



Agenda Item 6: Analysis of environmental protection and sustainable development of air transport

- d) **Definition of new operational methods in view of the sustained growth of air transport, taking into account environmental protection**

**OPERATIONAL METHODS FOR ENVIRONMENTAL PROTECTION IN AIR
TRANSPORT**

(Presented by the Secretariat)

SUMMARY	
This working paper presents the aspects that must be taken into account for defining the new operational methods in view of the sustained growth of air transport, taking into account environmental protection and the different aspects of air navigation and, especially, the ATM Operational Concept and the ICAO Global Air Navigation Plan, with a view to limiting or reducing the environmental impact of aircraft engine emissions.	
References: <ul style="list-style-type: none">- Programme of activities of the ICAO South American Regional Office;- ICAO Annex 6; and- ICAO Annex 16.	
ICAO strategic objectives:	A: <i>Safety</i> C: <i>Environmental protection</i>

1. Introduction

1.1 As the global forum for cooperation between its member States and the global aeronautical community, the International Civil Aviation Organization (ICAO) establishes standards and recommended practices for the safe and orderly development of international civil aviation.

1.2 ICAO has established three strategic objectives based on its permanent function of fostering a global civil aviation system that operates on a permanent and uniform basis, with the highest efficiency and under optimum safety, environmental protection and sustainability conditions.

1.3 One of the three Strategic Objectives of ICAO, which are the basis for the activities of the Organization, is *Environmental protection and sustainable development of air transport*. This objective seeks to promote the harmonious and economically feasible development of international civil aviation in order to limit or reduce the environmental impact of aircraft engine emissions. The 37th Session of the ICAO Assembly, held on 28 September to 8 October 2010, adopted Resolution A37-18: Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality, and Resolution A37-19 – Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change. Both resolutions supersede Resolution A36-22. The complete text of these resolutions may be found at: www.icao.int/env.

1.4 In the last 40 years, aviation has improved its efficient use of fuel by 70%; however, studies suggest that, given the potential growth of this industry and the likelihood of adoption of cleaner fuel industries, these problems could worsen in the future. Fuel consumption in aviation would increase by a factor of 2.5 by 2015, and approximately 4.0 by 2050.

2. Discussion

Assembly Resolution A37-19

2.1 The new resolution on climate change reflects the decision of ICAO Member States to continue playing a role in global efforts to address the issue of climate change, working through ICAO to limit or reduce GHG emissions by international aviation. It is based on ICAO past achievements since the last ICAO Assembly, including the High-Level Meeting and the Conference on Alternate Fuels of 2009. The resolution includes the goals of international aviation to improve the efficiency of fuel consumption by 2% per year up to 2050, and stabilise its CO₂ emissions at 2020 levels. The resolution encourages the States to send to ICAO, on an annual basis, their action plans, describing policies and actions, and other information about CO₂ emissions. It also invites the States to select and develop their action plan and send it as soon as possible to ICAO, preferably by the end of 2012, so that ICAO can compile the information related to the global goals. The action plans should include information on the measures envisaged by the States, indicating their national capabilities and the respective circumstances, as well as any other specific information.

2.2 The last two Meetings of Directors of Civil Aviation took note of the concern of ICAO and the measures being taken to mitigate the environmental impact of aviation, and unanimously endorsed such measures and agreed that the States should apply an approach based on the traditional strengths of aviation in terms of technological innovation, in order to address increased aviation emissions in the long run.

2.3 Air transport is a vital element of the global economy that is responsible for the safe and efficient transport of more than 2.2 billion passengers and 40.5 million tonnes of cargo per year. Although the 2% contribution of aviation emissions to total CO₂ man-made emissions (greenhouse effect) is relatively small, it is foreseen that air traffic will increase in the near future. This paper provides an overview of recent ICAO activities related to international aviation and the environment.

2.4 This working paper is aimed at encouraging States to develop a regional strategy to limit, inasmuch as possible, the impact of air transport on the environment, and to make sure that environmental issues are duly taken into account, through the definition of new operational methods and ongoing monitoring of environmental performance. To achieve this, it is necessary to create global awareness amongst the aeronautical sector as to the need to apply sustainable practices that promote energy saving, reduce polluting emissions and noise and, at the same time, permit economic development and the growth of commercial aviation.

2.5 There are many opportunities to improve fuel efficiency and to reduce CO₂, as described in the measures approved by the High-Level Meeting on International Aviation and Climate Change held in October 2009. These encompass aircraft and the associated technological development, alternate fuels, improved air traffic management, and the use of infrastructure, more efficient operations, market-based economic measures, and regulatory measures.

2.6 The definition of new environmentally-sustainable operational methods must take into account the following aspects:

- a) Improve fuel efficiency
- b) Reduce CO₂ emissions
- c) Consider the interrelationship between noise and local air quality.

2.7 ICAO is aware of the adverse environmental effects that may be associated with aircraft activity and of the responsibility that the Organization and its member States have in harmonising, inasmuch as possible, the safe and orderly development of civil aviation with environmental quality.

2.8 The Meeting could take note that the ICAO Committee on Aviation and Environmental Protection (CAEP) has initiated, through the Independent Panel (IE), a study to analyse possible recommendations on operational improvements to air traffic related to nitrogen oxides (NO_x) and fuel consumption in the medium (10 years) and long (20 years) term.

2.9 Likewise, pursuant to the conclusions of the fourth meeting of the ALLPIRG Advisory Group (ALLPIRG/4) concerning environmental benefits, GREPECAS should monitor the implementation of air navigation facilities and services, taking into account environmental issues, which would include the implementation of operational improvements, such as:

- a) Reducing the length of air routes,
- b) Fostering flexible flight planning,
- c) Promoting RNAV and RNP in continental airspace,
- d) Completing the expansion of RVSM,
- e) Applying reduced separation minima,
- f) Encouraging dynamic sharing of airspace by civil and military aircraft (when not in use by the military),
- g) Fostering flexible tracks, dynamic re-routing, and user-preferred routes (UPR) in oceanic airspace
- h) Promoting RNAV and RNP in the TMA,
- i) Promoting continuous descent arrivals (which can generate savings of 50-200 kg of fuel per flight),
- j) Encourage collaborative decision making in order to reduce ground delays and re-routing,
- k) Encourage cruise climbs and phased oceanic climbs.

2.10 In this sense, since 2001, and in order to improve the ATS route network, SAM States have implemented new RNAV routes, thus contributing to a reduction of some paths that led to a harmonious transition between the en-route flight phase and the terminal control area.

2.11 As a result of these initiatives, between 2009 and 2010, SAM States held meetings to implement the action plan of the Route Optimisation Programme of the South American Region, based on the general principle that the ATS route network must serve as the basis for airspace organisation and air traffic service requirements.

2.12 Furthermore, in order to ensure the route network efficiency with civil/military coordination and cooperation, the use of the flexible use of airspace (FUA) concept is fundamental to ensure that the requirements of all airspace users are met.

3. **Conclusion**

3.1 It is important to note and make sure that the different levels of development worldwide will not lead to incompatibility of the various components of the ATM Operational Concept between ICAO Regions. Given the broad scope of these components in particular, the aforementioned considerations require judicious coordination of regional and global planning and implementation, with a view to an optimum implementation of such systems. The new procedures could be used as the starting point for a State action plan to reduce emissions.

4. **Suggested action**

4.1 The Meeting is invited to:

- a) take note of the information provided in this working paper;
- b) assess, in particular, the aspects listed in paragraphs 2.5 and 2.8, which serve as the basis for defining the new operational methods for environmental protection;
- c) encourage the focal points of the action plan to attend the training workshop in Montreal on 21-23 November 2011;
- d) encourage member States to develop action plans on CO₂ emissions and send them to ICAO;
- e) analyse any other related matter it may deem appropriate; and
- f) encourage the States of the Region to promote initiatives that will ensure the adoption of joint actions by the States of the Region, taking into account the sustainable growth of air transport.