS-B ground stations at close distance. Several occurrences have been reported among which the majority were encountered during the en-route phase of flight, in areas where political tensions prevail. In some cases high power jammers have been used, impacting a large volume of airspace.

2.4 Once the degradation of GNSS performance is recognised, the consequences may differ from case to case. In some most severe cases, not only the required navigation capability is affected, but the airplane may experience Terrain Avoidance and Warning System (TAWS) errors, and trigger sudden "'terrain-pull up" warnings, including during Instrument Landing System (ILS) approaches. This could lead to inappropriate action by flight crews.

2.5 Finally, it shall be noted that the aforementioned interference impacts may be in many cases reduced within States which have set-up simultaneously: 1) an efficient spectrum regulation policy, involving civil aviation, to alleviate the impact of unexpected interference events, 2) a civil aviation coordination mechanism with State Military authorities.

2.6 In the future, technical means should be deployed to detect and identify areas of frequent interference, so that operational and technical mitigations can be put in place in advance, and that negative impacts on safety related to the aircrew "surprise" effect can be alleviated. It is not expected that ground-based interference estimation systems alone be either practical or efficient: aircraft are in an ideal position to assess interference areas in real-time. Airborne technical means should be developed to e.g. detect interference on-board and broadcast a position message at the start and end of the detected interference event. These positions would then be used by the ground-based systems to locate more precisely the interferer.

2.7 Given the global nature of aviation operations, it is desirable that States ensure that a radio frequency interference risk mitigation framework, including agreements, processes and equipment capabilities for mitigation actions, are in place, tested and exercised regularly. For GNSS, a Radio Frequency Interference (RFI) mitigation plan is described in the ICAO GNSS Manual, DOC 9849.

Such framework should be built on the International Telecommunication Union's (ITU) Radio Regulations, which includes provisions for the prevention and removal of radio interference, whether between radio services or countries, between frequency assignments, or from other sources of electromagnetic radiation.

At national level, radio-regulatory authorities are normally responsible for radio spectrum inspection and compliance functions which should enable the identification and measurement of interfering signals, the verification of proper technical and operational characteristics of radiated signals, and the detection and identification of illegal transmitters. If a safety service is affected, urgent action shall be taken.

2.8 Identification of an interference source can be a difficult and often time-consuming activity. Some States have found that, when aviation stakeholders assist the national radio-regulatory authority in local detection actions, resolutions are more time-effective. States are encouraged to continue to report their experiences to the spectrum and frequency working groups in ICAO to ensure knowledge sharing and establishment of best practices.

3. GNSS AND OTHER TESTING ACTIVITIES AND NEED FOR AN ENHANCED CIVIL/MILITARY COORDINATION

3.1 As stated above, statistical data[3] established based on ATM Incident and voluntary Reporting in ECAC airspace and neighbouring airspace are showing a significant increase in the number of GPS Outage reports. While further investigations of the reported GPS failures cannot confirm military activities as causes of the outages with certainty, this nonetheless remains probable for cases near zones of conflict. Therefore, it is appropriate to reiterate that States should use caution when conducting civil and military GNSS and other testing activities which could contribute to operational impact on aviation CNS systems. Airspace Users should be informed accordingly.

3.2 Many States have already put in place efficient civil-military processes to coordinate testing activities, in particular in the context of military exercises. Considering the potential negative impact of GNSS testing on the safety of flights, States are strongly encouraged to further enhance civil-military coordination related to GNSS and associated testing[4]. States should therefore strive to establish through the involvement of both civil and military stakeholders, at State, regional or global level guidelines and best practices sharing for any civil or military GNSS testing activities.

4. CONFLICT ZONE MANAGEMENT

4.1 With increased reliance on digital and space-based CNS services, interference to such services (regardless of the origin of such interference) is becoming more operationally relevant. While closure of airspace due to conflict causes a re-routing of air traffic around that zone, interference to CNS services can extend to regions far outside of the closed airspace. Therefore States are urged when assessing the interference risks associated with conflict zones to consider that the use of satellite-based CNS systems can potentially be impacted beyond that zone.

--- End of Paper ---

[3] EVAIR Safety bulletin (https://publish.eurocontrol.int/publications?title=&field_term_publication_type_tid=238&year[value][year]=) and
ECR (European Central Repository for accident and incident reports in aviation).

[4] For the military, GNSS testing can occur during exercises or military operations/equipment in areas near conflict zones. For civil purposes, such testing is typically conducted to further develop vulnerability mitigation measures in order to improve the resiliency of GNSS to interference

Attachment B

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International Civil Aviation Organization

WORKING PAPER

ASSEMBLY — 40TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 13: Audit Programmes – Continuous Monitoring Approach

RELEVANT, ROBUST AND UP-TO-DATE USOAP-CMA

(Presented by Finland on behalf of the European Union and its Member States[5], the other Member States of the European Civil Aviation Conference[6]; and by EUROCONTROL)

[5] 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, Sweden and United Kingdom.

[6] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

Following the recommendations of AN-Conf/13 this paper underlines the importance of USOAP-CMA and fully supports its further development and strengthening. It proposes some high-level principles for the future evolution of this Programme, which will help drive safety improvements. It also calls upon the States and international organisations to provide support to ICAO.

Action: The Assembly is invited to:

a) ensure that the evolution of USOAP-CMA provides more relevant, robust, accurate and up-to-date information and is managed in a risk-based manner;
b) recognise that USOAP-CMA should be continued and further strengthened towards an agile, responsive, risk-based and robust system;
c) recommend that the further evolution should review aspects such as the data basis and planning, indicators, training and staff competency, cross-fertilisation, interfaces with other programmes, effective use of resources of ICAO and contracting States, the applied auditing techniques and methods and improvement of technology tools in particular the CMA on-line framework;
d) Call upon all ICAO Member States, international and regional organisations to support ICAO in improving USOAP-CMA.
e) Direct the Council to prioritise the work on the evolution of USOAP-CMA and ensure that adequate human and financial resources are allocated to the Programme;

Instruct the ICAO Secretary General to:

f) implement the AN-Conf/13 recommendations, and in particular those referring to the future evolution of USOAP-CMA;
g) continue ensuring the effective and efficient management and implementation of the Programme.

Strategic Objectives:	This working paper relates to the Strategic Objective of Safety.
Financial implications:	The activities referred to in this paper will continue subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.

References:	A37-5 (The Universal Safety Oversight Audit Programme (USOAP) continuous monitoring approach) AN-Conf/13 recommendation 6.3/1 (Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA)) Doc 9735 (USOAP-CMA Manual)

1. BACKGROUND

1.1 Since its inception in 1999 the Universal Safety Oversight Audit Programme (USOAP) has proved to be a valuable mechanism to provide standardised, objective and comprehensive information regarding the implementation of the Critical Elements (CE) of safety oversight in the Contracting States. The information it provides contributes towards enabling States and international organisations to make informed decisions regarding improvement of their safety oversight systems, mutual acceptance of certificates, prioritisation of ramp inspections, authorisation of foreign carriers and definition of technical assistance activities.

1.2 In 2013 USOAP transitioned to a Continuous Monitoring Approach (CMA), the current model of the Programme. Following the discussion on the development of USOAP at the 39th Assembly, the Secretariat established the Group of Experts for USOAP Structured Review (GEUSR) which made a number of important recommendations and observations. During the 13th Air Navigation Conference (AN-Conf/13) the States supported those recommendations and observations and called on ICAO to implement them as a matter of priority. As a result of a number of additional proposals tabled by States (representing various regions) asking for the improvement and enhancement of the Programme, the Conference recommended that ICAO establish a study group to address these issues, avoid duplication of effort and find synergies to enhance the efficiency of the USOAP CMA beyond the GEUSR recommendations while maintaining safeguards to guarantee the independence, universality, standardization and global acceptance in the implementation of the programme[7].

2. DISCUSSION

2.1 In the 20 years since USOAP's inception 185 States have been audited. However, sixty-six of these USOAP missions took place before 2015, and of these, twenty-one States were visited more than ten years ago,[8] and therefore the relevance of a significant portion of USOAP-CMA data is now questionable.

2.2 It is of utmost importance that the USOAP-CMA is continued by ICAO and allocated appropriate resources due to the relevance of the data it provides to ICAO, States and international organisations. The Council should therefore guarantee the human and financial resources needed for the further development and maintenance of the Programme and the Secretary General should ensure its effective and efficient management and implementation.

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7 Cf. paragraphs 6.3.1-6.3.9 of the AN-Conf/13 report (Doc 10115) and recommendations 6.3/1 h) and i).

8 https://www.icao.int/safety/Pages/USOAP-Results.aspx, data for Q1 2019.

Expected information

2.3 The AN-Conf/13 recommended that ICAO ensure that the continuous monitoring of States remains robust, relevant and up-to-date. The future evolution should take as its starting point what was agreed at the AN-Conf/13, complemented by high-level directives from the Assembly for this work in terms of expected information to be delivered by the Programme, the desired qualities of USOAP-CMA itself and the particular areas to be considered as identified in this paper.

2.4 USOAP-CMA is not a goal in itself. It is in the common interest of ICAO, States and international organisations that the Programme provides relevant, credible and up-to-date information that can be used in an effective manner.

2.5 Need for an agile, responsive, risk-based and robust Programme

2.6 The Programme itself, in order to provide the required information should be agile, responsive, risk-based and robust. This means that it should be able to address safety concerns in a timely manner, properly reflect the evolution of the situation of the State in question, and the oversight activities should be prioritised based on risk and using a transparent process.

2.7 Areas of interest

2.8 In the future evolution of USOAP-CMA, beyond the implementation of the valuable recommendations and observations of GEUSR, particular attention should be given to:

- Planning of activities;
- Indicators of State safety performance;
- Cross-fertilisation with other ICAO activities;
- Interfaces with other programmes;
- Training and staff competency, both at the level of ICAO and the States;
- Effective use of ICAO and State resources;
- Applied auditing techniques;
- Databases supporting the programme
- Improvement of technology tools, in particular the CMA on-line framework

2.9 The technical details should be discussed by the study group referred to in the AN-Conf/13 recommendation.

2.10 Taking into account the importance of this Programme and the constraints on the resources of ICAO, States and international organisations should be prepared to complement the funds and staffing provided by the General Programme budget by actively supporting the Secretariat activities through financial and in-kind donations.

3. CONCLUSION

3.1 A well-functioning USOAP-CMA adds significant safety value to most aviation safety actors: it would, in particular, allow several stakeholders to rely more on the data it produces, to feed their own safety oversight activities. Therefore, there should be a common understanding of the need to continue and further strengthen the Programme with a view to achieving the objectives described above – to be agile, responsive, risk-based and robust, providing relevant, credible and up-to-date information. Necessary resources should be allocated to allow reaching that goal. The Assembly is therefore invited to take the actions listed in the "Executive Summary".

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WORKING PAPER

ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other issues to be considered by the Technical Commission

ADDRESSING CAPACITY CHALLENGES IN THE AIR NAVIGATION SYSTEM THROUGH A COLLABORATIVE GLOBAL NETWORK-CENTRIC APPROACH

(Presented by Finland on behalf of the European Union and its Member States[9], the other Member States of the European Civil Aviation Conference[10]; and by EUROCONTROL)

[9] 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, Sweden and United Kingdom.

[10] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

The paper addresses the need for improvements of the air navigation system to meet a growing airspace and aerodromes user demand, specifically at peak times and in congested areas. It advocates a collaborative global network-centric planning of airspace design, air traffic flow management (ATFM), operational and technical interoperability and thus building a global "network of networks" by better interconnecting regional/sub-regional networks. Implementing such an approach can contribute to the efficient continuity of air traffic flows at global level between ICAO regions as well as within the regions, supporting continuity of flows also during crises. A comprehensive ATM data exchange across the regions is required.

3.2 **Action:** The Assembly is invited to:

3.3 Urge States to:

a) Support a collaborative global network-centric approach for airspace design, ATFM and operational and technical interoperability to meet growing user demand and to ensure the efficient continuity of air traffic flows at global level between ICAO regions as well as within the regions;
b) Speed up the air navigation system modernisation to improve the overall network performance;
c) Commit fully to a collaborative approach together with the members of the air navigation community;
d) Establish a comprehensive ATM data exchange, including across all ICAO regions, to enable an efficient air traffic management system including planning, design, implementation, operation and performance measurement; and
e) Ensure that appropriate performance indicators and metrics are developed, agreed and used in a harmonised manner supporting a network-centric planning and operation.

3.4 Direct the Council to:

f) Encourage the fullest possible participation by states and the air navigation community in a collaborative global network-centric planning and operation;
g) Strengthen the role of PIRGs in support of a global network-centric approach and establish structural inter-PIRGs cooperation in this regard.

3.4.1

3.4.2 Instruct the Secretary General to:

h) Initiate a review of ICAO's Global Air Traffic Management Operation Concept to reflect the sixth edition of the GANP regarding collaborative cross-border planning and operation of the air navigation system based on a network centric view;

Strategic Objectives:	This working paper relates to Strategic Objective of Air Navigation Capacity and Efficiency
Financial implications:	The activities referred to in this paper will continue subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.

References:	AN-Conf/13 recommendation 3.3/1 (Network operations (NOPS))
	Global Air Navigation Plan (GANP, Doc 9750)
	Global Air Traffic Management Operation Concept (GATMOC, Doc 9854)

1. INTRODUCTION

1.1 The continuous global growth of air traffic poses a significant challenge to the air navigation system. The requirement to safely provide a continuous increase of airspace and aerodromes capacity as well as facilitating user preferred trajectories at defined levels of performance generates the need for a different approach to planning and operations of the air navigation system. Moreover, new entrants are likely to create further demand and may have an impact on existing concepts of operations if capacity challenges are not appropriately addressed. It is also recognised that a system operating at or close to its capacity limits is more susceptible to system disruptions.

1.2 To meet airspace user demand and to ensure the safe, efficient and environmentally sustainable continuity and predictability of air traffic flows at global level between ICAO regions as well as within the regions, specifically at peak times and in saturated areas, there is a need for an increase in the capacity of the air navigation system. The need to find an appropriate balance between capacity, environment and cost-efficiency without compromising safety requires careful consideration. Significant operational harmonisation together with advanced automation can help to balance sometimes-competing expectations. Strengthened global cooperation is key in ensuring the desired level of traffic predictability for both planning and operational phases. Other factors to consider are today's complex and highly dynamic security environment as well as ICAO's "No Country Left Behind" (NCLB) initiative.

2. A GLOBAL NETWORK-CENTRIC APPROACH

2.1 Although there is no simple or single solution to overcome all these challenges, a collaborative network-wide planning and operation, as envisaged by ICAO's Global Air Navigation Plan (GANP), has demonstrated its potential to improve air traffic flow efficiency across flight information region (FIR) boundaries and thus contributes beneficially to the air navigation system. Other regions share similar experiences.[11] Network-wide planning and operation have not exhausted their potential and further steps are needed, including those necessary to support an evolutionary transformation into a trajectory-based operations (TBO) environment.

2.2 A collaborative network-centric approach focuses on the link between the operational and technical dimensions of the air navigation system including airspace, operations and technology, infrastructure, applications, data services, humans and cost. The intent is to ensure that airspace and aerodrome capacity is optimised according to operational needs, without being limited by FIR or national boundaries. In a future TBO environment, a four-dimensional flight trajectory collaboratively developed, managed and shared would serve as a common reference for decision-making across all stakeholders.

[11] See, for example, AN-Conf/13 WPs 40, 86, 109, 202, 237.

2.3 To better understand the concept and its implications a proper definition of "the network" is key. A network can be defined as: "aerodromes, airspace and interfaces that connect them, ATM/CNS infrastructure, airspace users, resources and capabilities that together meet a defined level of performance". Its components shall continuously evolve and adapt to reflect their varying impact on the performance of the network. This will support the network optimisation and the achievement of the agreed local and network level performance. Any airport, airspace, route, infrastructure, resource or capability may form a part of the network in the broadest sense and will therefore require the availability of static, strategic and tactical data for the use of all relevant stakeholders. A subset, however, will be critical to performance at any given time and it is this subset that will be the main focus of coordinated network level improvements.

2.4 A logical next step is to extend the scope of regional network-wide planning by linking it initially to adjacent regions. Being able to have a perspective on flight operations across larger areas can make the whole system more efficient and thus better able to support user-preferred trajectories and continuity of flows, particularly during times of crises. The ultimate goal is to enable a collaborative global network-centric planning of airspace design, air traffic flow management, operational and technical interoperability, supporting an interconnection of regional/sub-regional networks across ICAO regions and thus creating a "network of networks".

2.5 A global network-centric approach may also be advantageous when accommodating future needs, including, for example, new entrants or the realization of integrated CNS services, as agreed by AN-Conf/13. Also, it can assist in better implementing ICAO provisions in a harmonized manner globally so that all States may have access to the significant benefits of safe and efficient air transport and thus supporting the NCLB initiative.

2.6 Subject to the endorsement by the Assembly of the sixth edition of the GANP, efforts shall be made to review ICAO's Global Air Traffic Management Operation Concept (GATMOC) with the view to align the two companion documents. Particular attention is to be paid to the significance of a collaborative cross-border planning and operation of the air navigation system based a network-centric view, including an interoperable infrastructure, at global, regional and local levels.

3. COLLABORATIVE DECISION-MAKING

3.1 Strategic and tactical collaboration between the involved members of the air navigation community, including regulators, airspace users, aerodrome operators, air navigation service providers, standardisation organisations, manufacturers and the military, is essential to address the multidisciplinary challenges ahead, in particular where the diverging expectations and interests regarding in particular capacity, environment and economic impact are balanced to achieve optimum network performance. For example, overall capacity objectives at network level should have priority over a greater freedom for individual flights.

3.2 Today's security environment is complex and highly dynamic and can have considerable impact on aviation. A collaborative process will allow a better common use of resources shared by civil and military aviation, i.e. airspace, facilities and services. This ensures a safe, secure, orderly and efficient civil aviation as well as ensuring that the requirements of military missions are met. Additionally, it assists in addressing the mutually supporting roles of civil and military aviation.

3.3 The role of the ICAO planning and implementation regional groups (PIRGs) in support of global network-centric approach shall be strengthened. A more structured and focused cooperation between PIRGs is required to deliver operational and technical efficiencies at interfaces between ICAO regions in support of more effective continuity of air traffic flows at the global and regional levels.

4. COMPREHENSIVE ATM DATA EXCHANGE

4.1 A comprehensive ATM data exchange is considered a key enabler for an efficient air traffic management system with regard to planning, design, implementation, operation and performance measurement. It facilitates dynamic and flexible collaborative decision-making between stakeholders including the implementation of improved predictive algorithms and better delay propagation models which are essential components of a well-functioning network traffic flow management system.

4.2 To ensure accessibility and usability of ATM data, an efficient, secure and interoperable data exchange is essential. A technology-neutral and performance-based data exchange specification is considered best suited for interconnection of networks at global and regional levels. Network resiliency, also during crises, requires consideration.

4.3 When considering ATM data exchange in support of a network-centric approach, it appears necessary to take into consideration specific requirements for aerial surveillance sovereignty missions. Special arrangements should set up between data providers, Air Navigation Service Providers and responsible State authorities.

5. MEASURING EFFECTIVENESS

5.1 Network performance expectations should be reached through meeting a set of specific, measurable, achievable, relevant and timely objectives. To verify the effectiveness of improvement measures, including those across all ICAO regions, appropriate performance indicators and metrics need to be developed, agreed and used in a harmonized manner.

6. CONCLUSION

6.1 Airspace and aerodrome capacity constraints should not become limiting factors to global air traffic growth. States, operational stakeholders, including military, and relevant regional organisations should be fully committed to a collaborative network-centric approach and to speed up the air navigation system modernisation, supporting in particular international and cross-border services, where these are needed to improve the overall network performance.

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WORKING PAPER

ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 29: Aviation Safety and Air Navigation Regional Implementation Coordination Mechanisms

RESILIENCE TO A MAJOR ACCIDENT – COOPERATION, MUTUAL SUPPORT AND REGIONAL ACCIDENT AND INCIDENT INVESTIGATION ORGANISATIONS (RAIOS)

(Presented by Finland on behalf of the European Union and its Member States[12], the other Member States of the European Civil Aviation Conference[13]; and by EUROCONTROL)

12 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, Sweden and United Kingdom.

13 Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

Contracting States have an international obligation to investigate aircraft accidents and serious incidents and to issue Final Reports within a reasonable timeframe. These reports with their lessons learned are highly valuable for the international aviation community and for safety management.

To fulfil their international obligations, Contracting States also have the possibility to delegate such investigation to another State or to a RAIO. However, there are challenges and difficulties to fully delegate a major accident investigation. Regional cooperation and mutual support help to be resilient when facing a major accident. It can also provide economies of scale by allowing for the sharing of required resources.

This working paper puts emphasis on the Annex 13 obligations that each Contracting State has to abide by, aims to encourage mutual support between States and to expand the concept of RAIOs to include the global experience of other models and best practices that have been developed.

Action: The Assembly is invited to:

1) Reaffirm the importance of effective and independent accident investigations in accordance with Annex 13 to the Chicago Convention, in particular the obligation and value of publishing Final Reports for further improving aviation safety globally.
2) Call upon Contracting States to promote mutual support within their region or sub-region and to foster regional cooperation in order to fulfil their international obligation to conduct effective and independent accident investigations to enhance aviation safety while recognizing the national accountabilities in the event of a major accident crisis.
3) Direct ICAO to recognize the recent initiatives related to regional cooperation and to review the ICAO Manual on RAIOs (Doc 9946) to enrich it with the different concepts of Regional Accident Investigation (RAI) mechanisms in order to encourage more Contracting States to seek to cooperate in a pragmatic manner that suits their geographical, cultural, political and/or legal environment.

Strategic Objectives:	This working paper relates to the Safety Strategic Objectives.
Financial implications:	None
References:	A38-12 Appendix N (Cooperation among Member States in investigations of aircraft accidents) Annex 13, Manual on Regional Accident and Investigation Organisations (Doc 9946)

1. **INTRODUCTION**

1.1 Each Contracting State, in which an accident occurred, has the obligation to institute an investigation in accordance with Article 26 of the Chicago Convention.

1.2 In 2016, amendment 15 modified Annex 13 by notably adding a definition for an accident investigation authority. Standard 3.2 of Annex 13 now stipulates that: "*A State shall establish an accident investigation authority that is independent from State aviation authorities and other entities that could interfere with the conduct or objectivity of an investigation*."

1.3 Because of the changing regulatory, economic and technical environment as well as the growing sophistication and complexity of modern aircraft, the conduct of an accident or serious incident investigation requires participation by experts from many specialized technical and operational fields and access to specially equipped facilities for investigation. These resources and assets are not necessarily available in all ICAO Contracting States.

1.4 ICAO Assembly Resolution A38-12 (Appendix N) recommends that Contracting States cooperate in the investigation of aircraft accidents, especially accidents in which the investigation requires highly specialized experts and facilities. It also recommends the provision for expert assistance and facilities for the investigation of major aircraft accidents on request by other Member States.

1.5 The ICAO Universal Safety Oversight Audit Programme (USOAP) in the accident investigation field indicated findings that have been associated, in general, with a lack of resources (human, material and financial) and a number of issues related to regulations and organization for the investigation of accidents and incidents.

1.6 Cooperation in the field of accident investigations represents the way forward consistent with the spirit of the No Country Left Behind (NCLB) initiative which would contribute to improve safety.

2. **DISCUSSION**

2.1 **Importance of effective and independent investigations**. Effective identification of aviation hazards and correction of system deficiencies are required in order to support risk management processes that contribute to further enhance accident prevention and to reduce the number and severity of accidents.

2.2 Contracting States have an international obligation to investigate aircraft accidents and serious incidents and to issue Final Reports within a reasonable timeframe. The accident investigation authorities play a core role in the effective identification of aviation hazards. Their work is of the utmost importance in determining the causes of an accident or incident and in drawing lessons for the improvement of aviation safety. Their public reports are highly valuable for the international aviation community and for safety management.

2.3 A review of 1 157 fatal accidents[14] indicated that 59 per cent of the Final Reports were not publicly available. The lack of these Final Reports means that relevant safety information is not available to implement safety actions. In some cases, States that participated in such investigations were aware of safety issues but unable to disseminate the information as the responsibility was with the State conducting the investigation to release information either in the Final Report or in an interim statement. Upcoming amendment 17 to the Annex 13 would already entitle States participating in the investigation to request consent to release a statement containing safety issues, if the State conducting the investigation would not publish the Final Report or an interim statement within a reasonable timeframe.

2.4 There is a difference between a State that does not want to release the Final Report, and a State that is unable to conduct an investigation on its own due to resources constraints and does not seek assistance nor delegate it to another State. Annex 13 already contains sound provisions regarding participation of States, assistance and delegation that need to be reaffirmed in the context of this Assembly.

2.5 Accident investigations, especially when dealing with major accidents, are not only a technical activity, but have to take into account the socio-political crisis context surrounding a major accident. At national level, numerous organizations are involved and interact with the accident investigation authority in the response to a major accident, in particular the judicial authorities. Annex 13 (Standard 5.10) stipulates that: "*The State conducting the investigation shall recognize the need for coordination between the investigator-in-charge and the judicial authorities.*" Depending on each State's organisation, other non-aviation institutions are also involved such as Foreign Affairs, Ministry of Interior, Ministry of Justice, Ministry of Health or Ministry of Defence. A major civil aviation accident represents a national (and international) crisis that goes beyond the domain of civil aviation.

2.6 **Delegation and regional cooperation**. During the period from 1999 to 2019, only three investigations on major accidents involving more than 100 fatalities were delegated to another State. While serious incidents are commonly delegated, States generally prefer to fulfil their international obligations by using their own organisations On the rare occasions where the investigation was delegated, the States involved were challenged with cultural or political differences.

2.7 Regional cooperation in investigations can provide economies of scale by allowing for the sharing of required resources. By working together, States of a region or sub-region can conduct an effective accident and incident investigation system and then have a stronger voice globally, notably when encouraging safety actions and issuing safety recommendations for more effective improvements in aviation safety and accident prevention.

2.8 Considering that data available from Aircraft Tracking, Autonomous Distress Tracking, Deployable Flight Data Recorder and Data Streaming options may be useful to the investigation but may be located in multiple States other than the State responsible for the investigation, it will be increasingly important that States having access to information relevant to the accident cooperate to optimize the overall efficiency of GADSS. .

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14 Accidents that occurred between 1990 and 2016 involving aircraft with a MCTOM over 5 700 kg.

2.9 Accident investigation activities go beyond the field of civil aviation, involving other authorities and are often associated to a socio-political crisis with ripple effects on other domains not covered by the Chicago Convention. In comparison, the activities of safety oversight involving civil aviation authorities and stakeholders, hence making regional cooperation on safety oversight less challenging than in the field of investigations.

2.10 Regarding regional cooperation, ICAO has used the term RAIO in a very broad manner (on the ICAO website on the subject[15], five regional initiatives are listed). They all have different features such as network of cooperation, regional mechanism, or a stand-alone entity capable of conducting an investigation upon delegation from its members. The only RAIO known to operate along Doc 9946 model is the Interstate Aviation Committee[16], which was established in 1991 prior to the publication of this guidance material. The various models of cooperation chosen by States do not necessarily constitute an 'organisation' and therefore there should be broader term in use than the term 'RAIO'. A number of ICAO regions[17] have recently focused on cooperation in the field of accident investigation. For example, the European Network of Civil Aviation Safety Investigation Authorities (ENCASIA) for European Union Member States that respects the sovereignty of each ICAO contracting state represents a pragmatic model for regional cooperation in the field of safety investigation.

2.11 ENCASIA has developed the ENCASIA Mutual Support System (EMSS), which is intended to help accident investigation authorities with limited resources or experience to investigate a major complex aircraft accident. This cooperative system was inspired by the longstanding "*European Civil Aviation Conference (ECAC) Code of Conduct on Cooperation in the Field of Civil Aviation Accident and Incident Investigation*" which exists for all ECAC 44 Member States[18]. EMSS is a voluntary process that helps these authorities identify their capability gaps and to develop contingency plans and prior arrangements with other safety investigation authorities. Another example is South America where cooperation is achieved through a regional mechanism that shares the same objective as ENCASIA. These are examples of Regional Accident Investigation (RAI) mechanisms to provide mutual support rather than delegating full investigations, which are not reflected in the ICAO Manual on RAIOs (Doc 9946) that was published in 2011 and would need to be updated to cover them. These RAI mechanisms should be strengthened and clarified in order to foster more cooperation in this field at sub-regional and regional levels.

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15 https://www.icao.int/safety/Implementation/Pages/COSCAPs-RSOOs-RAIOs.aspx

16 The Interstate Aviation Committee represents Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

17 For example, the RASG-MID Steering Committee in Cairo, Egypt on 25-27 June 2018 presented a draft roadmap concerning the enhancement of cooperation between the Middle East and North Africa (MENA) States in the field of accident investigation. More recently, the ICAO North American and Caribbean Office organised a meeting for RAIOs and a Workshop on Accident Investigation and Prevention (AIG) Implementation, in Mexico on 12-15 March 2019. It was followed by a RASG-EUR Accident investigation and ECCAIRS user workshop held in the Paris Regional Office on 8-10 April 2019.

18 See ECAC website for more details

3. CONCLUSIONS

3.1 There is a need to recognize the difficulties of delegating the investigation of major civil aviation accidents and to promote sub-regional and regional mechanisms that do not necessitate full delegation. Hence, it is key to encourage various forms of cooperation, which need to be customized to a geographical, cultural, political and/or legal specific environment. This could also go beyond regions through the establishment of transcontinental mechanisms, especially between countries or sub-regions that have historical, linguistic and cultural links.

3.2 The Assembly is invited to endorse the actions proposed in this Working Paper.

Attachment F

International Civil Aviation Organization

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EX/xx

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WORKING PAPER

ASSEMBLY — 40TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 15: Environmental Protection – General provisions, Aircraft Noise and Local Air Quality– Policy and Standardization

DEVELOPMENT OF SUPERSONIC AEROPLANES SUBJECT TO PUBLIC ACCEPTABILITY BASED ON SUBSONIC STANDARDS

(Presented by Finland on behalf of the European Union and its Member States[19], the other Member States of the European Civil Aviation Conference[20])

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

[20] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

While acknowledging the importance of technological innovation, the authors of this paper consider that it is very important to ensure that civil supersonic aeroplanes development does not undermine the considerable efforts made over many years to reduce aviation's environmental impact, and does not have adverse or disproportionate effects on safety, capacity and operations.

Action: The Assembly is invited to:

a) Reaffirm that limiting or reducing the number of people affected by aircraft noise is a permanent and joint responsibility of all stakeholders in the aviation sector;

b) Reaffirm that any supersonic aeroplane project needs to aim to comply with the most recent noise standards for subsonic aeroplanes to avoid a step backwards from efforts achieved so far to reduce aeroplanes' noise at source;

c) Reaffirm that a CO_2 standard is to be developed based on the standard for subsonic aeroplanes and that the existing Annexe 16, Volume II, Chapter 3 addressing emissions is to be updated;

d) Instruct the Council, in the light of the available information and availing itself of the appropriate machinery, to review the Annexes and other relevant documents, so as to ensure that they take

account of the problems which the operation of supersonic aeroplanes may create for the public;

e) Reaffirm the importance it attaches to ensuring that no unacceptable situation for the public is created by operations from supersonic civil aeroplanes at both supersonic and subsonic speeds;

f) Reaffirm that the integration of supersonic civil aeroplanes at airports and into the ATM system should not cause adverse impacts on operations, safety and the environment; and

g) Instruct the Council, with the contribution of the ANC and CAEP, to assess the performance impacts (safety, operational and environmental) of the integration of supersonic operations into the air navigation system, at and around airports, and, propose any mitigation actions, where appropriate.

Strategic Objectives:	This working paper relates to the following Strategic Objectives of Environmental Protection.
Financial implications:	The activities referred to in this paper will be undertaken subject to the resources available in the Regular Programme Budget and/or from extra budgetary contributions.

References:	Chicago Convention and its Annex 16 A39-1

1. INTRODUCTION

1.1 Limiting or reducing the number of people affected by aircraft noise is a permanent and joint responsibility of all stakeholders in the aviation sector. Addressing the noise problem remains one of the most challenging tasks. Noise exposure around airports is the dominant subject of complaints and, in recent years, it has constrained traffic growth at many airports. Significant constraints will continue to be imposed on future growth in air traffic, including the rejection of any increase in airport capacity, if progress cannot be demonstrated in reducing significantly aircraft noise at source.

1.2 There are also growing concerns about the impact of aviation on local air quality, the associated human health and welfare impacts and climate change. In Europe, CO_2 and NOx emissions are predicted to increase by at least 21% and 16% respectively by 2040. Other harmful pollutants are particulate matter (PM), ground level ozone (O3). With regard to climate change, there is an increasing need for aviation to contribute to efforts to limit global warming to which it contributes both through its CO_2 emissions and other climate forcers

1.3 In Europe, the aviation research effort is driven by the "Flightpath 2050" vision. Technological innovation is a key factor in aviation and Europe's ambition is to develop technologies and procedures to achieve a 75% reduction in CO_2 emissions per passenger kilometre to support the ATAG target[21] and a 90% reduction in NO_x emissions. The perceived aircraft noise is also to be reduced by 65%. These are objectives relative to the capabilities of typical new aircraft in 2000.

1.4 Monitoring technology improvements over time, ICAO has been developing more and more stringent noise standards limiting aircraft noise at source. Public acceptance of newly designed aircraft is linked to their compliance with the latest existing noise standards.

1.5 Likewise, for local air quality and climate change, which are primarily public health and environmental concerns respectively, aircraft certification standards are fundamental to the significant progress that the sector has made in controlling these emissions. Only by continuing to do so can growth in the sector be acceptable to the public.

1.6 Considering the overall contemplated traffic growth and in order to be able to accommodate it, it is of paramount importance that the integration of supersonic civil aeroplanes into the air navigation system including airports must not cause adverse impacts on the overall performance targets for operations

[21] The ATAG target is to reduce, by 2050, the net aviation carbon emissions by half of what they were in 2005

1.7 Thus, if the aviation sector wishes to continue to be allowed to grow, it is fundamental to ensure that aircraft noise and emissions standards safeguard that the current levels of environmental protection do not deteriorate, and to guarantee that the integration of supersonic aeroplanes in the air navigation does not cause adverse impact.

2. A COHERENT REGULATORY FRAMEWORK FOR SUPERSONIC AEROPLANES

2.1 While acknowledging the importance of innovation the possibility for civil aeroplanes to fly at supersonic speeds would represent a technological advance, the authors of this paper considers that it is very important to ensure that this development does not undermine the considerable efforts made over many years to reduce aviation's environmental impact in the field of noise and emissions.

2.2 The authors acknowledge that an important difference between subsonic and supersonic aeroplanes is that, while subsonic airplanes mainly cause a noise nuisance near airports, supersonic aeroplanes produce sonic booms along their flightpaths as long as they maintain a supersonic speed, not only when they reach a supersonic speed.

2.3 However, while noting the important technical differences between subsonic and supersonic aeroplanes, the authors believe that the two classes of aircraft are fundamentally similar and will compete for the same passengers, airspace and access to airports using the same aviation system. There is therefore a need to ensure that the significant progress made over many decades in the environmental performance of the global subsonic fleet is not jeopardised by allowing significantly more lenient environmental standards for the future supersonic fleet.

2.4 In particular, regarding aircraft noise around airports, given that supersonic aeroplanes are aimed at both replacing subsonic aeroplanes and generating new traffic demand, if they were noisier than their subsonic counterparts, it would lead to a step backwards from the results achieved so far to reduce aeroplanes' noise at source. Such a situation would no doubt lead to negative reactions from the public and potentially harm societies' opinion of aviation in general. Therefore, any supersonic aeroplane project needs to comply with the most recent noise standards with respect to subsonic operations.

2.5 As regards the emissions produced when the aeroplane flies at subsonic speed, and following the example of subsonic aeroplanes, supersonic aeroplanes should be subject to ICAO standards. A CO_2 standard is to be developed based on the standard for subsonic aeroplanes and the existing Annex 16, Volume II, Chapter 3 addressing emissions is to be updated. The impact of emissions produced at supersonic speed is also to be considered.

2.6 Finally, the authors consider that a coherent regulatory framework is required from ICAO. This means that a package of regulations is required to facilitate the introduction of supersonic aeroplanes, including noise, emissions, safety and operations.

3. ENVIRONMENTAL IMPACT ASSESSMENT TO ENSURE NO "UNACCEPTABLE SITUATION FOR THE PUBLIC"

3.1 Recognizing that the type certification of a supersonic aeroplane could occur in the 2020-2025 timeframe, resolution A39-1[22] reaffirms the importance the Assembly attaches to ensuring that no unacceptable situation for the public is created by sonic boom from supersonic aircraft in commercial service. The Assembly also instructs the Council to review the Annexes and other relevant documents, so as to ensure that they take due account of the problems which the operation of supersonic aircraft may create for the public[23].

3.2 Regarding problems that supersonic aeroplanes may create for the public, the environmental impact of operations at both supersonic and subsonic speeds should be considered, since there are potential unacceptable situations for the public in both flight regimes. CAEP is undertaking an exploratory study to provide a better understanding of airport noise impacts resulting from the introduction of supersonic aircraft.

3.3 Furthermore, the assessment of the environmental impact of supersonic aeroplanes when operating at supersonic speed should not be limited to sonic booms. Emissions and other effects on the climate have to be addressed as well.

4. INTEGRATION OF SUPERSONIC CIVIL AEROPLANES

4.1 In the middle of the next decade a significant number of supersonic aeroplane operations might be introduced into and out of congested airspace, and potentially at congested airports. The CAEP/12 work programme comprises an exploratory study that includes a fleet and operations estimation and a noise impact assessment for a selection of airports based on the noise performance information of supersonic project aeroplanes currently available. It will also provide information regarding the climate impacts of such aircraft.

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22 Appendix G, paragraph 1: "Reaffirms the importance it attaches to ensuring that no unacceptable situation for the public is created by sonic boom from supersonic aircraft in commercial service;"

23 Appendix G, paragraph 2: "Instructs the Council, in the light of the available information and availing itself of the appropriate machinery, to review the Annexes and other relevant documents, so as to ensure that they take due account of the problems which the operation of supersonic aircraft may create for the public and, in particular, as regards sonic boom, to take action to achieve international agreement on measurement of the sonic boom, the definition in quantitative or qualitative terms of the expression "unacceptable situations for the public" and the establishment of the corresponding limits;"

4.2 Integration of supersonic civil aeroplanes must not cause adverse impacts on the current level of capacity, safety and environmental protection. There is therefore also a need for decision-makers to understand how supersonic aeroplanes will operate, how their operations could affect those of subsonic aeroplanes in the same airspace and what the resulting environmental impact[24].

4.3 The Assembly should instruct the Council, in the light of the available information and availing itself of the appropriate machinery, to review the Annexes and other relevant documents, so as to ensure that they take account of the problems which the operations of supersonic aeroplanes may create for the public. To that end ANC and CAEP should also assess the performance impacts of supersonic civil aeroplane operations. As such, impacts on the Air Traffic Management system, including at and around airports, in terms of possible adverse effects on the current levels of safety, capacity and environmental protection should be assessed, and mitigation actions should be proposed, where appropriate.

- END -

[24] Mitigating the environmental impact of new entrants to the airspace (from drones to supersonic flights), was considered a key issue at the European Higher Airspace Operations Symposium on 2nd April.

Attachment G

International Civil Aviation Organization

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WORKING PAPER

ASSEMBLY — 40TH SESSION

ECONOMIC COMMISSION

Agenda Item ##: Title of agenda item

CONSUMER PROTECTION /AIR PASSENGER RIGHTS

(Presented by Finland on behalf of the European Union and its Member States[25] and the other Member States of the European Civil Aviation Conference[26])

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

[26] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

EXECUTIVE SUMMARY

This working paper focuses on the application of the ICAO high level, non-binding, non-prescriptive Core Principles on Consumer Protection and the evolution of the passenger experience when using air transport.

Since the adoption of the core principles in 2015 the air market has evolved; so have the rules of ICAO Member States in the field of consumer protection and in particularly field of air passenger rights. Therefore, it is important to share experiences and views on how the core principles have been implemented so far at a global level.

Moreover, beyond the traditional concept of the passenger rights, the aviation industry has developed significantly, leading to the appearance of new practices, not always addressed by the current passengers' protection regimes.

Action: The Assembly is invited to:

a) call upon ICAO to take actions to facilitate an exchange of views and good practices on the application of ICAO Core Principles on Consumer Protection and of a monitoring system as presented in paragraph 2;

b) call upon ICAO to ensure that in conducting these tasks it recognises the evolution in the perception of passengers' expectations, their rights and the quality of service offered as presented in paragraph 3; and

c) to this end invite ICAO to deal with the abovementioned matters by using an existing ICAO body.

Strategic Objectives :	This working paper relates to Strategic Objective: D - Economic Development of Air Transport

Financial implications:	Any activities relating to this working paper may be made subject to the availability of budgetary resources of the ICAO Regular Program budget for the period 2020-2022.
References:	*C-WP/14804* *Resolution A39-15* *ICAO Core Principles on Consumer Protection* *https://www.icao.int/sustainability/SiteAssets/pages/eap_ep_consumerinterests/ICAO_CorePrinciples.pdf* *State letter SP 38/1 – 15/60, dated 31 July 2015*

a) INTRODUCTION

Over the past decades air transport has become an essential element of today's society. What initially was something only available to a few people, is now an industry that annually moves billions of passengers and tons of cargo, connecting cities and countries providing large parts of the world's population with access to jobs, leisure, training or cultural opportunities for which distances are no longer barriers.

Historically air transport has doubled in size every 15 years and is expected to continue to do so. Along with the continuing liberalisation of air transport, the protection, and improvement of air passenger rights has gained greater importance at the international, regional and national levels. The 1999 Montreal Convention sets certain unified rules on the liability of air carriers for the carriage by air of passengers, baggage and cargo. More than four years have passed since the adoption of the ICAO Core Principles on Consumer Protection and, according to research conducted by the ICAO Secretariat (C-WP/14804), over 60 States have implemented aviation-specific consumer protection regulations. In total, 191 States have aviation-specific or general consumer protection regulations protecting air passengers[27].

Recognizing the high-level, non-binding and non-prescriptive nature of the ICAO Core Principles, Europe strongly supports the exchange of views on the application of these core principles in order to determine certain good practices that could help encourage long-term operational convergence and compatibility in this area at global level. This is key in order to ensure a level playing field among airlines across the world and avoid the double imposition of passenger rights regimes.

[27] ICAO's data base on aviation specific consumer protection regulations

Moreover, the aviation industry has evolved significantly, which has led to the appearance of new practices by airlines, which are not always viewed positively by passengers. The densification of aircraft cabins, with seats not suitable for all types of passengers, non-transparent allocation of seats to force the surcharge for adjacent seats, or extreme cases such as those where passengers already aboard have to leave an aircraft for no other reason than an overbooking policy, are just a few examples of practices taking advantage of gaps in the legislation, that run counter a minimum level of service quality, which passengers should enjoy globally. In the light of recent airline insolvencies the question of passenger's protection and assistance in such cases arises.

b) ICAO CORE PRINCIPLES ON CONSUMER PROTECTION

The sixth Air Transport World Conference (ATCONF-6), held in March 2013, addressed the need to provide consumers of air transport services with protection, stating the importance of protecting the interests of consumers and the need of convergence and compatibility, and recommending that ICAO continue to monitor closely the developments in the field of consumer protection and maintain its leadership role in the preparation of policy guidelines, taking into account the interests of States, the industry, air passengers and any other actors in aviation.

The ICAO Council adopted the 'Core Principles on Consumer Protection' in June 2015 comprising high-level recommendations of relevance prior to, during and after travel.

By decision of the Council, the ICAO core principles on consumer protection were disseminated to all States by means of State Letter SP 38/1-15/60 dated 31 July 2015. Member States and concerned industry stakeholders were encouraged to apply the core principle in policy-making and in regulatory and operational practices. The States presenting this paper are committed to the application of these core principles.

The abovementioned State Letter also called on Member States to provide information on experiences gained or issues encountered in the application of these core principles.

At the 39th Session of the ICAO Assembly in 2016, the Assembly urged Member States and concerned stakeholders to give regard to, and apply, the ICAO high level, non-binding, non-prescriptive core principles on consumer protection in policy-making and regulatory and operational practices, and to keep ICAO informed of the experiences gained or issues encountered in their application.

The work of ICAO in the recent past focused mostly on “massive disruptions” and flight disruptions caused by “extraordinary circumstances”. Nevertheless, the protection of passengers is broader in nature as recognised also by the core principles.

Recognising the dynamic nature of the air transport industry, the core principles are a “living document”, which would be refined and improved from time to time in the process of their application, based on the experiences gained and feedback received.

While continuously promoting the principles of protection to the consumer and encouraging States to fully implement it, ICAO could serve as a forum for exchange of views and good practices on these issues. While it is clear that these topics are addressed differently in different parts of the world reflecting the local socio-economic environment and the role of regulators in the market, it is important to share the experiences on how the core principles have been implemented so far. All States and concerned stakeholders should be encouraged to join the discussion. On that basis, good practices could be identified and shared.

c) EXPERIENCE/quality of service

The traditional concept of air passenger rights is based on the assumption that users always have the option to choose and they will therefore choose the services that best suit their preferences and needs. This assumption does not apply in cases where the user has no choice. In many instances, people may have no other choice than using air transport and they sometimes find a limited offer, with little or no possibilities to choose between operators.

As air travel evolves rapidly and becomes more accessible, passengers increasingly expect levels of protection that go beyond strict compliance with the terms specified in the contract of carriage. In the coming decades, pressure from citizens will grow for the competent authorities to take actions on the issue. It is now necessary that ICAO Member States, in coordination with industry, assess whether further work might be required in order to determine if some level of consistency between approaches to passenger rights is warranted.

In order to carry out this task in a satisfactory manner, it is important that ICAO starts the work in this field without delay, identifying the different perceptions, expectations and, sensitivities of users in each part of the world, characterizing them, and generating a solid base of knowledge, which will guide the work of ICAO in this area, based on a deeper understanding of user needs. ICAO could examine the reality and create a knowledge base that enables and fosters the development, where appropriate, of guidance material on passenger rights.

d) ACTION

The Assembly is invited to:

a) call upon ICAO to take actions to facilitate an exchange of views and good practices on the application of ICAO Core Principles on Consumer Protection and of a monitoring system as presented in paragraph 2;

b) call upon ICAO to ensure that in conducting these tasks it recognises the evolution in the perception of passengers' expectations, their rights and the quality of service offered as presented in paragraph 3; and

c) to this end invite ICAO to deal with the abovementioned matters by using an existing ICAO body.

- END -

International Civil Aviation Organization

A40-XXXX-WP/xxxx
//2019

WORKING PAPER

ASSEMBLY — 40TH SESSION
EXECUTIVE COMMITTEE

Agenda Item XX:

PERSPECTIVES ON SUSTAINABLE AVIATION

(Presented by Finland on behalf of the European Union and its Member States[28] and the other Member States of the European Civil Aviation Conference[29])

EXECUTIVE SUMMARY

Underlining the importance of mitigating the climate impacts of international aviation, Europe strongly supports the ICAO basket of measures including CORSIA and acknowledges achievements already made.
It is crucial that all States and regions effectively implement CORSIA and participate in CORSIA offsetting requirements from the pilot phase to achieve ICAO's goal of Carbon Neutral Growth from 2020 onwards, also recalling the essential role of sustainable aviation fuels in that endeavour.

Action: The Assembly is invited to:
a) support the development of a broad range of policy measures under the ICAO basket of measures to support States with practical ways of effectively addressing climate impacts from the aviation sector;
b) request Member States to build on the work of ICAO by taking action to ensure that CORSIA is implemented comprehensively, early and worldwide, putting in place the necessary national policies and regulatory frameworks be established for the compliance and enforcement of CORSIA;
c) note the remaining challenges in turning sustainable aviation fuels into an operational reality, and invite ICAO and States to develop more ambitious measures to support their uptake in line with the 2050 ICAO Vision for Sustainable Aviation Fuels;
d) support work on a long-term emissions reduction goal for international aviation, in the light of the recent reports and developments for example within UNGA, IPCC, UNFCCC, IMO building on the commitments from the industry and the technical possibilities; and
e) note Europe's commitment to building capacity for environmental protection with a view to ICAO's 'No Country Left Behind' initiative.

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28 Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

29 Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey and Ukraine.

Strategic Objectives:	This working paper relates to the following Strategic Objective of Environmental Protection.
Financial implications:	The activities referred to in this paper will be undertaken subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.
References:	Chicago Convention and its Annex 16 Resolutions A39-2 and A39-3

1. CNG2020 AND THE BASKET OF MEASURES

1.1 The adoption of the CORSIA SARPs and its agreed Implementation Elements demonstrated a shared commitment to implement the 2016 agreement by the ICAO Assembly to stabilise aviation emissions at 2020 levels. This is an initial step towards reaching the objectives of the Paris Agreement, in particular to limit the global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5°C.

1.2 The latest ICAO CAEP Environmental Trends Assessment shows an increase in fuel burn and CO_2 emissions by a factor of 2.2 to 3.1 between 2015 and 2045. In the most likely scenario, the number of flights departing from airports in the ECAC region is expected to grow from 5.2 million in 2016 to 8.4 million in 2040, whilst fuel consumption is expected to increase from 46.2 Mt in 2016 to 67.5 Mt in 2040. Despite on-going fuel efficiency improvements, emissions are forecast to increase whilst the special report of the Intergovernmental Panel on Climate Change (IPCC) on meeting the 1.5°C temperature goal[30] warned that without significant reductions in global emissions, we might reach 1.5°C of global warming as early as 2030. This reaffirms the urgent need to achieve the goal of Carbon Neutral Growth from 2020 onwards (CNG2020), and to strive for further emissions reductions.

1.3 The States presenting this paper strongly support the ICAO basket of measures including CORSIA as the key means to achieve ICAO's CNG2020 target. These States and the aviation sector have taken action on all elements of the basket of measures, as reported in the 2019 European Aviation and Environment Report (EAER)[31] and in action plans submitted to ICAO by ECAC Member States. According to the EAER, a 24% decrease in fuel consumption per passenger kilometre was achieved between 2005 and 2017 and average fuel burn per passenger kilometre is expected to further decrease by 12-22% by 2040.

1.4 Like many other states around the globe, ECAC Member States have also started implementing the CORSIA SARPs, which illustrates their commitment to the scheme and to a robust and legally-binding implementation in their jurisdictions. All 44 ECAC Member States have volunteered to participate, right from the beginning, in the voluntary pilot phase of CORSIA, as expressed in the 2016 Bratislava Declaration, and are fully engaged and mutually supportive in CORSIA implementation.

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30 https://www.ipcc.ch/sr15/

31 The core aim of the report is to provide an objective, clear and accurate source of information on the environmental performance of the aviation sector at the European level. https://www.easa.europa.eu/eaer/

1.5 The States presenting this paper support the operationalization of CORSIA with robust rules and governance to be adopted and implemented, backed by the broadest possible participation and domestic implementation. It is crucial that all States and operators commit to CNG2020 and to implement CORSIA effectively. A high level of participation is key to ensure a positive climate impact through a global scheme. The CORSIA-eligible emission units, including mechanisms to secure appropriate supply and additionality, and the sustainability framework for eligible fuels will be of crucial importance for CORSIA's effectiveness and credibility. To the same end, CORSIA shall take into account developments under the Paris Agreement and operationalize the prevention of double counting.

2. SUSTAINABLE AVIATION FUELS (SAF)

2.1 Given the sector's expected growth and its limited energy alternatives in the short term, as already recognized by ICAO, the use of SAF, possibly completed with the emergence of fully electric and hybrid electric aircraft, has the potential to be one of the key measures to significantly reduce aviation's climate footprint, while bringing additional socio-economic and other environmental benefits. The States presenting this paper acknowledge the leading role of ICAO in SAF promotion and the significant progress achieved so far, especially in developing global standards for its use and demonstrating its safety and technical feasibility. They also welcome the progress made at the Second ICAO Conference on Aviation and Alternative Fuels (CAAF2) and the first ICAO Stocktaking Seminar and encourage the ICAO Assembly to take steps towards updating the 2050 ICAO Vision to include an aspirational quantified proportion of CAF to be substituted with SAF by 2050, as agreed by CAAF2.

2.2 At the same time, there are still significant remaining challenges in turning SAF into an operational reality for aviation, among them: (i) the price of SAF relative to fossil-based kerosene; (ii) existing policy incentives driving primarily investments for the use of bioenergy in ground transport and resulting in low availability of SAF; (iii) the use of sustainable aviation fuels does not necessarily reduce aviation carbon emissions unless accompanied by robust sustainability certification.

2.3 The 2050 ICAO Vision for Sustainable Aviation Fuels calls on States, industry and stakeholders, in particular airlines, to proactively and concertedly aim for a significant proportion of conventional aviation fuels to be substituted with SAF by 2050. Whereas current policies have resulted in only minimal volumes being available in the short term, ICAO and its Member States should consider taking stronger policy actions to incentivize investments and contribute to the development of a cost-competitive SAF market, including synthetic fuels produced from additional renewable electrical energy. Balanced supply objectives established through dialogue between regulators and stakeholders can be an effective means for States to promote higher SAF production and use.

2.4 ICAO has a unique role to play in the global harmonization of sustainability requirements for SAF in aviation by establishing a robust set of criteria including key environmental principles and also ensuring that the use of SAF contributes to wider UN Sustainable Development Goals.

3. LONG TERM GOAL

3.1 Achievement of the global commitment to CNG2020 by international aviation remains an essential contribution to the long-term temperature goal of the Paris Agreement. Since CNG2020 was adopted, ICAO has made substantial progress in implementing measures to meet this goal. ICAO Member States should be proud of these achievements, which illustrate that effective action can be achieved when States act together on a global basis to address global challenges. For international aviation to keep up with other sectors' levels of ambition in efforts to mitigate climate change, a longer-term emissions reduction trajectory for the global aviation sector needs to be considered. By providing certainty in the long term, this will incentivise investment in innovation in technologies within the sector.

3.2 The 2015 Paris Agreement sets clear goals to limit the global temperature increase, encompassing all anthropogenic greenhouse gas emissions. Achieving these goals requires peaking global emissions as soon as possible and reaching a net zero global economy in the second half of the century.

3.3 As mentioned in paragraph 1.2, the IPCC Special Report on meeting the 1.5°C temperature goal highlights not only the unprecedented scale of the action that is needed, but also the urgency with which it is required. It also illustrates that CO2 emissions reduction pathways that could meet the temperature goal of 1.5°C would involve global CO2 emissions reductions across all human activities by about 45% from 2010 levels by 2030 of and reach net zero by 2050.

3.4 While not covered by most States' Nationally Determined Contributions (NDCs) under the Paris Agreement, international shipping, through the International Maritime Organisation (IMO), has defined an emissions reduction pathway whereby its emissions should peak "as soon as possible" and be reduced by "at least 50% by 2050 compared to 2008". For over a decade now, the international aviation industry has been committed to a very similar long-term goal that aims to reduce its net emissions by 50% by 2050 compared to 2005 levels.

3.5 The States presenting this paper underline the importance of addressing the impact of international aviation on climate change with an ambitious long-term perspective and call for ICAO to agree on a long-term goal for international aviation, consistent with the **1.5°C** temperature goal~~s~~ of the Paris Agreement.

3.6 As with CNG2020, any long-term goal would need to take into account the principle of special circumstances and respective capabilities (Resolution A39-2, para. 6) by not placing specific obligations on individual States.

3.7 CAEP has been given a mandate on this topic pursuant to Resolution A39-2 Paragraph 9, in which the 39th Assembly requested the Council to explore the feasibility of a long-term global aspirational goal for international aviation. CAEP continues this work under the proposed CAEP/12 work programme.

3.8 To facilitate the above request for a long-term goal for international aviation, the States presenting this paper believe that an evaluation of options on how international aviation can fit into the global carbon reduction pathways described above is now necessary. This important information will allow ICAO to make an informed decision as soon as possible on a long-term goal to reduce CO_2 emissions from international aviation, building on the commitments from the industry and on the technical possibilities.

4. **CAPACITY BULDING**

4.1 In 2018, ECAC Member States participated in the first phase of the ICAO ACT-CORSIA buddy partnership programme. This initiative, together with other projects funded by the European Union (EU) provided assistance in the form of expert training and necessary follow-up support to recipient States, including in Africa, the Caribbean, and the ASEAN Member States[32]. This covers the ability to implement CORSIA from the start of its voluntary phase in 2021, or at the earliest possible time, and the promotion of the rest of the basket of measures, including the preparation or update to their State Action Plans that tracks, manages and reports on their aviation emissions.

4.2 The projects, deployed in full cooperation with ICAO, will promote the most effective implementation of ICAO standards and best practises across these regions. They illustrate the wider European commitment encompassed in the Bratislava Declaration signed in 2016 by all ECAC Member States, and in the Declaration of Intent signed in 2016 between the EU and ICAO in the margin of the 39th General Assembly.

– END –

[32] Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.