**DIRECTORS GENERAL OF CIVIL AVIATION-MIDDLE EAST REGION
FIFTH MEETING (DGCA-MID/5)**

(Kuwait, 4-6 November 2019)

Agenda Item 7: Environmental Protection

INTERNATIONAL CIVIL AVIATION AND THE ENVIRONMENT

(Presented by the Secretariat)

SUMMARY

This paper provides information on the work of the Organization on environmental protection during the 2016-2019 triennium and the outcome of the 40th Session of the ICAO Assembly.

1. INTRODUCTION

1.1 The work of ICAO on environmental protection focuses on meeting three major environmental goals that aim to:

- limit or reduce the number of people affected by significant aircraft noise;
- limit or reduce the impact of aviation emissions on local air quality; and
- limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

1.2 A consolidated statement of continuing policies and practices related to environmental protection is revised and updated by the Council every three years for adoption by the ICAO Assembly. The present version, Assembly Resolutions A40-17, A40-18 and A40-19,[1] were adopted in October 2019.

1.3 This information paper summarizes the work of the Organization on environmental protection during the 2016-2019 triennium and the outcome of the 40th Session of the ICAO Assembly.

[1] These three resolutions supersede Assembly Resolutions A39-1, A39-2 and A39-3.

2. ICAO GLOBAL ENVIRONMENTAL TRENDS

2.1 In response to a request by the 39th Session of the Assembly, an updated set of global environmental trends, including noise, local air quality, and emissions that affect the global climate was presented during the 40th Session of the Assembly (A40-WP/54). The updated trends show lower long-term projections for fuel burn, noise, and NOx than those presented at A39 (see A39-WP/55) and this can be attributed to a combination of aircraft with better technology entering the fleet, as well as a reduction in the forecasted long-term traffic demand. Some highlights of the updated environmental trends are listed below:

- International aviation consumed approximately 160 megatons (Mt) of fuel in 2015. By 2045, compared with an anticipated increase of 3.3 times growth in international air traffic (expressed in revenue tonne kilometres), fuel consumption is projected to increase by 2.2 to 3.1 times compared to 2015, depending on the technology and Air Traffic Management (ATM) scenario.

- In 2015, landing and take-off (LTO) NOx emissions were approximately 0.18 Mt. In 2045, they are projected to range from 0.44 to 0.80 Mt depending on the technology and ATM scenario, which represents a growth of between 2.4 and 4.4 times over the period and can be compared with the forecasted 3.3 times growth in international air traffic.

- In 2015, the total area exposed to yearly average day-night noise levels (DNL) above 55 dB was 14,400 square-kilometres, and its growth by 2045 ranges from 1.0 to 2.2 times compared to 2015, depending on the technology scenario. The total population inside this 55 dB DNL area was approximately 30 million people in 2015. As with previous trends results on noise, a decoupling of growth in yearly average DNL from air traffic growth can be observed. Of note is that under an advanced aircraft technology scenario, from about 2030, the total yearly average DNL may no longer increase with an increase in air traffic. A number of ambitious actions would need to be carried out on the part of Member States for that scenario to be realized.

3. BASKET OF CO2 MITIGATION MEASURES

3.1 The ICAO basket of CO_2 mitigation measures includes aircraft technology and Standards, operational improvements, sustainable aviation fuels and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), in order to achieve global aspirational goals for international aviation of improving fuel efficiency by two per cent per year and keeping its CO_2 emissions from 2020 at the same level (carbon neutral growth from 2020).

3.2 Technology and Standards

3.2.1 In March 2017, the new Aeroplane CO_2 emissions Standard was adopted by the ICAO Council as a new Volume III to Annex 16, which will apply to new aeroplane type designs from 2020, and to aeroplane type designs already in-production in 2023. Thus, if an in-production aeroplane design is changed at a time beyond 2023, the aeroplane would have to comply with the new CO_2 emissions Standard. In 2028, there is a production cut-off, meaning that in-production aeroplanes that do not meet the Standard from 2028 can no longer be produced, unless the designs are modified to meet the Standard.

3.2.2 The likelihood of electric aircraft entering service has increased over the past ten years, including all-electric, hybrid-electric, partially turboelectric, and turboelectric aircraft. Research is on-going in this area and ICAO will continue to monitor technologies and update relevant Standards and Recommended Practices (SARPs) as appropriate.

3.3 Operational Improvements

3.3.1 During the triennium, an analysis was undertaken to estimate and inform the global aviation community on the CO_2 reduction benefits from the implementation of the Aviation System Block Upgrades (ASBUs) Strategy – Block 0 and Block 1 modules. The analysis shows that current and planned implementation of the B0/B1 ASBU elements will provide a total annual global fuel saving in 2025 of between 167 to 307 kg per flight, which corresponds to a reduction of 26.2 Mt of CO_2 to 48.2 Mt of CO_2, or savings of USD 5 to 9.2 billion.

3.4 Sustainable Aviation Fuels

3.4.1 The second ICAO Conference on Aviation Alternative Fuels (CAAF/2) was held in October 2017. CAAF/2 adopted recommendations and subsequently a declaration was approved for further work by ICAO, Member States and other stakeholders. As part of the declaration, the Conference endorsed the 2050 ICAO Vision for Sustainable Aviation Fuels as a living inspirational path and called on States, industry and other stakeholders, for a significant proportion of aviation fuels to be substituted with sustainable aviation fuels by 2050.

3.4.2 The first ICAO stocktaking seminar was held from 30 April to 1 May 2019 at ICAO Headquarters to facilitate the exchange of information among States and relevant stakeholders. The seminar established important building blocks for the quantification of the 2050 ICAO Vision, leading to CAAF/3. The Second ICAO Stocktaking Seminar toward the 2050 Vision for Sustainable Aviation Fuels will take place at ICAO Headquarters from 28 to 29 April 2020.

3.5 CORSIA

3.5.1 Through Resolution A39-3, the ICAO Assembly adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as the first global market-based measure (MBM) scheme for any industry sector. In response to a request by the Assembly, in 2018, the Council adopted the CORSIA-related SARPs and guidance (also referred to as the "CORSIA package") that comprise three distinct, but interrelated components:

- Annex 16 – Environmental Protection, Volume IV – *Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*: provides the required actions by States and aeroplane operators to implement CORSIA;

- Environmental Technical Manual (Doc 9501), Volume IV – *Procedures for demonstrating compliance with the CORSIA: provides guidance on the process to implement CORSIA*; and

- Five CORSIA Implementation Elements, which are reflected in 14 ICAO documents and are to be approved by the Council prior to their publication. These documents are directly referenced in Annex 16, Volume IV and are essential for the implementation of CORSIA.

3.5.2 Annex 16, Volume IV became applicable as of 1 January 2019. The First Edition of the Environmental Technical Manual (Doc 9501), Volume IV was issued under the authority of the ICAO Secretary General in August 2018, to make the most recent information available to administrating authorities, aeroplane operators, verification bodies and other interested parties, aiming at achieving the highest degree of harmonization possible.

3.6 Work on the CORSIA implementation elements is on-going, specifically:

- ICAO has developed and updated the CORSIA CO_2 Estimation and Reporting Tool (CERT) which aims to simplify the estimation and reporting of CO_2 emissions from international flights for those operators with low levels of activity to fulfil their monitoring and reporting requirements under CORSIA.

- The Council has been considering recommendations by the Committee on Aviation Environmental Protection (CAEP) on CORSIA eligible fuels, in response to the request of the Assembly to provide a methodology to reduce an operator's offsetting requirement through the use of such fuels under CORSIA (Resolution A39-3, paragraph 6). The Council agreed on two themes of sustainability criteria for CORSIA eligible fuels to be applied during the pilot phase of CORSIA by 2023, and requested CAEP to develop further proposals on strengthened sustainability criteria by the end of 2023.

- In 2019, the Council established the Technical Advisory Body (TAB) with the objective of making recommendations to the Council on eligible emissions units for use under CORSIA. The Council also approved the Emissions Units Criteria (EUC) to be used by the TAB in undertaking its tasks to assess emissions units programmes (and potentially project types) against the EUC.

- The CORSIA Central Registry (CCR) is currently in its development phase, and ICAO aims to have the CCR operationalized in 2020, which is aligned with the timing when States are to submit 2019 CO_2 emissions data to ICAO for the first time.

3.6.1 During the 2016-2019 triennium, priority has been given to the implementation of the CORSIA MRV system, in light of the SARPs' applicability to undertake CO_2 emissions monitoring from 1 January 2019. In this regard, ICAO organized CORSIA regional seminars and workshops in 2017, 2018 and 2019 to build capacity in States for the development of their MRV systems, in light of the progress of work on the CORSIA-related SARPs and guidance.

3.6.2 The Organization has also put in place the ACT-CORSIA (Assistance, Capacity building and Training for the CORSIA) programme, which harmonizes and brings together all relevant actions and promote coherence to capacity building efforts related to CORSIA implementation. Under this programme buddy partnerships have been established, involving 15 donor States and 98 recipient States.

4. STATES' ACTION PLANS AND ASSISTANCE

3.7 ICAO has continued to work directly with Member States to support the development and update of their Action Plans. State Action Plans are a voluntary planning and reporting tool for States to communicate information on their selected CO_2 emissions mitigation measures from the ICAO basket of measures. The level of detail submitted within a State Action Plan will ultimately enable ICAO to compile global progress towards meeting the goals set by Assembly Resolution A37-19, and reaffirmed

by A38-18, A39-2 and A40-18. As of June 2019, 116 Member States, representing more than 93 per cent of international aviation Revenue Tonne Kilometres (RTK), have voluntarily submitted their action plans to ICAO.

3.8 In 2017, seven ICAO Seminars on State Action Plans were organized. In early 2019, ICAO also updated ICAO Doc 9988, *Guidance on the Development of State Action Plans on CO_2 Emissions Reduction Activities*, to reflect the key decisions related to CORSIA; and integrate lessons learned from the projects implemented by ICAO (see below). The updated Doc 9988 should also facilitate the improved identification of assistance needs by ICAO Member States and it should allow States to better quantify the information included in States' Action Plans.

3.9 Assembly Resolution A39-2 encouraged States that have already submitted action plans to share the information therein, and to build partnerships with other States that have not yet prepared action plans. ICAO has been facilitating the establishment of such ICAO State Action Plan buddy partnerships. To date, seven such partnerships have been established.

3.10 Other assistance activities included the successful completion of two projects: one in cooperation with the EU, and one in cooperation with UNDP/GEF:

- The ICAO-EU project supported 14 States in Africa and the Caribbean with the development and implementation of States' Action Plans, and with the establishment of CO_2 emissions monitoring systems for international aviation. All 14 selected States developed and submitted fully quantified Action Plans, and established National Action Plan Teams with relevant stakeholders from the aviation sector to oversee their implementation. An Aviation Environmental System (AES) was installed in each State as a tool to monitor CO_2 emissions from international aviation.

- The ICAO-UNDP/GEF project supported States in implementing emission reduction measures, in particular developing States and Small Island Developing States (SIDS). The project included the implementation of two solar-at-gate pilot projects at two international airports in Jamaica, which could now serve as a model for other airports to follow as an emission mitigation strategy.

5. MAIN RESULTS OF THE 40TH ICAO ASSEMBLY

5.1 The 40th ICAO Assembly adopted three Resolutions on environmental protection: A40-17 on general provisions, noise and local air quality; A40-18 on international aviation and climate change; and Assembly Resolution A40-19 on Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). In brief, the Assembly:

a) endorsed the **ICAO global environmental trends** as the basis for decision-making on environmental matters, and requested that the next Assembly be provided with further updated trends;

b) recognized the importance for ICAO to closely follow-up innovative environmentally-driven technologies, and others that may impact the environment, including new energy sources for aviation, assessing their impact on noise and emissions, and **maintaining and developing relevant ICAO environmental SARPs and guidance**, where necessary

c) invited the Council to request CAEP to continue its on-going work on the development of **supersonic aircraft standards, prioritizing the exploratory study**;

d) requested the Council to task CAEP to work on **noise issues related to Remotely Piloted Aircraft System (RPAS) operations**, by inviting States to share their experiences, and consolidating these experiences as a potential best practice guidance for States;

e) recognized the **progress achieved in each of the elements of the ICAO basket of measures** to reduce CO_2 emissions from international aviation;

f) encouraged ICAO to continue to **cooperate with other UN bodies and international organizations**, ensuring ICAO's leadership in all matters related to international civil aviation;

g) acknowledged the progress achieved under the **State Action Plans initiative**, and agreed that ICAO should continue to **enhance capacity-building and assistance activities**, including the organization of seminars and training, provision of guidance and tools, facilitating access to financial resources and experts, establishment of additional feasibility studies, more partnerships among States including through the State Action Plan Buddy Programme;

h) agreed that Member States should support work on the **2050 ICAO Vision for Sustainable Aviation Fuels**, including the organization of annual ICAO stocktaking seminars. The Committee also highlighted the need for ICAO to provide a forum to exchange information and facilitate better understanding of lower carbon aviation fuel;

i) a clear majority of States agreed that additional clarity should be given to the Council to prioritize the work on the **feasibility of a long-term global aspirational goal** for international aviation CO_2 emissions reduction, and present options, followed by a roadmap for implementation, for consideration by the 41st Session of the ICAO Assembly;

j) noted the successful development of CORSIA-related SARPs and guidance, as well as the progress in developing various CORSIA Implementation Elements. It also recognized that while CORSIA implementation is on track, there is need for further work, such as CORSIA eligible fuels and CORSIA eligible emissions units. In this regard, the Assembly was informed of the on-going work by the Technical Advisory Body (TAB) in assessing emissions units programmes against the approved criteria, and its first recommendations on CORSIA eligible emission units are expected for the consideration by the Council in March 2020;

k) acknowledged the importance of Member States and their National Accreditation Bodies (NABs) and ICAO, working together to increase the availability of accredited verification bodies, for access by aeroplane operators. In this regard, the Assembly recognized that the ICAO Secretariat provided the CORSIA verification training courses to facilitate accreditation of verification bodies, and was also working with the International Accreditation Forum (IAF) to facilitate accreditation activities by NABs;

l) noted that 81 States had announced their voluntary participation in CORSIA from its outset, which had increased from 65 States since the last Assembly in 2016, recognizing the importance and benefits of capacity-building and assistance activities to enable more States to join; and

m) noted the successful implementation of the ICAO Assistance, Capacity-building and Training for CORSIA (ACT-CORSIA) programme, in particular the establishment of CORSIA Buddy Partnerships among States. It emphasized the importance of a coordinated approach to ICAO training, and support for the continuation of the programme.

6. NEXT STEPS ON LONG-TERM GLOBAL ASPIRATIONAL GOAL

6.1 In response to the 40th Session of the ICAO Assembly's request above, a clear plan is needed to prioritize the work on the feasibility of a long-term global aspirational goal for international aviation CO_2 emissions reduction, and present options, followed by a roadmap for implementation, for consideration by the 41st Session of the ICAO Assembly. This issue will be considered by the Council at its 218th Session in November 2019. Following the discussion and any guidance from the Council, further discussion will be held at the CAEP Steering Group meeting to be held from 2 to 6 December 2019, and concrete actions to implement the Resolutions A40-17, A40-18, and A40-19 will be proposed at the 219th Session of the Council.

— END —