



**WORKING PAPER**

**ASSEMBLY — 40TH SESSION**

**EXECUTIVE COMMITTEE**

**Agenda Item 15: Environmental Protection – General provisions, Aircraft Noise and Local Air Quality– Policy and Standardization**

**MANAGEMENT OF ENVIRONMENTAL IMPACTS AROUND AIRPORTS**

(Presented by Finland on behalf of the European Union and its Member States<sup>1</sup>  
and the other Member States of the European Civil Aviation Conference<sup>2</sup>)

**EXECUTIVE SUMMARY**

Improvements in the environmental performance of aviation are crucial in order to achieve the ICAO environmental goals on noise and air quality, and thereby manage the environmental impacts around airports.

The ICAO ‘Balanced Approach to aircraft noise management’ is an existing key instrument for noise management at airports (reduction of noise at source, land-use planning, operational procedures, operating restrictions). In order to maintain its effectiveness, the Balanced Approach has to be properly implemented and each of the 4 pillars has to be kept up to date to ensure they can contribute as part of the overall approach. This paper proposes amendments to the ICAO Assembly Resolution on local noise-related operating restrictions.

In addition, a comprehensive approach should be developed for the management of air quality around airports. The agreement on a new aircraft engine non-volatile Particulate Matter (nvPM) emissions standard for both mass and number reinforces the control of engine emissions at source. The implementation of environmental management systems at airports also provides essential processes to address air quality issues.

<sup>1</sup> Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

<sup>2</sup> Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Moldova, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and United Kingdom.

**Action:** The Assembly is invited to:

- a) reaffirm that mitigation measures to address noise and air quality impacts around airports should remain central to future international, national and regional policies;
- b) reaffirm the importance of the ICAO environmental goals to (1) limit or reduce the number of people affected by significant aircraft noise and (2) limit or reduce the impact of aviation emissions on local air quality;
- c) support the ICAO Balanced Approach and the need for all four pillars to be maintained in order to ensure it remains an effective tool to manage airport noise;
- d) note that the composition of the global fleet has evolved over time with new technology penetrating the market, such that only 2.5% of total operations in Europe during 2017 were made by Chapter 3 aircraft, and that certain airports have already implemented operating restrictions on aircraft that are Chapter 3 compliant;
- e) conclude that consideration shall be given to updating the statement in the ‘Local noise-related operating restrictions’ section of ICAO Assembly Resolution A39-1, as presented in Appendix I, which originates from 2001, such that operating restrictions are permitted on Chapter 4 aircraft of MTOM of 55,000kg and over, as well as those certified to earlier standards, if justified under the Balanced Approach;
- f) note the increasing importance of a comprehensive approach for managing air quality around airports, especially those impacts from aircraft and airport equipment emissions.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective of Environmental Protection.
<i>Financial implications:</i>	The activities referred to in this paper will be undertaken subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.
<i>References:</i>	<ul style="list-style-type: none"> <li>• Chicago Convention and its Annex 16</li> <li>• A39-1</li> </ul>

## 1. ENVIRONMENTAL IMPACTS AROUND AIRPORTS

1.1 The number of flights is increasing worldwide, and at most large airports. For instance, by 2040, in Europe, there will be 53% more flights than in 2017<sup>3</sup>, and an average growth of 1.9% per year. By 2035, in the absence of appropriate efforts, some 20 major European airports will face significant congestion and related environmental impacts due to the higher level of traffic. Additionally, the number of major European airports that handle more than 50,000 annual aircraft movements is expected to increase from 82 in 2017 to 110 in 2040<sup>4</sup>. A similar trend can be observed at the global level and, in fact, growth in other areas of the world, such as Asia, is even faster.

1.2 Against this background, the authors of this paper welcome the fact that the new Annex 16 Volume 1 Chapter 14 noise standard for aircraft with an MTOM of 55,000 kg and over became applicable from 31 December 2017. Long-term exposure to aircraft noise is linked with a variety of health impacts, including ischaemic heart disease, sleep disturbance, annoyance and cognitive impairment<sup>5</sup>. The new noise standard will help mitigate these impacts.

<sup>3</sup> [www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/challenges-of-growth-2018.pdf](http://www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/challenges-of-growth-2018.pdf)

<sup>4</sup> [www.easa.europa.eu/eaer/](http://www.easa.europa.eu/eaer/)

<sup>5</sup> [www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018](http://www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018)

1.3 In terms of mitigating the impact of aviation emissions on airport air quality levels, the authors of this paper also welcome the recent agreement at the CAEP/11 meeting in February 2019 on a new aircraft engine non-volatile Particulate Matter (nvPM) emissions standard for both mass and number. A comprehensive approach should be developed for the management of air quality around airports including aspects from ultrafine particles. A recent European study highlighted the importance of mitigating environmental impacts from aircraft engine emissions at idle, which occur predominantly on airport aprons.<sup>6</sup> In light of this, the authors of this paper welcome the work on mitigating environmental impacts through fuel specifications (e.g. sulphur), and through the application of measures through airport environmental management systems. Airports initiatives include low emission vehicle fleets, on-site production and purchasing of renewable energy, provision of Fixed Electrical Ground Power (FEGP) and Pre-Conditioned Air (PCA) at airport gates and improving public transport systems to increase surface access.

1.4 Acknowledging the expected increase in exposure of local populations to aviation activities in term of noise and air quality, as well as the problem of the public acceptability of aviation as a whole, it is crucial that measures to address these environmental challenges remain central to future international, national and regional policies.

## 2. ICAO BALANCED APPROACH FOR MANAGEMENT OF NOISE IMPACTS AROUND AIRPORTS

2.1 The sustainable development of air transport requires mitigation measures aimed at reducing the noise impact from aircraft around airports, with the objective to limit or reduce the number of people affected by significant aircraft noise and fostering compatibility between aviation activities and residential areas, in particular where night flights are concerned.

2.2 The ICAO Balanced Approach to airport noise management should remain the foundation of noise regulation for aviation as a global industry. It recognises the value of, and does not prejudice, relevant legal obligations, existing agreements, current laws and established policies. The Balanced Approach is a single harmonised instrument that encompasses various elements.



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<sup>6</sup> Non-volatile particle emissions from aircraft turbine engines at ground-idle induce oxidative stress in bronchial cells, Hulda R. Jonsdottir, Mathilde Delaval, Zaira Leni1, Alejandro Keller, Benjamin T. Brem, Frithjof Siegerist, David Schönenberger, Lukas Durdina, Miriam Elser, Heinz Burtscher, Anthi Liati & Marianne Geiser, Nature Communications Biology, March 2019, <https://doi.org/10.1038/s42003-019-0332-7>

2.3 The application of the Balanced Approach frames the discussion around mitigation measures taken following its principles. It reduces the risk of disputes when, after consideration of all other elements of the Balanced Approach, operating restrictions are required.

2.4 Along these lines, in the implementation of the Balanced Approach it is important that requirements and actions linked to it are correctly, broadly and timely ensured. The citizens and the local political responsible shall be well informed about the principles and potential of the Balanced Approach, to take sound decisions based on cost-efficiency.

### 3. **BALANCED APPROACH PILLAR ON OPERATING RESTRICTIONS**

3.1 The Balanced Approach is a consistent way to address the noise problem in the most cost-effective way on an airport-by-airport basis. This is only possible when the four pillars of the Balanced Approach are kept up to date, and in line with the technological potential for improvement of new products, growing transport demand, the growing push towards urbanisation and the necessity to protect human health.

3.2 The ICAO Committee on Aviation Environmental Protection (CAEP) work programme for the next three years already contains some work items aimed at reviewing the application and efficiency of the first 3 of the 4 pillars of the Balanced Approach, namely on source noise control, operational opportunities to reduce noise and land-use planning.

3.3 With respect to the fourth pillar concerning the use of operating restrictions, Appendix E of the current ICAO Resolution A39-1 on noise and air quality, “.....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 and Chapter 14 of Annex 16 and any further stringency levels adopted by the Council”.

3.4 This particular statement has been part of the ‘Local noise-related operating restrictions’ section of ICAO Assembly Resolutions since 2001. During this time, the composition of the global fleet has evolved with new technology penetrating the market such that only approx. 2.5% of total operations in Europe during 2017 were made by Chapter 3 aircraft. In addition, certain airports have already implemented operating restrictions on aircraft that are Chapter 3 compliant.

3.5 With the above in mind, and to ensure that all pillars of the Balanced Approach remain fit for purpose and up-to-date, it is proposed to amend the Assembly Resolution A39-1 to permit operating restrictions to Chapter 4 aircraft with an MTOM of 55,000 kg and over, as well as those certified to earlier standards, if justified under the Balanced Approach.

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## APPENDIX

### PROPOSED UPDATE TO THE EXISTING TEXT IN A39-1 APPENDIX E ON 'LOCAL NOISE-RELATED OPERATING RESTRICTIONS'

*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* further reductions in noise at source are expected as a result of the adoption of new noise certification standards in Volume I of Annex 16 and through the assimilation of noise reduction technology in the fleet;

*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 or Chapter 4 of Annex 16;

*Whereas* if operating restrictions on Chapter 3 or Chapter 4 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 or Chapter 4 aircraft;

*Recognizing* that the noise standards in Annex 16 were not intended to introduce operating restrictions on aircraft and, specifically, that the standards contained in Annex 16, Volume I, Chapter 4 for aircraft that

have a MTOM of less than 55,000 kg, and Annex 16, Volume I, Chapter 14, and any further stringency levels adopted by the Council, are based on the understanding that it is for certification purposes only; and

Recognizing that the noise standards in Annex 16 were not intended to introduce operating restrictions on aircraft and, specifically, that the standards contained in Annex 16, Volume I, Chapter 4 and Chapter 14, and any further stringency levels adopted by the Council, are 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 Annex 16, Volume I, Chapter 3 of Annex 16, or on aircraft that have a MTOM of 55,000 kg and over and which comply with Annex 16, Volume I, Chapter 4, 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 Annex 16, Volume I, Chapter 3 of Annex 16, or with Chapter 4 for aircraft that have a MTOM of 55,000 kg and over:

- 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 Annex 16, Volume I, Chapter 4 for aircraft that have a MTOM less than 55,000 kg and or in Annex 16, Volume I, Chapter 14 of Annex 16 and/or any further stringency levels adopted by the Council.