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## **ASSEMBLY — 35TH SESSION**

### **REPORT OF THE EXECUTIVE COMMITTEE ON AGENDA ITEM 15**

(Presented by the Chairman of the Executive Committee)

The attached report on Agenda Item 15 has been approved by the Executive Committee. Resolution 15/1 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 as the complete report on Agenda Item 15.*

(31 pages)

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**Agenda Item 15: Environmental protection**

15:1 At its fifth, sixth, seventh, eleventh and thirteenth meetings, the Executive Committee considered the subject of environmental protection on the basis of a progress report by the Council on work on aircraft noise and engine emissions (WP/56) and two other Council reports: one on the application of market-based measures to limit or reduce greenhouse gas emissions from civil aviation (WP/76) and one updating the consolidated resolution on environmental protection, Resolution A33-7 (WP/77). In addition, there were 21 papers presented by States and Observers: WPs 72, 85, 95, 99, 101, 115, 123, 132, 137, 138, 139, 146, 153, 172, 174, 177, 182, 222, 223, 235 and 247.

15:2 The Committee noted that the Council's Committee on Aviation Environmental Protection (CAEP) and its various expert groups continued to undertake most of the Organization's environmental work and that CAEP had met in February 2004 (CAEP/6). Considerable progress had been achieved in the noise and emissions area, further details of which are given below.

**Aircraft noise: general**

15:3 The Council reported (WP/56) that in May 2004 it had considered amendments to Annex 16 — *Environmental Protection*, Volume I — *Aircraft Noise*, Annex 6 — *Operation of Aircraft*, Part III and Annex 14 — *Aerodromes*, Volume I which arose from the recommendations of CAEP/6. The most significant aspects of the proposed amendments are new provisions relating to documents attesting noise certification, provisions for re-certification, and references to the balanced approach to noise management. These and other Annex amendments proposed by CAEP/6 would be considered by Council for adoption, in the light of comments from States and international organizations. As requested by the 33rd Session of the Assembly (Resolution A33-7, Appendix C), ICAO guidance material had been developed to assist States in implementing the balanced approach (*Guidance on the Balanced Approach to Aircraft Noise Management*, Doc 9829) and the Council had approved further work on the guidance as part of CAEP's activities. A new edition of the *Airport Planning Manual*, Part 2 — *Land Use and Environmental Control* (Doc 9184) had been published and a new edition of the *Environmental Technical Manual on the use of Procedures in the Noise Certification of Aircraft* (Doc 9501) was expected shortly. Regarding the evolution of noise, there had been a significant improvement in the situation with a reduction in the size of the population affected by noise of up to 30 per cent in the short term (2006) when compared to the forecast presented at CAEP/5 (January 2001), largely due to the accelerated retirement of older aircraft and the reduction in forecast operations for large transport jets. In addition, the settlement under Article 84 of the dispute between the United States and fifteen European States, which concluded satisfactorily on 5 December 2003, had reinforced ICAO's role as a forum for mediation of aviation issues.

15:4 In WP/101, Australia suggested that the guidance material on the balanced approach (Doc 9829) could be enhanced if strategies were incorporated to address "people issues", and called for the Council to incorporate community engagement techniques into the balanced approach as part of CAEP's further work on Doc 9829 to ensure that guidance remains current and responsive to the needs of States.

15:5 In WP/247, China presented information on measures taken by and experiences of the Chinese government in dealing with aircraft noise, and proposed that consideration be given to combining the noise aspects of Resolution A33-7 with Annex 16 to produce an independent and comprehensive Annex to the Convention, which would serve as a uniform legal basis for Contracting States to follow. It also called

for further strengthening of research on aircraft noise control and a pro-active approach in addressing the airport noise problem, including developing standards and recommended practices.

15:6 India, in WP/172, expressed concerns about the impacts of night curfews that exist at airports in some parts of the world, including the need for some airports in other countries to accommodate a large volume of international operations at inconvenient hours, as well as potentially adverse effects for market access and use of traffic rights and for the growth of air transport. The continuing need for such curfews was questioned, in view of the technological progress that had been made in making aircraft quieter. The Assembly was requested to take a position on night curfews to alleviate the problems identified.

15:7 In WP/153, ACI expressed support for ICAO's leadership role on environmental issues. It welcomed the guidance material on the balanced approach and expressed the view that there were a number of issues that needed to be further developed in the guidance to make it a more useful document for airports (including more emphasis on noise reduction at source; a realistic role for land use planning; the refinement of the noise index and contour descriptions; and more flexibility in the cost benefit analysis). ACI also called for more stringent aircraft noise standards to be incorporated in Annex 16, in order to reduce noise and facilitate airport capacity development to meet future traffic growth.

15:8 In WP/138, ECAC States drew attention to the noise situation around airports situated in densely populated areas, where the legitimate complaints from populations could have serious consequences on the air transport system by limiting the development of certain airports and therefore limiting the capacity of the entire system. The effect of a ruling in 2003 by the European Court of Human Rights is that States subject to its jurisdiction are legally obliged to strike and maintain a fair balance between the rights and interests of the aviation sector and the rights and interests of those adversely affected by the noise impact of its activities. Against this background, ECAC States supported the adoption of environmental goals as proposed by the Council, welcomed the guidance material on the balanced approach and requested the Council to promote its use. They also requested the Council to develop further measures to reduce aircraft noise at source and, in the light of the progress made in limiting or reducing the number of people affected by noise around airports, to consider whether work on new noise stringency standards should be undertaken.

15:9 In WP/72, IATA welcomed the ICAO guidance material on the balanced approach. It emphasized the importance of promoting and harmonizing noise management at and around airports, and called for States to adopt and implement this new guidance material.

15:10 Following consideration of these papers and further discussion on aircraft noise in general, the Committee expressed its appreciation for the substantial progress made since the 33rd Session of the Assembly, notably the development and publication of the *Guidance on the Balanced Approach to Aircraft Noise Management* (Doc 9829). Noting that the guidance was a "living document" and that CAEP already had plans to further develop certain aspects of it in order to remain responsive to States' needs, the Committee requested that guidance on community engagement techniques be included and other suggested additions be considered, resources permitting, and that the guidance be promoted through workshops. The Committee urged States to implement the Balanced Approach, making use of the new guidance.

15:11 The Committee also welcomed the study of the evolution of aircraft noise, and agreed on the need to continue to provide such assessments, which are useful for noise policy-making by ICAO and States.

15:12 The Committee noted that many of the proposals that had been presented were already provided for in the CAEP work programme that had recently been approved by the Council. For example, regarding the call for more stringent noise Standards in Annex 16, CAEP already had a process to consider the need for more stringent Standards, based on a comprehensive technological review and the principles contained in its terms of reference (technical feasibility, economic reasonableness and environmental benefit, and the potential interdependence of measures to control noise and to control engine emissions). In addition, the Committee encouraged States with specific proposals that were not already members of CAEP, such as China, to consider participating in CAEP so that their proposals could be reviewed at expert level.

15:13 Regarding the difficulties faced by some States as a result of noise-related curfews in other States, it was recognised that this was a delicate matter. It was noted that ICAO guidance calls for the consideration of curfews and other operating restrictions within the context of the balanced approach. The Committee concluded that this matter should be further studied by the Council, resources permitting, particularly with a view to determining the scope and scale of the problem.

15:14 In conclusion, the Committee expressed its support for the work currently being undertaken by CAEP in the noise field and the contributions of the aviation community to CAEP's work, and recommended that the Council:

- a) assign the priority and resources required to address the aircraft noise-related tasks on the CAEP work programme, including the proposals for additional work on further developing the Balanced Approach guidance and to study the issue of noise curfews; and
- b) urge States to commit the necessary efforts and resources to ensure that the CAEP work programme on aircraft noise is fully implemented.

15:15 The Committee also considered aircraft noise in connection with the updating of Resolution A33-7 (see paras. 15:55 to 15:57 below).

#### **Aircraft engine emissions: general**

15:16 The Council reported (WP/56) on its work on aircraft engine emissions, including the progress on technical and operational measures to reduce emissions and cooperation with other UN bodies in this area. CAEP/6 had recommended more stringent Standards for oxides of nitrogen (NO<sub>x</sub>) for inclusion in Annex 16, Volume II - *Aircraft Engine Emissions*, for consideration by the Council. The new NO<sub>x</sub> Standard, which would be 12 per cent below the current permitted levels, was approved unanimously by CAEP/6 as part of a two-step approach that includes consideration of more stringent Standards for aircraft engine emissions, especially NO<sub>x</sub>, in light of a technology review process and the CAEP principles of technical feasibility, economic reasonableness, environmental benefit and interdependencies, aiming to complete the process for review in 2010. CAEP continued to work on assessing the available scientific information on the impact of aircraft engine emissions, both globally and at ground level, and on emissions reduction technology. Efforts continued on the development of mid and long-term goals for aircraft emissions reduction and on the need for further developing tools to determine interdependency between emissions and noise. Guidance material had been published on operational measures (*Operational Opportunities to Minimize Fuel Use and Reduce Emissions*, Circ 303) so as to enable airports, airlines and other stakeholders

that have successfully reduced emissions to share their techniques with others, and two workshops had been held to promote these practices, as requested by the Assembly (Resolution A33-7, Appendix H). Further development of models would be necessary for the assessment of CNS/ATM environmental benefits. CAEP was currently analyzing these models and the environmental-related information contained in the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750) would be updated accordingly.

15:17 The Council report also drew attention to the growing presence of UN bodies in the CAEP process and the increasing cooperation with the UN Framework Convention on Climate Change (UNFCCC), which underscored the leadership role and responsibilities of ICAO in the field of aviation and the protection of the environment. Regular reports had been made to the UNFCCC process regarding the work in progress within ICAO on limiting or reducing greenhouse gases from aviation. At the request of the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA), ICAO was cooperating in an exercise aimed at improving both the quality of data on aviation missions reported by Parties to the UNFCCC and the methodology on which this reporting is based. In this connection, ICAO had hosted two meetings of experts on emissions data and modelling, in conjunction with the UNFCCC Secretariat, and was exploring aviation emissions models that could be used to assist SBSTA.

15:18 Through WP/99, Australia provided information on research being undertaken to explore the potential for air traffic management (ATM) efficiencies that would ultimately lead to fuel and emissions savings. Results so far were in line with earlier estimates of 6 to 16 per cent savings in carbon dioxide that were made by the Intergovernmental Panel on Climate Change (IPCC) in its *Special Report on Aviation and the Global Atmosphere* (1999). The Assembly was invited to urge other States to implement similar operational measures, as outlined in the new ICAO guidance material (Circ 303), to reduce fuel consumption and hence carbon dioxide and other gaseous emissions.

15:19 ECAC States, in a paper elaborated and coordinated with EUROCONTROL (WP/146), provided information demonstrating that ATM can deliver considerable environmental performance improvements, while ensuring that safety is not compromised. This included the introduction of Reduced Vertical Separation Minima (RVSM) in 41 States (ECAC plus associated transition area), which had reduced fuel burn and emissions by up to 5 per cent in the upper atmosphere, and a number of current pan-European environmental activities. ECAC States called for the Assembly to encourage the relevant ICAO bodies to include the contribution of ATM in their work and also to encourage States to make an environmental impact analysis an integral part of their RVSM implementation programmes.

15:20 Referring to the above-mentioned IPCC report, IATA (WP/174) stressed the environmental benefits from ATM planning. It requested that ICAO - through CAEP and Regional Planning Groups, and States - through their ATS providers, assess the environmental impact of specific implementation plans and take full account of environmental benefits in CNS/ATM systems implementation.

15:21 In WP/235, the Islamic Republic of Iran proposed the development of guidance material to assist States in the design and manufacture of aircraft engines with the aim of limiting both aircraft noise and the environmental impact of engine emissions. The paper also called for a study of new types of aviation fuel that would contain less pollutants.

15:22 In WP/123, the Russian Federation expressed the view that there was no reliable evidence of the impact of greenhouse gases on the world's climate. It stressed the need for a scientifically-

substantiated approach to the introduction of measures to limit or reduce aircraft engine emissions and recommended that ICAO in its future work should concentrate attention on reducing NO<sub>x</sub>, in view of the threat it poses to human health and the environment, and that a comparative analysis of the impact of NO<sub>x</sub> and CO<sub>2</sub> emissions on the environment be undertaken.

15:23 In WP/222, Tunisia presented the position of ACAC Members in support of the recommendation from CAEP/6 for a new, more stringent Standard for NO<sub>x</sub> emissions which will apply as of 2008. They called on the Assembly to reflect in the updated consolidated resolution that these are production Standards and would not be used to impose operational restrictions or charges in the future on existing aircraft engines.

15:24 In WP/153, ACI emphasized that emissions, like noise, are increasingly becoming a factor that limits airport capacity expansion and the ability to meet future traffic growth. Local air quality was an increasingly important environmental issue for airports. While some market-based measures such as emissions trading offer one solution to the issue, ACI believed that reduction at source remained the only long-term credible solution. It considered that the CAEP/6 recommendation to reduce the permitted NO<sub>x</sub> limits in Annex 16 by 12 per cent was insufficient and invited the Assembly to support a significant future increase in stringency of emissions standards in Annex 16 at an earlier date than the planned 2010. ACI also drew attention to the issue of “hazardous air pollutants” generated by aircraft operations and encouraged ICAO to take a leadership role in developing credible information on the subject.

15:25 In WP/137, ECAC States drew attention to the serious negative effects on the aviation sector worldwide if the need for a high standard of air quality at and around airports is not effectively addressed, noting that the Air Quality Guidelines of the World Health Organization (WHO) clearly describe some of the adverse effects of these pollutants on human health. While recognizing the progress made by ICAO on emissions standards and operational measures, they considered that new actions were needed to address this issue and avoid increased opposition to traffic growth. They recommended the Assembly to reflect in its resolution on environmental protection that new actions are needed to protect air quality as the contributions from aircraft engines to nitrogen dioxide and to ozone concentrations are increasing again, and to welcome the proposal by CAEP for a new standard for NO<sub>x</sub> emissions. They also called for the Assembly to request the Council to ensure that CAEP would review the NO<sub>x</sub> Standard by 2010; to ensure that CAEP work related to the extension of the existing certification regime for NO<sub>x</sub> emissions to encompass all phases of flight taking into account the performance of the whole aircraft would be completed by 2007; and to study the appropriate characterization of the particulate matter emitted by aircraft engines, as proposed by CAEP, with a view to changing the existing ICAO standard for smoke emissions in light of the latest WHO recommendations.

15:26 In WP/139, ECAC States focussed on the growing concerns about aviation’s contribution to climate change and to the consequent need to limit or reduce the global environmental impact of engine emissions. They requested the Council to continue to support activities aimed at further improvements to existing technology and operations and, if possible, identify new technology and operations, that will reduce emissions and facilitate the sustainable growth in aviation.

15:27 In WP/85, IATA expressed the air transport industry’s commitment to continue its active participation in aviation’s ongoing efforts to limit or reduce greenhouse gas emissions on the understanding that these efforts should be guided by the overriding necessity of a sustainable global society to protect air

transport's ability to grow and thereby meet demand to minimize costs and to minimize competitive distortions. Expressing support for ICAO's leadership on climate change issues, IATA urged ICAO to further develop global climate change policies according to aviation's specific requirements, in order to retain the most flexible and cost-effective solutions, and to ensure that ICAO strongly represents aviation's interests and promotes aviation's accomplishments in UN debates on climate change and other global issues that can affect aviation. It called for ICAO to support the continued development of aviation as a critical element in a sustainable global society, and called on States to promote or implement infrastructure improvements, in particular through suitable CNS/ATM solutions. IATA also made some specific proposals regarding the draft consolidated statement of continuing ICAO policies and practices related to environmental protection.

15:28 In addition to the above-mentioned papers, the UNFCCC Secretariat made a statement to the meeting, in which he drew attention to developments which had taken place in the last few days that increased the likelihood of the Kyoto Protocol coming into force in the near future. Article 2, paragraph 2 of the Kyoto Protocol stated that Parties included in Annex I to the UNFCCC shall pursue limitation or reduction of greenhouse gases from aviation, working through ICAO. He acknowledged the excellent work of ICAO on emissions from international aviation, noting that aviation is a significant source of emissions. It was important to base policies and practices to control emissions from aviation on a good factual basis. The UNFCCC and ICAO had therefore been cooperating on methodological work related to greenhouse gases inventories and the Convention's SBSTA had invited ICAO to explore opportunities for examining and improving the quality of data reporting and comparability. ICAO had provided regular updates to SBSTA on its activities, and had organized a side event from ICAO on emissions from aviation at SBSTA/20 in June, where ICAO reported the preliminary results of an aviation data comparison between the UNFCCC inventories and the results from three models being used by CAEP. He also noted that the IPCC's work on revising their emissions inventory guidelines was benefiting from ICAO's inputs. All these developments illustrated the constructive contribution ICAO was making toward the improvement of inventories of greenhouse gases emissions from aviation.

15:29 In the ensuing discussions, the Committee underlined the importance of ICAO's leadership role on emissions-related issues, and welcomed the excellent cooperation between ICAO and other UN bodies, notably the UNFCCC process. In this connection, it was noted that it was important not only to report on ICAO's environment-related activities, but also to ensure that aviation's role in economic and social development worldwide is not overlooked.

15:30 The Committee recognized that, as with noise, emissions growth from aviation had declined recently, but there remain growing concerns regarding aircraft engine emissions both at the local and global level. It welcomed CAEP's work on emissions and the progress achieved by CAEP/6, notably the recommendation for a new NO<sub>x</sub> standard. As in the case of noise, it was noted that many of the matters raised in the discussions were already covered in the new work programme of CAEP.

15:31 Regarding the scientific aspects of aviation's contribution to climate change, the Committee was reminded that the IPCC *Special Report on Aviation and the Global Atmosphere* (1999) had recognised that the effects of some types of aircraft emissions were well understood and the effects of others are not, and had identified a number of key areas of scientific uncertainty (see Assembly Resolution A33-7, Appendix H). The Committee noted that CAEP had a process for considering the new scientific findings since the publication of the IPCC report through its focal point on research, and emphasised the importance of ensuring that the work of ICAO and States in this field has a reliable scientific basis.

15:32 With regard to operational measures to limit or reduce emissions, the Committee expressed its appreciation for the development of the guidance material contained in *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* (Circ 303) and welcomed the promotion of this material through workshops. The Committee recognized that ATM has a significant role to play in alleviating air transport's environmental impact and encouraged States that had not already done so to explore the possibilities offered by ATM to reduce fuel use and emissions. The Committee also called for ICAO, through CAEP in cooperation with other relevant bodies such as the Planning and Implementation Regional Groups (PIRGs), to develop appropriate tools to assess emissions reductions associated with implementation of ATM measures. States and international organizations were encouraged to provide ATM experts to support CAEP in these activities.

15:33 In conclusion, the Committee expressed its support for the work currently being undertaken by CAEP in the emissions field and recommended that the Council:

- a) assign the priority and resources required to address the aircraft emissions-related tasks on the CAEP work programme;
- b) urge States to commit the necessary efforts and resources to ensure that the CAEP work programme on aircraft engine emissions is fully implemented; and
- c) continue to cooperate closely with other UN bodies involved in emissions, notably the UNFCCC process and the IPCC, and to be responsive to their requests for information.

15:34 The Committee also considered aircraft engine emissions in connection with the updating of Resolution A33-7 (see paras 15:55 to 15:57 below).

#### **Aircraft engine emissions: market-based measures**

15:35 In WP/76, the Council reported on its work in response to the Assembly's request "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 evaluate the costs and benefits of the various measures with the goal of addressing aircraft engine emissions in the most cost-effective manner" (Assembly Resolution A33-7, Appendix I).

15:36 This work had focussed on voluntary measures (under which industry and governments would agree to a target and/or a set of actions to limit or reduce emissions), emissions trading (a system whereby the total amount of emissions would be capped and allowances in the form of permits to emit could be bought and sold to meet emission reduction objectives), and emission-related levies. While aircraft engine emissions have a potential impact both at a local level and globally, this work had focussed on the global impact. It had been assumed that the market-based measures would target CO<sub>2</sub> emissions, while leaving open the possibility of later extending this work to other greenhouse gas emissions from aviation.

15:37 With respect to voluntary measures, a Template Agreement - Memorandum of Understanding that States and other parties concerned could use, along with associated guidance on voluntary measures to



limit or reduce CO<sub>2</sub> emissions, had been developed and approved by the Council. As part of its future work, CAEP would monitor implementation.

15:38           Regarding emissions trading, in 2001 the Assembly had endorsed the development of an open emissions trading system for international aviation and requested the Council, as a matter of priority, to develop guidelines. CAEP had enlisted the assistance of consultants in exploring a number of different emissions trading options and, in the light of the consultants' work, CAEP/6 had recommended – and the Council had since approved – that further work should focus on two approaches. Under one approach, ICAO would support the development of a voluntary emissions trading system that interested airlines, airports, States and international organizations might propose; under the other approach, ICAO would provide guidance for use by States, as appropriate, to incorporate emissions from international aviation into States' emissions trading schemes consistent with the UNFCCC process.

15:39           With respect to emission-related charges, in 2001 the Assembly had recognized the continuing validity of a policy developed by the Council in 1996 (State letter AN 1/17.9-97/62 dated 11 June 1997), one of the key points of which is that any such levies be in the form of charges rather than taxes. In response to the Assembly's request, CAEP had attempted to develop further guidance to address issues that could arise if some States were to implement a CO<sub>2</sub> emissions charge, but had been unable to arrive at a consensus because of a number of outstanding issues, including cost-effectiveness and various legal, policy and implementation aspects (listed in more detail in WP/76). The Council recognized that resolving these issues was likely to be a difficult task and had also noted that some possible new approaches had been identified by CAEP, although these ideas were not mature at present and would need further elaboration. Further studies of outstanding issues were needed, and their exact nature would be identified after the Assembly. In these circumstances, the Council was proposing to the Assembly a revised version of Assembly Resolution A33-7, Appendix I – *Market-based measures regarding aircraft engine emissions*, in which States would be discouraged from imposing such charges. However, a group of European States had expressed a minority view, insisting that scope for action consistent with the current ICAO policy be retained.

15:40           In WP/123, the Russian Federation stressed the need for a scientifically substantiated approach to the introduction of market-based measures. Such measures should be further studied before being introduced and, in the meantime, unilateral action should be avoided.

15:41           In WP/177, Canada, Mexico and the United States invited the Assembly not to support the implementation of CO<sub>2</sub> charges at this time as ICAO guidance was not sufficient and the approach had not been shown to be cost-effective. They were of the opinion that further studies needed to be undertaken to resolve the outstanding legal, policy and economic issues with respect to CO<sub>2</sub> charges. They expressed their support for the continued development of guidance for voluntary measures and open emissions trading to mitigate aviation's climate change impact. Finally, they encouraged States who wished to pursue CO<sub>2</sub> charges to enter into a voluntary agreement with like-minded States on a reciprocal basis.

15:42           In WP/115, ACAC Members recalled that in the context of the UNFCCC and the Kyoto Protocol, developing countries were excluded from obligations to reduce or limit greenhouse gas emissions. As such, market-based measures, as envisaged by ICAO, should not be imposed on developing countries, as this would further deteriorate their economic situation.

15:43 In WP/132, member States of the African Civil Aviation Commission (AFCAC), recalling the outcome of CAEP's work, noted that there was no consensus within ICAO on the use of the framework for guidance on the application of emissions-related charges. They expressed concerns regarding the need to protect the economic interests of developing States and to ensure that actions taken are consistent with their commitments under the UNFCCC process.

15:44 ACI, in WP/153, expressed its support for the continuing work of ICAO on market-based measures, including emissions trading, emissions charges (with the exception of levies such as taxes) and voluntary agreements, noting that these measures should offer measurable and accepted goals of absolute emissions reduction.

15:45 In WP/139, ECAC States emphasized their obligations under the UNFCCC and under the Kyoto Protocol. They called on ICAO to promote policies that would assist Contracting States parties to the UNFCCC to take precautionary measures to combat climate change, and reiterated European opposition to any prohibition on greenhouse gas emission-related charges. In a related paper (WP/223 and Corr. No. 1), ECAC States proposed a series of amendments to the draft Appendix I presented by the Council.

15:46 IATA, in WP/85, urged States to refrain from any local, national or regional measures, such as taxes or charges, that could jeopardize operational and voluntary measures. In WP/95, IATA expressed its support for the Council's proposed revision of Appendix I to Resolution A33-7, and stressed that the interests of airspace users should be taken into account when carrying out further studies on emissions-related charges.

15:47 In WP/182, LACAC States voiced their opposition to any form of emissions charges that could be imposed on developing countries, be it at the domestic, regional or global level.

15:48 The Committee noted that discussions on the use of market-based measures were taking place in a context of consensus as to the general objectives that were pursued by States regarding the need to address aviation's impact on climate change, and recognized the leadership role that ICAO had to play in this regard. However, diverging views existed on the pace and methods which should be used to reach these objectives, as reflected below. There was also general agreement that the issue of emissions from aircraft engines should be dealt with in a comprehensive manner, combining technical, operational and economic measures, and that trade-offs between noise and emissions, and between CO<sub>2</sub> and NO<sub>x</sub> should be taken into account.

15:49 The Committee welcomed the progress made since the 33rd Session concerning voluntary measures and emissions trading. It also took note of the fact that some voluntary measures were being implemented or would be in the near future. Regarding the future development of an international aviation open emissions trading system, the Committee endorsed the plans of the Council for conducting further studies and developing appropriate guidance, on the basis of two identified approaches.

15:50 Turning to the more difficult issue of emission-related charges, the Committee took note of the work undertaken since the 33rd Session, and of the diverging opinions. A majority of States supported the draft revision of Appendix I to Assembly Resolution A33-7 presented by the Council. In their view, the application of charges would not be the most cost-effective option (consistent with UNFCCC, Art. 3, para. 3) and there remained fundamental questions about the scientific basis for such a charge and about its

legitimacy if applied at a global level. In view of all the outstanding issues that were not resolved, as reflected in the Council report, there was an evident need for further studies, some of them possibly involving the ICAO Legal Committee. These States felt that no unilateral measures should be imposed but that solutions should rather be pursued at a multilateral level. Finally, they stressed that the focus should primarily be put on technical and operational measures, rather than on market-based measures. In view of their economic difficulties, developing States had serious concerns that such measures could possibly be applied to them while they had no obligations under the current international climate change instruments; they consequently expressed a strong opposition to emission-related levies and requested to be exempted from them.

15:51 The Committee was also reminded that the issue of allocation of greenhouse gas emissions from international aviation to national greenhouse gas inventories had not yet been resolved in the UNFCCC process. Since allocation could be done in different ways, it might be premature for States to introduce any CO<sub>2</sub> charges which could prove to be inconsistent with their legal obligations under the UNFCCC process.

15:52 An opposing view, which was held by ECAC States and one other State, stressed the need for flexibility. They needed to keep all options for market-based measures open, since one of the options selected, emissions trading for example, may not be sufficient in itself to deal completely with the problem. They considered that removing the possibility of introducing charges would be a retrograde step for ICAO and that it could undermine ICAO's credibility in the emissions field. They felt that scientific uncertainty should not be used as a means of avoiding action, referring to the precautionary principle recommended in the Rio Declaration (1992) and the UNFCCC (Art. 3, para. 3) and to the polluter-pays principle. They also put forward the need for those States that had accepted commitments under the UNFCCC process, and more especially under the Kyoto Protocol expected to enter into force shortly, to take action that was consistent with this process, while taking into account the concerns of developing States, in a context of common but differentiated responsibilities. Finally, they clarified that the issue of emission-related charges should not be confused; there were two types of emissions-related charge. One type addressed local air quality and was already in effect in a few European States. The other type was global in nature and aimed at greenhouse gases; although studies were being undertaken on them in Europe, at this stage there were no imminent plans to introduce them.

15:53 The Committee recognized that States have commitments under the UNFCCC and that ICAO has special responsibilities in this process, particularly now that the Kyoto Protocol seemed likely to enter into force. It agreed that future work on CO<sub>2</sub> emissions charges should address and attempt to resolve the outstanding issues that had been identified in the Council's report and during the Committee's discussions, and noted that the Council would be considering how such studies would be conducted in the light of the Assembly's consideration of this matter. The views expressed would help the Council in its future deliberations.

15:54 Turning to Appendix I of the draft Assembly Resolution that had been presented by the Council, the Assembly considered various proposals for amendments. After extensive negotiations, particularly concerning emission-related levies, an agreement was reached. Studies on greenhouse gas emissions charges would continue. Over the next three years, such charges would not be introduced internationally, although there would be some scope for States to introduce them under certain circumstances that are described in the revised text; this matter would be considered and discussed again at the next regular session of the Assembly. Some specific provisions were also introduced concerning emissions levies related

to local air quality. The revised text of Appendix I was incorporated into a revised text of a new draft resolution to supersede Assembly Resolution A33-7 (see paras. 15:55 to 15:57 below).

### **Consolidated Resolution**

15:55 At its 33rd Session, the Assembly had adopted Assembly Resolution A33-7, *Consolidated statement of continuing ICAO policies and practices related to environmental protection*. In accordance with Clause 2 of the Resolution, the Council submitted in WP/77 a new consolidated statement, based on Resolution A33-7 with revisions in the light of developments since the 33rd Session. The following substantive revisions had been made:

- a) incorporation of new ICAO goals in the environmental field (Appendix A);
- b) concerning aircraft noise: revisions to reflect new guidance material on the “balanced approach” to noise management (Appendix C) and on land-use planning and management (Appendix F); and
- c) concerning aircraft engine emissions: revisions to reflect new guidance material on operational measures to limit or reduce the environmental impact of emissions (Appendix H) and the further studies that had been undertaken on market-based measures (Appendix I).

15:56 In considering the Council’s draft, the Committee also took into account its earlier discussions concerning Appendix I on market-based measures; the need to introduce text reflecting earlier conclusions reached by the Committee; and some specific proposals for revising the Council’s draft contained in a paper presented by ECAC States (WP/223 and Corr. No. 1).

15:57 The Committee submitted for adoption by the Plenary, Resolution 15/1, including Appendices A through I, to supersede Resolution A33-7.

## **RESOLUTION FRAMED BY THE EXECUTIVE COMMITTEE AND RECOMMENDED FOR ADOPTION BY THE ASSEMBLY**

### **Resolution 15/1**

#### **Consolidated statement of continuing ICAO policies and practices related to environmental protection**

*Whereas* in Resolution A33-7 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 A33-7 consists of an introductory text and a number of Appendices concerning specific but interrelated subjects;

*Considering* the need to incorporate new ICAO goals in the environmental field (Appendix A);

*Considering* the need to reflect new ICAO guidance material regarding aircraft noise, notably on the “balanced approach” to noise management (Appendix C) and on land-use planning and management (Appendix F) and to respond to other developments in this field since the 33rd Session of the Assembly; and

*Considering* the need also to reflect developments that have taken place since the 33rd Session of the Assembly in the field of aircraft engine emissions, including new ICAO guidance material on operational measures and further studies on market-based measures to limit or reduce 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 35th 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 A33-7.

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## 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;

*Whereas* reliable information on the environmental effects of aviation is essential for the development of policy by ICAO and its Contracting States; 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. In carrying out its responsibilities ICAO 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 taking a leadership role on all civil aviation matters related to the environment and *requests* the Council to maintain the initiative in developing policy guidance on these matters, and not leave such initiatives to other organizations;

3. *Requests* the Council to regularly assess 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 disseminate information on the present and future impact 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;
5. *Invites* States to continue their active support for ICAO's environment-related activities on all appropriate occasions;
6. *Invites* States and international organization to provide the necessary scientific information to enable ICAO to substantiate its work in this field;
7. *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
8. *Urges* States to refrain from unilateral environmental measures that would adversely affect the orderly 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* aircraft engine emissions have an environmental impact at both the local and global levels which, 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* following the recent downturn in traffic and the reduction in the number of flights, which eased momentarily the pressure on environmental concerns, it is expected that aviation will return to traditional growth patterns in 2005 and beyond;

*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<sup>1</sup> (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 in Annex 16, Volume I, Chapter 4 and the recent proposal for new, more stringent standards for emissions of oxides of nitrogen to be implemented on 1 January 2008;

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

4. *Urges* Contracting States from regions of the world that are currently 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;

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<sup>1</sup> Reference will need to be updated in the light of Assembly action on Resolution A33-14.



*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*, as requested by the Assembly in 2001, ICAO guidance has been developed to assist States in implementing the balanced approach (*Guidance on the Balanced Approach to Aircraft Noise Management* (Doc 9829));

*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 stake-holders, 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:
  - 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:
- 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.

#### **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

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*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;

*Whereas* it is also expected that the new 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 updated information 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

### 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*, since publication of the IPCC special report, further work has been undertaken on some of the key areas of scientific uncertainty identified in the report, such as the influence of contrails and aerosols on cirrus clouds and the climate impact from oxides of nitrogen and methane;

*Whereas* ICAO has requested that the IPCC, in preparing its Fourth Assessment Report due for publication in 2007, include an update of the main findings of the special report;

*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 UNFCCC’s Subsidiary Body for Scientific and Technological Advice has sought the assistance of ICAO on methodological issues related to the collection and reporting of greenhouse gas emissions at a national level;

*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;

*Whereas* the ICAO Council has been exploring policy options to limit or reduce the environmental impact of aircraft engine emissions from civil aviation, particularly in response to Assembly Resolution A33-7, Appendices H and I, 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;

*Recognizing* that substantial fuel savings and emissions reductions can be achieved through improvements in Air Traffic Management (ATM); and

*Welcoming* the steps taken by ICAO to promote the use of operational measures, including the publication of *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* (Circ 303) and the holding of two workshops on this subject;

*The Assembly:*

1. *Urges* States to:
  - a) promote scientific research aimed at addressing the uncertainties identified in the IPCC special report on Aviation and the Global Atmosphere; and
  - b) ensure that future international assessments of climate change undertaken by IPCC and other relevant United Nations bodies include updated information on aircraft-induced effects on the atmosphere;
  
2. *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;

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- c) to continue to assist the UNFCCC's Subsidiary Body for Scientific and Technological Advice with regard to methodological issues; and
  - d) to continue to develop the necessary tools to assess the benefits associated with ATM improvements, and to promote the use of the operational measures outlined in ICAO guidance (Circ 303) as a means of limiting or reducing the environmental impact of aircraft engine emissions; and
3. *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 Contracting 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 Contracting 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 Contracting States to the fullest practicable extent to reduce or eliminate taxes related to the sale or use of international air transport;

*Noting* that the ICAO policy on exemption of aviation fuel from taxation has been called into question in some Contracting States which impose taxes on other transport modes and other sources of greenhouse gases;

*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;

*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 reports 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 further studies and guidance are needed for the use of an emissions-trading system for international civil aviation;

*Noting* that a template agreement and associated guidance has been prepared by CAEP for the use of voluntary measures by Contracting States and interested parties in the short-term;

*Recognizing* that the extensive studies which have been undertaken to provide additional guidance to Contracting States regarding emission-related levies have identified a large number of outstanding issues on which there are different views; and

*Whereas* Contracting States have legal obligations, existing agreements, current laws and established policies;

*The Assembly:*

1. *Requests* the Council to continue to develop guidance for Contracting States on the application of market-based measures aimed at reducing or limiting the environmental impact of aircraft

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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 United Nations Framework Convention on Climate Change (UNFCCC);

2. *Encourages* Contracting States and the Council, taking into account the interests of all parties concerned, including potential impacts on the developing world, to evaluate the costs and benefits of the various measures, including existing 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 Contracting States striving to take action in a consistent manner to both domestic and international aviation emissions:

a) Voluntary measures

- 1) *Encourages* action by Contracting States, and other parties involved, to limit or reduce international aviation emissions, in particular through voluntary measures and to keep ICAO informed; and
- 2) *Requests* the Secretary General to facilitate such actions by making available guidelines that ICAO has developed for such measures, including a template voluntary agreement, 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;
- 2) *Urges* States to follow the current guidance contained therein;
- 3) *Recognizes* that existing ICAO guidance is not sufficient at present to implement greenhouse gas emissions charges internationally, although implementation of such a charge by mutual agreement of States members of a regional economic integration organization on operators of those States is not precluded, and *requests* the Council to:
  - a) carry out further studies and develop additional guidance on the subject;
  - b) place a particular focus on the outstanding issues identified in earlier studies and by the Assembly; and
  - c) aim for completion by the next regular session of the Assembly in 2007;
- 4) *Urges* Contracting States to refrain from unilateral implementation of greenhouse gas emissions charges prior to the next regular session of the Assembly in 2007, where this matter will be considered and discussed again;

- 5) *Requests* the Council to study the effectiveness of, and to develop further guidance on emissions levies related to local air quality by the next regular session of the Assembly in 2007, and *urges* Contracting States to actively participate and share information in this effort; and
  - 6) *Urges* Contracting States to ensure the highest practical level of consistency with ICAO policies and guidance on emissions levies related to local air quality;
- c) Emissions trading
- 1) *Endorses* the further development of an open emissions trading system for international aviation; and
  - 2) *Requests* the Council, in its further work on this subject, to focus on two approaches. Under one approach, ICAO would support the development of a voluntary trading system that interested Contracting States and international organizations might propose. Under the other approach, ICAO would provide guidance for use by Contracting States, as appropriate, to incorporate emissions from international aviation into Contracting States' emissions trading schemes consistent with the UNFCCC process. Under both approaches, the Council should ensure the guidelines for an open emissions trading system address the structural and legal basis for aviation's participation in an open emissions trading system, including key elements such as reporting, monitoring and compliance.

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