

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 4: Capacity-enhancement measures

4.2 Regional measures :

EUROPEAN ATC CAPACITY ENHANCEMENT – RECENT EXPERIENCE AND FUTURE PERSPECTIVES

(Presented by the European Organisation for the Safety of Air Navigation – EUROCONTROL, on behalf of its Member States and those of ECAC¹)

SUMMARY

¹ The ECAC Member States are: **Albania**, Armenia, **Austria**, Azerbaijan, **Belgium**, Bosnia and Herzegovina, **Bulgaria**, **Croatia**, **Cyprus**, **the Czech Republic**, **Denmark**, Estonia, **Finland**, **France**, **Germany**, **Greece**, **Hungary**, Iceland, **Ireland**, **Italy**, Latvia, Lithuania, **Luxembourg**, **Malta**, **Moldova**, **Monaco**, **the Netherlands**, **Norway**, Poland, **Portugal**, **Romania**, Serbia and Montenegro, **the Slovak Republic**, **Slovenia**, **Spain**, **Sweden**, **Switzerland**, **The former Yugoslav Republic of Macedonia**, **Turkey**, **Ukraine** and **the United Kingdom**).

The 31 Member States of EUROCONTROL appear in **bold**.

* French, Spanish and Russian versions provided by EUROCONTROL.

A common performance-driven planning process, managed by EUROCONTROL, is in place for the 41 States of the European Civil Aviation Conference (ECAC).

The process focused on ATC capacity enhancement in its initial phase and proved to be successful both in terms of planning and of actual achievement. It is progressively being extended to address other performance criteria, safety in particular.

The process is consistent with and in support of the ICAO regional planning process; it supports implementation decision-making and open discussion with airspace users and other main actors in the aviation field.

Suggested action by the Conference is in paragraph 6.

REFERENCES

1. EUROCONTROL ATM 2000+ Strategy, 2003 edition:
<http://www.eurocontrol.int/eatmp/library/strategydoc.html>
2. EUROCONTROL European Convergence and Implementation Plan (ECIP) Level 1 Years 2003 to 2007: http://www.eurocontrol.int/ecip/eciplevel1_en.pdf
3. EUROCONTROL ECIP Status Report 2001,
<http://www.eurocontrol.int/ecip/statusreport.pdf>
4. EUROCONTROL European ATC Capacity Report for Summer 2002,
http://www.eurocontrol.int/eatmp/capacity/Capacity_Report_Summer_2002.pdf

1. CONTEXT AND NEEDS

1.1 The sustained growth of air traffic and the associated increasing delays experienced in Europe over the last decade required a significant increase in airspace capacity.

1.2 In response to this demand, in 1997, the Transport Ministers of the European Civil Aviation Conference (ECAC) States requested EUROCONTROL to propose a comprehensive Air Traffic Management (ATM) Strategy for Europe that would meet the needs of the aviation sector up to 2015.

1.3 To this end, the EUROCONTROL Air Traffic Management Strategy for the years 2000+ (Ref. 1: ATM 2000+ Strategy), designed to improve ATM service provision in Europe, within the framework of a performance-driven top-down planning process, was adopted. This process is documented in the “European Convergence and Implementation Plan” (Ref. 2: ECIP).

2. CAPACITY PLANNING AT EUROPEAN ATM NETWORK LEVEL

2.1 The ECIP stems from the EUROCONTROL revised Convention, which sets out the requirement to coordinate States' implementation plans to secure convergence towards a uniform "gate-to-gate" European ATM System. The ECIP describes the commonly agreed medium-term actions to be taken by the States to meet the strategic principles and objectives set out in the ATM 2000+ Strategy.

2.2 The ECIP is part of a performance driven planning process, where planning decisions are based on benefits rather than technology, and takes as its foundation the need to set and attain quantifiable and measurable ATM performance targets for the ATM key performance areas. In its initial phase the process has been applied for capacity enhancement. Capacity profiles have been defined to quantify the ATC capacity required at each of the 68 area control centres (ACCs) in order to cope with expected traffic growth, and to meet an overall delay target representing the optimum balance between the cost of delays and the cost of providing air traffic control (ATC) services. Performance targets are being defined in line with other performance objectives set out in the ATM 2000+ Strategy (e.g. safety, cost-efficiency, and environment).

2.3 The ECIP also lists implementation objectives that set out the actions needed to achieve the required performance in the European ATM network. These implementation objectives stems from the more developed Operational Improvements identified by the ATM 2000+ Strategy as having the potential to satisfy the ATM performance requirements and to meet the airspace users' needs. They are supported by Research & Development programmes. The ECIP consists of two levels:

- a) level 1 of the ECIP sets out ATM Performance Targets and ECIP Implementation Objectives; and
- b) level 2 of the ECIP breaks down the ECIP Implementation Objectives into generic Stakeholder Lines of Action (SLoA) that describe what has to be done by each of the aviation stakeholders to meet the objective and by when.

2.4 The actions to be taken in each individual State are documented in a Local Convergence and Implementation Plan (LCIP) which constitutes the joint medium-term implementation plan for the State's civil aviation and military authorities, the air navigation service providers (ANSPs) and an increasing number of airport operators. The LCIP is the result of a cooperative planning effort between national stakeholders and EUROCONTROL, and is endorsed by the State authority, to demonstrate national commitment to the changes and implementation actions.

2.5 The EUROCONTROL Provisional Council endorses ATM performance targets, new ECIP Implementation Objectives, and significant changes to existing objectives, following consultation with all of the aviation stakeholders², through the EUROCONTROL working arrangements and structures. The ECIP is part of a rolling 5-year planning and implementation process. Since the first edition was published in October 2000, a new edition is produced each year, extending the planning horizon by one year. The yearly

² EUROCONTROL Stakeholders: the Airspace Users (AUs), the Air Navigation Service Providers (ANSPs), the Regulatory Authorities (RAs), the Airports, and the Aeronautics Industry.

planning cycle is concluded by the annual publication of a status report consolidating the information of all the LCIPs.

3. ACHIEVEMENTS

3.1 Improved European capacity planning process

3.1.1 The process described above has effectively been put in place and developed over the past four years. It is not only consistent with the ICAO Air Navigation Plan/Facilities and Services Implementation Document (ANP/FASID) process, but also with the ICAO Global Air Navigation Plan for CNS/ATM Systems (Doc 9750), as far as operationally applicable in the medium term, through the EUROCONTROL ATM 2000+ Strategy.

3.1.2 Experience gained in the three performance planning cycles since the ECIP was first published indicate that the ECIP/LCIP process is both effective and well supported by the European aviation stakeholders, who obtain the following benefits:

- a) a single composite plan covering most operational and technical ATM activities and encompassing all stakeholders;
- b) a clear assessment of priorities of the implementation objectives, through the identification of their contribution to the Operational Improvements set out in the EUROCONTROL ATM 2000+ Strategy;
- c) visibility of the benefits expected from the implementation measures; and
- d) clearly defined responsibilities and time-scales for achieving specific actions.

3.1.3 From a European perspective, the LCIP documents provide a comprehensive and independent view of the national plans and implementation actions, as well as of how these contribute to multinational and pan-European programmes. They also provide the means to monitor and coordinate local actions and report on the progress of plans as part of the yearly European-level status reporting system. The yearly production and distribution of the ECIP Status Report also provides an incentive for States to meet their commitments in a consensus-based decision-making environment.

3.2 Evolution of ECAC air traffic capacity in recent years

3.2.1 Over the period 1997 to 2001, the effective capacity of the European ATM system has increased on average by 4 per cent per annum. However, this was not sufficient to match the growth in traffic (at 5 per cent p.a. on average) and to contain air traffic delays.

3.2.2 The 2002 summer period has seen a marked decrease in delays (-45 per cent). While this can be partly attributed to a reduction in air traffic, the main reason is a substantial increase in the capacity of the European ATM system resulting from the actions of the Air Navigation Service Providers. This increase can be estimated at around 14 per cent for the European area where reduced vertical separation minimum (RVSM) was implemented in 2002.

3.2.3 As air traffic delays have generally been reduced to an acceptable level and the en-route ATC “capacity gap” appears to be practically closed, the impact of airport congestion now appears more critical.

3.3 Measures that have contributed to capacity increase

3.3.1 Capacity was increased by a variety of inter-related measures covering the application of best practice in terms of airspace structure development including sectorisation, staffing, sector configuration management and dynamic allocation of human resources to better meet demand. These measures were taken by national service providers, with the support and coordination, as appropriate, by the EUROCONTROL Agency.

3.3.2 Airspace and route network changes, developed and implemented in full coordination at European level, played a very significant part. In particular, the implementation of RVSM in the EUR region was undoubtedly the key contributor to the capacity increase. The capacity benefits were also enabled by more flexible use of airspace and new or revised ATC procedures.

3.3.3 The implementation of a number of national ATC systems projects (e.g. new ACC operations rooms or new radar systems) increased ATC productivity through the automation of certain ATM processes, the extensive use of enhanced computer tools, and better inter-action between humans and machines.

3.3.4 The EUROCONTROL Central Flow Management Unit (CFMU) also re-doubled the efforts for improving the management of capacity at network level by strengthening the pre-tactical planning process, as a joint effort between the CFMU, national Flow Managers and the aircraft operators. This contributed to the improved overall performance by reducing the impact of remaining ACC capacity limitations.

4. FUTURE PERSPECTIVES

4.1 Although traffic did decrease recently in Europe (by about 2 per cent in 2002) it is expected that growth will resume in coming years (average growth rates of about 4 per cent p.a. are envisaged). The policy of States is to plan for more capacity in order to be ready to accommodate demand when traffic growth does resume. In addition airport capacity planning will be progressively embedded within the process.

4.2 The main operational improvements and related enablers which have the potential to satisfy the requirements and on which research, validation and development work is on going, include:

- a) further airspace reorganisation;
- b) optimised management of capacity (Collaborative Decision Making - CDM for ATFM);
- c) extension of the 8.33 kHz R/T frequencies implementation;
- d) improved procedures and CDM to improve airport throughput;
- e) mode S surveillance (in the applicable area: from 2003 till 2008);

- f) mode S enhanced surveillance (capacity gains ranging from 5 to 10 per cent in applicable area: from 2005);
- g) LINK 2000 + - introduction of controller-pilot data link communications (CPDLC) in ACCs (up to 15-20 per cent capacity gains, starting 2007, depending on aircraft equipage);
- h) new generation of data link applications from AGC (start about 2008-2010) and progressive introduction of cooperative air traffic services (ATS), including automatic dependent surveillance (ADS) and, ADS broadcast (ADS-B).

4.3 A more complete list of potential future capacity enhancement measures is given in the EUROCONTROL ATM 2000+ Strategy (refer to the Attachment of the EUROCONTROL-ECAC - Paper presented to the Conference under Agenda Item 1.1).

5. FURTHER APPLICATION OF THE PLANNING METHODOLOGY

5.1 In summary, in Europe, the ECIP/LCIP provides a useful and efficient means of focusing investments of the ECAC Member States on operational changes that contribute most to improving the European ATM performance, and a mechanism for monitoring the implementation of the ATM infrastructure improvements.

5.2 This performance-driven planning methodology is permanently being improved in view of a more consistent application inside the ECAC area. In particular, it should be reinforced by the introduction of a formal regulatory process in the framework of the European Union. Support will be provided to ICAO through the European Air Navigation Planning Group (EANPG) to extend it to adjacent FIRs in the EUR Region.

5.3 This process and the experience gained with the ECIP/LCIP were presented to the Fourth Meeting of the ICAO CNS/ATM Systems Implementation Advisory Group / ALLPIRG (February 2001) in view of a possible application to other regions, as appropriate. The conclusion was:

“That, with a view to benefiting from EUROCONTROL’s experience and expertise in the field of performance-driven planning and implementation methods, particularly with regard to the collaborative links that the Agency maintained with its CNS/ATM partners, PIRGs:

- a) study the approach to planning and implementation taken by EUROCONTROL, with a view to the possible application of its elements in their respective regions of responsibility;
- b) take steps to issue appropriate invitations for EUROCONTROL’s attendance at PIRG; and
- c) meetings.”

6. **ACTION BY THE CONFERENCE**

6.1 The conference is invited to:

- a) note the performance driven planning approach commonly adopted by European States;
and
- b) recommend that States in all ICAO Regions consider adopting a similar performance-driven planning process.

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