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ASSEMBLY — 37TH SESSION

REPORT OF THE EXECUTIVE COMMITTEE ON AGENDA ITEM 17

(Presented by the Chairman of the Executive Committee)

The attached report on Agenda Item 17 has been approved by the Executive Committee. Resolution 17/1 is recommended for adoption by the Plenary.

Note.— After removal of this covering sheet, this paper should be inserted in the appropriate place in the report folder.

(21 pages)

Agenda Item 17: Environmental protection

17.1 At its third, fourth, and ... meetings, the Executive Committee considered the subject of environmental protection on the basis of progress reports by the Council on the Organization's technical work on aircraft noise and engine emissions (WP/21 and WP/26) and on issues related to climate change (WP/22, WP/23 and Corrigendum No. 1, WP/25 and WP/27). Based on these progress reports, the Executive Committee considered the Council's proposal that updates Appendices A through H of Resolution A36-22, *Consolidated Statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality* (WP/24 and Corrigendum No. 1), and a proposal by the Secretary General that replaces Appendices I through L of Resolution A36-22, *Consolidated Statement of continuing ICAO policies and practices related to environmental protection – Climate change* (WP/262). In addition, there were 20 papers presented by States and Observers: WPs 108, 109, 117, 174, 181, 185, 186, 187 (Revision No. 1), 188, 216, 217, 240, 241, 251, 270, 271 (Revision No. 1), 272, 275, 304 and 316.

17.2 GENERAL PROVISIONS, NOISE AND LOCAL AIR QUALITY

17.2.1 The Council submitted a report (WP/21) on progress made by ICAO since the 36th Session of the Assembly on civil aviation and the environment, including activities carried out by the Secretariat and the Council's Committee on Aviation Environmental Protection (CAEP).

17.2.2 The Committee noted that CAEP and its various expert groups continued to undertake most of the technical aspects of the Organization's environmental work and that CAEP had met in February 2010 (CAEP/8). In March, the Council reviewed and approved, with comments, the Recommendations of CAEP/8.

17.2.3 Significant progress regarding new environmental Standards for certification of aircraft has been made. CAEP/8 agreed on production cut-off and certification Standards relating to oxides of nitrogen (NO_x). The new NO_x Standards are up to 15% more stringent than the 2004 (CAEP/6) Standards. Formal comments have been received from States on these and other technical updates to Annex 16. After a review of these comments by the Council, adoption of the new SARPs is expected by November 2011.

17.2.4 In line with the ICAO High-level Meeting on International Aviation and Climate Change recommendation to develop a global CO₂ Standard for new aircraft types, CAEP is undertaking technical analyses with the aim to recommend an aircraft CO₂ emissions Standard in 2013. CAEP is also working on Standards for non-volatile particulate matter emissions and assessing several noise stringency scenarios.

17.2.5 In light of the potential to save substantial emissions related both to local air quality and global climate change from operational initiatives, CAEP has made substantial progress in updating the information in ICAO Circular 303 - *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* with regard to operational measures being undertaken. The remaining work is expected to be finalized by 2013.

17.2.6 Regarding the establishment of mid-term (10 year) and long-term (20 year) technology goals using the independent experts process, CAEP/8 adopted noise reduction goals as well as reviewed industry progress against NO_x reduction goals established in 2007. Activities are underway to establish goals for operations and fuel burn reduction technologies. Progress in other activities, such as finalization of five studies on market-based measures, has also been made. Similarly, ICAO's liaison with other UN bodies and Standard setting organizations, such as SAE International, has continued. An Environmental Colloquium on aviation and climate change was held in May 2010 and the 2010 Environmental Report has been launched.

17.2.7 The Committee was invited to support the continued work of the CAEP and ICAO Secretariat on issues relating to civil aviation and the environment and to consider the information in WP/21 as a reference for the update of Assembly Resolution A36-22.

17.2.8 The 36th Session of the Assembly had also requested that the Council regularly assess the present and future impact of aircraft noise and engine emissions and continue to develop tools for this purpose. CAEP has approved tools that permit the consideration of interrelationships between aircraft noise, emissions that affect local air quality (LAQ), and emissions that affect the global climate. These tools were used to evaluate scenarios in each of those domains for a baseline year of 2006 and for the future years 2016, 2026 and 2036, as provided in WP/26. A full-flight fuel burn analysis also considered the year 2050. The evaluations were based on an unconstrained forecast and did not consider the effects of alternative fuels.

17.2.9 In absolute terms, the total global population exposed to aircraft noise, total global aircraft emissions that affect LAQ, and total global aircraft emissions that affect the global climate are expected to grow. Aviation's noise and emissions footprint is, however, predicted to grow at a rate slower than the demand for air travel and on a per-flight basis; efficiency is expected to improve throughout the period.

17.2.10 The Committee was invited to accept the global environmental trends presented in the paper as the basis for decision making on environmental matters during this session of the Assembly; to request the Council to continue work in this area with the support of States and to ensure that the next session of the Assembly is provided with an updated global environmental trends assessment; and to consider the information in this paper for the update of Assembly Resolution A36-22.

17.2.11 Assembly Resolution A36-22 requested that the Council submit at each Assembly a consolidated statement of continuing ICAO policies and practices related to environmental protection. In WP/24 and Corrigendum No. 1, the Council submitted a draft text of Appendices A through H of Resolution A36-22, updated to reflect developments since the 36th Session of the Assembly, in particular, with developments from CAEP/8. It was noted that only Appendices A, B, C, F and H had been changed. It was also noted that information on the progress achieved by the Organization in the area of international aviation and climate change, and related factual information for the update of Appendices I through L of the Resolution, are presented in WP/25.

17.2.12 In WP/270, India reviewed the issue of night curfews in some parts of the globe and its impact on operations in other parts of the world. It described the potential economic and environmental impacts of night curfews on airlines, on communities around airports, and on the public at large. It was requested that the Council revisit this issue using a more comprehensive approach.

17.2.13 In WP/108, Belgium, on behalf of the European Union (EU) and its Member States and by the other States Members of the European Civil Aviation Conference (ECAC) and by Eurocontrol, recognized the importance of aviation to economic development, while acknowledging the environmental challenges posed by aviation growth. Europe fully supports ICAO's efforts to address aviation environmental issues while taking interdependencies into account and stands behind the ICAO balanced approach to noise management. Europe is ready to be constructive and work with all stakeholders on environmental protection.

17.2.14 With regard to WP/270, the Secretariat advised the meeting that, as a result of a similar discussion during the 36th Session of the ICAO Assembly, CAEP had been tasked to carry out a study on noise curfews focusing on environmental technical issues. CAEP completed this study in February 2010 and the conclusions of the study were presented and approved by the Council of ICAO in April 2010. The study concluded that, while the European curfews may be a contributing factor to the generation of night-time aircraft movements in some case study airports, there were probably a number of other influencing factors such as time zones, airline economics and passenger demand. The CAEP/8 meeting agreed that the technical issues have been fully addressed. Any request to extend this work in CAEP will result in diverting resources from other high-priority tasks such as the establishment of new Standards, including those for aircraft CO₂ emissions.

17.2.15 Several States expressed support for the proposal from India for further studies on noise curfews. One State observed that when curfews were initially instituted, aircraft such as DC-8 and B707 were in service. Since then, aircraft have become substantially quieter and the need for curfews should be revisited. The continuation of noise curfews in some parts of the world affects developing countries in Latin America and Africa. A connection to the issue of slots allocation at airports with curfews was also mentioned, where a large percentage of capacity is eliminated because of the inability of airports to operate at night. This also leads to congestion of traffic during daytime hours.

17.2.16 Some other States took the position that no further work on curfews is warranted in light of the study that has been carried out by CAEP. The situation at some very large airports was highlighted, where there may be a take-off or landing every thirty seconds. Such traffic, while it facilitates global air traffic and is critical to global economy, raises issues of quality of life for communities around airports. For this reason, an approach which balances economic and development benefits with environmental impacts is essential. Any such issues should be handled by arrangements between States, if at all.

17.2.17 An observer, who has been deeply involved in the CAEP work on noise curfews, informed the meeting that the CAEP study only considered environmental issues and did not look at economic and political issues. As observed earlier, the cause of night-time movements in case-study airports was determined to be not solely noise curfews at destination airports. Instead, the causes included operator economics, time-zones, passenger convenience, and other factors. The extent of this problem was also found to be highly dependent on city pairs.

17.2.18 The Chairman noted the consensus of the meeting on referring this matter to the Council of ICAO for consideration. As the originator of the proposal, India, while noting the resource constraints described by the Secretariat, offered to provide the necessary resources for any further studies on curfews.

17.2.19 A member State noted the potential negative impact of unilateral measures on developing countries. In the past, due to noise restrictions on older aircraft, developing countries have suffered

financially due to their operators' inability to replace aircraft in their fleets. As older aircraft could no longer be operated in regions with restrictions, there was a cost borne by developing countries due to reduced operations. The role of ICAO is to promote cooperation amongst States and the interest of all States should be taken into account. Following from Article 24 of the *Convention on International Civil Aviation*, no unilateral action should be taken and no charges and taxes should be imposed on developing countries, especially those related to emissions.

17.2.20 The Committee noted the achievements of CAEP and the comments of States and Observers.

17.2.21 The Committee expressed satisfaction with the CAEP work, supported its further development, and accepted the proposed Appendices A through H of the *Consolidated Statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality*.

Resolution 17/1: Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality

Whereas in Resolution A36-22 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 A36-22 consists of an introductory text and a number of Appendices concerning specific but interrelated subjects;

Considering the need to reflect developments that have taken place since the 36th Session of the Assembly in the field of aircraft noise and engine emissions; and

Considering the need to define a specific ICAO policy to address aviation's impact on global climate (Resolution 17/1 : Consolidated statement of continuing ICAO policies and practices related to environmental protection - Climate change), the increasing concern on aviation and climate change and as part of ICAO's policies and practices related to environmental protection;

The Assembly:

1. *Resolves* that the Appendices attached to this Resolution and listed below, together with Resolution 17/1: *Consolidated statement of continuing ICAO policies and practices related to environmental protection - Climate change*, constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection, as these policies exist at the close of the 37th 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 — Aviation impact on local air quality

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

3. Declares that this resolution, together with Resolution 17/: *Consolidated statement of continuing ICAO policies and practices related to environmental protection - Climate change*, supersede Resolution A36-22.

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 comprehensive measures embracing technological improvements, more efficient air traffic management and operational procedures and the appropriate use of airport planning, land-use planning and management and market-based measures;

Whereas all ICAO Contracting States agreed to continue to pursue all 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;

Whereas other international organizations are emphasising the importance of environmental policies affecting air transport;

Whereas the sustainable growth of aviation is important for future economic growth and development, trade and commerce, cultural exchange and understanding among peoples and nations; therefore prompt action must be taken to ensure that it is compatible with the quality of the environment and develops in ways that alleviate adverse impacts;

Whereas reliable and best available information on the environmental effects of aviation is essential for the development of policy by ICAO and its Contracting States;

Whereas as far as there are recognized interdependencies of the environmental effects from aviation, such as noise and engine emissions, they need to be considered when defining source control and operational mitigation policies;

Whereas airspace management and design can play a role in addressing the impacts of aviation greenhouse gas emissions on the global climate, and the related economic and institutional issues need to be addressed by States, either individually or collectively on a regional basis;

Whereas cooperation with other international organizations is important to progress the understanding of aviation's impacts on the environment and in order to develop the appropriate policies to address these impacts;

Recognizing the importance of research and development in fuel efficiency and alternative fuels for aviation that will enable international air transport operations with a lower environmental impact;

The Assembly:

1. *Declares* that ICAO, as the lead United Nations (UN) Agency in matters involving international civil aviation, is conscious of and will continue to address the adverse environmental impacts that may be related to civil aviation activity and acknowledges 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. In carrying out its responsibilities, ICAO and its Contracting States will strive to:

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

2. *Emphasizes* the importance of ICAO continuing to demonstrate its leadership role on all international civil aviation matters related to the environment and *requests* the Council to maintain the initiative in developing policy guidance on these matters, which recognises the seriousness of the challenges which the sector faces;

3. *Requests* the Council to assess regularly the present and future impact of aircraft noise and aircraft engine emissions and to continue to develop tools for this purpose;

4. *Requests* the Council to maintain and update knowledge of the interdependencies and trade-offs related to measures to mitigate the impact of aviation on the environment so as to optimise decision making;

5. *Requests* the Council to establish a set of aviation environmental indicators which States could use to evaluate the performance of aviation operations and the effectiveness of standards, policies and measures to mitigate aviation's impacts on the environment;
6. *Requests* the Council to disseminate information on the present and future impact and trends of aircraft noise and aircraft engine emissions and on ICAO policy and guidance material in the environmental field, in an appropriate manner, such as through regular reporting and workshops;
7. *Invites* States to continue their active support for ICAO's environment-related activities, and urges Contracting States to support activities not foreseen in the budget by providing a reasonable level of voluntary contributions;
8. *Invites* States and international organizations to provide the necessary scientific information and data to enable ICAO to substantiate its work in this field;
9. *Encourages* the Council to continue to cooperate closely with international organizations and other UN bodies on the understanding of aviation impacts on the environment and on the establishment of policies to address such impacts; and
10. *Urges* States to refrain from environmental measures that would adversely affect the orderly and sustainable 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 scientific community is improving the understanding of uncertainties associated with the environmental impact of aircraft emissions at both the local and global levels, this impact remains a cause of concern and requires appropriate action;

Recognizing that there are interdependencies related to design and operations of aircraft when addressing concerns related to noise, local air quality, and climate change;

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 engine emissions;

Whereas the Council has adopted Annex 16, Volume I — *Aircraft Noise*, which comprises noise certification standards for subsonic aircraft (except Short Take Off and Landing /Vertical Take Off and Landing aeroplanes) and has notified Contracting States of this action;

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

Whereas the Council has initiated work on the development and adoption of an aircraft CO₂ Standard and has notified Contracting States of this action;

Whereas ICAO policy guidance on measures to address environmental concerns related to aircraft noise and engine emissions has been published;

Whereas the Council has adopted medium and long term technology goals for reduction of noise and oxides of nitrogen (NO_x) while making significant progress on technology and operational goals for aircraft fuel burn reduction;

The Assembly:

1. *Welcomes* the continuing benefits of the more stringent aircraft noise Standard in Annex 16, Volume I, Chapter 4 that took effect on 1 January 2006 and the work initiated in 2010 on assessing scenarios for more stringent noise Standards;

2. *Welcomes* the consideration by the Council in May 2010 of the new, more stringent Standards for emissions of NO_x proposed to be implemented on 31 December 2013 as well as consideration of a production cut-off for aircraft engines not meeting the current standards for emissions of NO_x proposed to be implemented on 31 December 2012;

3. *Welcomes* the plan approved by the Council in May 2010 for development of an aircraft CO₂ Standard;

4. *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;

5. *Welcomes* the adoption by the Council in May 2010 of the medium- and long-term technology goals for reducing aircraft noise and engine emissions of NO_x;

6. *Requests* the Council, with the assistance and cooperation of other bodies of the Organization and of other international organizations, to establish medium and long term technology and operational goals related to aircraft fuel burn, in addition to the recent development of NO_x and noise reduction goals;

7. *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, and that the necessary resources are made available to do so;

8. *Urges* Contracting States from regions of the world that are currently under-represented in CAEP to participate in the Committee's work;

9. *Requests* the Council to provide States and International Organizations information on available measures to reduce the impact of aviation operations on the environment so that action can be taken using the appropriate measures;

10. *Urges* Contracting States to follow, where appropriate, the ICAO provisions developed pursuant to Clause 4 of this Appendix; and

11. *Requests* the Council to continue the work on developing and employing scenarios for assessing the future environmental impact of aviation emissions and to cooperate with other international organizations in this area.

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

Whereas, the ICAO guidance developed to assist States in implementing the balanced approach (*Guidance on the Balanced Approach to Aircraft Noise Management* (Doc 9829)) has been subsequently updated;

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 (Doc 9829), 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:

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- a) promote and support studies, research and technology programmes aimed at reducing noise at source or by other means taking into account interdependencies with other environmental concerns;
 - 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 considering interdependencies with other environmental concerns; 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 and taking into account the possible impact of such restrictions at other airports;
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:
- a) assess continuously the evolution of the impact of aircraft noise;
 - b) ensure that the guidance on the balanced approach in Doc 9829 is current and responsive to the requirements of States; and
 - c) promote the use of the balanced approach, for example through workshops; and
7. *Calls upon* States to provide appropriate support for this work on ICAO guidance and any additional work on methodologies, and for the assessment of the impact or effectiveness of measures under the balanced approach as necessary.

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 implementation of 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) has been completed in some States 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;

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 (Doc 9829) 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 new 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 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; 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;

Recognizing that the new standard contained in Annex 16, Volume I, Chapter 4 has increased 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 has recently been updated;

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

Aviation impact on local air quality

Whereas there are growing concerns about the impact of aviation on the atmosphere with respect to local air quality and the associated human health and welfare impacts;

Whereas the evidence of this impact from emissions of NO_x and particulate matter (PM) from aircraft engines on local surface and regional air quality is now more compelling;

Recognizing that the scientific community is improving the understanding of uncertainties associated with the impact from emissions of NO_x and PM from aircraft engines on the global climate;

Recognizing that there are interdependencies related to design and operations of aircraft when addressing concerns related to noise, local air quality, and climate change;

Recognizing that ICAO has established technical Standards and fostered the development of operational procedures that have reduced significantly local air quality pollution from aircraft;

Whereas many pollutants such as soot and unburned hydrocarbons from aircraft engines affecting local and regional air quality, have declined dramatically over the last few decades;

Whereas recent progress in operational procedures such as continuous descent operations has resulted in further reduction of emissions from aircraft;

Whereas an assessment of trends in aviation emissions of NO_x, PM, and other gaseous emissions shows increasing global emissions values;

Whereas the impacts of aviation emissions of NO_x, PM, and other gaseous emissions need to be further assessed and understood;

Recognizing the robust progress made in understanding impacts of non-volatile component of PM emissions while the scientific and technical work continues on better assessment of volatile component of PM emissions;

Whereas the impacts of aviation emissions on local and regional air quality is part of the total emissions in the affected area and should be considered in the broader context of all sources that contribute to the air quality concerns;

Whereas the actual local air quality and health impacts of aviation emissions depend on a series of factors among which are the contribution to the total concentrations and the number of people exposed in the area being considered;

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 Contracting States regarding charges (*ICAO's Policies on Charges for Airports and Air Navigation Services*, Doc 9082) including specific guidance on noise-related charges and emissions-related charges for local air quality;

Whereas the ICAO Council had 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;

Whereas the ICAO Council has adopted policy and guidance material related to the use of emission-related charges to address the impact of aircraft engine emissions at or around airports;

Noting that the ICAO Council has published information on environment management systems (EMS) that are in use by aviation stakeholders; and

Noting that the ICAO Council has developed an Airport Air Quality Guidance Manual which has been subsequently updated;

The Assembly:

1. *Requests* the Council to monitor and develop its knowledge of, in cooperation with other relevant international organizations such as WHO, the effects of aviation emissions of PM, NO_x and other gases on human welfare and health, and to disseminate information in this regard;

2. *Requests* the Council to continue its work to develop technologically feasible, environmentally beneficial and economically reasonable standards to further reduce the impact of local air pollution from aircraft;

3. *Requests* the Council to develop certification requirements for non-volatile PM emissions while continuing to monitor progress in scientific and technical understanding of volatile and non-volatile components of PM emissions;

4. *Requests* the Council to ensure that the interdependencies between measures to reduce aircraft noise and engine emissions that affect local air quality as well as global climate are given due consideration;

5. *Requests* the Council continue its work to develop long-term technology and operational goals with respect to aviation environmental issues, including NO_x emissions from aircraft;

6. *Requests* the Council continue to foster operational and air traffic improvements that reduce the impact of local air pollution from aircraft;

7. *Encourages* action by Contracting States, and other parties involved, to limit or reduce international aviation emissions affecting local air quality through voluntary measures and to keep ICAO informed;

8. *Welcomes* the development and promotion of guidance material on issues related to the assessment of airport-related air quality and requests the Council to actively pursue this activity, aiming for the completion of the Airport Air Quality guidance in 2011;

9. *Requests* the Council to work with States and stakeholders in promoting and sharing best practices applied at airports in reducing the adverse effects of aviation emissions on local air quality;

10. *Welcomes* the development of the guidance on emission charges related to local air quality and *requests* the Council to keep up-to-date such guidance and *urges* Contracting States to share information on the implementation of such charges; and

11. *Urges* Contracting States to ensure the highest practical level of consistency and take due account of ICAO policies and guidance on emissions charges related to local air quality.