



WORKING PAPER

FIFTH MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 23 – 24 March 2006)

Agenda Item 2.7: Environmental benefits of CNS/ATM Systems

ATM-RELATED ENVIRONMENTAL ACTIVITIES

(Presented by the European Organisation for the Safety of Air Navigation – EUROCONTROL)

SUMMARY

ATM can deliver considerable environmental performance improvements, while ensuring that safety is not compromised. This paper describes a number of developing pan-European environmental activities under way whose applicability at the global level would merit consideration.

Action by ALLPIRG/5 is in paragraph 9.

1. INTRODUCTION

1.1 Air Traffic Management (ATM) has a key role to play in minimising the impact of aviation on the environment. This was acknowledged in the conclusions of ALLPIRG/4 relating to the environmental benefits of CNS/ATM systems, and was also highlighted at the 33rd ICAO Assembly. At the 35th ICAO Assembly, States, in Resolution 15/1, Appendix H, recognised that “*substantial fuel savings and emissions reductions can be achieved through improvements in Air Traffic Management (ATM)*”.

1.2 World-wide fleet efficiency is improving now at an estimated 1% per year; but annual traffic is growing at a rate of approximately 4%. There is, therefore, from the emissions perspective, an annual gap of about 3% that is proving difficult to bridge. Moreover, the overall increase in traffic, and its spread to secondary airports, may now be generating expansion of airport noise contours for the first time in many years.

1.3 The industry therefore expects Air Traffic Management (ATM) to strengthen its contribution towards meeting the environmental challenge. EUROCONTROL, the European Organisation for the Safety of Air Navigation, through its Environmental Policy and Strategy, is committed to playing a leading role in this task.

2. ATM AND AIRPORT RELATED ENVIRONMENTAL PROTECTION

2.1 The principal operational initiative currently under development is the pan-European adoption of a harmonised Continuous Descent Approach (CDA) technique to reduce aircraft noise, fuel burn and emissions. Flight trials have been successfully conducted over the last eighteen months at Bucharest, Manchester and Stockholm airports with encouraging results. Working closely with stakeholders, a harmonised methodology, guidance material and phraseology are being developed so that an implementation campaign can start in 2007.

2.2 The concept of Collaborative Environmental Management (CEM) at airports is being strongly promoted, whereby an airport operator, the principal aircraft operators and the airport air traffic control provider work as a team to identify and improve environmental issues for which they have collective responsibility. Such issues will often impose airport capacity constraints and it is expected that the application of CEM will help to avoid the further imposition of constraints on current and future airport capacity.

2.3 Several research initiatives are being pursued to establish whether they could lead to operational improvements, such as improved noise abatement departure procedures, reduced taxi-ing times and steeper glide slope angles on approach. In 2005, the European Civil Aviation Conference (ECAC) entrusted EUROCONTROL with the harmonisation of noise abatement operational procedures in Europe following a joint workshop thereon with the European Commission.

3. ATM AND CLIMATE CHANGE

3.1 Improved operational efficiency is the key to minimising fuel burn and greenhouse gas emissions. Pressure from airspace users is intense on this issue; with oil prices expected to remain high, this focus will remain. The introduction of Reduced Vertical Separation Minima (RVSM) in the European area has had measurable environmental benefits of up to 5% reduction in fuel burn and emissions. No attempt can be identified, however, to validate such benefits at the global level. Given the importance of this contribution from ATM to environmental protection, EUROCONTROL believes that ICAO should undertake a study into the fuel burn and greenhouse gas emissions minimisation achieved in those regions in which RVSM has been implemented.

3.2 The next major pan-European programme to deliver network efficiency improvements is the Dynamic Management of the European Airspace Network (DMEAN). Harnessing existing technologies and operational concepts, it is expected to deliver considerable improvements in efficiency, whether from the structural or operational perspectives. The DMEAN programme has embedded an “environmental case” in its planning from the concept development phase.

3.3 A pan-European ATM Environmental Indicators facility is under development which, through a combination of flight plan, network design and aircraft performance information and algorithms, has already delivered system-wide views on the utilisation of European airspace in terms of network efficiency, fuel burn, greenhouse gas emissions and airport noise load. This provides EUROCONTROL with a unique capability to track the evolving environmental performance of the pan-European ATM network.

4. IMPROVING ENVIRONMENTAL AWARENESS WITHIN ATM ORGANISATIONS

4.1 An issue of major importance is that of improving the environmental awareness of air traffic management personnel. A web-based e-Learning training package to ATM stakeholders will be available from April 2006 over the world-wide web (www.eurocontrol.int/environment). Three modules will cover the following issues: transport and the environment; aviation and the environment; ATM and the environment. The general public will have access to the first two modules; module 3 is for ATM and related aviation personnel. The package has been developed to be readily translatable from English into other international languages.

5. SESAR ¹

5.1 The European Commission and EUROCONTROL are jointly funding a major industry-wide initiative to develop an ATM Master Plan to support the implementation of the Single European Sky. EUROCONTROL has been working with the SESAR consortium to ensure that environmental risks and opportunities are identified early. The ATM improvements implemented through SESAR should therefore minimise aviation's impact on society and the environment.

6. ATM ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGIES AND TOOLS

6.1 EUROCONTROL has at its disposal an increasingly sophisticated suite of products that it uses to undertake environmental impact assessments. Operational initiatives such as RVSM, the vertical expansion of 8.33 kHz channel spacing, Free Route airspace and Continuous Descent Approach have already benefited from this capability. Moreover, products to examine local air quality issues and interdependences between, for example, noise and emissions are being developed.

6.2 These capabilities are harnessed to support stakeholders' needs, in particular those of ICAO's Committee on Aviation Environmental Protection (CAEP), especially with respect to fuel burn and emissions modelling (noise expertise has also been put at the disposition of ICAO). The Advanced Emissions Model (AEM) was developed in the late 1990's by EUROCONTROL originally to support CAEP in a cooperative effort with the United States Federal Aviation Administration (FAA) to develop a preliminary common methodology to quantify on behalf of the CAEP to provide an assessment of the environmental benefits arising from CNS/ATM initiatives. Work with the FAA continues under a joint Memorandum of Co-operation which includes environmental research. EUROCONTROL also publishes an annual inventory of global traffic movements and emissions.

6.3 These capabilities have been put at the disposal of the CAEP as it seeks to harmonise a global approach to emissions modelling methodologies and tools. The Advanced Emissions Model is being used to provide CAEP with fuel burn and emissions estimates for the years 2002-2005 and forecasts for the years 2010 and 2020. EUROCONTROL also supports the CAEP initiatives to develop a global operations database, validate aircraft performance models and review candidate methodologies for assessing local air quality.

¹ Single European Sky ATM Research

7. OPERATIONAL INITIATIVES TO MINIMISE AVIATION'S ENVIRONMENTAL IMPACT

7.1 From this paper, it is clear that support to the CAEP has concentrated mainly on emissions modelling and related issues. Nevertheless, EUROCONTROL also contributed to the development of ICAO Circular 303 on Operational Opportunities to Minimise Fuel Use and Reduce Emissions. At ICAO Assembly 35, in Resolution 15/1 Appendix H/2.d), the Assembly requested the Council to “*continue to develop the necessary tools to assess the benefits associated with ATM improvements, and to promote the use of operational measures outlined in ICAO guidance (Circ 303) as a means of limiting or reducing the environmental impact of aircraft engine emissions.*”

7.2 Recently, however, support to ICAO through its CAEP has been expanded to include the topic of Continuous Descent Approach (CDA), for which EUROCONTROL provides the CAEP Focal Point. A report is currently being compiled at the global level to advise CAEP of the potential noise, fuel burn and emissions benefits that can be achieved through the introduction of CDA. This report will also include a review of operational aspects arising from CDA implementations world-wide and may result in subsequent global guidance, via the appropriate ICAO working arrangements.

7.3 EUROCONTROL strongly urges ICAO to undertake more detailed work at the global level to identify, quantify and promote implementation of best operational practice to ensure that the movement of air traffic generates the least possible social and environmental impact. This could entail, *inter alia*, improved flight profiles, enhanced noise abatement approach and departure procedures, raising intercept altitudes, direct routing and noise preferential routes.

7.4 EUROCONTROL would welcome the opportunity to increase its contribution to ICAO on operational issues such as those listed above.

8. CONCLUSION

8.1 EUROCONTROL is committed to ensuring that ATM plays a more important role in minimising aviation's impact on the environment. The operational, technical and research expertise that EUROCONTROL has at its disposal is being harnessed to that end. Several initiatives are under way which will bear fruit in the coming years. These would benefit from consideration by ICAO to ensure harmonised implementation at the global level.

9. ACTION BY ALLPIRG

9.1 ALLPIRG is invited to:

- a) request ICAO to undertake a study into the environmental benefits of the introduction of RVSM and to ensure that this information is transmitted to policy makers;
- b) request ICAO to address operational opportunities that minimise aviation's social and environmental impact in greater detail in the CAEP work programme and to promote harmonised implementation thereof; and
- c) encourage ICAO to seek appropriate support from recognised expert organisations in its work on operational opportunities to minimise aviation's social and environmental impact, noting the support offered by EUROCONTROL in this regard.