COLLOQUIUM ON ENVIRONMENTAL ASPECTS OF AVIATION

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BACKGROUND INFORMATION PAPER

AIRCRAFT ENGINE EMISSIONS - ICAO'S EXISTING POLICIES

(Presented by the Secretariat)

SUMMARY

In recent years, the scope of ICAO's policy-making to address the environmental impact of aircraft engine emissions has been expanded to include global effects. This background information paper explains this expanded scope and then briefly describes ICAO's policies on engine certification standards, the use of operational practices and the use of market-based options, and where more detailed information can be found.

1. THE EXPANDED SCOPE OF POLICY-MAKING

1.1 In the past, ICAO focussed primarily on the ground level effects of emissions. In recent years, ICAO has recognized the need to also address the global impacts of aircraft engine emissions.

1.2 In this regard, the Kyoto Protocol (1997) to the United Nations Framework Convention on Climate Change (UNFCCC) is of particular importance. The Protocol, which has not yet entered into force, requires countries listed in Annex I to the Convention (industrialized countries) to reduce their collective emissions of six greenhouse gases, the one most relevant to aviation being carbon dioxide. International aviation emissions are currently excluded from the targets. Instead, Article 2, paragraph 2 of the Kyoto Protocol states that the responsibility for limiting or reducing greenhouse gas emissions from aviation bunker fuels shall fall to the Annex I parties, **working through ICAO**.

1.3 In 1998, the ICAO Assembly reviewed its policy on the global impact of emissions[1]. In particular, it requested the Council of ICAO, through CAEP, to study policy options to limit or reduce the greenhouse gas emissions from civil aviation, taking into account the IPCC *Special Report on Aviation and the Global Atmosphere* and the requirements of the Kyoto Protocol, and to report to the Assembly session later this year. It also requested the Council to cooperate closely with other organizations involved in the definition of environmental problems in the upper atmosphere and in policy-making in this field, notably with the Conference of the Parties to the UNFCCC.

[1]Assembly Resolution A32-8, Appendix F (reproduced in BIP/2).

2. ENGINE CERTIFICATION STANDARDS

2.1 Aircraft are required to meet the engine certification standards adopted by the Council of ICAO. These are contained in Annex 16 — *Environmental Protection*, Volume II — *Aircraft Engine Emissions* to the Convention on International Civil Aviation. These were originally designed to respond to concerns regarding air quality in the vicinity of airports. As a consequence, they establish limits for emissions of oxides of nitrogen (NO_x), carbon monoxide, unburned hydrocarbons, for a reference landing and take-off (LTO) cycle below 915 metres of altitude (3 000 ft).[2]

2.2 While these standards are based on an aircraft's LTO cycle, they also help to limit emissions at altitude. Of particular relevance is the standard for NO_x, a precursor for ozone, which at altitude is a greenhouse gas. The standard for NO_x was first adopted in 1981, then made more stringent in 1993, when ICAO reduced the permitted levels by 20 per cent for newly certificated engines, with a production cut-off on 31 December 1999. In 1999, the Council further tightened the standard by about 16 per cent on average for engines newly certificated from 31 December 2003.

2.3 The *ICAO Engine Exhaust Emissions Data Bank* (Doc 9646), issued in 1995, contains a comprehensive database of aircraft jet engine emissions certification data. Subsequent updates of the data bank are available through the ICAO web site.[3]

3. THE USE OF OPERATIONAL PRACTICES

3.1 ICAO will shortly publish guidance material, in the form of an ICAO Circular, on operational opportunities to minimize fuel use and reduce emissions. The Circular will include information on aircraft ground level and in-flight operations, as well as ground service equipment and auxiliary power units.

3.2 ICAO has emphasized to States that early implementation of new communications, navigation, surveillance and air traffic management (CNS/ATM) systems would be an effective means of reducing fuel burn and avoiding unnecessary emissions. The results of a preliminary study of the environmental benefits associated with CNS/ATM and the methodology for their assessment are expected to be included in the next revision of the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750).

4. THE USE OF MARKET-BASED OPTIONS

4.1 Market-based options to limit or reduce emissions include environmental levies (charges or taxes), emissions trading and voluntary measures. This is a subject where policy is under development. The information presented below is limited to existing Council or Assembly policies on charges and taxes (information on the results of CAEP/5 on all market-based options will be presented under Session 8).

4.2 While ICAO has long-standing policies covering charges in general (*ICAO's Policies on Charges for Airports and Air Navigation Services*, Doc 9082/6), they do not specifically address emission-related charges. ICAO has also developed separate policy guidance to States on taxation (*ICAO's Policies on*

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[2]There are also provisions regarding smoke and vented fuel.

[3]DERA in the United Kingdom has been the focal point for maintaining this data bank and for making it available on the Internet. It is accessible through the ICAO Web site (www.icao.int), click on "Environment" and then "Publications".

Taxation in the Field of International Air Transport, Doc 8632), which recommends the reciprocal exemption from all taxes levied on fuel purchased for international flights, a policy implemented in practice in the vast majority of bilateral air services agreements, and also calls on States to reduce or eliminate taxes related to the sale or use of international air transport.

4.3 In December 1996, the ICAO Council adopted a policy statement in the form of a resolution, concerning the use of emission-related levies[4]. While the Council considered that the development of an internationally agreed environmental charge or tax that all States would be expected to impose would appear not to be practicable at that time, given the differing views of States and the significant organizational and practical implementation problems that would be likely to arise, the Council strongly recommended that environmental levies that States may introduce should be in the form of charges rather than taxes.

4.4 This Council guidance, which is interim pending further work being undertaken by CAEP, states that the funds collected should be applied, in the first instance, to mitigating the environmental impact of aircraft engine emissions. This could be done, for example, through addressing the specific damage caused by emissions, if that can be identified; or by funding scientific research on their environmental impact; or by funding research aimed at reducing their environmental impact through developments in technology and new approaches to aircraft operations.

4.5 This interim guidance also urges States considering the introduction of emission-related charges, to take into account the non-discrimination principle in Article 15 of the Chicago Convention. In addition, the charges should be related to costs, and they should not discriminate against air transport compared with other modes of transport. Furthermore, there should be no fiscal aims behind the charges.

4.6 In 1998, the Assembly requested that ICAO continue to pursue the question of emission-related levies with a view to reaching a conclusion prior to the Assembly Session this year on the guidance to be given to States[5]. It also urged States to refrain from unilateral action to introduce emission-related levies inconsistent with the current interim guidance.

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[4]Attached to State letter AN 1/17.9-97/62 dated 11 June 1997

[5]Assembly Resolution A32-8, Appendix H (reproduced in BIP/2).