Statement from the
International Civil Aviation Organization (ICAO)
to the Thirteenth Session of the UNFCCC Subsidiary Body for
Scientific and Technological Advice (SBSTA)

(Lyon, 11 – 15 September 2000)

At previous SBSTA Sessions, ICAO reported on the substantial activities underway to respond to the role identified for it under Article 2.2 of the Kyoto Protocol[1]. This provision requires Annex I Parties to pursue limitation or reduction of emissions of greenhouse gases from aviation bunker fuels, *working through ICAO*.

As previously reported, the highest body of ICAO, the ICAO Assembly, adopted a resolution in September/October 1998, calling for its subsidiary bodies to "study policy options to limit or reduce the greenhouse gas emissions from civil aviation, taking into account the findings of the IPCC *Special Report on Aviation and the Global Atmosphere* and the requirements of the Kyoto Protocol" and to report back to the next meeting of the Assembly in September/October 2001[2]. With this clear mandate, the expert group within ICAO that focuses on environment (the Committee on Aviation Environmental Protection, CAEP) had initiated actions aimed at providing the technical and economic policy basis for decisions on limiting or reducing greenhouse gases that could be taken by the Council of ICAO or at the next Assembly meeting.

Today's report will focus on the progress that has been made in each of the three emissions working groups within the CAEP process as they finalize their reports for consideration by a meeting of the CAEP Steering Group later this month, in preparation for the next full meeting of CAEP (CAEP/5, 8 - 17 January 2001, Montreal). The emissions working groups are focussed on the following areas:

- ✈ further development of technology and related worldwide standards;
- ✈ reducing fuel burn through improved operational measures; and
- ✈ analysing the potential use of market-based options.

Technology and standards

ICAO is considering to what extent technology can help, through improved engine or airframe design, to limit or reduce greenhouse gas emissions.

[1]These statements are accessible on the ICAO web site, www.icao.int under Environmental Protection.
[2]Appendix F to Resolution A32-8, *Consolidated statement of continuing ICAO policies and practices related to environmental protection* (also available on the ICAO web site).

The present ICAO Standards for emissions certification of aircraft engines (contained in Volume II of Annex 16 to the *Convention on International Civil Aviation*) 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 and smoke for a reference Landing and Take-off (LTO) cycle below 915 metres altitude. These limits are expressed in terms of mass of emissions per unit of engine thrust.

The working group is carrying out assessments of technological advances which specifically address emissions of greenhouse gases.

It is also studying alternate emissions methodologies that will encompass all phases of flight (climb and cruise emissions, as well as LTO cycle). In this connection, it is assessing the appropriateness of current and alternative regulatory frameworks taking into account cruise emission parameters, certification methodologies, standards and recommended practices for engines and/or aircraft and the necessary certification protocols and associated technical materials for incorporation into Volume II of Annex 16. In addition to considering the types of emissions already covered by Annex 16, the new methodologies will take into account fuel efficiency and productivity of the whole aircraft, which would have a direct bearing on CO_2 emissions. CAEP will also follow developments in the characterization and measurement of other emissions such as particulates that could be relevant to contrail production and additional cirrus cloud formation.

The work on methodologies is very complex, requiring close cooperation with industry and scientific experts. For CAEP/5, the group is expected to present an analysis of options and recommendations for further development.

Operational measures

ICAO is considering to what extent operational measures might help to limit or reduce the amount of fuel consumed and hence the amount of emissions of greenhouse gases produced. The group responsible for this topic is working on two key deliverables for the CAEP/5 meeting.

The first is a quantification of the environmental benefits possible with the adoption and implementation of ICAO's satellite-based CNS/ATM (communications, navigation, surveillance/air traffic management) systems. This is a coordinated effort between the Federal Aviation Administration (United States) and the European Organization for Safety of Air Navigation – EUROCONTROL (29 European States). The study methodology and an initial global assessment of the environmental benefits of CNS/ATM nears completion. This initial study quantifies the emissions reductions to be achieved both in Europe and the United States based on planned enhancements to the respective air traffic environments, and provides baseline assessments of the various ICAO regions on which to base future improvements. After CAEP/5, the next steps would be to work with ICAO's regional planning groups to help them incorporate environmental considerations into their CNS/ATM implementation plans, and to provide an assessment of those benefits.

The second is guidance material for States and the aviation community on operational opportunities to reduce aircraft emissions. The group has completed a first draft of a document that addresses ways

to reduce aircraft engine emissions in all phases of aircraft operations. The goal of the document is to offer practical information to reduce aircraft engine emissions through improvements in operational procedures and practices. The document incorporates a wide variety of inputs from airlines, airports, and air traffic service providers to give an end-to-end look at practices now in use to reduce emissions. Its coverage includes technology, maintenance, non-revenue flying, weight reduction, load factor, flight planning, airports, take-off, climb, cruise, descent and landing, infrastructure, etc. After CAEP/5, the next step would be to finalize the document and to make it generally available.

Market-based options

ICAO is also considering the use of market-based options as a potentially attractive means of limiting or reducing greenhouse gas emissions at the lowest possible cost.

The task of this working group is to "identify and evaluate the potential role of market-based options, including emission charges, fuel taxes, carbon offsets, and emissions trading regimes". The group is progressing towards its goal of developing an objective, policy-neutral report evaluating a range of market-based options to reduce or limit emissions of carbon dioxide from the aviation sector.

As was reported to SBSTA earlier[3], in order that different types of market-based options can be evaluated on a consistent basis, an initial set of common assumptions had been developed. These included two initial targets for emission reductions and two alternatives for geographic scope. On that basis, an initial set of specifications for the various market-based options had been developed, including a fuel tax, a revenue-neutral charge, an en-route emissions charge or tax, open and closed emissions trading systems, and various forms of voluntary agreement.

The group has since received the initial results from a screening analysis of the economic and environmental impacts of the specified options. Following a review of these results, the group further refined the common assumptions and the specified options.

It is planned that CAEP/5 will receive for review a detailed definition of the options, an assessment of their environmental and economic impacts, and an assessment of them in terms of administrative and legal issues and their impacts on equity and competitiveness.

Definitions of "Domestic" and "International"

ICAO has followed with interest, and has contributed to, the development of the IPCC report on *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. In so far as the report refers to emissions from aircraft, the guidance is essentially of a technical nature. As is accurately reflected in the report[4], the recommended definitions of "domestic" and "international" differ from those recommended by ICAO for statistical purposes. While there may be justifications for using different definitions than those used by the aviation community, ICAO would like to draw SBSTA's attention to the possibility that choice of definitions of "domestic" and "international" could have policy implications.

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[3]For details, see ICAO Statement to Eleventh Session of SBSTA.
[4]Page 2.61, footnote 20.

Strengthening exchange of information

ICAO emphasizes its willingness to explore ways to further strengthen the exchange of information between ICAO and SBSTA.

At its last meeting in May, the CAEP Steering Group recognized the need to respond positively to assist the UNFCCC process in addressing its data problems concerning international aviation emissions. The ICAO Secretariat is therefore exploring, in consultation with the UNFCCC Secretariat, the possibility of holding an informal meeting or workshop on improving the accuracy and quality of aviation emission inventories. Initial contacts suggest that this might take place in the first half of 2001.

Summary

ICAO is continuing to make progress in studying policy options to limit or reduce the greenhouse gas emissions from civil aviation, in preparation for the next ICAO Assembly session in September/October 2001.

An important milestone in this process will be the next full meeting of the Committee on Aviation Environmental Protection (CAEP) in January 2001. CAEP/5's report will subsequently be reviewed by the Council, which in turn will report to the ICAO Assembly.

ICAO will be pleased to provide information on the outcome of CAEP/5 and of the Colloquium on Environmental Aspects of Aviation to be held in April 2001, to SBSTA at its Fourteenth Session.