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of space technology for air navigation, through work accomplished within the framework of ICAO on questions concerning the use of space technology for air navigation purposes;

Whereas a global concept of future communications, navigation and surveillance/air traffic management (CNS/ATM) systems based on satellite technology has been endorsed by ICAO Member States and approved by the Council;

Whereas, according to the ICAO CNS/ATM systems concept, use of satellite technology will assist in overcoming inherent limitations in the existing air navigation systems and satisfy, on a global basis, international civil aviation requirements in the foreseeable future; and

Noting the result of collaboration of Contracting States in using space technology for air navigation on a broad international basis, and the need for such collaboration to continue in the future;

The Assembly:

1. *Resolves* that ICAO continue to be responsible for:
 - a) stating the position of international civil aviation on all related outer space matters; and
 - b) monitoring and coordinating the work performed by States on regional and global planning on these matters in order that the introduction of the future ICAO CNS/ATM systems takes place in an orderly and efficient manner globally and in a balanced way taking due account of safety as well as economic considerations;
2. *Requests* the Council to continue its work to determine the operational, technical, financial, managerial and legal institutional requirements for global satellite systems for civil aviation purposes, taking due account of the provisions of Resolution A27-10, Appendix J, regarding the coordination of aeronautical systems and subsystems;
3. *Urges* that Contracting States continue keeping the Organization informed regarding the programmes and the progress achieved in the exploration and use of outer space that are of interest to international civil aviation;
4. *Requests* the Secretary General to ensure that the international civil aviation positions and requirements are made known to all organizations dealing with relevant space activities and to continue to arrange for the Organ-

ization to be represented at appropriate conferences and meetings connected with or affecting the particular interests of international civil aviation in this field;

5. *Declares* that Resolution A22-20 is superseded by this resolution.

A33-7: Consolidated statement of continuing ICAO policies and practices related to environmental protection

Whereas in Resolution A32-8 the Assembly resolved to continue to adopt at each ordinary Session a consolidated statement of continuing ICAO policies and practices related to environmental protection;

Whereas Resolution A32-8 consists of an introductory text and a number of Appendices concerning specific but inter-related subjects;

Considering the need to incorporate new ICAO policies and guidance material regarding aircraft noise and to respond to other developments in this field since the 32nd Session of the Assembly, notably the concept of a “balanced approach” to noise management (Appendix C), guidance on the process and criteria to use when considering possible new local operating restrictions (Appendix E) and guidance on land-use planning and management (a new Appendix F); and

Considering the need also to reflect developments that have taken place since the 32nd Session of the Assembly in the field of aircraft engine emissions, including an improved understanding of their impact and of possible means of limiting or reducing greenhouse gases from aviation (Appendices H and I);

The Assembly:

1. *Resolves* that the Appendices attached to this Resolution and listed below constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection, up to date as these policies exist at the close of the 33rd Session of the Assembly:

Appendix A — General

Appendix B — Development of Standards, Recommended Practices and Procedures and/or guidance material relating to the quality of the environment

Appendix C — Policies and programmes based on a “balanced approach” to aircraft noise management

Appendix D — Phase-out of subsonic jet aircraft which exceed the noise levels in Volume I of Annex 16

Appendix E — Local noise-related operating restrictions at airports

Appendix F — Land-use planning and management

Appendix G — Supersonic aircraft — The problem of sonic boom

Appendix H — Environmental impact of civil aviation on the atmosphere

Appendix I — Market-based measures regarding aircraft engine emissions

2. *Requests* the Council to submit at each ordinary session of the Assembly for review a consolidated statement of continuing ICAO policies and practices related to environmental protection; and

3. *Declares* that this Resolution supersedes Resolution A32-8.

APPENDIX A

General

Whereas the preamble to the *Convention on International Civil Aviation* states that “the future development of international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world . . .” and Article 44 of that Convention states that ICAO should “develop the principles and techniques of international air navigation and . . . foster the planning and development of international air transport so as to . . . meet the needs of the peoples of the world for safe, regular, efficient and economical air transport”;

Whereas many of the adverse environmental effects of civil aviation activity can be reduced by the application of integrated measures embracing technological improvements, appropriate operating procedures, proper organization of air traffic and the appropriate use of airport planning, land-use planning and management and market-based measures;

Whereas other international organizations are becoming involved in activities relating to environmental policies affecting air transport;

Whereas in fulfilling its role, ICAO strives to achieve a balance between the benefit accruing to the world community through civil aviation and the harm caused to the environment in certain areas through the progressive advancement of civil aviation; and

Whereas ICAO envisages co-operation with other international organizations, as necessary, including possible participation in projects financed by the United Nations Environment Fund;

The Assembly:

1. *Declares* that ICAO is conscious of and will continue to take into account the adverse environmental impacts that may be related to civil aviation activity and its responsibility and that of its Contracting States to achieve maximum compatibility between the safe and orderly development of civil aviation and the quality of the environment;

2. *Requests* the Council to continue to pursue all civil aviation matters related to the environment and also maintain the initiative in developing policy guidance on these matters, and not leave such initiatives to other organizations;

3. *Invites* States to continue their active support for ICAO’s environment-related activities on all appropriate occasions;

4. *Encourages* the Council, if and when it deems this desirable to pursue co-operative arrangements with the United Nations Environment Programme for the execution of environmental projects financed by the United Nations Environment Fund; and

5. *Urges* States to refrain from unilateral environmental measures that would be harmful to the development of international civil aviation.

APPENDIX B

Development of Standards, Recommended Practices and Procedures and/or guidance material relating to the quality of the environment

Whereas the problem of aircraft noise in the vicinity of many of the world’s airports, which continues to arouse public concern and limit airport infrastructure development, requires appropriate action;

Whereas the Council has adopted Annex 16, Volume I — *Aircraft Noise*, which comprises noise certification

standards for subsonic aircraft (except STOL/VTOL) and has notified Contracting States of this action;

Whereas noise-related charges are in use at some airports and long-standing ICAO policy guidance exists on this subject (*ICAO's Policies on Charges for Airports and Air Navigation Services*, Doc 9082);

Whereas the environmental impact of aircraft engine emissions, while not fully understood, is a cause of concern;

Whereas the Council has adopted Annex 16, Volume II — *Aircraft Engine Emissions*, which comprises emissions certification standards for new aircraft engines and has notified States of this action;

Whereas the future development of aviation could increase and aggravate the problems of both aircraft noise and aircraft engine emissions unless action is taken to alleviate the situation;

Whereas the Council has established a Committee on Aviation Environmental Protection (CAEP) for the purpose of assisting in the further development of Standards, Recommended Practices and Procedures and/or guidance material on aircraft noise and aircraft engine emissions; and

Noting Resolution A33-14 (Appendix Q) on drawing the attention of aircraft manufacturers and operators to the need for future generations of aircraft to be designed so that they are capable of being operated efficiently, and with the least possible environmental disturbance, from aerodromes used for the operation of present-day jet aircraft;

The Assembly:

1. *Welcomes* the adoption by the Council in June 2001 of the new, more stringent aircraft noise standard for inclusion in Annex 16, Volume I, Chapter 4;

2. *Requests* the Council, with the assistance and cooperation of other bodies of the Organization and of other international organizations, to continue with vigour the work related to the development of Standards, Recommended Practices and Procedures and/or guidance material dealing with the impact of aviation on the environment;

3. *Requests* the Council to ensure that its Committee on Aviation Environmental Protection (CAEP) pursues its work programme in the noise and emissions fields expeditiously in order that appropriate solutions can be developed as quickly as possible;

4. *Urges* Contracting States from regions of the world that are currently not represented or under-represented in CAEP to participate in the Committee's work; and

5. *Urges* Contracting States to follow, where appropriate, the ICAO provisions developed pursuant to Clause 2 of this Appendix.

APPENDIX C

Policies and programmes based on a “balanced approach” to aircraft noise management

Whereas a goal of ICAO is to promote the highest practicable degree of consistency in international civil aviation, including environmental regulations;

Whereas the uncoordinated development of national and regional policies and programmes for the alleviation of aircraft noise could hinder the role of civil aviation in economic development;

Whereas the severity of the aircraft noise problem at many airports has given rise to measures which limit aircraft operations and has provoked vigorous opposition to the expansion of existing airports or construction of new airports;

Whereas ICAO has accepted full responsibility for pursuing a course aimed at achieving maximum compatibility between the safe, economically effective and orderly development of civil aviation and the quality of the environment, and is actively pursuing the concept of a “balanced approach” for the reduction of aircraft noise and ICAO guidance on how States might apply such an approach;

Whereas the balanced approach to noise management developed by ICAO consists of identifying the noise problem at an airport and then analysing the various measures available to reduce noise through the exploration of four principal elements, namely reduction at source, land-use planning and management, noise abatement operational procedures and operating restrictions, with the goal of addressing the noise problem in the most cost-effective manner;

Whereas the assessment of present and future impact of aviation noise is an essential tool for the development of policy by ICAO and its Contracting States;

Whereas the process for implementation and decisions between elements of the balanced approach is for Contracting States and it is ultimately the responsibility of indi-

vidual States to develop appropriate solutions to the noise problems at their airports, with due regard to ICAO rules and policies;

Recognizing that in developing ICAO guidance on application of the balanced approach to noise management, a degree of flexibility is required in order to accommodate local, national and regional differences;

Recognizing that solutions to noise problems need to be tailored to the specific characteristics of the airport concerned, which calls for an airport-by-airport approach, and that similar solutions could be applied if similar noise problems are identified at airports;

Recognizing that measures to address noise may have significant cost implications for operators and other stakeholders, particularly those from developing countries;

Recognizing that States have relevant legal obligations, existing agreements, current laws and established policies which may influence their implementation of the ICAO “balanced approach”;

Recognizing that some States may also have wider policies on noise management; and

Considering that the improvements in the noise climate achieved at many airports through the replacement of Chapter 2 compliant aircraft (aircraft which comply with the noise certification standards in Volume I, Chapter 2 of Annex 16 but which exceed the noise levels in Volume I, Chapter 3 of Annex 16) by quieter aircraft should be safeguarded by taking account of the sustainability of future growth and should not be eroded by incompatible urban encroachment around airports;

The Assembly:

1. *Calls upon* all ICAO Contracting States and international organizations to recognize the leading role of ICAO in dealing with the problems of aircraft noise;

2. *Urges* States to:

- a) adopt a balanced approach to noise management, taking full account of ICAO guidance, relevant legal obligations, existing agreements, current laws and established policies, when addressing noise problems at their international airports;
- b) institute or oversee a transparent process when considering measures to alleviate noise, including:

- 1) assessment of the noise problem at the airport concerned based on objective, measurable criteria and other relevant factors;

- 2) evaluation of the likely costs and benefits of the various measures available and, based on that evaluation, selection of measures with the goal to achieve maximum environmental benefit most cost-effectively; and

- 3) provision for dissemination of the evaluation results, for consultation with stakeholders and for dispute resolution;

3. *Encourages* States to:

- a) promote and support studies, research and technology programmes aimed at reducing noise at source or by other means;

- b) apply land-use planning and management policies to limit the encroachment of incompatible development into noise-sensitive areas and mitigation measures for areas affected by noise, consistent with Appendix F to this Resolution;

- c) apply noise abatement operational procedures, to the extent possible without affecting safety; and

- d) not apply operating restrictions as a first resort but only after consideration of the benefits to be gained from other elements of the balanced approach and in a manner which is consistent with Appendix E to this Resolution;

4. *Requests* States to:

- a) work closely together to ensure the harmonization of programmes, plans and policies to the extent possible;

- b) ensure that the application of any measures to alleviate noise are consistent with the non-discrimination principle in Article 15 of the Chicago Convention; and

- c) take into consideration the particular economic conditions of developing countries;

5. *Invites* States to keep the Council informed of their policies and programmes to alleviate the problem of aircraft noise in international civil aviation;

6. *Requests* the Council to assess continuously the evolution of the impact of aircraft noise and to develop the

necessary ICAO guidance to assist States in implementing the concept of the balanced approach to noise management, and to report back to the next regular Session of the Assembly, particularly with regard to:

- a) the principal elements of the balanced approach and the relationship between them;
- b) the analytical and methodological tools that might be needed to assess and compare the elements; and
- c) local noise-related operating restrictions at airports; and

7. *Calls upon* States to provide appropriate support for this work on ICAO guidance.

APPENDIX D

Phase-out of subsonic jet aircraft which exceed the noise levels in Volume I of Annex 16

Whereas certification standards for subsonic jet aircraft noise levels are specified in Volume I of Annex 16;

Whereas for the purpose of this Appendix, a phase-out is defined as withdrawal of a noise-based category of aircraft from international operations at all airports in one or more States;

Whereas the Committee on Aviation Environmental Protection has concluded that a general phase-out of Chapter 3 aircraft operations by all the countries which imposed a phase-out on operations of Chapter 2 aircraft is not supported on cost-benefit grounds;

Whereas some States have implemented or initiated phase-outs of aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16, or are considering so doing;

Recognizing that the noise standards in Annex 16 are not intended to introduce operating restrictions on aircraft;

Recognizing that operating restrictions on existing aircraft may increase the costs of airlines and could impose a heavy economic burden, particularly on aircraft operators which may not have the financial resources to re-equip their fleets, such as those from developing countries; and

Considering that resolution of problems due to aircraft noise must be based on the mutual recognition of the

difficulties encountered by States and a balance among their different concerns;

The Assembly:

1. *Urges* States not to introduce any phase-outs of aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16 before considering:

- a) whether the normal attrition of existing fleets of such aircraft will provide the necessary protection of noise climates around their airports;
- b) whether the necessary protection can be achieved by regulations preventing their operators from adding such aircraft to their fleets through either purchase, or lease/charter/interchange, or alternatively by incentives to accelerate fleet modernization;
- c) whether the necessary protection can be achieved through restrictions limited to airports and runways the use of which has been identified and declared by them as generating noise problems and limited to time periods when greater noise disturbance is caused; and
- d) the implications of any restrictions for other States concerned, consulting these States and giving them reasonable notice of intention;

2. *Urges* States which, despite the considerations in Resolving Clause 1 above, decide to phase out aircraft which comply with the noise certification standards in Volume I, Chapter 2 of Annex 16 but which exceed the noise levels in Volume I, Chapter 3 of Annex 16:

- a) to frame any restrictions so that Chapter 2 compliant aircraft of an individual operator which are presently operating to their territories may be withdrawn from these operations gradually over a period of not less than 7 years;
- b) not to restrict before the end of the above period the operations of any aircraft less than 25 years after the date of issue of its first individual certificate of airworthiness;
- c) not to restrict before the end of the period the operations of any presently existing wide-body aircraft or of any fitted with engines that have a by-pass ratio higher than 2 to 1; and
- d) to inform ICAO, as well as the other States concerned, of all restrictions imposed;

3. *Strongly encourages* States to continue to cooperate bilaterally, regionally and inter-regionally with a view to:

- a) alleviating the noise burden on communities around airports without imposing severe economic hardship on aircraft operators; and
- b) taking into account the problems of operators of developing countries with regard to Chapter 2 aircraft presently on their register, where they cannot be replaced before the end of the phase-out period, provided that there is proof of a purchase order or leasing contract placed for a replacement Chapter 3 compliant aircraft and the first date of delivery of the aircraft has been accepted;

4. *Urges* States not to introduce measures to phase-out aircraft which comply, through original certification or recertification, with the noise certification standards in Volume I, Chapters 3 or 4 of Annex 16;

5. *Urges* States not to impose any operating restrictions on Chapter 3 compliant aircraft, except as part of the balanced approach to noise management developed by ICAO and in accordance with Appendices C and E to this Resolution; and

6. *Urges* States to assist aircraft operators in their efforts to accelerate fleet modernization and thereby prevent obstacles and permit all States to have access to lease or purchase aircraft compliant with Chapter 3, including the provision of multilateral technical assistance where appropriate.

APPENDIX E

Local noise-related operating restrictions at airports

Whereas certification standards for subsonic jet aircraft noise are specified in Volume I of Annex 16;

Whereas for the purposes of this Appendix an operating restriction is defined as any noise-related action that limits or reduces an aircraft's access to an airport;

Whereas Appendix C to this Resolution calls for States to adopt a balanced approach to noise management when addressing noise problems at their international airports;

Whereas the scope for further reductions in noise at source is limited in that past improvements in noise reduction technology are being gradually assimilated into

the fleet but no significant breakthroughs in technology are anticipated in the foreseeable future;

Whereas at many airports, land-use planning and management and noise abatement operational procedures are already being used and other noise mitigation measures are in place, although urban encroachment continues in certain cases;

Whereas the phase-out of aircraft which comply with the noise certification standards in Volume I, Chapter 2 of Annex 16 but which exceed the noise levels in Volume I, Chapter 3 of Annex 16 (as provided for in Appendix D to this Resolution) will be fully implemented in some States by April 2002 and, assuming continued growth in aviation activity, without further action the number of people exposed to aircraft noise at some airports in those States may increase after that date;

Whereas the Council in June 1999 specifically requested the Committee on Aviation Environmental Protection to explore in a worldwide context the issue of possible operating restrictions on Chapter 3 aircraft;

Whereas there are significant regional differences in the extent to which aircraft noise is expected to be a problem over the next two decades and some States have consequently been considering placing operating restrictions on certain aircraft which comply with the noise certification standards in Volume I, Chapter 3 of Annex 16;

Whereas if operating restrictions on Chapter 3 aircraft are introduced at certain airports, this should be based on the balanced approach and relevant ICAO guidance and should be tailored to the specific requirements of the airport concerned;

Whereas these restrictions could have a significant economic impact on fleet investments of aircraft operators from States other than those in which the restrictions are imposed;

Recognizing that these restrictions go beyond the policy established in Appendix D to this Resolution and other relevant policy guidance developed by ICAO;

Recognizing that ICAO places no obligation on States to impose operating restrictions on Chapter 3 aircraft;

Recognizing that the noise standards in Annex 16 were not intended to introduce operating restrictions on aircraft and, specifically, that the newly adopted standard contained in Annex 16, Volume I, Chapter 4 is based on the understanding that it is for certification purposes only; and

Recognizing in particular that States have legal obligations, laws, existing arrangements and established policies which may govern the management of noise problems at their airports and could affect the implementation of this Appendix;

The Assembly:

1. *Urges* States to ensure, wherever possible, that any operating restrictions be adopted only where such action is supported by a prior assessment of anticipated benefits and of possible adverse impacts;

2. *Urges* States not to introduce any operating restrictions at any airport on aircraft which comply with Volume I, Chapter 3 of Annex 16 before:

- a) completing the phase-out of aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16, at the airport concerned; and
- b) fully assessing available measures to address the noise problem at the airport concerned in accordance with the balanced approach described in Appendix C;

3. *Urges* States which, despite the considerations in Resolving Clause 2 above, permit the introduction of restrictions at an airport on the operations of aircraft which comply, either through original certification or recertification, with Volume I, Chapter 3 of Annex 16:

- a) to base such restrictions on the noise performance of the aircraft, as determined by the certification procedure conducted consistent with Annex 16, Volume I;
- b) to tailor such restrictions to the noise problem of the airport concerned in accordance with the balanced approach;
- c) to limit such restrictions to those of a partial nature wherever possible, rather than the complete withdrawal of operations at an airport;
- d) to take into account possible consequences for air transport services for which there are no suitable alternatives (for example, long-haul services);
- e) to consider the special circumstances of operators from developing countries, in order to avoid undue economic hardship for such operators, by granting exemptions;

f) to introduce such restrictions gradually over time, where possible, in order to take into account the economic impact on operators of the affected aircraft;

g) to give operators a reasonable period of advance notice;

h) to take account of the economic and environmental impact on civil aviation in the near term of recent events; and

i) to inform ICAO, as well as the other States concerned, of all such restrictions imposed; and

4. *Further urges* States not to permit the introduction of any operating restrictions aimed at the withdrawal of aircraft that comply, through either original certification or recertification, with the noise standards in Volume I, Chapter 4 of Annex 16.

APPENDIX F

Land-use planning and management

Whereas land-use planning and management is one of the four principal elements of the balanced approach to noise management;

Whereas the number of people affected by aircraft noise is dependent on the way in which the use of land surrounding an airport is planned and managed, and in particular the extent to which residential development and other noise-sensitive activities are controlled;

Whereas activity may increase significantly at most airports and there is a risk that future growth may be constrained by inappropriate land-use near airports;

Whereas the phase-out of subsonic jet aircraft which comply with the noise certification standards in Volume I, Chapter 2 of Annex 16 but which exceed the noise levels in Volume I, Chapter 3 of Annex 16 has succeeded at many airports in reducing the size of the noise contours depicting the areas where people are exposed to unacceptable noise levels as well as in reducing the total number of people exposed to noise;

Considering it essential that these improvements should be preserved to the greatest extent practicable for the benefit of local communities;

Whereas it is also expected that the newly adopted standard contained in Annex 16, Volume I, Chapter 4 will

increase the opportunities for operators to replace aircraft in their fleets by quieter aircraft;

Recognizing that while land-use management includes planning activities that may primarily be the responsibility of local authorities, it nevertheless affects airport capacity, which in turn has implications for civil aviation; and

Whereas guidance material on appropriate land-use planning and noise mitigation measures is included in the *Airport Planning Manual* (Doc 9184), Part 2 — *Land Use and Environmental Control*, which is currently being updated and expanded;

The Assembly:

1. *Urges* States that have phased out operations of Chapter 2 aircraft at their airports as provided for in Appendix D to this Resolution, whilst preserving the benefits for local communities to the greatest extent practicable to avoid inappropriate land-use or encroachment whenever possible in areas where reductions in noise levels have been achieved;

2. *Urges* States to ensure that the potential reductions in noise levels to be gained from the introduction of quieter aircraft, particularly those complying with the new Chapter 4 standard, are also not avoidably compromised by inappropriate land-use or encroachment;

3. *Urges* States, where the opportunity still exists to minimize aircraft noise problems through preventive measures, to:

- a) locate new airports at an appropriate place, such as away from noise-sensitive areas;
- b) take the appropriate measures so that land-use planning is taken fully into account at the initial stage of any new airport or of development at an existing airport;
- c) define zones around airports associated with different noise levels taking into account population levels and growth as well as forecasts of traffic growth and establish criteria for the appropriate use of such land, taking account of ICAO guidance;
- d) enact legislation, establish guidance or other appropriate means to achieve compliance with those criteria for land-use; and

e) ensure that reader-friendly information on aircraft operations and their environmental effects is available to communities near airports; and

4. *Requests* the Council to:

a) ensure that the guidance on land use in Doc 9184 is current and responsive to the requirements of States; and

b) consider what steps might be taken to promote land-use management, particularly in those parts of the world where the opportunity may exist to avoid aircraft noise problems in the future.

APPENDIX G

Supersonic aircraft — The problem of sonic boom

Whereas since the introduction of supersonic aircraft in commercial service action has been taken to avoid creating unacceptable situations for the public due to sonic boom, such as interference with sleep and injurious effects to persons and property on land and at sea caused by the magnification of the sonic boom; and

Whereas the States involved in the manufacture of such supersonic aircraft, as well as other States, continue to carry out research into the physical, physiological and sociological effects of sonic boom;

The Assembly:

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;

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; and

3. *Invites* the States involved in the manufacture of supersonic aircraft to furnish ICAO in due course with proposals on the manner in which any specifications established by ICAO could be met.

APPENDIX H

**Environmental impact of civil aviation
on the atmosphere**

Whereas there are growing concerns about environmental problems in the atmosphere such as global warming and depletion of the ozone layer;

Whereas the “Agenda 21” action plan adopted by the 1992 United Nations Conference on Environment and Development calls on governments, with the co-operation of relevant United Nations bodies, to address these problems;

Whereas the most comprehensive assessment so far of aviation’s contribution to these problems is contained in the special report on *Aviation and the Global Atmosphere*, which was prepared at ICAO’s request by the Intergovernmental Panel on Climate Change (IPCC) in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer and was published in 1999, and which reports *inter alia* that:

- aircraft emit gases and particles which alter the atmospheric concentration of greenhouse gases, trigger the formation of condensation trails and may increase cirrus cloudiness, all of which contribute to climate change;
- aircraft are estimated to contribute about 3.5 per cent of the total radiative forcing (a measure of change in climate) by all human activities and this percentage, which excludes the effects of possible changes in cirrus clouds, is projected to grow; and
- although improvements in aircraft and engine technology and the efficiency of the air traffic system will bring environmental benefits, they will not fully offset the effects of the increased emissions resulting from the projected growth in aviation;

Whereas the IPCC special report recognizes that the effects of some types of aircraft emissions are well understood, reveals that the effects of others are not, and identifies a number of key areas of scientific uncertainty that limit the ability to project aviation impacts on climate and ozone;

Whereas the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system;

Whereas the Kyoto Protocol, which was adopted by the Conference of the Parties to the UNFCCC in December 1997 and has yet to enter into force, calls for developed countries to pursue limitation or reduction of greenhouse gases from “aviation bunker fuels”, working through ICAO (Article 2.2);

Whereas the Kyoto Protocol treats international and domestic emissions from the aviation sector differently, in that developed countries are called on to pursue the limitation or reduction of greenhouse gases from international aviation working through ICAO (Article 2.2 of the Protocol), while domestic aviation emissions are included in national targets for developed countries that call for an overall reduction in total emissions from all sources of 5.2 per cent for the period 2008–2012 (compared with 1990 levels and based on six specific greenhouse gases) and the potential advantages of harmonizing treatment of domestic and international aviation emissions have been noted; and

Whereas the ICAO Council has been exploring policy options to limit or reduce the greenhouse gas emissions from civil aviation, particularly in response to Assembly Resolution A32-8, Appendix F, and work is in progress on technology and standards, on operational measures to reduce fuel consumption and hence emissions and on market-based measures (see Appendix I), and regular reports have been provided to the Conference of the Parties to the UNFCCC;

The Assembly:

1. *Expresses its appreciation* to the Intergovernmental Panel on Climate Change (IPCC) and to the Montreal Protocol’s Scientific Assessment Panel for the special report on *Aviation and the Global Atmosphere*;
2. *Urges* States to promote scientific research aimed at addressing the uncertainties identified in this IPCC special report;
3. *Requests* the Council:
 - a) to continue to co-operate closely with the IPCC and other organizations involved in the definition of aviation’s contribution to environmental problems in the atmosphere, and with organizations involved in policy-making in this field, notably with the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC);
 - b) to continue to study policy options to limit or reduce the environmental impact of aircraft engine emissions and to develop concrete proposals and provide advice

as soon as possible to the Conference of the Parties of the UNFCCC, placing special emphasis on the use of technical solutions while continuing its consideration of market-based measures, and taking into account potential implications for developing as well as developed countries; and

- c) to promote the use of operational measures as a means of limiting or reducing the environmental impact of aircraft engine emissions; and

4. *Invites* Contracting States and international organizations to keep ICAO informed of developments in this field.

APPENDIX I

Market-based measures regarding aircraft engine emissions

Whereas Appendix H of this Resolution sets the general context in which policy options including market-based measures are considered as a means of limiting or reducing the environmental impact of aircraft engine emissions;

Whereas market-based measures are policy tools that are designed to achieve environmental goals at a lower cost and in a more flexible manner than traditional regulatory measures;

Whereas in recent years there has been increasing recognition by governments of the need for each economic sector to pay the full cost of the environmental damage it causes and the subject of market-based measures for protecting the environment, including charges or taxes on air transport, an emissions trading system or voluntary measures, has been raised, for example, in the context of controlling greenhouse gas emissions;

Whereas Principle 16 of the Rio Declaration on Environment and Development (1992) states that “National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment”;

Whereas the Kyoto Protocol treats international and domestic emissions from the aviation sector differently, the potential advantages of harmonizing treatment of the two categories of emissions have been noted and it has been acknowledged that some States or groups of States are already taking action to design options for reducing emissions from domestic sectors, including domestic aviation emissions;

Whereas ICAO policies make a conceptual distinction between a charge and a tax, in that “a charge is a levy that is designed and applied specifically to recover the costs of providing facilities and services for civil aviation, and a tax is a levy that is designed to raise national or local government revenues which are generally not applied to civil aviation in their entirety or on a cost-specific basis”;

Whereas ICAO has developed policy guidance to States on taxation (*ICAO’s Policies on Taxation in the Field of International Air Transport*, Doc 8632), which recommends *inter alia* the reciprocal exemption from all taxes levied on fuel taken on board by aircraft in connection with international air services, a policy implemented in practice through bilateral air services agreements, and also calls on States to the fullest practicable extent to reduce or eliminate taxes related to the sale or use of international air transport;

Whereas Article 15 of the *Convention on International Civil Aviation* contains provisions regarding airport and similar charges, including the principle of non-discrimination, and ICAO has developed policy guidance for States regarding charges (*ICAO’s Policies on Charges for Airports and Air Navigation Services*, Doc 9082) including specific guidance on noise-related charges;

Whereas the ICAO Council has adopted on 9 December 1996 a policy statement of an interim nature on emission-related charges and taxes in the form of a resolution wherein the Council strongly recommends that any such levies be in the form of charges rather than taxes, and that the funds collected should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions;

Whereas such charges should be based on the costs of mitigating the environmental impact of aircraft engine emissions to the extent that such costs can be properly identified and directly attributed to air transport;

Noting that the Council has received a report from its Committee on Aviation Environmental Protection (CAEP) on possible options regarding the use of market-based measures to limit or reduce aircraft engine emissions, initially focussing on carbon dioxide, and that further work is planned;

Noting that analyses conducted by CAEP have shown that an open emissions-trading system* was a cost effective

* A system whereby the total amount of emissions would be capped and allowances in the form of permits to emit carbon dioxide could be bought and sold to meet emission reduction objectives.

measure to limit or reduce carbon dioxide emitted by civil aviation in the long-term;

Noting that in the short-term voluntary measures* could serve as a first step towards future actions to further reduce emissions; and

Recognizing that further studies and further guidance are needed for the use of levies in the short-term;

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 penalized for so doing;

b) Emission-related levies

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

* A mechanism under which industry and governments agree to a target and/or to a set of actions to reduce emissions.

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

3) *Urges* 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.

A33-19: Consolidated statement of continuing ICAO policies in the air transport field

A33-13: Use of cross-polar routes

A33-18: Preventing the introduction of invasive alien species

Whereas Contracting States have demonstrated a concern for the environment and have contributed to human welfare and quality of life through actions related to engine emissions, the ozone layer, aircraft noise and tobacco smoke in aircraft cabins;

Whereas Contracting States have recognized a responsibility to achieve maximum compatibility between civil aviation operations and the quality of the human environment;

Whereas the global community has increasingly recognized the threat to biological diversity posed by invasive alien species;