WORKING PAPER

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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ASSEMBLY – 35TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 15: Environmental protection

RECOMMENDATION FOR TACKLING THE GROWING CONTRIBUTION OF AIRCRAFT ENGINE EMISSIONS TO CLIMATE CHANGE

(Presented by 41 Contracting States[2], Members of the European Civil Aviation Conference)

SUMMARY

This paper calls attention to the growing concerns about the aviation contribution to climate change and to the consequent need to limit or reduce the global environmental impact of engine emissions, so as to facilitate the sustainable growth in aviation.

Action by the Assembly: The Assembly is invited to reflect in its consolidated statement the recommendations in paragraph 14.

BACKGROUND

1. The Committee on Aviation Environmental Protection (CAEP) has carried out a great deal of work on emissions from aircraft. One action by ICAO (1996) resulted in the preparation of the Intergovernmental Panel on Climate Change (IPCC) special report "Aviation and the Global Atmosphere". The report recognised that the subsonic aircraft produced today are about 70% more fuel efficient per passenger kilometre than 40 years ago.

2. CAEP has:

- considered how technical innovation can help, through improved engine and airframe design, to achieve reduction in emissions;

[1] English and French versions provided by ECAC.

[2] Albania, Armenia, Austria*, Azerbaijan, Belgium*, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus*, Czech Republic*, Denmark*, Estonia*, Finland*, France*, Germany*, Greece*, Hungary*, Iceland, Ireland*, Italy*, Latvia*, Lithuania*, Luxembourg*, Malta*, Moldova, Monaco, Netherlands*, Norway, Poland*, Portugal*, Romania, Serbia and Montenegro, Slovakia*, Slovenia*, Spain*, Sweden*, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom*.

* Member States of the European Union are indicated with an asterisk in the above list.

- considered the appropriateness of the current and alternative regulatory frameworks for responding to the atmospheric effects caused by engine emissions;

- begun work on a certification methodology for emissions in climb and cruise conditions to complement existing airport related landing and take off standards;

- examined Low-NOx technology and long-term emissions technology goals.

3. The IPCC report[1] uses the term “radiative forcing” to describe the greenhouse effect. Taking 1992 as a reference year, the share of radiative forcing caused by aviation amounted to 3.5% of the total due to all anthropogenic activities. In the reference scenario, the radiative forcing caused by aviation is projected to grow over the period 1992 –2050 by a factor of 3.8 and to amount in 2050 to 5% of all anthropogenic activities. Greenhouse gas emissions from international air transport reported by Annex 1 Parties to the United Nations Framework Convention on Climate Change (UNFCCC) increased by 48% between 1990 and 2000.

4. Aircraft perturb the atmosphere by changing background levels of trace gases and particles and by forming condensation trails (contrails). Aircraft emissions include greenhouse gases such as CO2 and H2O that trap terrestrial radiation and chemically active gases that alter natural greenhouse gases, such as O3 and CH4. Particles may directly interact with the Earth's radiation balance or influence the formation and radiative properties of clouds. There is a causal chain whereby the direct emissions of aircraft accumulate in the atmosphere, change the chemistry and the microphysics, and alter radiatively active substances in the atmosphere, which change radiative forcing and hence the climate.

5. Latest forecasts for the growth of traffic in the aviation sector, discussed at CAEP/6, project annual growth of 4.1% through to 2020, with an additional 12,667 aircraft being added to the world fleet between 2002 and 2020 to accommodate this growth. Although improvements in aircraft and engine technology and the efficiency of the air traffic system will bring environmental benefits, they will not offset the effects of the increased emissions resulting from the projected growth in aviation, as described in the IPCC report.

6. In January 2001, the IPCC Third Assessment Report, reviewing all the scientific evidence on climate change from all sources concluded that "an increasing body of observations gives a collective picture of a warming world and other changes in the climate system." It noted in particular that:

- the global average surface temperature had increased over the 20th century by about 0.6 degrees C;

- temperatures appeared to have risen during the past four decades in the lowest 8 km of the atmosphere;

- the extent of snow and ice had decreased;

- the global average sea level has risen and ocean heat content has increased.

[1] Intergovernmental Panel on Climate Change 1999, Aviation and the Global Atmosphere.

7. In a report commissioned by the United Nations Environment Programme's (UNEP) Finance Initiatives ("Climate Change and the Financial Services Industry") it was argued that "As the potential economic consequences of climate change come into focus, company directors, executives, pension fund trustees and institutional investors will be increasingly compelled to respond. Financial institutions will need to estimate the full extent of consolidated financial liabilities - throughout all sectors of the economy and in all regions of the world - to fully inform their investment banking, asset management, equity research and portfolio risk management activities".

8. The World Meteorological Organisation (WMO) presented a paper to CAEP[1], which suggested that climate change may induce weather situations such as high surface temperatures, strong winds and convective weather, which would influence the operational conditions for aviation in a negative way.

POLICY REQUIREMENTS FOR THE FUTURE

9. All 41 ECAC States have obligations under UNFCCC and 39 of them have ratified the Kyoto Protocol. These 41 States, representing some 18% to 20% of the volume of the world air transport, have the obligation to limit or reduce greenhouse gases in aviation.

10. In response to increasing concerns about aviation's contribution to climate change, ICAO Assembly Resolution A33-7 (September/October 2001) requested the Council to study policy options to limit or reduce the environmental impact of engine emissions and to provide proposals to the Conference of the Parties to the UNFCCC.

11. The Council has responded by agreeing a template, with guidance, for voluntary agreements between government and industry, and identifying two broad avenues to pursue emissions trading - a voluntary approach, and an approach consistent with UNFCCC processes. There has also been a great deal of work on the technical and legal aspects of emissions related levies, which did not result in agreement on further guidance.

12. The Kyoto Protocol calls on Parties to pursue the limitation or reduction of greenhouse gases emissions from aviation working through ICAO. But it has been difficult to secure agreement to concerted meaningful action. This increases the pressure on States with specific emissions reduction commitments to take action that is not globally harmonised.

13. We need to address these impacts - failure to act now will result in increased pressure for stringent demand management or a freeze on infrastructure development, or both. Further objections to the development of airport capacity will have a negative impact on the industry. Action is being taken in other sectors - there is a risk aviation will be viewed as lagging behind and measures might be taken without adequate consultation with or input from the aviation community.

ACTION BY THE ASSEMBLY

14. ECAC Member States invite the 35th Session of the ICAO Assembly to:

a) recognise that the climate change impact of aviation is growing over time;

b) promote policies to assist those contracting States that are parties to UNFCCC to take precautionary measures to combat climate change;

[1] CAEP/6-IP/31 - Operational impact of climate change on aviation.

c) recognise that States have relevant legal obligations, existing agreements, current laws and established policies which may influence the action they seek and might need to take to limit or reduce emissions, and therefore join ECAC Member States in not supporting the proposals for the Assembly Resolution in A35-WP/77, with regard to market-based measures as discussed in the ICAO Council[1], namely that the text of its Appendix I (reproduced in the attachment to this paper) be amended so that the possibilities to implement market-based measures to reduce green house gases will be restricted and, particularly, that States are urged not to impose CO2 emissions charges until ICAO has conducted the necessary legal, economic and technical studies.

d) request the Council to continue support activities aimed at further improvements to existing technology and operations and, if possible, identify new technology and operations, which will reduce emissions and facilitate the sustainable growth in aviation.

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[1] cf. C-DEC 172/19, paras 5 and 6.

APPENDIX A

EXTRACT FROM ASSEMBLY RESOLUTION A33-7, APPENDIX I

The Assembly

1. *Requests* the Council to continue to develop guidance for States on the application of market-based measures aimed at reducing or limiting the environmental impact of aircraft engine emissions, particularly with respect to mitigating the impact of aviation on climate change; and to develop concrete proposals and provide advice as soon as possible to the Conference of the Parties to the UNFCCC;

2. *Encourages* States and the Council, taking into account the interests of all parties concerned, to evaluate the costs and benefits of the various measures with the goal of addressing aircraft engine emissions in the most cost-effective manner and to adopt actions consistent with the framework outlined below, with States striving to take action in a consistent manner to both domestic and international aviation emissions:

a) Voluntary measures

1. *Encourages* short term action by States and other parties involved to limit or reduce international aviation emissions, in particular through voluntary measures; and

2. *Urges* the Council to facilitate actions by developing guidelines (e.g., for quantifying, monitoring and verifying emission reductions or actions) for such measures, including a template voluntary agreement, as appropriate, and to work to ensure that those taking early action would benefit from such actions and would not subsequently be penalised for so doing;

b) Emission-related levies

1. *Recognizes* the continuing validity of Council's Resolution of 9 December 1996 regarding emission-related levies;

2. *Urges* States to follow the current guidance contained therein;

3. U*rges* States to refrain from unilateral action to introduce emission-related levies inconsistent with the current guidance; and

4. *Urges* the Council to carry out further studies and develop further guidance on the subject;

c) Emissions trading

1. *Endorses* the development of an open emissions trading system for international aviation; and

2. *Requests* the Council to develop as a matter of priority the guidelines for open emissions trading for international aviation focussing on establishing the structural and legal basis for aviation's participation in an open trading system, and including key elements such as reporting, monitoring, and compliance, while providing flexibility to the maximum extent possible consistent with the UNFCCC process.

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