



EUROCONTROL  
ANNUAL **REPORT**  
**2004**



# EUROCONTROL – THE EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL is an intergovernmental organisation with 34 Member States and has as its primary objective the development of a seamless, pan-European Air Traffic Management (ATM) System. More specifically its goals are to:

- heighten air traffic safety
  - increase airspace capacity
  - reduce air traffic delays
  - enhance the air traffic management system's cost-effectiveness
  - minimise the effect of air traffic on the environment
- Cooperative network design covering ATM strategies and concepts (EATM), research and development (EEC) and training (IANS)
  - Pan-European functions such as flow management (CFMU) and route charges (CRCO)
  - Provision of regional air traffic control services on behalf of Member States requesting such services (Maastricht UAC and CEATS)
  - Regulatory activities addressing safety regulation (ESARRs) and supporting EC regulation through the drafting of implementing rules for the Single European Sky

Originally founded in 1960 as a civil/military international organisation dealing with air traffic control at a European level, EUROCONTROL is now a world leader, pioneering advances in air traffic management technology, operational procedures and system interoperability.

With approximately 2,400 experts based in seven European countries, EUROCONTROL's core activities are based on four main pillars:

Working closely with Member States, air navigation service providers, civil and military airspace users, airports, the aerospace industry, professional organisations and European institutions, EUROCONTROL is committed to ensuring that airspace users and passengers can continue to benefit from a safe, expeditious and efficient air transport system.



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# 2004 HIGHLIGHTS



## > 10 February

EUROCONTROL wins ATC MAASTRICHT 2004 Award for its Enhanced Tactical Flow Management System

## > 17 February

European ATM leaders start implementing the Strategic Safety Action Plan (SSAP), the first phase in a long-term effort to enhance ATM safety in a region stretching from Ireland to Azerbaijan and from Italy to Iceland

## > 26 February

100 aircraft owned by 6 airlines sign up to become pioneers for LINK 2000+, EUROCONTROL's controller-pilot data link implementation programme



## > 1 March

Bosnia and Herzegovina becomes EUROCONTROL's 32nd Member State.



## > 7 April

Future benefits of medium-term conflict detection tool confirmed in a series of trials conducted at EUROCONTROL's Maastricht Upper Area Control Centre

## > 29 April

Egypt delegates billing and collection of air navigation charges to EUROCONTROL

## > 1 May

Ukraine becomes EUROCONTROL's 33<sup>rd</sup> Member State

## > 25 May

EUROCONTROL launches CASCADE – a new programme to ensure that future Cooperative Air Traffic Services will be moved swiftly and safely from concept to implementation



## > 10 June

EAD – the European Aeronautical Information Services Database - celebrates one year of operations

## > 18 June

The ARTAS (ATM Surveillance Tracker and Server), already in use at Schiphol, Lisbon and the Maastricht Upper Area Control Centre, enters operational service at five European air traffic control centres



## > 1 July

One year of successful controller-pilot data link operations at EUROCONTROL's Maastricht Upper Area

## > 26 July

EUROCONTROL launches formal consultations on three of the seven Single European Sky mandates entrusted to it by the European Commission



> 28 August

Central European Air Traffic Services (CEATS) Agreement enters into force



> 1 September

Poland becomes EUROCONTROL's 34<sup>th</sup> Member State

> 13 September

The European Commission and EUROCONTROL sign a Grant Agreement worth 4.6 million for a project to further develop the air traffic management services in five West Balkan Countries.

> 24 September

August 2004 sees record numbers of flights across Europe with the number reaching a record 821,377 – up 5.4% on the previous year

> 27 September

EUROCONTROL and FAA sign a Memorandum of Cooperation

> 11 October

EUROCONTROL and IATA sign a Memorandum of Understanding on Advanced Aviation Training

> 15 October

EUROCONTROL and EUROCAE sign Agreement on development of technical specifications and standards

> 20 October

EUROCONTROL celebrates 40<sup>th</sup> anniversary of the official decision to set up the first Multinational Air Traffic Control Centre at Maastricht



> 5 November

The Provisional Council supports another major initiative – DMEAN (the Dynamic Management of the European Airspace Network)

> 16 November

EUROCONTROL launches formal consultations on Single European Sky interoperability mandates



> 15 December

DGS is the first Directorate to achieve the 'Committed to Excellence' validation from the European Foundation for Quality Management.

# FOREWORD FROM LÁSZLÓ KISS, VICE-PRESIDENT OF THE PROVISIONAL COUNCIL



The Provisional Council, EUROCONTROL's policymaking body, made a number of key decisions in 2004, paving the way for Europe's future air traffic management (ATM) system.

The focus during the year was on enhancing safety, while improving efficiency, reducing costs and working towards the implementation of the Single European Sky (SES).

In July, the Provisional Council agreed a proposed schedule for vital actions such as the development of key safety indicators to better monitor compliance with EUROCONTROL's strategic safety objectives. The session also approved further development of the EUROCONTROL Safety Regulatory Requirement Implementation Monitoring and Support Programme. This will ensure full coordination with measures being taken by the International Civil Aviation Organization, helping to optimise the cost-effectiveness of international safety oversight activities.

Significant progress has been made in implementing the Strategic Safety Action Plan approved by the Provisional Council in 2003. At its session in November, the Council noted greater awareness on the part of Member States of the need to further enhance safety, along with an increased emphasis on training. Development of a safety net is underway and there are early signs of improvements in runway safety. However, the session also underlines the need for improved reporting of incidents and dissemination of the lessons learnt. It urged all partners to push ahead with the recommendations for the European Action Plan for Prevention of Runway Incursions.

The Safety Regulation Commission (SRC) published its Annual Safety Report on 4 November. The Report summarises the main achievements of the SRC over the past year, and reports on the implementation of ECAC-wide safety performance and the level of EUROCONTROL Safety Regulatory Requirement (ESARR). It also provides the SRC's main objectives for the forthcoming year and analyses issues of sufficient safety significance to justify the development of recommendations to the Provisional Council.

The November session also saw the approval by the EUROCONTROL Permanent Commission of the implementation of ESARR 1 "Safety Oversight in ATM", establishing safety requirements for an effective national ATM oversight function.

The efficiency of the European ATM system is improving steadily. Between 1999 and 2004, ATM delays were reduced by 67% in the summer months, and the resumption of strong growth following the situation in Iraq and the SARS outbreak was set against a background of further reductions. Between May and October 2004, traffic increased by 5.3% over the same period the previous year, while delays caused by ATM, at 1.2 minutes per flight, continued to move towards the target set by the Provisional Council in 2002 of a one-minute ATM delay per flight.

Besides endorsing the new DMEAN (Dynamic Management of European Airspace Network) programme, the Provisional Council also welcomed the establishment of an action plan for cooperation on the EGNOS/GALILEO satellite navigation programmes and the creation of a Joint Programme Board for research and data sharing.

High on the Provisional Council's agenda during 2004 was development of the implementing rules for the Single European Sky (SES).

The adoption of the SES regulations by the European Community at the beginning of 2004 was a vital step towards a unified European ATM system and has given rise to increased activity on all fronts. At its session on 5 November, the Council was briefed on the significant ongoing work to meet the tight deadline for the development of draft regulatory and other material on air-space design, flexible use of airspace and a common charging scheme. EUROCONTROL is also working extensively with the European Commission on implementing the measures contained in the Memorandum of Cooperation signed in December 2003.

During summer 2004 a major step forward was achieved towards the implementation of the Single European Sky in the CEATS region with the fifth ratification of the CEATS Agreement by Bosnia and Herzegovina, thus enabling the entry into force of the CEATS Agreement. This step was a key enabler in the process of meeting and sustaining the rapidly increasing ATM capacity demand in central Europe.

The Regulatory Committee, supported by the Regulatory Unit, continued to develop the regulatory structures and working methods necessary to complement the SES and in 2004 produced an initial version of the EUROCONTROL Regulatory Work Programme (RWP) for 2004, based on the best anticipation of the SES requirements. At its 21<sup>st</sup> Session, the Permanent Commission, on the recommendation of the Provisional Council, approved the core part of the 2005 EUROCONTROL RWP. This updates the 2004

Programme, which was based on the best estimates of SES requirements, and takes into account all of the SES mandates both – those already awarded – and those expected in the course of 2005.

The Civil/Military Interface Standing Committee continued to monitor developments in ATM/CNS in the ECAC area and to advise the Provisional Council on issues having an impact on military responsibilities. The EUROCONTROL Military Unit produced its first newsletter in early January, focussing on Key Performance Indicators and on the review of the exemption policy for equipping State aircraft with 8.33 kHz radios.

The tragic death of Mikko TALVITIE on 17 March 2005 shocked us all. The year 2004 was his final term as President of the Provisional Council and in his last meeting he welcomed the appointment of Mr David McMillan as his successor. The full meeting of the Provisional Council on 7 April 2005 paid tribute to Mikko's warm personality and to the contributions he made to our Organisation. Mr McMillan takes over at a crucial moment in the European ATM story, when it is more important than ever that the Member States of the EUROCONTROL Organisation, along with Air Navigation Service Providers and other stakeholders, work together to achieve the common goal of a more efficient, safe, cost effective pan-European air traffic management system.



# FOREWORD

## BY THE DIRECTOR GENERAL, VÍCTOR M. AGUADO

### Safety

Perhaps the most promising of the developments in 2004 was the publication of the Strategic Safety Action Plan (SSAP) in February. Europe now has an overall strategy which brings together various components of ATM safety, including human resources, training, equipment and procedures, safety regulation and safety management.

Not many months after the launch of the SSAP, the report on the midair collision at Überlingen in 2002 was released. The report highlighted the need to improve safety in five areas and in particular to focus on safety management and safety training and the use of the independent Airborne Collision Avoidance System (ACAS). The report also underlined the need for pan-European regulations to be transposed into national legislation and for these regulations to be fully enforced and monitored.

The Report's recommendations were in line with findings of the High-Level European ATM Safety Action Group, set up after the collision by EUROCONTROL. It was this Group of European safety experts that prepared the SSAP.

### Growth

2004 showed a return to vigorous traffic growth – this time, without accompanying delay. Never before have Europe's skies been so busy: the 29,500 flights a day threshold was reached in September.

Comparing September with September - traditionally the month in which the heaviest traffic is seen - in 2004, there was 8% more traffic than in September

2001 and yet there was **50%** less delay. This is real proof that efforts made by States, Air Navigation Service Providers and EUROCONTROL are paying off.

### Enlargement

Three States joined the Organisation in 2004. **Bosnia-Herzegovina** joined in March; **Ukraine** in May and **Poland** in September, bringing the total number of Member States to 34. EUROCONTROL is progressively drawing close to mirroring the membership of the European Civil Aviation Conference, to which 41 States belong.

### Technical Developments

The year began on a high note with the **Enhanced Tactical Flow Management System** winning the Jane's Award at the ATC 2004 Conference and Exhibition at Maastricht, the Netherlands.

An important step was made in July with the ratification of the **CEATS** (Central European Air Traffic Services) Agreement by Bosnia-Herzegovina. This ratification meant that the Agreement entered into force, a crucial step in the programme. With this fifth ratification, CEATS implementation activities were able to begin.

2004 was the anniversary year of the **EAD**, the European Aeronautical Information Services Database, which provides a central database of validated dynamic and static aeronautical data. Users maintain that EAD has significantly improved the accuracy, accessibility and availability of this information and they welcome the fact that it is more cost-effective than the previous systems.

2004 was a highly satisfactory year for European Air Traffic Management. I am sure that we will continue to build on the achievements made to date and meet the challenges of creating a sustainable air transport system.

Our priorities are to continue to support the implementation of the Single European Sky and to facilitate the application of its principles in the non-EU Member States.

We will progress the preparation of the CEATS agreement, with the aim of making it one of the first tangible examples of the Single European Sky implementation.

Pan-European programmes will be pursued; EUROCONTROL must lead the way in identifying solutions to future challenges.

We will carry on supporting our Member States and the European Community, as well as helping Air Navigation Service Providers to reach the targets.



### Senior Management

2004 was an eventful year for EUROCONTROL's senior management. Karl-Heinz Kloos took over from Arnold Vandenbroucke as the Director of the Maastricht Upper Area Control Centre, and Bo Redeborn joined EUROCONTROL as Director ATM Strategies.

Senior Director, Wolfgang Philipp, left the Agency after 15 years of sterling service for a well-deserved retirement. Entirely devoted to air traffic management from the beginning, Wolfgang's career was an illustrious one. It was with great satisfaction that EUROCONTROL learned that he was to receive the Air Traffic Controllers' Association's Glen A. Gilbert Award, which is given "to a recognised leader in aviation who has demonstrated long-term commitment to excellence" – he is only the second European to have been so honoured.

Another interesting development was the launch of the **CASCADE** (Cooperative Air Traffic Services) programme aimed at improving information exchange and task-sharing between the air and the ground. It will exploit airborne systems and enhance ground-based technology to deliver more capacity and safety in a cost-effective manner.

Many other technical advances were made in 2004; you will read about them in more detail in the pages that follow.

### Single European Sky

Good progress was made on preparing regulations for the Single European Sky. Workshops were held on the themes of Airspace Design, Flexible Use of Airspace, Functional Airspace Blocks; Common Requirements and Interoperability.

Final reports on the draft Implementing Rules for Airspace Design, Flexible Use of Airspace and the Common Charging Scheme were submitted. The Interoperability draft Implementing Rules were issued for formal consultation in November.

It is expected that the first regulations based on EUROCONTROL drafts will be adopted by the European Commission towards the end of 2005.

# SENIOR MANAGEMENT & ORGANISATION STRUCTURE



Victor M. Aguado  
Director General



Wolfgang Philipp  
Senior Director

retired in May 2004



Jean-Marc Garot  
Director  
EUROCONTROL  
Experimental Centre



George Paulson  
Director ATM  
Programmes



Massimo Fusco  
Director Central  
Route Charges Office



Francisco del Pozo  
Director Finance



Volker Thiem  
Director  
Human Resources



Jean-Robert Bauchet  
Director Central Flow  
Management Unit



Gerhard Stadler  
Director  
General Secretariat



Lars Wedbäck  
Director Institute  
of Air Navigation  
Services



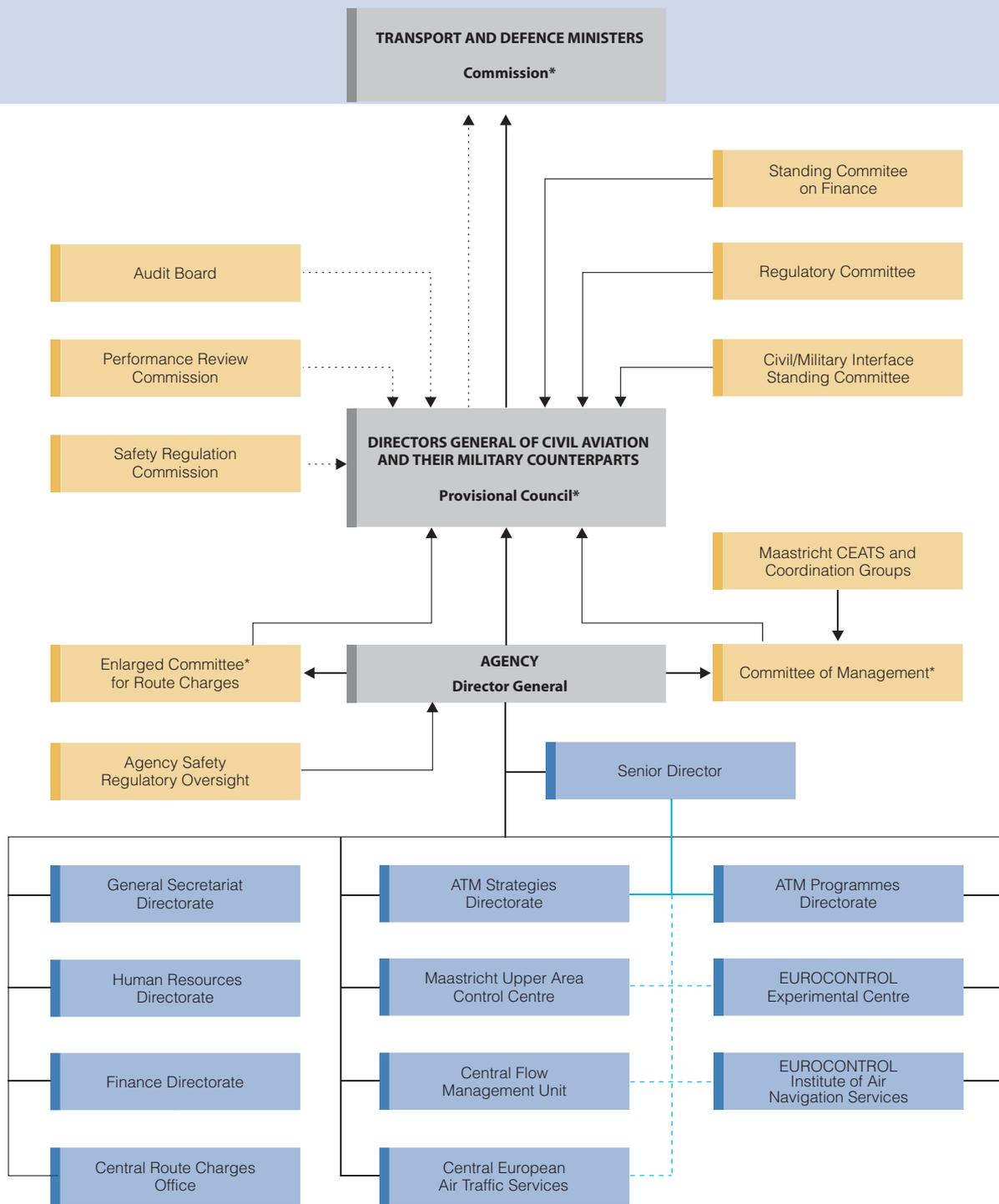
Bo Redeborn  
Director Air Traffic  
Management  
Strategies



Karl-Heinz Kloos  
Director Maastricht  
Upper Area Control  
Centre



Guido Kerkhofs  
Director Central  
European Air Traffic  
Services Programme



→ Reporting to  
 - - - - - Reporting to EUROCONTROL Commission through the Provisional Council

\* Until the ratification process of the revised EUROCONTROL Convention is completed

— EATM Service Business Unit  
 - - - - - EATM Coordination

# SENIOR MANAGEMENT & ORGANISATION STRUCTURE

## Legal basis

EUROCONTROL was established by the EUROCONTROL International Convention relating to Cooperation for the Safety of Air Navigation of 13 December 1960, subsequently amended on 12 February 1981.

In 1997 the amended Convention was revised to take into account changes in the political and operational environment of air traffic management. There are still a few States that have not yet ratified the revised Convention. Hence it has not yet entered into force.

## Governing structure

EUROCONTROL is organised into three bodies, including two governing bodies, the EUROCONTROL Commission and Provisional Council, and one executive body, the Agency.

### **EUROCONTROL Commission**

The EUROCONTROL Commission represents Member States at ministerial level. It formulates general policy and is responsible for decisions and regulatory functions. The Commission also approves the EUROCONTROL annual budget, the five-year programme, contract regulations, financial regulations and staff regulations, and is responsible for appointing the Director General and Directors. It gives a final ruling on the Agency's annual accounts.

### **Provisional Council**

Member States are represented in the Provisional Council at Director General of Civil Aviation level. (The European Community is in the process of joining EUROCONTROL and is also represented).

The Provisional Council meets at least three times a year and is responsible for implementing EUROCONTROL'S general policy, as established by the Commission, and for supervising the Agency's work. It acts in an advisory capacity to the Commission and makes recommendations to it on the approval of the yearly budget, on the maximum amount of debt that the Agency can take in the year and on the appointment of the Director General and Directors. It also approves contracts exceeding €1 million.

The Director General and Directors attend the meetings of the Provisional Council and of the Commission, but have no voting rights. The governing bodies of EUROCONTROL do not, therefore, include any executive director.

EUROCONTROL's institutional structure includes a number of bodies reporting to the Provisional Council or to the Commission that monitor the transparency of the Agency's work, supervise operations in specific areas, facilitate dialogue and coordinate work programmes in certain domains.

These are the:

- Enlarged Committee for Route Charges
- Maastricht Coordination Group
- Central European Air Traffic Services Coordination Group
- Performance Review Commission

- Safety Regulation Commission
- Audit Board
- Civil/Military Interface Standing Committee
- Regulatory Committee
- Standing Committee on Finance

The Standing Committee on Finance (SCF) was set up in November 2003 to replace the Advisory Financial Group and started work in January 2004. It is an expert Committee of the Provisional Council, to which it provides advice and submits recommendations on all budgetary and financial issues affecting EUROCONTROL.

### **The Agency**

The EUROCONTROL Agency is responsible for performing tasks prescribed by the Convention or entrusted to it by the Commission or the Provisional Council. Under the revised Convention, the Director General is exclusively responsible for its executive management. Agency Directors meet once a month in the General Meeting of Directors. There is a Management Board for each Business Unit, comprising the Director General and several Directors, which is in charge of reviewing business plans and the performance of units against their business plans. Business plans are approved by the Director General.

# ORGANISATIONAL DEVELOPMENTS IN EUROCONTROL



## Accession of new Member States

The ever wider geographical reach of EUROCONTROL's activities since it was formed has yielded concrete operational, political and institutional benefits. Over the past 15 years membership has increased considerably, from 11 Member States in 1990 to the current 34 States. Five of these have joined since 2001.

The continued expansion of EUROCONTROL provides opportunities for greater standardisation and safer operations, improving the performance of the overall European ATM network. It will also stimulate the development of regional cooperation initiatives, which will boost integration and cooperation within areas having similar needs, thus benefiting the entire European ATM system.

While membership of EUROCONTROL has increased steadily, a few European States are still not members. In this respect, the Directorate of the Secretariat General has already initiated negotiations and exploratory talks, with the aim of achieving membership of all 41 European Civil Aviation Conference (ECAC) States within two years.

There are no specific provisions in the Revised Convention regarding the eligibility of States to become EUROCONTROL Member States. However, the established practice is for a State to become eligible when it is both European and a member of ECAC, which defines "Europe" as the geographical area comprising all of the countries which are members of the Council of Europe.

**In the 45 years since EUROCONTROL was formed the environment in which the Agency functions has changed dramatically from one in which European airspace was run purely by national service providers to one in which international cooperation, cross-border communications and harmonisation of technology and procedures have become fundamental to the way European air traffic management (ATM) is operated.**

**Today, EUROCONTROL has as its prime objective the development of a seamless, pan-European ATM system. To do this, continued accession of new Member States is seen as fundamental, not only because it is central to the establishment of a Single European Sky but also because of the many other benefits, including enhancement of EUROCONTROL's weight and political influence in aviation-related matters both at the European level and worldwide.**



In October 2002, the Member States and the European Community signed a Protocol on the Accession of the European Community to EUROCONTROL. This was the culmination of negotiations aimed at ensuring consistency between the two organisations as they work together to develop the European ATM system. This move was followed by the conclusion of a Memorandum of Cooperation with the European Commission in December 2003, establishing a framework for mutual cooperation and support in five areas: implementation of the Single European Sky, research and development, data collection and analysis in the areas of air traffic and environmen-

tal statistics, satellite navigation and international cooperation in the field of aviation.

Three new States joined EUROCONTROL during 2004: Bosnia and Herzegovina in March, Ukraine in May and Poland in September. Also in March, Serbia and Montenegro, and Armenia in December, took an important step towards becoming a Member of EUROCONTROL with the signing of the EUROCONTROL revised Convention and the Protocol for the Accession of the European Community.

Poland plays a strategically important role for European ATM, particularly in Eastern Europe and the Baltic States, and its accession is timely, following the EU's recent expansion. With strong traffic growth, averaging 7% a year between 1997 and 2003 and expected to rise by around 18% this year and to stabilise at 6% a year by 2010, Poland is a crucial addition to European ATM.

The relationship between Poland and EUROCONTROL dates back to 1991, when the country became a member of ECAC. In 1996, a bilateral agreement was concluded relating to the European Air Traffic Control Harmonisation and Integration Programme.

Ukraine has been an active member of the European aviation community since December 1999, when it joined ECAC. Its long-standing relationship with EUROCONTROL began with the 1995 Bilateral Agreement concerning the billing and collection of air navigation charges by EUROCONTROL. A Letter of Agreement has existed between Ukraine and the Central Flow Management Unit since 1998.

## ORGANISATIONAL DEVELOPMENT IN EUROCONTROL

An ECAC member since November 2002, Bosnia and Herzegovina, situated at the crossroads of western and eastern Europe plays a strategically important role in the European air traffic management system. Bosnia and Herzegovina is one of the States committed to the development of the Central European Air Traffic Services (CEATS) Programme, the Agreement for which was signed in September 2001. Following a successful restructuring of its Civil Aviation Authority, the country is now working on a strategic plan fully integrating its CEATS activities. Following the country's ratification of the CEATS Agreement in August 2004, the Agreement entered into force.

### Ratification of the Revised Convention

The EUROCONTROL Convention of 1960, which is its legal foundation, was revised in 1997 to take account of changes in the political and operational environment of ATM within which the Agency functions. Early implementation of certain provisions of the Revised Convention has enabled EUROCONTROL to take initiatives to hasten the delivery of an improved, safe and efficient ATM system and to improve and streamline decision-making. Changes in the management structure included the establishment of a new decision-making procedure: the EUROCONTROL General Assembly and the Council will replace the EUROCONTROL Commission and the Provisional Council, after entry into force is achieved.



EUROCONTROL has  
34 Member States.

They are:

**Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the former Yugoslav Republic of Macedonia, Malta, Moldova, Monaco, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom.**

ECAC States which have  
started procedure for  
accession to  
EUROCONTROL

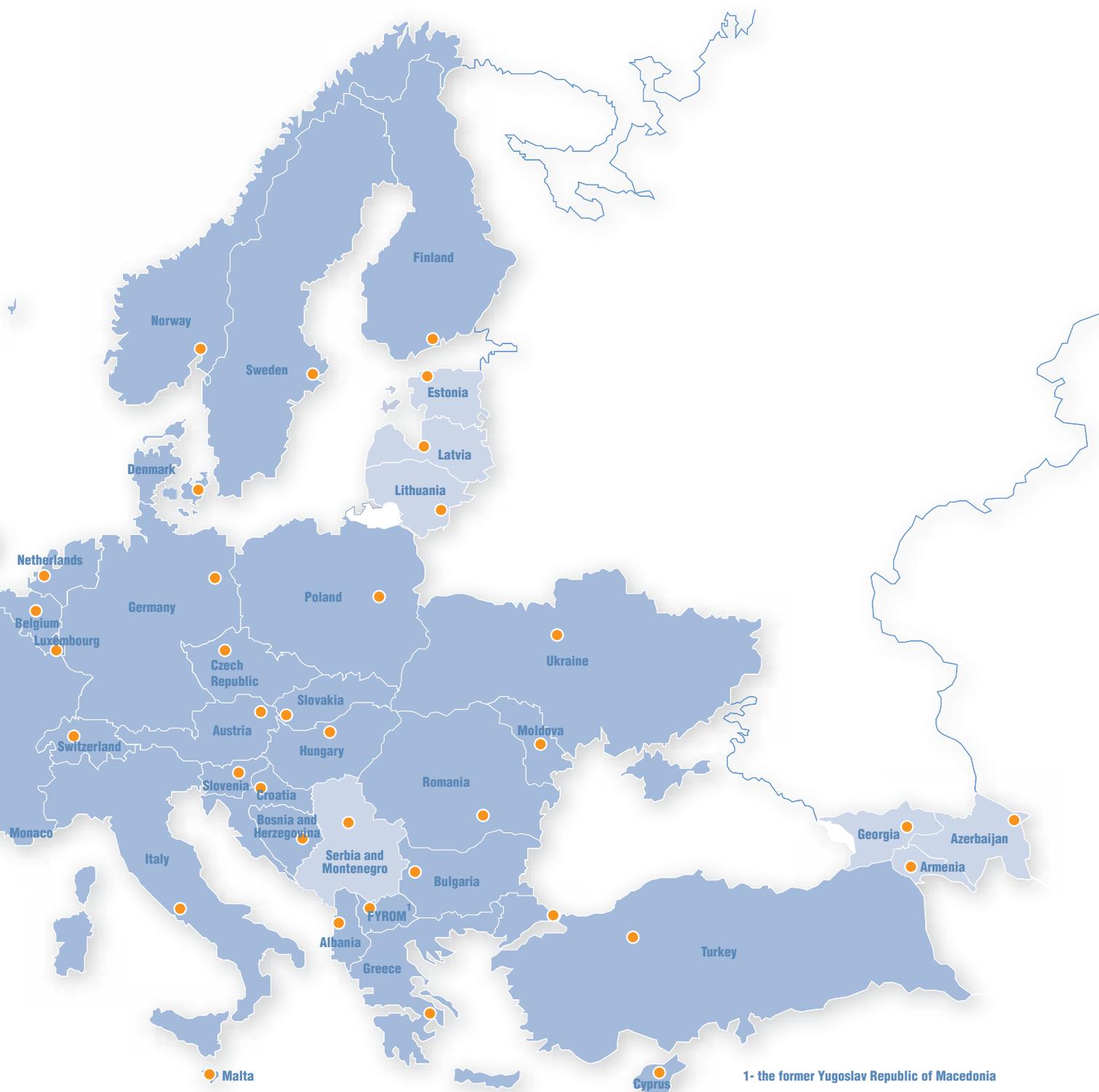
**Armenia, Serbia and Montenegro\*  
and Lithuania**



\* Membership enters into force on 1<sup>st</sup> July 2005



-  EUROCONTROL Member States
-  ECAC Member States (April 2005)



# INTERNATIONAL ACTIVITIES

## Regional cooperation

The pursuit of an improved air traffic management (ATM) system is, by definition, a global effort in which stakeholders are increasingly finding ways of cooperating to increase ATM efficiency, safety and cost-effectiveness.

Closer cooperation between States will lead to better organisation of air traffic control facilities and services and respond to legitimate airspace user requirements. This approach avoids the duplication of financial and human efforts and leads to better use of resources, benefiting States, air traffic services providers and airspace users.

In Europe, EUROCONTROL is working with the European Community and with Member States to develop the Single European Sky (SES), a seamless air traffic management (ATM) area in which the traditional national approach to airspace organisation and management is replaced by a more integrated European perspective. This major initiative is the culmination of years of European ATM cooperation which began in 1972 with the creation of the highly successful four-States Maastricht Upper Area Control Centre.



Today, through its many cooperation initiatives, EUROCONTROL has built up a wealth of experience on regional ATM cooperation issues as part of its long-term commitment to harmonising ATM practices, equipment and airspace. Today, the Agency has established a Regional ATM Cooperation strategy that:

- encourages regional ATM cooperation
- ensures support and facilitation for existing initiatives
- identifies possible new areas of cooperation

Regional cooperation can take many different forms, involving EUROCONTROL in direct cooperation to help improve national ATM systems, or groups of systems, or working in partnership with other bodies such as the European Commission (EC) as part of wider-ranging initiatives.



### **2004 Highlights**

During the year several regional cooperation initiatives were agreed. One of the most significant was the signature on 13 September of a €4.6 million Grant Agreement between the EC and EUROCONTROL to further develop air traffic management services in five West Balkan States.

The Aviation Safety and Air Traffic Control Phase II (ASTAC II) project comprises Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro and the former Yugoslav Republic of Macedonia. The main objective is to adapt the air traffic and aviation conditions in these countries to those of the rest of Europe, while paving the way for the introduction of the SES.

Under the Agreement, EUROCONTROL will assist each country over the forthcoming 28 months to improve the status of its civil aviation authority, to develop regulations and procedures for aviation safety and to meet international standards on safety management, human resources and business planning. In partnership with the European Joint Aviation Authorities, training will also be carried out on the regulation and oversight of aircraft operators.

The ongoing Europe Middle-East Air Traffic Management Coordination (EMAC) project, grouping Cyprus, Egypt, Jordan, Lebanon and Syria, held its third Steering Committee meeting in Brussels on 28/29 April.

EMAC is a regional mechanism aimed at fostering ATM cooperation between Europe and the Middle East on large-scale EUROCONTROL programmes requiring coordination with regions adjacent to Europe. The project is supported by the International Civil Aviation Organization, the International Air Transport Association and the European Commission.

At the April Provisional Council meeting, EUROCONTROL was authorised to carry out negotiations leading to a formal Cooperation Agreement between the EMAC States. This has two strategic objectives:

Development of a mutually beneficial inter-regional cooperation on aviation-related issues between EUROCONTROL and EMAC participating States.

## INTERNATIONAL ACTIVITIES

### REGIONAL COOPERATION

Provision of support services by EUROCONTROL to the EMAC States to enhance the efficiency and safety of ATM in the region.

Potential areas of cooperation include airspace structure and route networking, exchange of traffic forecast information, aviation aspects of the Global Navigation Satellite System (GNSS), air traffic flow management, collection of air navigation charges, training and the organisation of joint events such as workshops, conferences and studies.

The ATM Cooperation in South-Eastern Europe (ACE) group held its second Steering Committee meeting in Bucharest, Romania, on 20-21 October. The ACE initiative brings together Bulgaria, Moldova, Romania and Turkey to cooperate on safety, 8.33 kHz expansion, communications, navigation and surveillance, research and development and air navigation charges. Bulgaria and Romania have also signed a Memorandum of Understanding to create a Functional Airspace Block.

Previous agreements between the Baltic States have been replaced by the new Baltic Air Navigation Cooperation (BANC) accord. In January 2005 a Memorandum of Cooperation was signed by Lithuania and Poland on increasing cooperation at Director General level, while coordinating the plans of the respective air navigation service providers. Latvia and Estonia are expected to join the BANC agreement. EUROCONTROL is supporting this initiative by supporting these States for the timely implementation of the SES.



In October, EUROCONTROL and the Irish Aviation Authority signed an Agreement on charges for communications services provided by the Shanwick Oceanic Area. The Agreement calls for EUROCONTROL's Central Route Charges office to take responsibility for all billing activities relating to the Area, which handles around 350,000 flights per year.

In 2003 the Regional Air Services Development Association (RADA) group was formed by Air Navigation Service Providers in Moldova, Armenia, Azerbaijan, Ukraine, and Georgia. RADA States will cooperate in areas such as ATM planning and the development of CNS/ATM concepts, air traffic service route network development, aeronautical information service and GNSS implementation. A Cooperation Agreement with EUROCONTROL is planned.



# EATM MEETING THE ATM CHALLENGE

Despite the setbacks to the aviation industry in the past few years, European air traffic growth has been maintained and is forecast to continue.

To meet the expected demand, EUROCONTROL's Programme for Performance Enhancement in European Air Traffic Management (EATM) is working to provide a further quantum increase in ATM and airspace capacity. At the same time the need to improve aviation safety, deliver good environmental performance and meet national security requirements has to be ensured.

Besides meeting the daily challenge of providing a safe, efficient and cost-effective ATM system, the EATM performance enhancement activities are closely involved with the creation of a seamless ATM system across the 41 (in 2004) European Civil Aviation Conference (ECAC) Member States. This results from the measures contained in the EUROCONTROL ATM 2000+ Strategy and the Single European Sky (SES) initiative of the European Commission (EC).



The scope of the work of the EATM Service Business Unit (SBU) extends to the Air Traffic Service authorities of the ECAC States, while supporting air traffic service providers and regulators, the EC, the military and industry, delivering common strategies, programmes and services. It also includes work to enhance the performance of air-side operations at airports.

## Major Activities in 2004

### Strategic Safety Action Plan launched

The launch of the Strategic Safety Action Plan (SSAP) in February marked the formal beginning of a programme that had its roots in the accidents at Überlingen, Germany in 2002 and Milan/Linateo, Italy the previous year.

The SSAP aims to increase the number of safety personnel in ATM, introduce incident reporting and data sharing on a non-punitive basis, further harmonise guidance material on operations with

**Cooperative Network Design is one of the core activities carried out by EUROCONTROL in its effort to bring together all stakeholders in the developing air traffic management (ATM) system, and in particular air navigation service providers, to work together to achieve the far-reaching aims of the ATM 2000+ Strategy, and, ultimately, the Single European Sky.**

**Cohesive planning and monitoring is essential if the ATM2000+ Strategy, the European ATM Master Plan and other strategic objectives are to be synchronised with national implementation plans to**



Airborne Collision and Avoidance Systems (ACAS), implement proposals for improving runway safety and ensure that States enforce European ATM safety regulatory requirements.

SSAP actions target the following high priority areas:

- Safety-related human resources in ATM
- Incident reporting and data sharing
- ACAS
- Ground-based safety nets
- Runway safety
- EUROCONTROL Safety Regulatory Requirements (ESARRs)
- Awareness of safety matters
- Safety and human factors research & development

In April, a two-day Regional SSAP workshop was held in Rome, followed by a second in Tallinn in late June, when calls were made for more

resources for safety management and regulation. A third workshop was held in Budapest in October, which focussed on airport operations.

Earlier in the year, the Italian Agenzia Nazionale per la Sicurezza del Volo (ANSV) issued its report into the Linate runway incursion accident. The report recommended the full and urgent implementation of the European Action Plan for the Prevention of Runway Incursions (now a part of SSAP), and confirmed that all ANSV recommendations were covered within the programme plan or in other EUROCONTROL documentation.

Later in the year the German Bundesstelle für Flugunfalluntersuchung (BFU) presented its report on the Überlingen mid-air collision. There was good overall consistency between the SSAP and the BFU reports. More work is now being undertaken by the Safety Regulatory Commission (SRC) and EUROCONTROL to identify any additional work packages that need

**produce tangible performance gains that keep pace with foreseeable demand on the ATM system.**

**Areas which come under the Cooperative Network Design heading include relevant activities carried out by the EATM SBU, the EUROCONTROL Institute of Air Navigation Services and the EUROCONTROL Experimental Centre, each of which reports in this section. A number of activities have direct involvement in European Commission projects such as the Sixth Framework programme and the ATM Masterplan.**

**Cooperative network Design activities are grouped together into the following core areas:**

- > **Strategic Planning and Monitoring**
- > **Innovative Research**
- > **Safety, Human Factors, Security and Environment**
- > **Network efficiency improvements**
- > **Sector productivity**
- > **Airport operations**
- > **Communications, Navigation and Surveillance**

## COOPERATIVE NETWORK DESIGN

### EATM: MEETING THE ATM CHALLENGE

to be included in the programme. This activity is being undertaken in conjunction with the International Civil Aviation Organization (ICAO).

#### European Commission issues mandates

In April the four regulations that comprise the SES entered into force. They are:

- **Framework Regulation.** Providing the framework for the creation of the SES by the end of 2004, proposing a new institutional framework for its creation as well as new working methods
- **Provision of Air Navigation Services.** Promoting the safe and efficient provision of air navigation services in a seamless and interoperable manner across the European Union (EU)
- **The Organisation and Use of Airspace.** This regulation proposes a number of actions related to the organisation and management of European airspace. It creates a European airspace as an operational continuum where common procedures for design, planning and management ensure the safety of the air traffic management network
- **Interoperability of the European Air Traffic Management network.** This regulation defines the conditions to ensure interoperability in the EU between the different ATM systems

To assist the EC in developing SES implementing rules, EUROCONTROL started work on some of the first set of EC mandates, two of which come under the Organisation and Use of Airspace implementing rule, and were therefore allocated to the EATM SBU:

- Flexible Use of Airspace
- Airspace Design

Furthermore, EUROCONTROL started work on the development of criteria for the Functional Airspace Blocks.

Draft rules have now been developed for the Flexible Use of Airspace (FUA) and Airspace Design rules and presented to the EC for rulemaking and transposition within the EU.

In early June the first of two consultation workshops on the Airspace Design and FUA Mandates was held. The second took place in early September.

In late September the first of two consultation workshops on the Functional Airspace Blocks (FABs) Mandates was held. The second followed in late November.

#### European Convergence and Implementation Plan extended

The European Convergence and Implementation Plan (ECIP) is a key element in the overall performance planning process for improving European ATM. It provides the framework for agreed actions to be taken by all States participating in European ATM performance enhancement work.

The main changes to the Plan in 2004 concerned the strengthening of safety-related actions. New objectives were also added, aimed primarily at enhancing and improving airport safety and





throughput, improving ATC tools, and communications and surveillance systems.

The ECIP Status Report for 2003 found that the implementation of ECIP objectives at national level had progressed satisfactorily, and that the actions required from the various aviation stakeholders to improve the ATM network were generally on target. There has been a steady increase in the percentage of pan-European objectives, reflecting the expanding and strengthening commitment of stakeholders to implement a uniform ATM system in the ECAC area.

During 2004 the EATM SBU continued to support all ECAC States in their efforts to implement the necessary ATM systems, regulations and procedures at local level by providing expert support to produce their own Local Convergence and Implementation Plans (LCIPs). These are a major driver for the achievement of commonly agreed ATM performance targets in ECAC States.

The safety regulation and safety management part of the document was extended to support the implementation of the SSAP. Efforts were also devoted to increasing the coverage of airports in the LCIP process, mainly dealing with runway incursion prevention and capacity elements for airports producing delays.

EUROCONTROL also started initial work on a common LCIP for Central European Air Traffic Services (CEATS) in which the ANSPs from the eight Member States were involved.

## 2004 Highlights

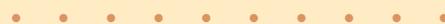
- > Another extremely busy year for the EATM's performance enhancement programme included the formal launch of the Strategic Safety Action Plan (SSAP) in February, the entry into force of the four regulations comprising the SES in April, and the conclusion of a series of trials of the Medium-Term Conflict Detection (MTCD) tool, also in April.



- > May saw the launch of the first new EATM initiative of the year, the Cooperative ATS through Surveillance & Communications Applications Deployed in ECAC (CASCADE) programme, which aims to improve information and task-sharing between pilots and air traffic control.



- > The battle to increase airspace capacity was taken to a new front with the agreement by the Provisional Council in November to a major new initiative proposed by EUROCONTROL, the Dynamic Management of European Airspace Network (DMEAN) programme, aimed at delivering increased capacity and better utilisation of European airspace.



- > The European AIS Database (EAD) programme was formally closed in July, marking the start of EAD oversight arrangements, with the creation and organisation of an EAD Oversight function to take over all pending and future activities related to the EAD service



- > During the year the elements of a major new SES initiative were put in place by EUROCONTROL and the EC. In its first phase the SESAME programme will provide for the delivery of an ATM Master Plan, providing the technical and operational complement to the SES programme,



## COOPERATIVE NETWORK DESIGN

### EATM: MEETING THE ATM CHALLENGE

#### **Merger creates CASCADE**

The merger of the Automatic Dependent Surveillance (ADS) and Air Ground Communication (AGC) programmes into the CASCADE programme was welcomed by a number of stakeholders. CASCADE will provide the platform for development, validation and implementation of Ground and Airborne Surveillance, Controller Pilot Data Link Communications (CPLDC) and Datalink Flight Information Service (D-FIS). The stakeholders share the EATM Management's view that merging two previously distinct programmes, one of a technical nature, the other operational, exploits synergies and will yield economies.

#### **Dynamic Management of the European Airspace Network launched**

The launch of the new DMEAN Programme was marked by the production of a management plan detailing how the Concept of Operations will be implemented. The plan, formulated using the ATM 2000+ Strategy and the Operational Concept Document, was produced in close cooperation with civil and military stakeholders.

DMEAN brings together a number of important EUROCONTROL initiatives in airspace design, namely: Collaborative Decision Making (CDM), FUA, Air Traffic Flow & Capacity Management (ATFCM) and information management.

The rationale of the DMEAN Framework Programme is that the DMEAN Concept of Operations should be implemented within 5 years. This very focused approach means that it will rely principally on proven technology and existing ATM infrastructures.



#### **Overall ATM/CNS Target Architecture initiative moves forward**

The Overall ATM/CNS Target Architecture (OATA) programme is developing a target concept and architecture to support the uniform Gate-to-Gate ATM network for Europe. Several iterations of the draft Architecture were delivered and a proposed avionics roadmap was prepared in conjunction with Airbus and Boeing. The roadmap was supported by study reports which included an investigation of the technology options for the implementation of System Wide Information Management. In June a contract was issued with the aim of delivering a high-level logical model for ATC.

The Joint Programme Board's work on the coherency and consistency of future research programmes was complemented by OATA. EUROCONTROL and the EC worked together on existing projects such as the EC's Gate-to-Gate and Cooperative ATM projects. Global information dissemination was also enhanced when, in March, the Federal Aviation Administration (FAA) began attending OATA meetings. EUROCONTROL was also invited to the FAA's Target System Description and Joint System Wide Information Management meetings.

One of the issues being addressed by the OATA work, the overall ATM system design, is contained in the Operational Concept Document (OCD). In June the Provisional Council approved version 2 of the OCD, reflecting the progress made in the understanding of the possible long-term requirements and goals, and taking into account the knowledge accumulated by the EATM domains.



**Link 2000+ Pioneers increase**

By November, the number of aircraft equipped under the EUROCONTROL LINK 2000+ Pioneer Programme had reached a total of 152 as increasing numbers of operators flying in the core area of Europe joined. At the same time, the Irish Aviation Authority confirmed its commitment to participation in the LINK 2000+ Programme and implementation of CPDLC services.

To increase the number of participating airframes, development of a possible financial incentive scheme was begun, aimed at accelerating the implementation of ATM programmes. This initiative is consistent with the SES, in particular the Service Provision Regulation of March 2004.

Air-ground Data Link services are part of the strategy for matching the required levels of capacity with traffic growth and performance targets. They are key enablers to improve service quality, safety, and cost effectiveness. To facilitate a timely implementation of these Air-Ground Data Link services for the benefit of all ATM stakeholders, EUROCONTROL set up an Incentives Project team to develop appropriate incentives.

and, as such, a template for the direction for European ATM over the next 20 years. EUROCONTROL launched the call for tenders for a study for the SESAME definition phase in January 2005.

> In late October the Airport Operations Conference & Exhibition brought together participants from every sector of the industry, including the military, for briefings on current and emerging ways of tackling airport issues. The need for improved collaboration between all actors within the airport environment was one of the main conclusions.

> Mr Bo Redeborn was appointed Director ATM Strategies in January. He took up his responsibilities the following month.

> Wolfgang Philipp retires

Mr Wolfgang Philipp, Senior Director EATM, retired at the end of May after 15 years of service with EUROCONTROL. He was instrumental in many strategic developments and milestones in European ATM, including the Central Route Charges system, the establishment of the Central Flow Management Unit, the creation of the European ATM Convergence and Harmonisation Implementation Programme, its successor, the European Air Traffic Management Programme and the more recent EATM organisation. As EATM Project Leader, he oversaw the implementation of a number of very successful programmes, including Reduced Vertical Separation Minima in Europe, the Airborne Collision Avoidance System and the introduction of 8.33 kHz frequency spacing. In November the US Air Traffic Controllers Association presented the prestigious Glen Gilbert Award to Mr Philipp during a special ceremony in Washington D.C.



## COOPERATIVE NETWORK DESIGN

### EATM: MEETING THE ATM CHALLENGE

#### **ACAS II Phase 2 implementation completed**

All of the necessary work for the implementation of Airborne Collision Avoidance System (ACAS) II Phase 2 on 1 January 2005 has been completed. Phase 2 requires all civil fixed-wing turbine-engined aircraft with a maximum take-off weight exceeding 5,700kg, or seating more than 19 passengers, to be equipped with ACAS II.

While expressing satisfaction at progress in implementing ACAS II Phase 2, stakeholders agreed that this phase had presented more difficulties than Phase 1, owing to the characteristics of the affected aircraft operators. Preparatory work involved the need for additional flight crew training. Together with the States' regulatory authorities, EUROCONTROL provided details of the exemption procedures, and of any transitional issues.

#### **Feasibility of TCAS-RA downlink studied**

EUROCONTROL was requested by the High Level European Action Group for ATM Safety to investigate the feasibility of downlinking ACAS Resolution Advisories (RAs), so that they could be displayed on the controller's working position.

Currently, pilots are required to notify ATC about RAs by radio. These verbal reports are often unreliable, sometimes difficult to comprehend, unstructured and missing vital elements (call-sign, type of RA, etc). The aim of an RA downlink would be to inform controllers of an RA event faster, more reliably and in a structured way, and hence increase controller situational awareness in a critical situation.



So far, the indications are that an RA downlink should be technically feasible and operationally acceptable. The majority of experimental participants saw operational benefits in the provision of RA information to the controller. They also believed that RA downlinking would decrease the likelihood of contradictory ATC clearances. Feasibility studies will continue in 2005 with more safety, operational, cost/benefit and technical studies.



### **8.33 kHz coordination needed**

Stakeholders are now convinced that a coordinated European approach is essential if the introduction of 8.33 kHz frequency separation between FL195 and FL245 in the core States is to succeed. A revised 8.33 kHz work programme comprising follow-up activities related to implementation above FL245, and detailed planning for the implementation of 8.33 kHz above FL195, was also completed.

As the year drew to a close, a new version of the handbook on European Aeronautical Spectrum Strategy was produced and distributed. A preparatory plan was developed for the World Radio Conference (WRC) 2007, and the associated European Aeronautical Common Position was also ready by the end of the year. The EATM SBU continuously participated in the ICAO and the European Conference of Postal and Telecommunications Administrations groups to ensure that European positions were taken into consideration.

### **Mode S transition extended**

In the second half of the year, an increasing number of aircraft operators reported difficulties beyond their control in equipping their aircraft to meet the 31 March 2005 Mode S Elementary Surveillance (ELS) compliance date. In many cases operators had asked for a delay in equipping a proportion of their fleet to Enhanced Surveillance standard to beyond 31 March 2007, because to equip all of their aircraft by that date would incur disproportionate installation costs.

In parallel with the airborne equipment installation issues, some ANSPs indicated that they would be unable to upgrade to full ELS operational functionality before mid-to-late 2006. ANSPs found that the operation of ground stations interrogating in Mode S was restricted because of radar detection anomalies caused by Mode S and Mode A/C transponders operating out of specification.

Given the scale of the corrective action necessary to resolve the issues identified, EUROCONTROL, with the endorsement of the regulatory authorities of the Mode S implementing States, proposed an extension of the transition period for up to 24 months.

### **Integration initiative for TMA RNAV**

Over the past few years, an increasing number of Precision RNAV (P-RNAV) Terminal Airspace procedures have been introduced at various locations across the ECAC States. These procedures have largely been designed and implemented on an individual national basis, and it has since been identified, above all for flight safety reasons, that it

## COOPERATIVE NETWORK DESIGN

### EATM: MEETING THE ATM CHALLENGE

was necessary to reduce the variety of procedures to the greatest extent practicable.

The EATM SBU has now ensured a coordinated and harmonised implementation of P-RNAV procedures in the ECAC area. The aims were to achieve consistency regarding TMA RNAV, including the associated aircraft and operator approval requirements. The target situation was agreed to be in place at the latest by November 2004 in major TMAs, with other TMAs following at the latest by April 2005.

#### **Challenges to Growth Study highlights airport congestion**

The Challenges to Growth Study 2004 clarified the future position of air transport in Europe via network-wide analyses of the long-term evolution of traffic. These showed that, for the highest growth scenario, airports will severely constrain traffic growth. Annual demand is forecast to increase to 21 million flights, a factor of 2.5 compared to 2003.

Despite a forecast increase in potential capacity of 60% in the airport network, it is expected that 17.6% of the traffic will not be accommodated. This is likely to have a significant impact on airport operations. More than 60 airports will be congested, and the top 20 will be saturated for at least 8-10 hours per day. The increase in demand from flights that cannot be accommodated will put pressure on traffic distribution patterns. Growth will be limited to parts of the airport network which are not yet congested, meaning that extra flights will only be possible at secondary airports, generally at less favourable times.



#### **Airport operations programme commended**

The Airport operations programme continued to make steady progress, with a number of stakeholders expressing their satisfaction. One major stakeholder, the UK's National Air Traffic Services (NATS), encouraged the use of the programme's products, such as Airside Capacity Enhancement Standards and Recommendations, at the many airports where it provides services. In France, the Airport Collaborative Decision-Making applications were close to being implemented at Paris airports.

Many stakeholders agreed that enhanced communication was a key factor in spreading best practices, leading to increased capacity amongst airports. The Airports Council International also noted that over the past few years the programme had succeeded in changing the airport operators' mindset by producing convincing business case assessments. The programme incorporated major airports into overall pan-European ATM capacity planning mechanisms.

#### **Research and Development needs pan-European coordination**

There has been a growing awareness in recent years that the organisation and management of ATM Research at pan-European level needs to be structured to ensure a more consistent and efficient approach to the challenges which have now been identified.



The importance of establishing a European Area of Research and Innovation was unambiguously affirmed by the Heads of EU-States during their Lisbon Summit in Portugal in 2000. A number of goals have been identified since then by a group of ATM experts and the avenues to achieve these goals have been defined in the Strategic Research Agenda of the Advisory Council for Aeronautics Research in Europe (ACARE). This work will provide the basis for identifying the research needs of the European ATM Master Plan.

The Joint Programme Board (JPB) being established by the EC and EUROCONTROL will ensure coherency and consistency between the two institutions for future ATM research programmes derived from the European ATM Master Plan.

### **ATM Security demonstrated**

The EATM SBU continued to make good progress with ATM security developments and achieved widespread support from many stakeholders. This was particularly evident during the demonstration and evaluation of Phase 1 of the European Regional Renegade Information Dissemination System, which was jointly organised using the resources of EUROCONTROL, NATO and some national air forces.

The demonstration, at Maastricht UAC (MUAC), aimed to show how it would be possible to reduce the number of fighter intercepts required to verify the status and intentions of aircraft that have "lost" communications with air traffic controllers. The demonstration scenario was focused on MUAC airspace.



### **EUROCONTROL contributes to global ATM work**

For the 35th ICAO Assembly (Montreal, 28 Sep-8 October) EUROCONTROL prepared and coordinated a set of papers on air traffic management matters. The considerations put forward in these papers were, on the whole, accepted and endorsed by the Assembly and were appropriately reflected in the resolutions and the report material, ensuring that European activity on ATM matters is well positioned in terms of ICAO's global work and will be given certain priority in that context.

Within the EATM SBU conscious and continuous efforts are being made to ensure that ATC and flight deck procedures are being updated to facilitate a safe and efficient ATM system in Europe. In this respect, EUROCONTROL submitted five proposals for amendments to ICAO documentation to the ICAO European Air Navigation Planning Group. The proposals had originated in various developments within the EATM SBU, such as changes with regard to the application of RVSM and issues identified in the European Action Plan for Runway Safety.

## COOPERATIVE NETWORK DESIGN

### EATM: MEETING THE ATM CHALLENGE



#### **ATM Environment Service developed**

A new EUROCONTROL strategic service to deliver the first set of indicators characterising the environmental performance of the pan-European ATM network has been developed. Also, through the Agreement of Cooperation with the European Space Agency (ESA), external funding has been secured for ATM-related environmental work. ESA will provide the majority of the funding required for the research study on contrails.

#### **EATM Services increasing**

EATM Services provided both indirect and direct support to all customers, or to specific groups of customers. They ranged from advice and consultation to assist stakeholders to implement actions, to the supply and support of specific tools that helped to improve local ATM performance. Service maintenance was also provided, including software upgrades, bug corrections and other maintenance tasks to ensure best service delivery quality.

Five logical clusters of services were identified in the EATM service portfolio, based on customer population, costs and benefits, namely:

- Pan-European Management Services from which all States benefit, such as LCIP
- Multinational Coordination services, for example services provided to the ICAO North Atlantic and European Regional Office in Paris
- Multinational Operational services such as EAD
- EATM Implementation Support
- Hardware/software updates and maintenance

In 2004, over 10% of the EATM budget was allocated to service activities and there were indications that this would increase in the near future. It was, therefore, considered necessary to take another approach in the budgeting, and most probably the financing, of services. Proposals were developed to find, in particular, alternative financing for the surveillance services provided by the EATM Service Business Unit.

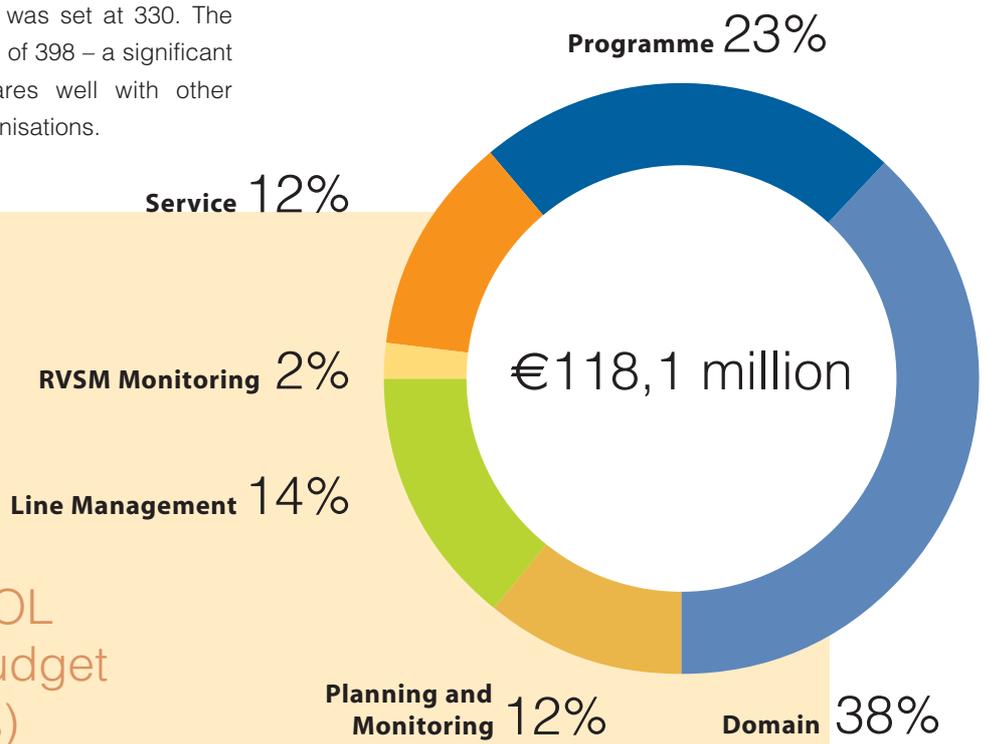


**High score for Quality Management**

In 2004 the EATM SBU continued to implement the improvement plan by adopting an evidence-based self-assessment approach using external assessors and following the European Foundation for Quality Management 'Recognised for Excellence' approach. The target score was set at 330. The EATM SBU achieved a score of 398 – a significant achievement which compares well with other European public sector organisations.

**Budget**

The EATM budget for 2004 was €118.1 million. About two thirds was allocated to programmes and domains, with more than 10% going to services.



EUROCONTROL  
EATM 2004 Budget  
(Headquarters)

# IANAS TRAINING FOR EXCELLENCE

With almost 40,000 students of 85 nationalities trained over the past 35 years, the Luxembourg-based Institute of Air Navigation Services has built up a solid reputation for educating European air traffic management (ATM) personnel to the highest standards.

The Institute's mission is to provide training for Air Navigation Service Providers (ANSPs), ATM regulators, Member States and EUROCONTROL personnel. The Institute also plays a key role in disseminating ATM concepts and projects in order to develop consistent regional safety standards, thereby contributing to worldwide improvements. In addition, it provides training on regulation for the development of common standards, an essential element of the Single European Sky (SES) concept.

Courses, workshops and seminars are designed, developed and delivered in traditional classrooms, ATC simulation facilities or, increasingly, via e-learning. The Institute works in close partnership with training establishments across European Civil Aviation Conference (ECAC) States, helping them to meet their national training requirements.



A number of courses have been designed to help develop awareness of the growing implication of the European Commission (EC) in the ATM network, and how EUROCONTROL supports the development and implementation of the SES. The Institute works closely together with the European Air Traffic Management (EATM) programme on education and awareness programmes aimed at enhancing the efficiency of local implementation. It also provides courses on safety and regulation in the context of the mandate given by the EC to EUROCONTROL, aimed specifically at safety management, safety improvement and safety regulation.



## Air Traffic Management

The efficiency with which ATM courses are delivered has been increasing steadily. Since 1998, the number of ATM students processed each year has risen from 1,092 to 3,047, while the overall budget has decreased by 25%. Similar efficiency increases were implemented in other areas, such as ATC ab-initio training. These have been achieved by utilising a variety of innovative training delivery methods (see graph).

There was a small growth in the number of participants attending ATM courses and workshops, to 3,977. The very high overall customer satisfaction level for ATM courses increased in 2004.

To meet heavy demand, the Institute created additional student capacity by providing information courses aimed at large-scale audiences. The wide-ranging "Towards a Future European ATM System" course is an excellent example of this.

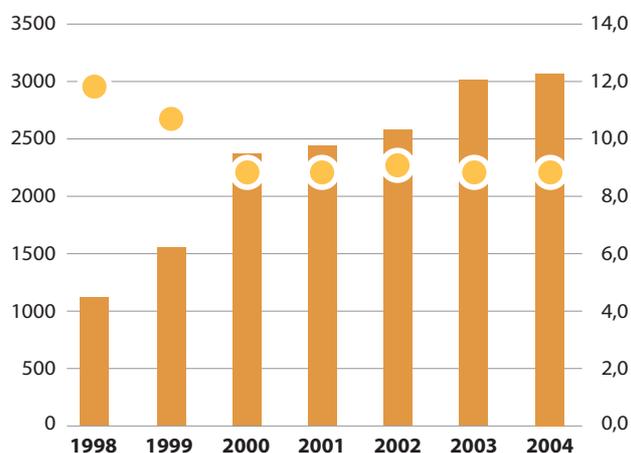
The Institute continued to deliver on-site training for customers. Out of a total of 191 ATM courses in 2004, 20 took place at on-site locations, allowing us to satisfy specific training needs and to fulfil local training requirements. Safety training courses were particularly popular for on-site delivery.

Despite our best efforts, in some areas the demand for training continued to outstrip the availability of ATM course places. To address this shortfall, the Institute entered into partnerships with other national training establishments with spare capacity. These now offer the Institute's On the Job Training Instructor (OJTI) training programme.

Additionally, the Institute managed the logistics for workshops on specific topics, and in 2004, provided the logistics for all the SES consultation workshops, in Luxembourg.

## Number of ATM students and Contribution by Member States

- Number of ATM students
- Contribution by Member States (in € million)



## COOPERATIVE NETWORK DESIGN

### ATM TRAINING FOR EXCELLENCE



#### **ATM course portfolio**

In 2004, ATM Training products continued to be tailored to the needs of Member States, ANSPs, regulatory authorities and EUROCONTROL. Training was provided for operational, technical, administrative and management staff. Consequently, the range and breadth of courses offered by the ATM Training Unit was very diverse.

While most courses were aimed at specific target audiences, a few were designed to bring together people from different backgrounds. Others were aimed at providing awareness and skill-based training. ATM courses were structured so as to fill niches in the market not covered by other training establishments. In short, the Institute's philosophy is to complement, rather than compete with, national training centres.

In 2004, the Institute launched new courses in the following areas:

- Competency Assessment
- Airport Capacity Enhancement
- GNSS European Applications
- Safety Management and Regulation

In addition, the following courses have undergone a complete review:

- Automated Support to ATS
- Classroom Instructional Techniques

#### **Future ATM priorities**

During 2004, the Institute concentrated on supporting EUROCONTROL's wide range of activities, including EATM programmes, training related to the Strategic Safety Action Plan (SSAP), support to ESARR 5 and flow management training. About 85% of the ATM training courses directly supported EATM activities.

It is expected that the domain activities of Environment and Security will generate training requirements in the near future. The Institute recently held discussions with the appropriate Agency experts on these topics.

In the context of the SSAP, the need to develop and deliver Safety Management and Safety Regulation training will remain a high priority for the next few years. ESARR 5 provides general safety requirements for ATM personnel who are responsible for safety-related tasks. Specific support to ESARR 5 was provided through the OJTI and Competency Assessment training courses for Air Traffic Controllers.

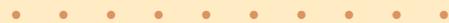


**ATM Training –  
a change in the approach to selection**

The Institute was only able to accommodate 75% of the 4,000 requests for slots received in 2004. Because demand for ATM training outstrips supply, it is essential that stakeholders with genuine training needs are given priority. The course attendance selection process was therefore reviewed and EATM and SRU experts were involved in the course allocation procedure. Furthermore, additional enrolment information, such as job title and name, has contributed to the selection of the right people to attend a given course at the right time. The benefits of this modification can be seen in recent participant satisfaction surveys.

## 2004 Highlights

- > The provision of ab-initio training for air traffic controllers for the Maastricht UAC (MUAC) and Luxembourg continued and during the year significant effort was devoted to aligning the courses with the Common Core Content in accordance with the EUROCONTROL Safety Regulatory Requirement for ATM Services' Personnel (ESARR 5).



- > E-learning courses are now part of our day-to-day business. We have created partnerships with ANSPs in Member States and with the International Air Transport Association to avoid duplication of work and foster mutual understanding amongst training providers.



- > A European Foundation for Quality Management (EFQM) assessment by EUROCONTROL Agency assessors confirmed that the Institute is improving its quality performance.



- > The Training Division is responsible for the following core business activities:

- Air Traffic Management training
- ATC ab-initio training for MUAC and Luxembourg
- Training development and support activities

## COOPERATIVE NETWORK DESIGN

### AIANS: TRAINING FOR EXCELLENCE



### Air Traffic Control

The Institute continued to meet the demand for ab-initio training at the Maastricht Upper Area Control Centre (MUAC). The ATC Training unit handled three MUAC ab-initio intakes, totalling 46 students, plus six from Bosnia and Herzegovina and Luxembourg. This amounted to a total of 1,305 student weeks.

In addition, ATC unit staff conducted a mapping exercise aimed at ensuring that the MUAC ab-initio course complied with Common Core Content guidelines in accordance with ESARR 5. Mapping of the course is expected to be completed in 2005.

To improve the quality of the ab-initio end-product, EUROCONTROL conducted a detailed review of MUAC ab-initio recruitment and training processes. Issues raised in the review are currently being discussed by the Agency Operational Training and Selection Group. The Institute then developed a detailed action plan to improve the quality and efficiency of its element of the ab-initio training process. Discussions regarding the implementation of the plan are currently underway with MUAC.

MUAC and the Institute are currently reviewing future MUAC training requirements. The aim is to ensure that course size is optimised to provide the Centre with a sufficient number of ab-initio controllers at the right time and of the right quality to meet their operational needs. In 2005, both parties expect to complete this task, and to

agree on the level of resources and funding required to achieve it. It is expected that the agreement will be encapsulated and finalised in a Service Level Agreement in the early part of this year.

In 2004 the ATC Training Unit provided Approach Radar Refresher Training to the Luxembourg administration. This training was supplemented by two Aerodrome refresher modules conducted on the Aerodrome Simulator and has enabled the Luxembourg administration to work towards meeting the requirements of ESARR 5.

Throughout 2004 the Institute continued to provide support to the Central European Air Traffic Services (CEATS) Programme. Training courses were developed and delivered to CEATS staff in various locations.

In order not to compete with Member States, all future ATC unit training activities will focus solely on meeting Maastricht and Luxembourg ab-initio training requirements.

#### **Training Development and Harmonisation Unit**

During 2004, the Training Development and Harmonisation Unit (TDH) concluded its revision of the Guidelines for ATCO Common Core Content Initial Training and of the Guidelines for a Common Basic Level of Technical Training for Air Traffic Safety Electronics Personnel. The upgrade of these documents was of particular importance in the context of the implementation of ESARR 5 Version 2.



Towards the end of 2004, the unit finalised training-related feasibility studies as part of Sense, the Agency Human Resource programme. TDH topics cover training harmonisation and development, e-learning methods and the creation of ELPAC, an English language proficiency test. Member States will be fully consulted on these feasibility studies during the early part of 2005.

### **e-learning issues**

The Institute's Learning Management System (LMS) hosts on-line education for the Central Flow Management Unit, MUAC, the Institute and a number of external users including LVNL, Nav Portugal, Skyguide and SATSA. By the end of 2004, a total of 100 individual modules were available on the the Institute's LMS. Of the total of 4,500 students who were registered on the LMS, more than 1,000 finished one or more of these modules.

In 2003, in conjunction with MUAC, the ATC unit produced a number of e-learning ATC Refresher Training modules aimed at enabling it to comply with ESARR 5 regulatory requirements. Recognising that these modules may assist Member States' ANSPs in meeting their own regulatory requirements, a number of additional modules have been produced by the Institute. By the end of 2004, a total of 15 modules had been made available to support Member States' ANSPs in meeting the ESARR 5 regulatory requirements regarding operational ATCO ongoing competency.

# EEC PATHWAY TO THE FUTURE

Located at Brétigny-sur-Orge, south of Paris, the EUROCONTROL Experimental Centre (EEC) plays a leading role in research to support the safe, efficient and environmentally sustainable management and operation of the European air traffic management (ATM) system.

Implementation of the European ATM Master Plan is the lynchpin of the overall work programme and is supported by a structured approach based around general objectives broken into local research areas in the form of the EEC Business Plan.

Besides implementing a safety culture throughout the Centre's activities, the emphasis is on early delivery of tangible results that meet identified and agreed needs, coupled with innovative research carried out through the European network of research institutions, in concert with public and academic bodies.



The EEC Business Plan is structured around two target dates:

- Deployment of the Single European Sky (SES) in 2012.
- Collaborative-High Performance concept deployment in 2017, paving the way towards the ATM 2020 vision.

Research activities carried out at the Centre fall into five domains:

- Airport Throughput (APT), concentrating on the capacity issues facing airports and their immediate environments.
- Innovative Research (INO), based around topics suggested in the Advisory Council for Aeronautical Research in Europe (ACARE) Strategic Research Agenda (SRA).
- Network Capacity and Demand (NCD) Management, working on airspace management, demand and capacity management, and traffic management issues.
- Sector Safety and Productivity (SSP), concerned with all aspects of air traffic control related to controller-centred sector-level planning and separation management functions.
- Society Environment Economy (SEE), addressing public perceptions and expectations concerning the air transport industry, and researching the drivers for the growth in transport demand. It also addresses the ATM contribution to the impact of air transport on the environment, as well as an economic assessment of the air transport industrial sector.



## Short-term support

Short-term activities, extending for around the next five years, are carried out in the overall context of the Centre's objective of preparing European ATM for the long term, which must address evolving methods and practices. This has the beneficial side-effect of maintaining contact with EUROCONTROL's day-to-day operations.

### Performance assessment

In accordance with the latest EUROCONTROL medium-term forecasts, capacity profiles have now been established for all air traffic control centres (ACCs) in the European Civil Aviation Conference (ECAC) area and for each year of the 2005-2009 planning period. Scenarios include low, medium and high traffic growth, new routes and acceptable delays.

Workshops have been organised to finalise the analysis with ANSPs. Medium-term capacity planning will help planning at network and local levels by identifying all possible implementation schemes.

A specific study was devoted to the implementation of the Central European Air Traffic Services Upper Area Control (UAC) scheme.

The Capacity Planning Task Force proposed several improvements to the medium-term capacity planning tools, finalising the methodology and continuing development of relevant tools.

Numerous Air Traffic Flow Management (ATFM) operational studies have been carried out, one of

the most demanding of which was the evaluation of capacity required for Greece during the Olympic Games in August 2004.

ATC complexity indicators and criteria have been identified by COCA (COmplexity and CApacity) and agreed by the Performance Review Unit (PRU) working group. They will be used annually to assess performance, cost and efficiency at State, ANSP or ACC levels. The COCA method has also been applied to the operational study of Maastricht UAC airspace to help support possible re-design or flexible management.

### Demand and capacity management

The Alternative Slot Allocation Procedure (ASAP) project, carried out in close cooperation with the Central Flow Management Unit (CFMU), led to further validation of the proposed new slot allocation algorithms. Analysis of the experimental results, however, led to the conclusion that in the short or even medium-term, the expected benefits would not be sufficient to justify implementation. The definition of a set of metrics and guidelines for a common approach will be re-used in other ATFM and Enhanced Tactical Flow Management System (ETFMS) performance assessment studies.

Capacity management will benefit from the new graphical features that have been simulated in order to validate the Innovative Configuration Optimiser, a tool allowing a collaborative approach to the design of new configurations and associated regulations. A prototype is now available and is to be used when operationally accepted.

## COOPERATIVE NETWORK DESIGN

### EEC: PATHWAY TO THE FUTURE



#### **Airport throughput**

Work was undertaken in the A380 Technical Group in cooperation with the Federal Aviation Administration (FAA), Airbus and the Joint Aviation Authorities (JAA) to support the analysis of the risks and severity of wake vortex encounters and deduce the separation minima to be applied.

In the domain of Surface Movement Management, Advanced Surface Movement Guidance and Control (A-SMGCS) procedures were validated in a real-time simulated environment. Validation will be pursued in 2005 in the form of field trials in five major European airports. Contribution was made to the EC's European Airport Movement Management project. Participation will continue, mainly in validation activities.

The implementation of the Collaborative Decision-Making (CDM) airport concepts was supported by several studies carried out at selected European Airports, particularly, during 2004, at London Heathrow and Lisbon. Requirements for CDM implementation have been produced, and Stockholm Arlanda has launched the first steps for implementation. Barcelona is in the test phase in shadow mode and is planning to go live early in 2005. A preliminary cost-benefit analysis already shows encouraging initial benefits. The CDM Website has been made available and a first version of the Implementation Manual provided.

#### **ATM safety**

In response to the tragic accidents at Überlingen and Milan-Linate, the European Action Group on ATM Safety (AGAS) identified several areas for improvement. One of these is safety research and development (R&D), for which several key risk areas have been addressed:

- Analysis of level bust incidents led to the design of a 'safety architecture' aimed at providing tools and working methods for minimising their occurrence.
- The issue of interactions between safety nets was approached through experiments with a traffic alert & collision avoidance (TCAS) resolution advisory (RA) downlink display for controllers, with the participation of a range of controllers and human factors specialists.
- The drop in controller vigilance or awareness due to fatigue following a busy period gave rise to surveys in several European ACCs. Initial results show that this is quite common and can affect performance. Counter-measures are now being investigated.

Following publication of the report on the Überlingen accident, a workshop was held in September to examine the lessons that could be learned and tackle the new issues raised.

Approaches to safety R&D were discussed with ANSPs, controller unions, pilot representatives and academia during a review meeting held in October. There is also close collaboration with the



FAA via the FAA-EUROCONTROL Action Plan 15 on Safety. This Plan resulted in a 'harmonised toolbox' of safety assessment and assurance techniques. The EC is also involved in the context of the Cooperative Approach to Air Traffic Services (CAATS) project, which aims to bring together key players in European ATM Safety R&D. In 2004 this gave rise to a survey of current practices and safety R&D priorities in Europe.

### Mid-term evaluation

The mid-term timeframe extends to 2012. Applied research is required to support a coherent concept of operations, which at the outset is the 'best guess' vision of how the future ATM system should behave. The aim is to identify quantifiable benefits and to define success criteria and tangible, customer-oriented results, leading to an operational concept ready for deployment within the 2012 timeframe. Research should therefore accomplish this by 2008. Special focus is to be placed on integrating safety assessment results.

#### System definition and assessment

A new unit (the System View Cell), created during the second half of the year, is committed to the development of a High Level Operational Concept. A first draft was released in December in the context of the EC's Cooperative ATM (C-ATM) project, which was fully accepted by key stakeholders, including airlines.

The Nordic System Wide Information Management project is being carried out with airport and aircraft operators and ANSPs. A model has been devel-

## 2004 Highlights

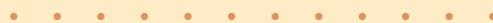
> The Centre maintained its overall strategy, although frequent adjustments were necessary to adjust to the constantly evolving ATM environment. In 2003 its role as leader of the organisation and management of European ATM research was strengthened, and this continued in 2004.



> Launch of the SES Implementation programme (SESAME), in tandem with the air transport industry, with the aim of drawing up a European ATM Master Plan.



> ACARE delivered the second edition of its Strategic Research Agenda (SRA), providing socio-economic scenarios and associated technologies and opening up new horizons for research and innovation.



> A task force was created to address organisational and management issues within the research agenda from a corporate perspective, with a view to full integration of the EEC work programme within the European Air Traffic Management (EATM) business framework. This could lead to the development of an integrated EUROCONTROL research work programme and the creation of a third dedicated directorate.



> The EUROCONTROL/European Commission (EC) Joint Programme Board has been formally established, leading to a common research work programme directed towards the European ATM Master Plan.



> Alignment of the work programme with the ATM Master Plan developed jointly with the aerospace and defence industries of Europe resulted in a newly created Work Breakdown Structure. The Business Plan, built to reflect this new structure, was approved by the EEC consultation group and by its management board.



## COOPERATIVE NETWORK DESIGN

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oped for a detailed analysis of the system's information flows and will be followed by a cost benefit analysis.

#### **Traffic management**

The Cooperative ATM Measures for a European Single Sky (CAMES) project aims to develop operational procedures requiring dynamic traffic flow coordination between several ACCs. The work programme has been defined with the CFMU, is co-funded by the European Commission and involves the Spanish, French, Italian and Swiss ANSPs. During 2004, traffic sequencing and balancing techniques were evaluated, allowing dynamic re-assignment of the traffic to new routes in response to demand.

A series of real-time simulations assessed the feasibility of the synchronisation measures with regard to safety, implied workload and cost/benefit indicators. A working session involving operational staff and feedback from controllers confirmed that re-distribution of the flights among sectors removed 'hot spots' from overload in the sectors involved and had a positive impact on safety. Controller workload is significantly reduced, while the extra traffic to be handled by the accepting units does not entail unacceptable additional workload. The impact on airlines and pilots remains to be evaluated.

From the ANSP perspective, the resulting cost/benefit ratio is highly beneficial, although from the airborne point of view it remains to be quantified. While there is no requirement for air-

craft equipage, or pilot training, there could be an impact on routes, potentially impacting costs.

The next step will be refinement of the operational concept, definition of roles and responsibilities, decision-making procedures and technical requirements. On-site trials are to be conducted at the end of 2005 and during 2006.

The results so far suggest that implementation may take place earlier than initially forecast.

#### **Separation management**

Separation management is investigated mainly from a controller-centred, sector-oriented, ATC operations point of view. Current work is aimed at building an integrated, system-oriented operational concept. In this respect, substantial contributions were made to the definition of separation management functions as part of overall concept development for the European Commission Gate-to-Gate and C-ATM projects.

In particular, the concept has been developed to embrace some degree of 4D planning and control, some Airborne Separation Assistance Systems (ASAS) applications and synchronisation functions facilitated by, for example, departure and arrival management tools.

The work was supported by a series of studies focusing on specific components and functions. For example, experiments showed that ASAS "sequencing and merging" procedures could be beneficially used together with an arrival manager tool.



Simulations were run to evaluate arrival and departure management facilities for the Italian and Swedish ANSPs. Live trials were also conducted to evaluate medium-term conflict detection tools, with a final set of exercises run at Maastricht UAC. Results show benefits in en-route sectors but are less conclusive in sectors dealing with climbing and descending traffic.

Technical aspects of Automatic Dependent Surveillance-Broadcast (ADS-B) implementation were investigated, showing substantial benefits for surveillance performance.

A significant contribution was made to the Mediterranean Free Flight project. A third series of real-time simulations was completed and extensive flight trials were planned. Partnerships were established with the EC's Northern Europe ADS-B Network Update Programme (NUP-2) and South European Pre-Implementation ADS Program (SEAP), with the international requirements focus group and in EUROCONTROL/FAA cooperative programmes.

To integrate safety concerns over separation management issues, a safety plan was written with both a top-down and a bottom-up approach, with special attention to the safety of live trials.

> **Regrouping of communications activities within a single unit has increased synergy. New activities include knowledge management, web content management and stakeholder relations.**



> **Externally, communications were improved by means of the Experimental Centre Consultation Group (ECCG), conferences, exhibitions and workshops, the EEC web-based newsletter, a public website, visits, organisation of a showroom and various publications. Internally, they benefited from the internal information monitoring group, the intranet, introduction of knowledge management procedures, 'weekly information corners', and the EEC News.**



> **The Maastricht ATC 2004 Innovation Award was granted for the work carried out on Aircraft Identification Tags using digital watermarking technology, which allows the insertion of call-sign tags on the screens of controllers using VHF communications.**



> **The third Annual Innovative Research workshop took on a new dimension with an audience of 144 participants representing stakeholders from 24 Member States. The First International Conference on Research in Air Transportation, jointly organised with the University of Zilina, Slovakia, was also a success, involving 139 scientists and researchers of 30 nationalities from 20 countries.**



> **A Joint Research Lab agreement was signed with the Sorbonne University in Paris to establish the Complex System Modelling and Cognition Laboratory at the EEC. This is a significant step towards the network of joint EUROCONTROL/academia research laboratories.**

## COOPERATIVE NETWORK DESIGN

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The new Operational Concept Validation Methodology was developed in the framework of the Gate-to-Gate project. Validation is now under way.

#### Airport throughput

The results of an initial feasibility study for the Time-Based Separation project were delivered and are based on rapid prototyping and development of business cases for risk evaluation. Significant results were achieved during 2004:

- Initial theoretical calculations showed that, on average, around three arrival movements per hour could be recovered with Time Based Separations (TBS) at a typically large European airport in headwind conditions.
- A wake vortex encounter risk study concluded that the use of TBS minima appeared to offer significant capacity benefits without increasing the risk of wake vortex encounters along the glide slope when operating in headwinds.
- Cost-benefit analyses indicated that implementing TBS at Frankfurt would not be beneficial because two parallel runways are used for arrivals in visual meteorological conditions. However implementation at London Heathrow would bring significant benefits. There was no requirement for new airborne equipment.
- Controller working methods and procedures, together with proposed support tools, were drawn up and tested in a series of rapid prototyping simulation runs. These indicated that the concept is feasible and understood and accepted by controllers. Two support tools proposed and further developed during the exercises – Intelligent Time Vectors (ITV) and Target Positions (TP) – were seen to be complementary, depending on the phase of the flight: ITV was more appropriate when the aircraft was in the maneuvering area and TP once the aircraft was established on the glide slope.

Considerable effort was devoted to analysing wake vortex separation requirements. This took the form of managing the European WakeNet Working Group, attending meetings in the USA, membership of the Light Detection and Ranging Working Group, participating in the FAA-NASA ConOps Team and issuing requirements for applied research topics. A survey on wake vortex detection technologies was also carried out.





## Long-term investigation

Long-term investigation in 2004 focused mainly on preparing the ATM R&D Master Plan and participating in the ACARE SRA, which takes a holistic and comprehensive approach to the air transport system and includes operator and service provider perspectives.

The initial vision aims to define the operating environment for deployment within the 2017 timeframe, based on the assumption that research activities will be completed in 2012. At this stage, the long-term vision remains essentially conceptual. For the mid-term, special focus will be placed on integrating the results of safety assessment.

Research will focus on:

- Airspace design and management, incorporating technological developments for air/ground-integration and four-dimensional precision trajectories.

- Developing the new generation of ATFM systems that will make full use of new technologies such as four-dimensional flight management systems and datalink. In particular, assignment of departure slots could be replaced by 'dynamic airborne contracts' to ensure greater flexibility.
- Extending the planning horizon to facilitate traffic organisation. This would be achieved through the introduction of specific tools based on experience gained in initial studies and deployments.
- Development of new tools for conflict detection and resolution assistance, including automatic generation of resolution advisories (CORA-2 project), separation applications (ASAS), departure sequencing and trajectory management.
- Airport throughput applications, in close cooperation with the EATM airport domain.
- Development of the ATC-Wake Operational Concept, for which a number of simulations of prototypes have already been delivered. Operational scenarios have also been delivered to the I-Wake project for on-board equipment.

The following documents are built upon the results of the long-term investigation carried out in 2004:

- The ATM R&D Master Plan for 2017.
- ACARE SRA Version 2 for the timeframe 2020+.

## COOPERATIVE NETWORK DESIGN

### EEC: PATHWAY TO THE FUTURE



### Innovative research

The major objective of Innovative Research is to clarify new ideas for more focused research within the framework of future editions of the ATM R&D Master Plan. Innovative ideas applicable in the short term are also promoted.

All Innovative Research activities are reviewed and if necessary reoriented at the end of each year by the Innovative Research Advisory Board, composed of internal and external ATM representatives.

Through partnerships with universities and research institutions, all studies follow an experimental validation method dealing with technical and operational feasibility assessment in which human safety management is of prime concern. Most studies are aligned with topics suggested in the ACARE SRA.

#### **Advanced airspace concepts**

The Innovative Operational Concept developed in the Paradigm Shift Project provides a detailed view of a concept of operations that capitalises on previous investigations of 'sectorless', 'super-sector', 'trunk route networks' and 'city-pair highways'. Based on a dual-route network combining long-haul highways and standard routes with decentralised control, operations would introduce the notion of timeflexible contracts and management of unexpected interruptions to deal with operational uncertainty. Investigations into the use of speed control in conflict resolution also made progress.

Remarkable progress was made on investigating three-dimensional stereographic displays. Integration of voice recognition for interaction with the display produced encouraging results, while the human-centred design approach yielded high performance for three-dimensional displays with regard to two-dimensional interfaces.

The Advanced Modelling for ATM under Uncertainty programme took a significant step forwards in the identification of discrepancies between actual flights and CFMU-scheduled flights. These have been demonstrated to be timescale insensitive. Distribution has been investigated, and regularities in patterns characterising uncertainty are still to be analysed.

Coordinated ATM research has been addressed through the Collaborative Action for Research in EUROCONTROL (CARE) project concerning Innovative Research. The second call for proposals received 50 responses from universities, industries and research institutions, six of which were selected.

### Institutional framework

The impact of air transport on the European economy is steadily increasing. The objective of this work package is to provide the air transport industry and policy makers with an increased understanding of the social context in which it is embedded. Research activity strives to improve the interface between the industry and the public by better anticipating future public expectations and perceptions, while providing information about technical trends.



International organisations such as EUROCONTROL, the EC and the International Civil Aviation Organization (ICAO) will receive the results of studies into strategies and possible new regulations. Support is to be provided to Member States, ANSPs and airport managers. Dialogue will be initiated with citizens on ATM issues and the scientific community is also to be involved through R&D coordination, particularly on environmental issues.

### **Improving the quality of life**

The 5A project (Attitude towards Aircraft Annoyance Around Airports) addresses the issue of how aircraft noise affects quality of life. Results are now being obtained through the use of significant new noise indices and an evaluation of the financial implications.

A press survey was conducted in order to get a picture of the perception of ATM by the general public. It revealed that, although if ATM is not generally discussed in the European press other than at national level, the more the public understands about the air traffic controller's job, the more balanced their opinions when crises, such as accidents, occur.

A study was carried out to obtain a better understanding of the meaning of what is called 'resistance to change' in ATM. A method for capturing both air traffic controller and management attitudes was devised and will be used in 2005-2006 in several air traffic control centres in Europe.

### **Environment**

Several initiatives are under way or have been completed:

- Work was undertaken to develop new guidance material on noise modelling. A harmonised source-propagation noise model for road, rail, industrial and aircraft noise sources has been developed.
- Fast-time simulations of the proposed noise abatement procedures at Paris Charles de Gaulle airport have been conducted, as well as validation of the new multi-configuration approach.
- The European Harmonised Aircraft Noise Contour Modelling Environment project is nearing completion.
- The CONTRAIL project initiated in 2003 in cooperation with the European Space Agency to study the relationship between changes in cirrus cloud and air traffic density has been completed.
- A global emissions model has been evaluated against nearly 5,000 datasets and has excellent compliance with ICAO criteria.
- A methodology for development of an airport air-quality inventory for all emission sources was delivered. A pilot study was conducted for the comparison of local air quality analysis methods at Zürich airport.

## COOPERATIVE NETWORK DESIGN

### EEC: PATHWAY TO THE FUTURE



#### **Economics**

Evaluation of the impact of new regulations and market-based instruments included a study of the side effects of air transport on EU economies. This complemented other studies addressing direct, indirect and induced impacts. A methodology for collecting relevant data has been devised and applied. A 3% increase in gross domestic product was seen for the EU.

Research was begun in 2003 to establish an economic evaluation of aviation noise annoyance at local level, taking the former airport in Athens as a case study. Further research with Aix-Marseilles University is investigating the impact of alliances on the airlines' competitive strategies, with a view to anticipating operations in 2025.

#### **Tools, models & simulators**

Integration and delivery of the next generation of real-time simulation facilities was completed during 2004.

The ATM Validation Experiment for Use towards EATMS (AVENUE) programme aims to provide a system architecture for a simulation platform capable of supporting the large-scale demonstration and validation initiatives of the European Commission, EUROCONTROL and the ATM industry.

A new version of the AVENUE-Compliant EUROCONTROL Simulations Capability and Platform Experimentation project (ESCAPE) uses industry-based components, such as Flight Manager, Trajectory Predictor and Arrival Manager and inte-

grates new functions required for the Datalink Operational Validation Experiments programme, and the CoSpace (assessing the impact of spacing instructions) and Gate-to-Gate projects.

The eDEP (Early demonstration and Evaluation Platform) is a low-cost, lightweight and web-enabled ATM simulator. A Tower system simulator was added and connected to ESCAPE and used to build the Sector Package 1 Demonstrator.

The Aircraft Performance Data Base models 99.1% of European air traffic. It is used for air traffic simulation and trajectory prediction in air traffic management research, modelling and strategic planning by an active user community covering research institutions, universities, ANSPs and ATM industry. A web application for aircraft performance calculation is now available, providing a flexible output to users.

The integration of ATFM simulators into the General ATFM Simulation Engine and Library environment is under way.



## Safety

A Safety Management System implementation strategy was developed and a roadmap created to promote a safety culture in EUROCONTROL projects under development at the EEC.

A safety methodology is being developed according to four main principles:

- Adapting and enhancing general safety assessment methods.
- Gaining a top-down model of safety for the medium-term.
- Learning from safety-related events.
- Building safety into the concept development phase of projects.

These approaches are being tested on a number of projects. The overall assessment process comes under the heading of Safety Assessment for New Designs (SAND).

A complementary 'top-down' approach is being developed, addressing three research areas and the whole future ATM Gate-to-Gate Concept, to determine where the main risks lie, and where investment in safety is most needed.

The Saflearn approach helps to decipher the lessons learned from current and past safety-related events. This has been successful in gaining safety-related data from three ANSPs and using it in 'safety learning exercises', whereby future concepts can benefit from current and past incidents.

# CFMU MANAGING THE ATM NETWORK

Since it started tactical operations in 1995 the EUROCONTROL Central Flow Management Unit (CFMU) has set new standards for air traffic flow management (ATFM) in European airspace. Delays caused by ATFM have been steadily reduced, while traffic growth has resumed strong growth after the September 11 attacks.

The CFMU is constantly looking for, and introducing improvements to ensure it can accommodate the predicted doubling of traffic using European airspace by 2020. It has also been called upon to adapt to changing circumstances with the aim of providing better value to air navigation service providers (ANSPs) and airspace users.

Traffic had already reached unprecedented levels in 2003, with an average of 23,197 flights per day, a rise of 2.8% compared to the previous year. 2004 saw a new record set for the average growth in traffic, at 4.5%, while the accumulated average delay per flight remained at the same level (1.7 minutes per flight). The efforts by the CFMU to maintain its



principal function, matching demand with capacity, are therefore succeeding. However, they must continue if the present trend is to be maintained.

The basic objectives of flow management continue to be the provision of safe, efficient and cost effective ATFM services. The continued deployment of the Enhanced Traffic Flow Management System (ETFMS), introduced in 2002, supports these objectives. The Air Traffic Flow and Capacity Management (ATFCM) strategy emphasises that the use of ATFM should be extended beyond slot allocation mechanisms to the optimisation of traffic patterns and capacity management. This strategy is being carried out.

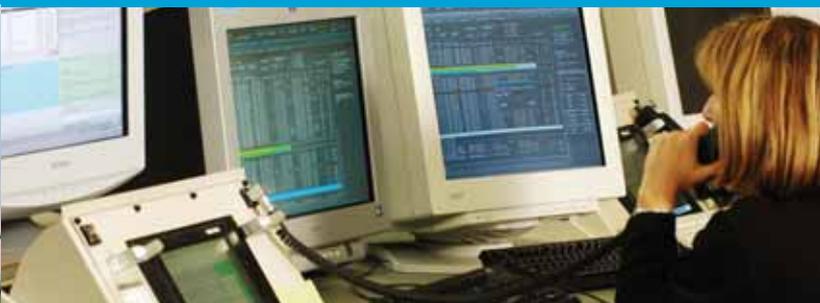
In addition to improving the CFMU's own processes, the global ATM environment in which it operates is also evolving. Given the CFMU's pan-European role, it is all the more important that its systems can adapt, allowing the CFMU to integrate its services more easily within the developing, collaborative, ATM environment.

**By definition, EUROCONTROL's work is carried out at European level, with the aim of maximising the safety and efficiency of the civil and military air traffic management network. Efficiencies arise from**

**the economies of scale inherent in working on a pan-European basis, while EUROCONTROL brings added value by providing services which are far less expensive than if they were provided by each individual service provider.**

## PAN-EUROPEAN FUNCTIONS

**EUROCONTROL also brings impartiality to the provision of services because it is equally responsible to all Member States and provides an identical service to all, while respecting the priorities of its governing bodies.**

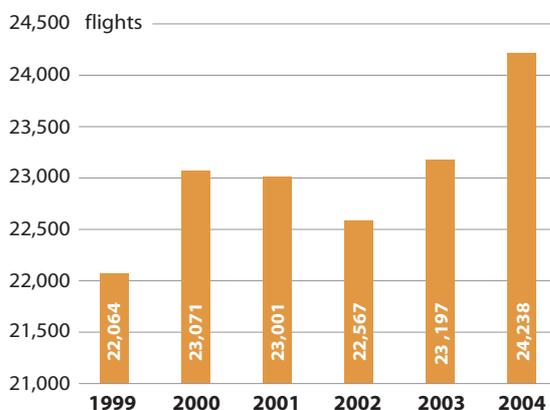


## Traffic growth in 2004

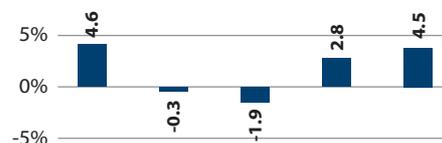
The decline in traffic in 2001 and 2002 recovered fully in 2003 and increased in 2004. The largest number of flights processed across Europe on a single day was 29,495 on 10 September 2004 a growth of 4.6% compared to the busiest day in 2003. The 2003 record was exceeded on 33 other days in 2004.

It is important to note that the growth in demand is not uniform. Some areas have experienced very high annual growth between May and August, for example Prague (25%), Warsaw (21%), Bratislava (21%), and Berlin (18%). These variations occur because of routing changes and growth in demand due to the enlargement of the European Union.

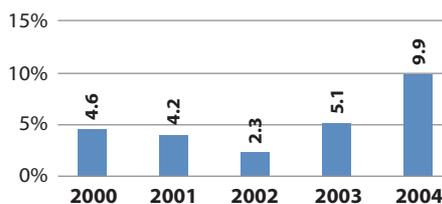
### Average daily traffic trends



### Daily traffic variation



### Traffic variation since 1999



Two of the key pan-European responsibilities assumed by EUROCONTROL are the dynamic management of air traffic flow in the short, medium and long term, carried out by the Central Flow Management Unit (CFMU), and the management of a flexible route charging mechanism, the responsibility of the Central Route Charges Office. The CFMU, which started tactical operations in 1995, is paving the way for a common European Air Traffic Flow and Capacity Management (ATFCM) system in the framework of a uniform European ATM system. Key interdependent services provided by the CFMU include ATFCM, Flight

Planning, Airspace Data operations, and data provision and reporting.

Collecting route charges is another Pan-European function carried out by EUROCONTROL on behalf of Member States. The system employed by the Central Route Charges Office is based on the International Civil Aviation Organization's (ICAO) recommendations for air navigation charges and for a regional charging body. The CRCO works closely with national route charges offices using data received from the CFMU.

## PAN-EUROPEAN FUNCTIONS

### CFMU: MANAGING THE ATM NETWORK

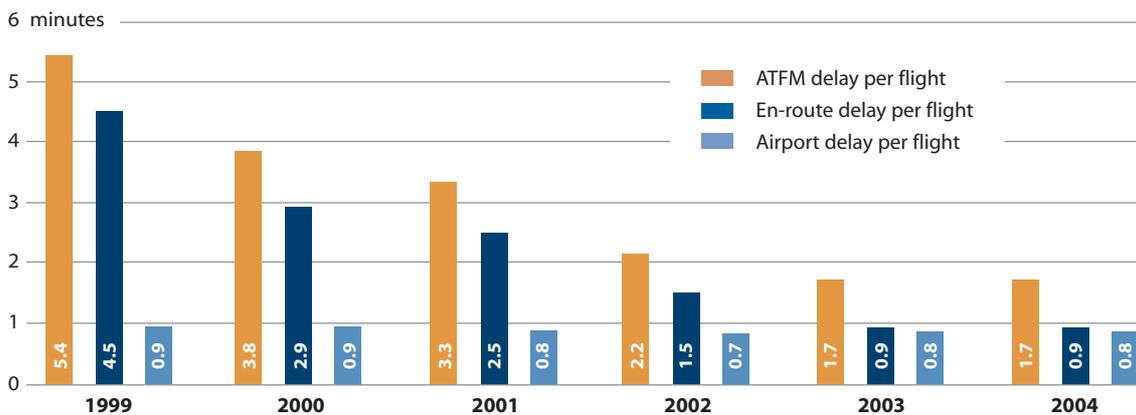


### Delay and capacity trends

For 2004, the average ATFM delay per flight was 1.7 minutes, of which 0.9 minutes were attributable to en-route delays.

expected to arise from en-route delays. The actual delay figures are thus below target, but above the forecast figures. However the growth in traffic was more than forecast, while the figure for the average delay per flight is identical to that of 2003.

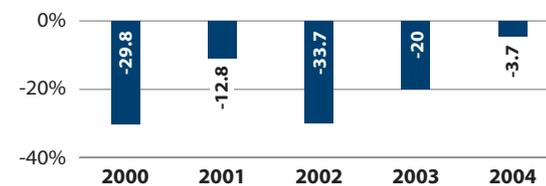
**Trend in the average daily ATFM delay per flight**



In summer 2004 (summer is defined as May to October), traffic increased by 5.3% on 2003, while the average delay was 1.9 minutes, 1.2 minutes of which was attributed to en-route delays – the same as for 2003. This is well within the target of 1.7 minutes, as derived from the Provisional Council target for a progressive reduction in en-route delays to one minute per flight by the summer of 2006.

The EUROCONTROL Statistic and Forecast Service had anticipated a traffic increase of 3.9% for 2004. The total ECAC delay forecast derived from this was 1.5 minutes, of which 0.8 minutes was

**Daily delay per flight variation**



**Delay per flight variation since 1999**





### Capacity increase

A comparison of summer 2004 figures with those of 1999 shows that traffic increased by 10% while total delays decreased by 67.2% and the average delay per flight by 70.2%. Given the rule that, at constant capacity, a 1% increase in traffic corresponds to a 5% increase in delay, we can conclude that since 1999 the ATC system has been able to absorb a 23% increase in traffic without increasing delays.

Using the same logic it is estimated that, compared to 2003, the measures taken to enhance and better manage capacity led to an effective increase of 5.5% in European ATM capacity for the summer and an average of 4.5% for the whole of 2004.

### Collaborative Decision-Making promoted

The use of Collaborative Decision-Making (CDM) processes has continued to be promoted. An interactive tactical daily briefing at 10.00 Central European Time was established last year. This is delivered using e-conferencing technology and is available to all ATFM participants at no cost beyond that of logging onto the internet. It allows participants to raise issues directly with the Tactical Network Coordinator in the CFMU Operations Room. Extensive utilisation of scenarios including flight level capping, alternative routing or rerouting has continued.

The CFMU introduced three Aircraft Operation Liaison Officer posts to its operations room. These people have undergone structured training and were integrated into the ATFCM operation by the end of 2004.

## 2004 Highlights

> Besides the standard daily activities of demand/capacity analysis and optimisation of network capacity, the CFMU handled several special events during the year. These included moves by several area control centre (ACCs) to new premises and to new operating systems, along with major sporting milestones and military exercises.

Two significant events during the summer required special preparation and coordination, namely the EURO2004 football championship in Portugal and the Olympic Games in Greece.

• • • • • • • • • •

### > EURO2004 supported

In February 2004 the Portuguese Authorities requested CFMU support to monitor flight plan compliance with airport slots at Faro, Lisbon and Porto during the EURO2004 football championship. Accordingly, the CFMU monitored filed flight plans against airport slot lists provided by the Portuguese Slot Coordination Unit. The Unit advised of discrepancies via text messages to the originator of the flight plan, advising them that no match was found between their flight plan and the approved airport list. No interventions were made in the normal flight plan filing process.

During the EURO2004 championship, 10,709 flights operated into the three airports, a daily average of 400 flights. The CFMU delivered 144 warning messages, representing 1.34% of the total. The exercise was seen by the Portuguese authorities as extremely helpful, although significant workload resulted from manual Integrated Initial Flight Plan Processing Unit (IFPU) manipulations. It is clear that a similar effort in future would need appropriate software development to avoid excessive workload.



# PAN-EUROPEAN FUNCTIONS

## CFMU: MANAGING THE ATM NETWORK



### Critical event initiatives launched

A 'critical event' is any unforeseen event which temporarily causes a reduction in capacity of sufficient magnitude to require flow management assistance. There can be many causes of such events, ranging from a failed luggage conveyor belt to industrial action or adverse weather conditions.

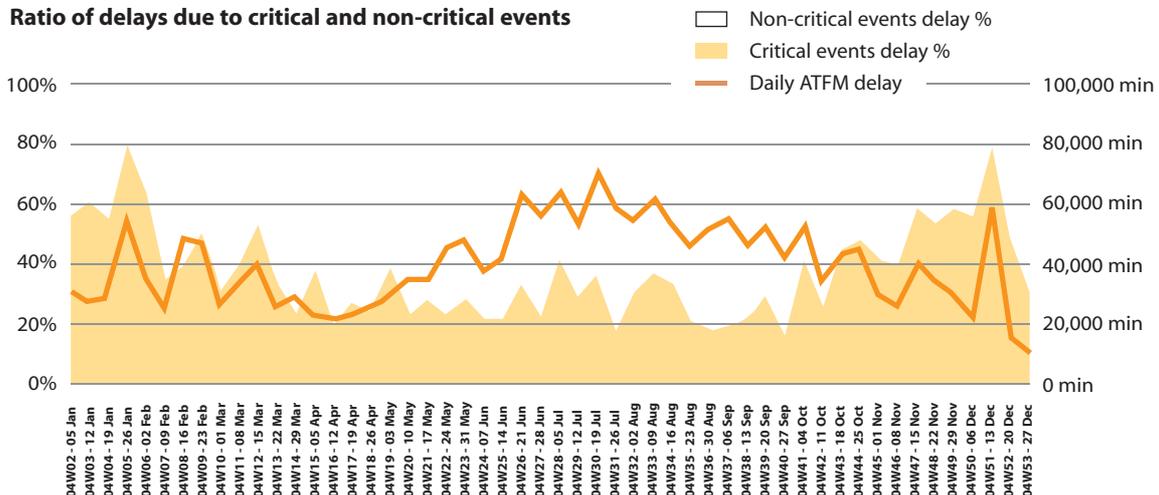
The handling of critical events is an integral part of our work and the CFMU has always assisted the ANSPs (and indirectly the airport authorities, handling agents and of course aircraft operators) to cope with such events. It is, however, worth noting that as traffic increases, so does this aspect of the work. A relatively small disruption, whatever the cause, is more likely to have a significant effect

when traffic levels are high. The ratio of delays due to critical/non critical events has remained about the same as for the preceding years.

In 2004 the CFMU launched several initiatives to improve the management of critical events. Three main activities were either initiated or implemented during the 2004-2005 winter season:

- Systematic debriefing of critical event situations with some airports (well advanced with London Heathrow, and in progress for Paris Charles de Gaulle and Amsterdam Schipol)
- More flexible management of departure or arrival regulation during an airport critical event through slot swapping procedures
- Assessment of the current ATFCM procedures with airports in the context of airport CDM development

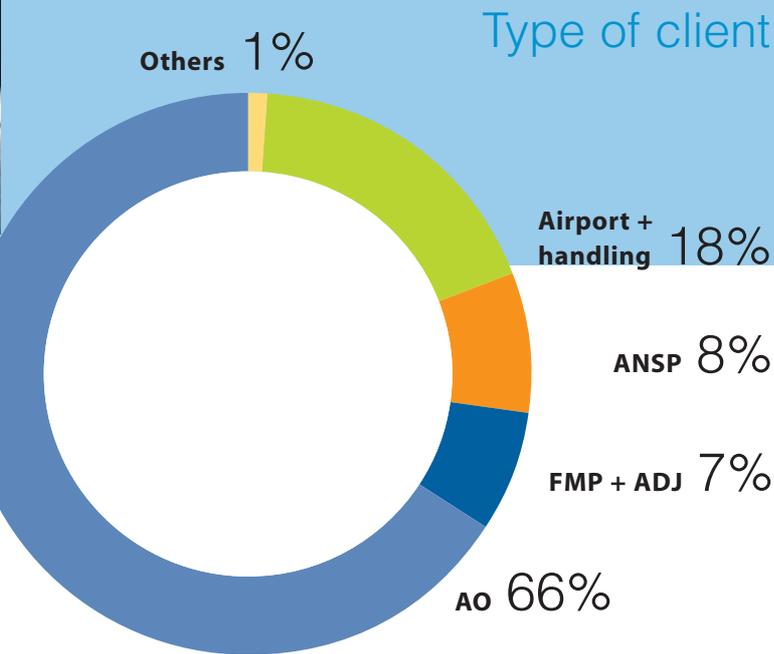
Ratio of delays due to critical and non-critical events



> Olympic Games planning pays off

Extensive planning and training took place prior to the Games, held in Athens during August. Training was given to Aircraft Operators (AOs) and ANSPs, comprising traditional classroom teaching and distance learning using Internet technology. The CFMU received very positive and enthusiastic endorsement of this approach.

During the Games an operator from Athens ACC joined the CFMU/Flow Management operations room to facilitate coordination between the CFMU and Athens. Daily e-conferences were held from 10 August to 31 August between the CFMU and Athens, Tirana, Belgrade, Brindisi, and Rome ACCs. Daily e-mail reports were also exchanged with Cairo, the former Yugoslav Republic of Macedonia, Bulgaria, Malta and Turkey. There was considerable cooperation from all the major players, leading to increased flexibility in capacities, configurations and routing scenarios. The result was that there was no negative ATFM impact.



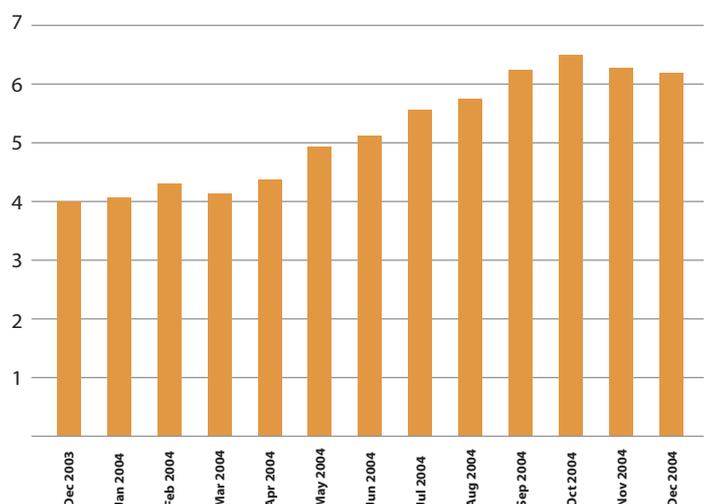
CFMU clients connect

The CFMU's clients, primarily aircraft operators, airport handling agencies and ANSPs, can access CFMU systems either via the Internet or a dedicated network. The number is constantly increasing and during the year 1,200 clients had accessed the CFMU 2,948 times. This is due in particular to the introduction of ETFMS and the associated increase in accuracy of real-time data. The suite of services available to CFMU customers has been enhanced. The networking infrastructure has been significantly improved to support the increased data communications and to support the continuously growing number of clients.

The graphs show the type of client (above) and the average number of queries (right) performed through remote CFMU terminal accesses. At the end of the year, more than six queries were made for each flight. This represents more than 100,000 queries per day.

A new service enabling access to CFMU archived information (CFMU Interactive Reporting) has been deployed, which allows clients to consult data and statistics.

Average number of queries per flight



## PAN-EUROPEAN FUNCTIONS

### CFMU: MANAGING THE ATM NETWORK



### Flight plan messages grow

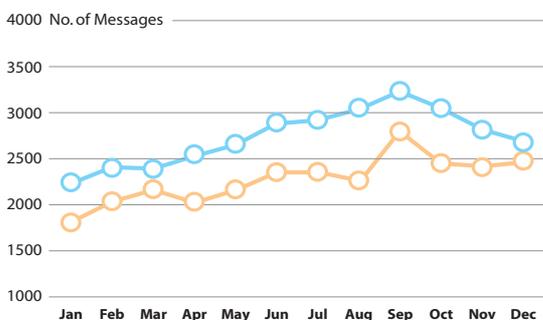
The general increase in air traffic during 2004 is also reflected in the number of flight plan-related messages processed by the Integrated Flight Plan Processing System (IFPS) system and of course the resulting increase in workload. The two IFPS Units processed a total of almost 14 million flight plan-related messages during 2004, an increase of 14.9% compared with 2003. The number of flight plans generated from Repetitive Flight Plans (RPLs) has slightly decreased; RPLs are filed for approximately 45% of all flight plans. Whereas several major companies have ceased using the RPL system, a large number of regional airlines and airlines on the eastern periphery of the CFMU area have started using it. The

Route Catalogue (available for “what if” re-routings and for validation of company route databases) now contains in excess of 41,000 routes (up from around 30,000 in 2003) for 18,691 city pairs.

In 2004, an average of 80.5% of the messages received by the IFPS were processed automatically, a slight increase on 2003. An important initiative to increase the automatic processing rate was introduced in April and has had significant results, the automatic acceptance rate increasing from 79.4% in the first quarter of 2004 to 81.1% in the last quarter. Improving the automatic acceptance rate is an important contributor to flight plan consistency. Overall, there was a 9% increase in the average daily workload in the IFPUs.

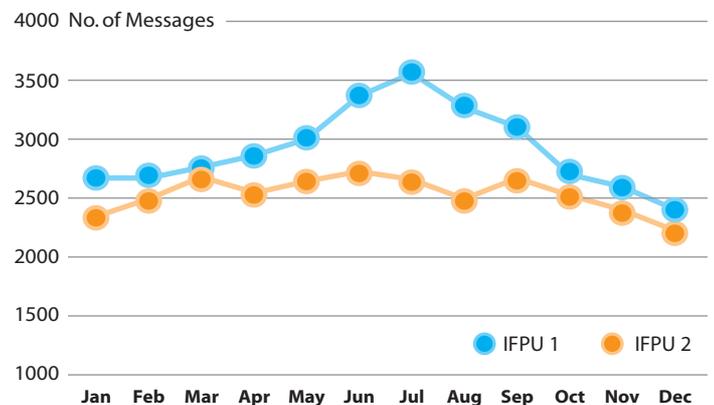
## 2003

Daily average manual processing load per month



## 2004

Daily average manual processing load per month





## Radar-derived data expands

The area from which the CFMU is receiving radar-derived data for the ETFMS continued to expand throughout 2004. Around 80% of ECAC flights are now updated after their departure using this information.

Operational utilisation of this information has advanced and has enabled an improved assessment of traffic demand. More than half of the flights are now adjusted before their departure, thanks both to the accuracy of the data, and to the commonly agreed Flight Activation Monitoring procedures, contributing to better capacity management.

During 2004, CFMU systems have further evolved towards offering more services to the remote user community.

- The new graphical interface has been fully validated and accepted by the different categories of users and will enter into service in 2005 at the different locations.
- The distribution of data from the ETFMS has also been prepared and is ready to be provided to ANSPs willing to receive them.
- The exchange of information with airports has been thoroughly assessed to make it effective and to allow airports and the CFMU to work more closely.
- The new architecture for the ENV data management system has allowed the decommissioning of the mainframe computer and better sharing of information, preparing the CFMU for further development of airspace management.

In June, the CFMU put its new message gateway infrastructure (ANg1) into operational use. ANg1 includes all the properties of the ECG, the EATMP Communications Gateway, but surpasses its functional scope by far.

The CFMU made major investments during the year to improve the security of its systems, by better isolating operational platforms and enhancing access control systems. These improvements were made in line with recommendations made by the Internal Audit.

## Policy and Strategy plan

In continuing the ATFM action plan, the CFMU has developed, together with its stakeholders, a Strategy for ATFCM that has been approved by the EUROCONTROL Commission. As a follow up, the CFMU Evolution Plan has been approved by the European ATFM Group. Both documents indicate the common views for the development of ATFM and the CFMU over the next 15 years.

# CRCO FUNDING SUSTAINABLE GROWTH

The Central Route Charges Office (CRCO) has been operating since November 1971 to provide EUROCONTROL's stakeholders with an efficient cost recovery system that funds air navigation facilities and services and supports the development of the European air traffic management system. In 2004 the CRCO collected charges on behalf of 31 Member States

The CRCO's mission embraces four objectives:

- Integration with EUROCONTROL strategy;
- Guiding the system's stakeholders;
- Enhancement of the quality of the services provided;
- Reduction of administrative costs.

The CRCO also provides additional services to Member States, including the calculation, billing and collection of terminal charges. Non-EUROCONTROL States can also benefit from its expertise on a bilateral basis.

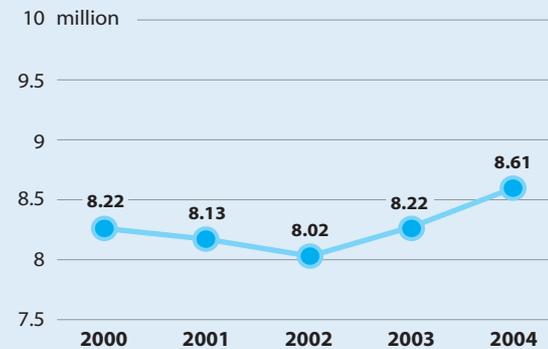


## Flight messages processed and distances flown

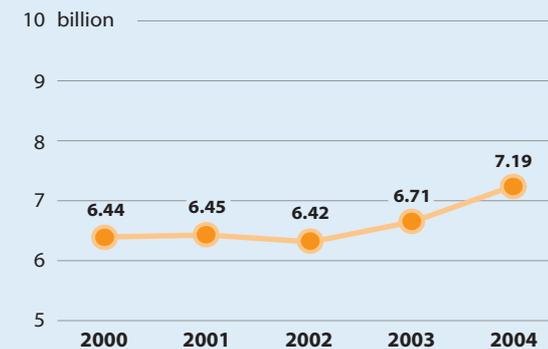
Over 8.61 million flight messages (IFR flights only) were processed in 2004, an increase of 4.8% over 2003.

The number of kilometres flown in the airspace of Member States for which route charges were calculated was 7.19 billion km, 7.0% more than for 2003.

**Flight messages**



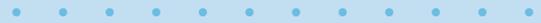
**Kilometers flown**





## 2004 Highlights

- > The recovery seen in 2003 continued in 2004, with the number of IFR flights increasing by 4.8% and the distances flown by 7.0%. There was also a 7.3% rise in the number of service units compared to 2003.



- > The Extranet to National Administrations (ETNA) secure internet site became fully operational at the end of 2003 and during 2004 published more than 60 different types of billing and accounting documents. ETNA allows contracting states of the multilateral route charges system to access confidential information via the Internet. As a result, paper versions of the related documents have been discontinued. This service also offers an online queries facility, allowing interrogation of user data such as addresses, fleet and value added tax details.



### Various developments took place in IT:

- Development and implementation of an IT architecture strategy for the next six years, with the aim of improving efficiency and security of IT systems while building on new technologies
- Realisation of IT security plans for 2003-2004. Key CRCO processes are now fully secured
- A full test of the Business Continuity Programme demonstrated that the CRCO could sustain a major incident while maintaining normal services to the States
- A major increase in CRCO IT storage capabilities was implemented, allowing for the development of a CRCO Document Management System and increasing the volumes available for the CRCO end-users



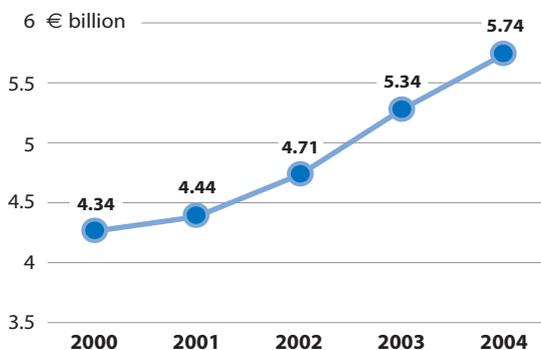
- > EUROCONTROL concluded bilateral agreements relating to terminal charges with Denmark, France, Ireland, Italy, and Moldova. Any EUROCONTROL Member State may avail itself of terminal charges billing and collection services.

## Amounts billed

The amounts billed to users totalled 5.74 billion, a 7.4 % increase over 2003. This was mainly due to the increase in the number of service units.

The medium-term recovery rate for 2003, or recovery rate after one year measured on 31 December 2004, was 99.20%, a 0.10% decrease on the previous year. The recovery rate at due date increased from 87.56% to 88.96% during the year.

### Amount billed



# PAN-EUROPEAN FUNCTIONS

## CRCO: FUNDING SUSTAINABLE GROWTH



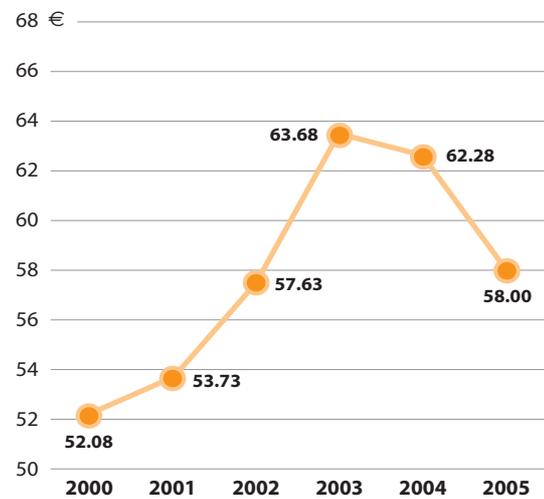
### Evolution of real (en-route) Air Navigation Services Unit Cost from 1982-2005

The graph below shows the unit cost per kilometre of the en-route services made available to users in the airspace of the States participating in 1982: Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands, Portugal (Lisbon and Santa Maria), Spain (Continental and Canaries), Switzerland, United Kingdom. These eleven States accounted for 71% of EUROCONTROL route charges in 2004.

Costs are actual between 1982 and 2003 and forecast for 2004 and 2005.

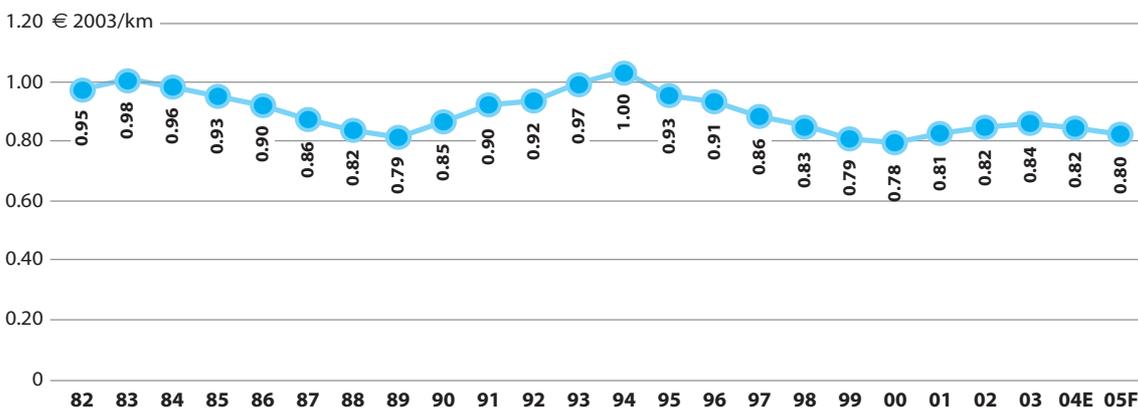
Over the last 20 years, there has been a cyclical pattern to unit cost per kilometre, with peaks in 1983 (€0.98/km), 1994 (€1.00/km) and 2003 (€0.84/km). The 2003 peak is significantly lower than the previous peaks, reflecting relatively lower unit costs since 2001.

### Average weighted national unit rate



The average weighted national unit rate for the Member States (calculated by dividing the sum of the costs chargeable to users by the sum of chargeable service units) decreased in 2004 to €62.28. The 2005 estimate is €58.00.

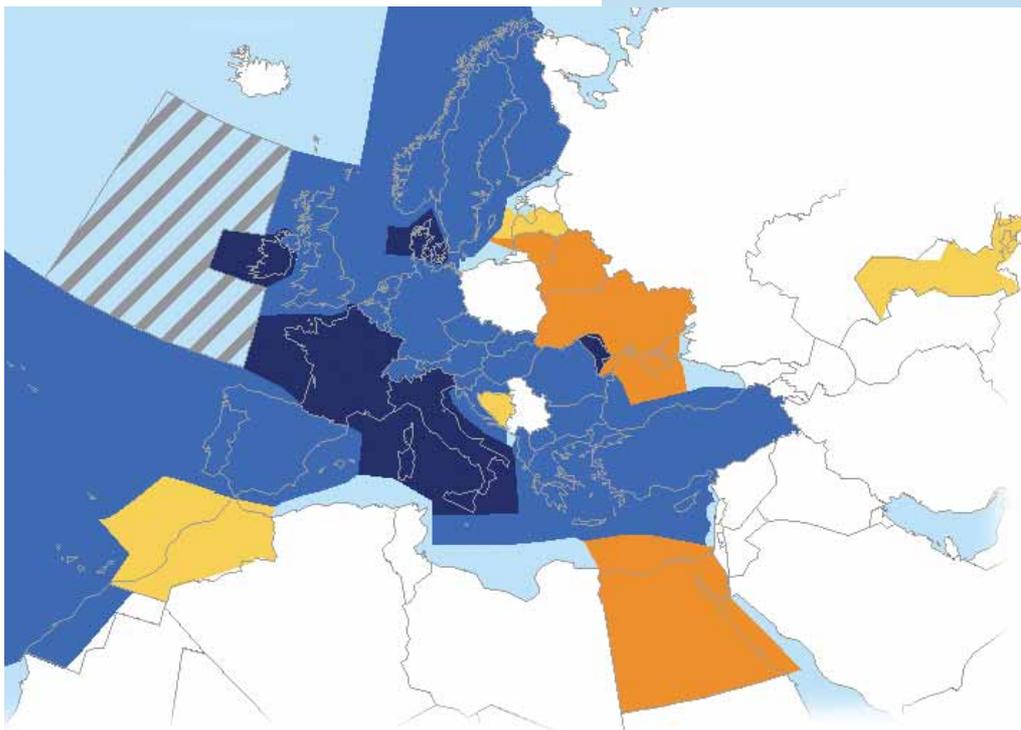
### Trend in real (en-route) ANS unit cost for the CRCO 88 area over 1982-2005 (in €2003/km)





## EUROCONTROL charging areas December 2004

- Participating States
- Participating States having a bilateral agreement for terminal charges
- Non-EUROCONTROL Member States having a bilateral agreement for route charges
- Non-EUROCONTROL Member States having a bilateral agreement for route and terminal changes
- ▨ Shanwick Communications Charges



> The total amount of terminal charges billed in 2004 was 308.50 million, corresponding to 2 million flights, an increase of 5.60% compared with 2003.



> The Irish Aviation Authority entrusted EUROCONTROL with the calculation, billing and collection of Shanwick communications charges in respect of flights performed in the Shanwick Oceanic Region from 1 November 2004.



> EUROCONTROL operates bilateral agreements relating to air navigation charges with eight non-Member States: Belarus, Bosnia and Herzegovina (until 31 December, 2004), Egypt (from June 2004), Latvia, Lithuania, Morocco, Ukraine (until 2007) and Uzbekistan. Air navigation charges comprise route charges, and optionally, terminal charges. In 2004, terminal charges were billed on behalf of Belarus, Lithuania, Egypt (from June 2004) and Ukraine.

The total amount of such air navigation charges billed in 2004 was €220 million, corresponding to 950,000 flights.

# MAASTRICHT UAC EUROPE'S ONLY INTERNATIONAL ACC

EUROCONTROL's Maastricht Upper Area Control Centre (MUAC) ensures the safe, efficient and expeditious flow of civil aircraft in the upper airspace (above 24,500 feet) of Belgium, the Netherlands, Luxembourg and North-West Germany. A Deutsche Flugsicherung (DFS) unit, controlling military air traffic over North-West Germany, is co-located with the civil facilities.

To cope with the complex patterns of air traffic demand and airspace architecture in the area, the Centre is organised on a European, rather than a national, basis. In operation since 1972, this avant-garde four-State regional cooperation project is the first example of functional airspace consolidation, working on the basis of operational requirements and major traffic flows rather than national boundaries.

An important mission of the Maastricht Centre is to pave the way for innovative safety, capacity and efficiency-enhancing programmes by conducting pre-operational trials of new operational concepts and technologies.



In 2004, the MUAC continued to provide safe, efficient and cost-effective air navigation services. The year was marked by a return to real growth, with a traffic increase of 4.3% and a reduction in total delays of 5.3%. These gratifying results were achieved while maintaining the total economic cost per flight below 2003 levels. In parallel, the Maastricht Equivalent Unit Rate also saw a pleasing reduction from the levels of 2003.

## REGIONAL ATC

**Regional cooperation brings considerably improved safety, capacity and efficiency benefits between participating States resulting from the increased synergies in the operation of European air traffic management.**

**The signature of the Maastricht Upper Area Control Centre (MUAC) Agreement in 1986 and the Central European Air Traffic Services agreement in 1997 are excellent examples of this. The Maastricht UAC has directed the skies over Belgium, Luxembourg, the Netherlands and north-western Germany for**



## Maximising operational performance

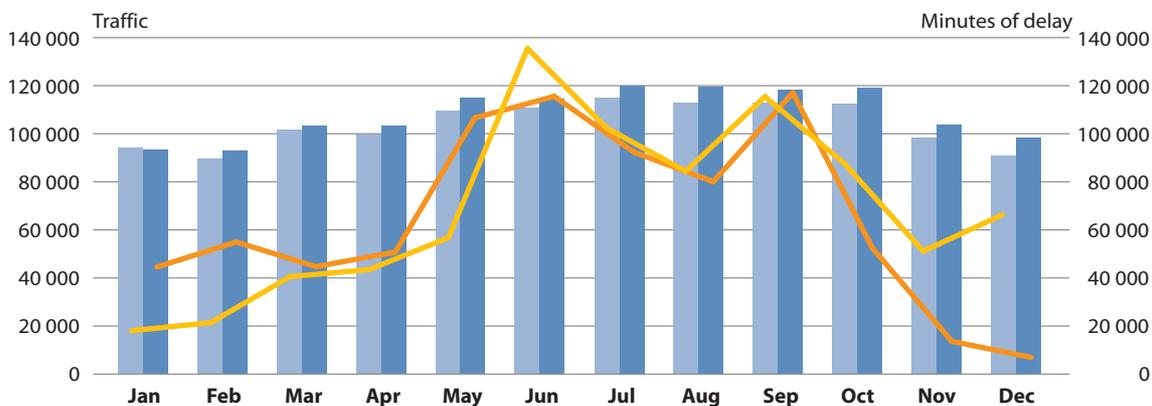
In 2004, a total of 1,296,979 flights were processed safely, representing a total capacity increase of 4.3%.

Total delays attributed to the MUAC fell by 5.3% when compared with 2003, to a total of 789,504 minutes. The average delay per flight decreased to 0.61 minutes in 2004, or 9.2%.

The Brussels sector group handled 37% of the traffic load, while the Hanover sector group handled 35% and the Deco (Delta/Coastal) group 28%.



### Traffic and minutes of delay in ALL SECTORS



nearly three decades. It is one of the busiest and most complex air traffic areas of the European continent.

The CEATS UAC will bring increased airspace capacity and greater efficiency compared to the eight separate national systems that currently manage the flow of air traffic throughout the region. It will also enhance safety by eliminating the need for flights to be handed over from one State to the other, and by bringing controllers together to work in the same centre using the

same data, common technologies and procedures.

Both the Maastricht and CEATS UACs can be seen as prototypes of the Functional Airspace Blocks (FABs) now being planned. The Maastricht and CEATS UACs will form part of the future Single European Sky (SES). One of the key elements of the SES foresees the creation of FABs, integrated airspace blocks based on operational requirements and created regardless of existing national boundaries.

## REGIONAL ATC

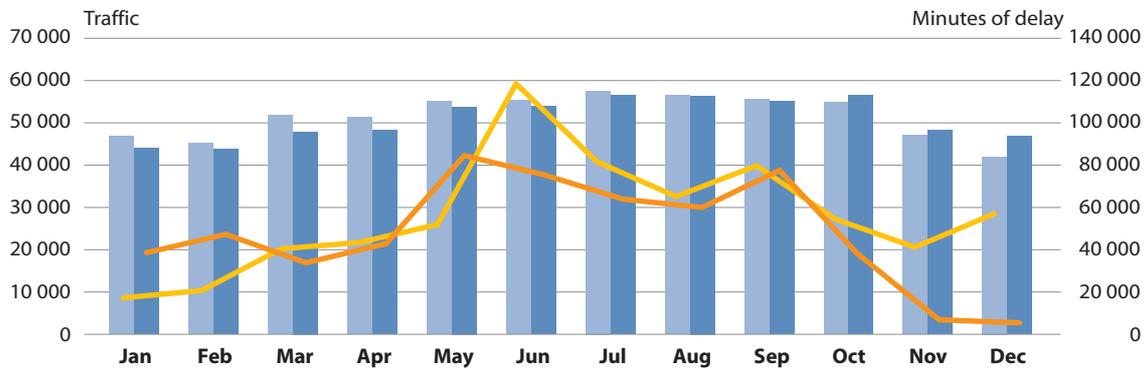
MAASTRICHT UAC:  
EUROPE'S ONLY  
INTERNATIONAL ACC

2003 ■ Traffic ■ Minutes of delay

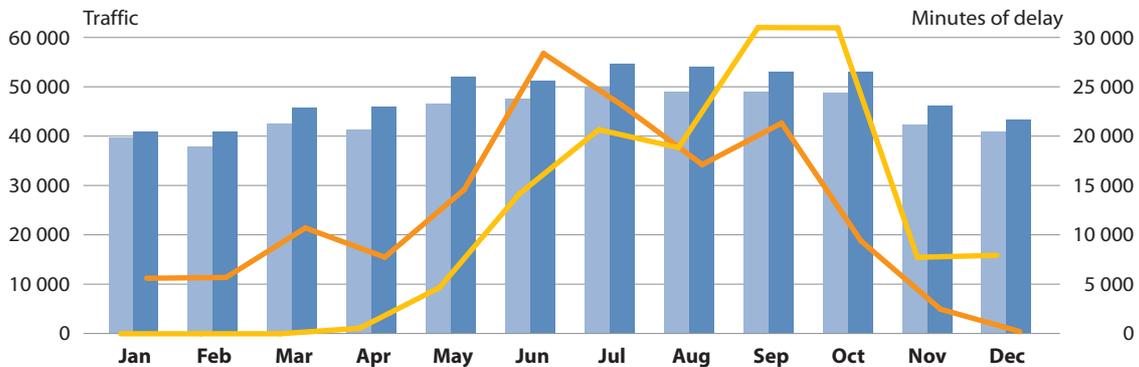
2004 ■ Traffic ■ Minutes of delay



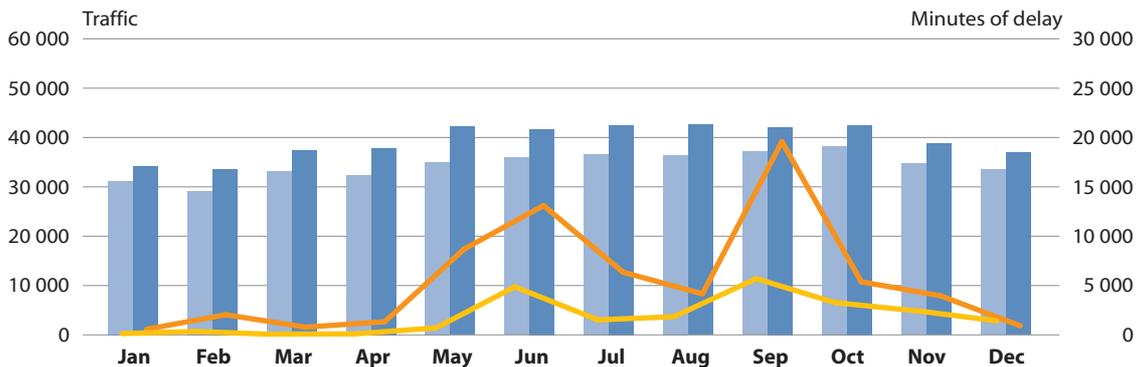
### Traffic and minutes of delay in the BRUSSELS SECTOR GROUP



### Traffic and minutes of delay in the HANOVER SECTOR GROUP



### Traffic and minutes of delay in the DECO SECTOR GROUP





## 2004 Safety Highlights

> The safety of air transportation is the prime concern for the aviation industry, governments and the travelling public. Major strides were made in 2004 in various key areas at the Maastricht Upper Area Control Centre (MUAC) as part of the ongoing effort to establish a solid, pro-active ATM safety structure.

> The implementation of the Safety Management System (SMS) continued, with the aim of having the full SMS in place by the end of 2005, meeting the provisions of EUROCONTROL Safety Regulatory Requirement 3 (ESARR3) and its recently introduced Executive Rule.

> Throughout 2004, work continued on developing a Unit Safety Case. This will provide objective evidence on how the Centre's operations meet the applicable regulations and requirements, and is therefore acceptably safe. It covers all aspects of the unit, ranging from operations and human resources, to engineering and safety management. Preparatory work was carried out throughout 2004 with a view to completing the Unit Safety Case by the end of 2005.

In terms of aircraft numbers, the Brussels sector group handled 611,469 aircraft, a reduction of 1.3% compared to 2003, the Hanover sector group 582,416, up 8.7% and the Deco sector group 473,119, an increase of 14.4%.

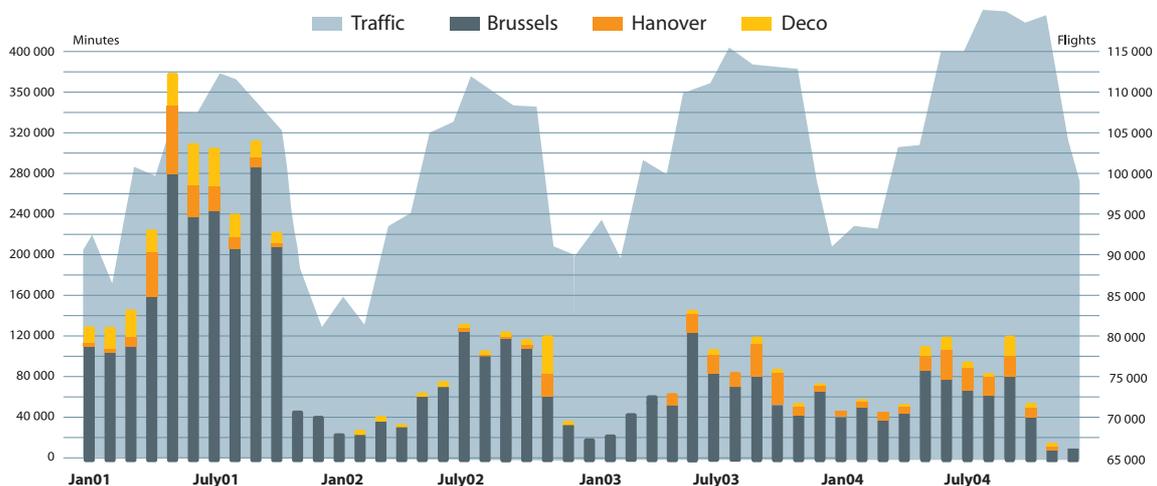
During the summer period (1 May to 31 October), higher levels of traffic were processed with fewer delays. During these crucial months, a 4.9% capacity increase was achieved, with an overall reduction in delays of 3.1%.

On 10 September 2004, the all-time daily record of 4,235 flights was achieved, an increase of 5.8% on the busiest day in 2003.

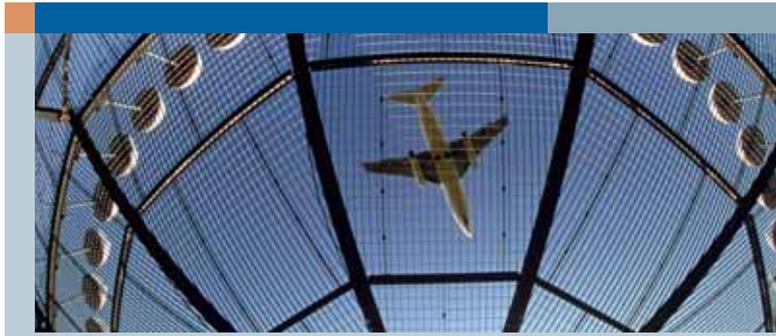
The objectives for 2005 include a 5.5% increase in capacity, which should consolidate the Centre's contribution towards the European target of an average of 1 minute total en-route delay per flight fixed by the Provisional Council for 2006.



Delay trend over the past four years

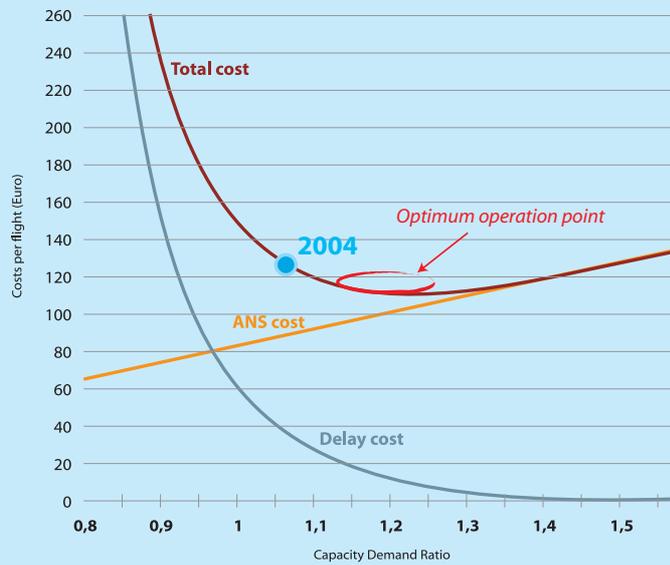


**REGIONAL ATC**  
**MAASTRICHT UAC:**  
**EUROPE'S ONLY**  
**INTERNATIONAL ACC**

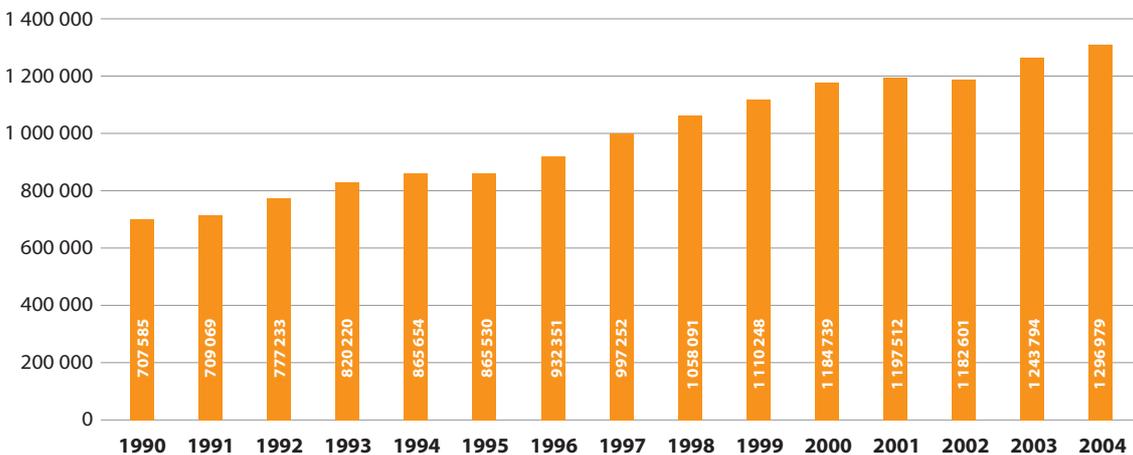


**Optimum operating point approached in 2004**

The total Air Navigation Service (ANS) cost is obtained by adding delay costs to direct ANS costs. It is based on a standard methodology developed by the PRC. The total ANS cost per flight through Maastricht UAC in 2004 was €124. Research into preparatory work for the 2005-2008 Capacity Enhancement Plan shows the Centre operates close to the optimum operating point at the borderline between cost efficiency and delays.



**1990 - 2004 traffic trends**





- > Several safety cases were also completed to support the major system and operational changes implemented during the past year. In addition, a comprehensive Safety Training Plan was prepared with the aim of conducting safety training across all functions of the Centre during 2005.



### Implementing ESARRs

- > At Maastricht, there is a clear commitment to implementing and meeting all applicable Safety Regulatory Requirements in a pro-active way and at the earliest possible opportunity. This will ensure the highest possible safety standards in all activities.
- > During 2004, the development of applicable Executive Rules based on ESARRs continued, with the MUAC being consulted on the content and applicability of these Executive Rules. In parallel to this, the Centre continued with the implementation of the SMS.



### Innovating further

- > Various safety surveys highlighted the need for further study into airspace complexity in the MUAC sectors. Complexity has been highlighted in a number of incidents as a key factor that can affect the safe separation of aircraft. An airspace complexity measurement project was therefore organised in 2004, in cooperation with the EUROCONTROL Experimental Centre.
- > The complexity factors that have an effect on overall safety were assessed to determine how they can be used to support the safe implementation of future changes in airspace, procedures or equipment. The study is also expected to support other EUROCONTROL initiatives, in particular the Performance Review Commission (PRC) benchmarks and the activities of the High-

### Operations in 2004 (entire year)

Average daily capacity	3,798
Average daily traffic	3,544
Average delay per flight (minutes)	0,61
ANS cost per flight	€ 90,00
Costs per minute delay	€ 62,00
Capacity/demand ratio	1,074
Delay costs per flight	€ 37,20

## REGIONAL ATC MAASTRICHT UAC: EUROPE'S ONLY INTERNATIONAL ACC



### Managing capacity

Capacity management is a core activity designed to provide a high-quality and cost-effective service to customers, while keeping ATFM delays at agreed levels. It sets the global framework for the planning of staff, airspace, systems and procedural changes.

During 2004, several important capacity enhancement programmes were implemented. Changes to sector configuration management were introduced, and innovative tactical capacity and flow management processes also contributed to the overall capacity gain. In parallel, human resources continued to be optimised.

In April and May two new sectors were made available in the Hanover and Brussels sector groups respectively, the primary objective being to increase air traffic safety by ensuring a better traffic balance and curbing congestion in the busiest sectors. The Centre now contains 16 operational sectors, which can be managed more flexibly according to traffic demand. A new Division Flight Level was also implemented in the Deco sectors, improving the balance of traffic between low and high sectors.

### Taking technical infrastructure to new levels

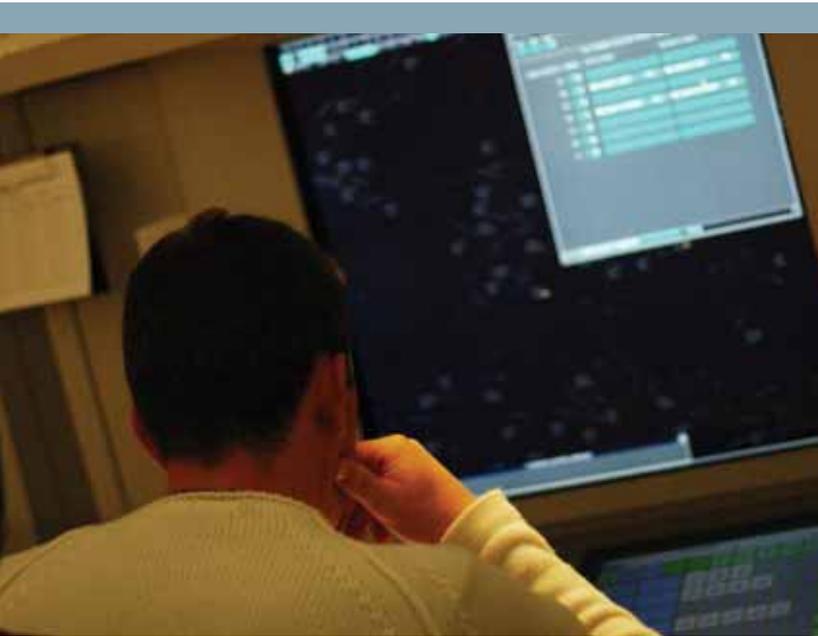
#### Record levels of system availability

During 2004, the Maastricht data processing system reached unprecedented levels of availability. In June, for the first time, the 12-month reliability figure reached 99.999051%, translating as a total system outage of less than one minute over the year. This is the result of tighter quality processes that support system development and enhanced testing measures.

#### Developing the new Flight Data Processing System (FDPS)

The hardware identified at the end of July 2004 was procured and deployed at the supplier's premises and at the MUAC. It will be used for the development and testing phases and, in the second half of 2006 will be installed in the operational and support environments.

FDPS software requirement specifications were refined and an amendment to the contract with the supplier was signed at the end of December to accommodate changes deemed necessary to increase the usability of the system, reduce controller workload and accommodate emerging advanced Medium-Term Conflict Detection (MTCDD) features. This global approach will ensure that new operational concepts are taken into account and that the interfaces with the existing systems are optimised before the new system is commissioned in 2007.



### Implementing Mode S

The introduction of Mode S Elementary Surveillance continued. The surveillance processing chain was prepared to accept Mode S radar data. The track server, together with the ATM Surveillance Tracker and Server System (ARTAS), is now capable of distributing Mode S-based tracks. The Operator Input and Display System was upgraded to provide the identification of aircraft to the controllers. The input from Mode S sensors is planned for early 2005.

### Looking ahead

The dramatic improvements in current safety and capacity levels to accommodate a possible doubling of traffic by 2015/2020 can only be achieved by introducing a new generation of advanced ATC systems.

Leading-edge technologies and ATM concepts will be phased in over the next few years to give controllers the ability to handle far more aircraft than currently possible, with even higher levels of safety. Since 1972 the MUAC has played a pivotal role within Europe as a pilot centre for preoperational trials of some of the new concepts and technologies, validating them for operational use and subsequently introducing them into day-to-day operations.

Level European Action Group for ATM Safety (AGAS). This methodology, coupled with the safety assessment method, is recognised as a leading-edge safety development which should generate improvements in the overall safety of the Centre, whilst supporting the required increases in capacity.



### The past must protect the future

> Following the publication in May 2004 of the report by the Bundesstelle für Flugunfalluntersuchung (BFU) on the tragic mid-air collision at Überlingen, action was taken to mitigate any possible risks identified in the report. Several practical and operational recommendations were contained in the report, which were evaluated and applied to the Maastricht environment. As a result of an internal safety audit commissioned immediately after the accident, a number of corrective actions had already been taken in advance of the results of the official investigation.

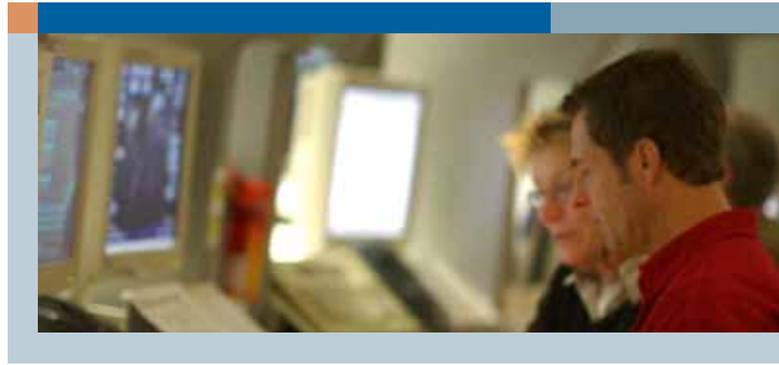


### Refining contingency planning

> Progress was made in developing contingency arrangements and evacuation procedures for the MUAC airspace. In the medium term, the Test and Training Room (formerly called "old operations room") will be equipped for use as an on-site contingency location. Discussions with Member States and customers on the need for an off-site contingency location will continue at a later stage.

## REGIONAL ATC

### MAASTRICHT UAC: EUROPE'S ONLY INTERNATIONAL ACC



#### Controller-pilot data link communications expand

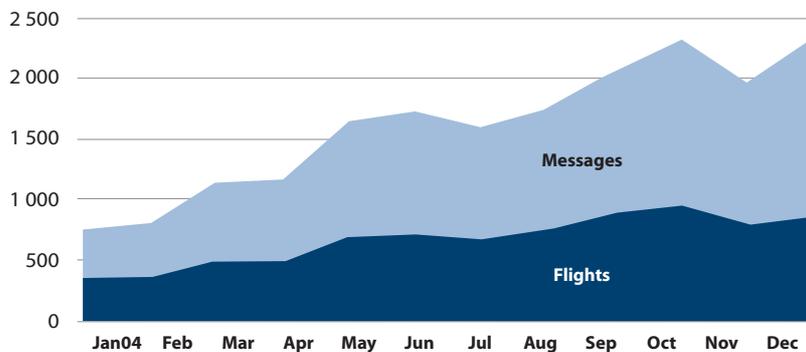
In a bid to drive further developments of controller-pilot data link communications (CPDLC), several enhancements of the data link infrastructure and procedures were implemented during 2004.

In line with the increasing numbers of CPDLC flights, the CPDLC message set expanded, increasing the choice available to controllers. These include heading, turn and climb/descend/

maintain messages. Although all messages require voice read-back by the aircrew, this development still represents an efficiency gain, since the controller will issue the instruction without having to resort to the frequency in the first place.

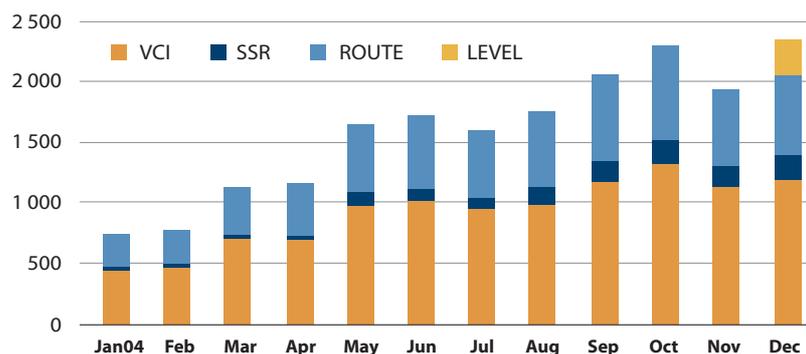
The next important development in data link in Maastricht took place early in 2005, with the first automation of CPDLC messages for new Secondary Surveillance Radar (SSR) uplinks.

#### Messages / Flights



The numbers of CPLDC messages, types of clearances and services used increased significantly in 2004

#### CPDLC message use in 2004



- VCI:** Voice change instructions
- SSR:** Secondary Surveillance Radar code changes
- Route:** Route/heading instructions
- Level:** Level change instructions



### **Medium-term conflict detection plans materialise**

During 2004, MTCD trials continued, demonstrating clear benefits in terms of future safety and capacity gains. The trials were a unique opportunity to capture additional requirements for the forthcoming Flight Data Processing System (FDPS). As a result, the original FDPS contract was amended to accommodate the advanced technical features of the MTCD tool.

### **A vision for the future**

Efforts to define a new operational concept gained momentum in 2004 with two real-time simulations to verify its validity. The new approach is based on the notion of generic and dynamic sectorisation and might see phased implementation in the medium-term.

## **Human resources**

On 31 December 2004, there were 420 staff in the operations division, including 240 controllers, 151 in the engineering division and 49 administrative staff.

The year saw a slow, but steady increase in the number of certified controllers, with a total of 14 new certifications. This increase comes as a relief for sectors with the strongest demand for capacity. A total of 22 new students started their air traffic controller training at the Centre.

A high turnover of engineering staff was recorded during 2004, owing to a wave of retirements. In total, six engineering staff retired and ten were recruited.

New organisational structures in the Operations Division became effective on 1 December 2004, paving the way for major managerial, organisational, procedural and human resource improvements. In 2005 the focus will be on achieving a cultural change among Division staff.

As part of the Centre's new safety, health and environment policy a non-smoking rule was introduced in February 2004. Dedicated rooms were made available to smokers. The alcohol and psychoactive substance control policy was introduced in December.

## **Enhancing security**

As a result of the general security survey commissioned in 2002, work began on upgrading the security system. Circular sliding doors containing electronically monitored access control functions were installed at several entrances to the building, while security-critical areas received a second layer of access control.

Other projects planned in 2005 include upgrading the closed circuit TV observation system, replacing the fence detection system, re-designing the main entrance hall and site entrance and creating a dedicated entrance for deliveries.

During 2004, the MUAC participated in validation activities of the European Regional Renegade Information Dissemination System (ERRIDS), aimed at optimising information sharing on security-related incidents between civil and military stakeholders, saving precious time needed to

## REGIONAL ATC

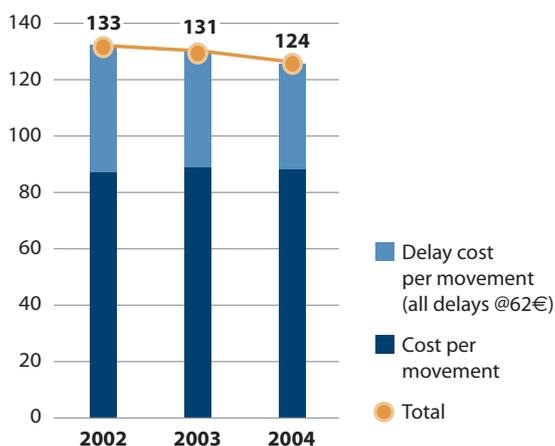
### MAASTRICHT UAC: EUROPE'S ONLY INTERNATIONAL ACC

respond to an operational security threat. Three ERRIDS prototypes were installed and the Centre participated in a real-time security threat simulation. In 2005 a pre-operational test-bed will be installed for further evaluation and development.

### Financial management

The publication of the ATM Cost-Effectiveness (ACE) 2002 Benchmarking Report in May 2004 confirmed that the MUAC was operating at high cost-efficiency ratios. Efforts to increase further operational productivity, to better control delays and further trim total economic cost will continue.

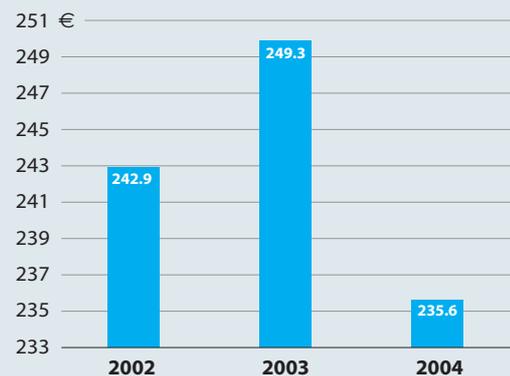
#### Total economic cost per flight



For 2004, the key results for the MUAC operations were:

Cost-base	112 M€	+ 1.7%
Traffic	1,296,979	+ 4.3%
Flight hours	475,485	+ 7.6%
Service Units	4,975,235	+ 8.4%
Delays	789,504	- 5.3 %
Equivalent unit rate	22.5€	- 6.2 %

#### Cost per flight hour controlled



The ATM cost per flight hour controlled amounted to €235.6, vs. €249.3 in 2003 and €242.9 in 2002.

In parallel, the total economic cost per flight was slightly below that of 2003, at €124 per flight (vs. €131 per flight in 2003), while the "Maastricht equivalent unit rate" saw a reduction of 6.2%, from €24 in 2003 to €22.5 in 2004.

Further cost efficiency measures were achieved through a number of initiatives, including renegotiation of contracts (energy, telecoms, catering, cleaning, printing etc.), reduction of external support, optimisation of support resources via automation tools and savings in travel costs.



## Single European Sky

In 2004, the Directors General of Civil Aviation of the Four States and EUROCONTROL decided to create a high-level Task Force, the Maastricht Legal Experts Task Force (MLE).

The MLE was mandated to examine the effects of the implementation of the Single European Sky (SES) regulations on the MUAC as well as to propose amendments to the Maastricht Agreement in order to ensure alignment with the EUROCONTROL Revised Convention. The MLE further submitted a proposal for the appointment of a National Supervisory Authority for the MUAC.

Preparations continued on meeting the SES regulations and in particular the “Common Requirements for the provision of air navigation services” defined within the SES legislation. Work concentrated on a number of key areas, including safety and quality management, human resources, financial management and reporting, technical and operational competence. The objective is to obtain certification by 2006.

In this context the MUAC Management System (MMS) was further developed with the aim of obtaining the ISO 9001 Certificate by the end of 2005.

# CEATS TOWARDS A UNIFIED CENTRAL EUROPEAN AIRSPACE

The Central European Air Traffic Services (CEATS) project is a far-reaching solution to the sustained growth of air traffic over central Europe. Launched in 1997, it will create a single, unified, air traffic control system to manage the upper airspace over eight Member States; Austria, Bosnia and Herzegovina, Croatia, the Czech Republic, Hungary, the northern part of Italy (Padua), the Slovak Republic and Slovenia.



## 2004 Highlights

A number of significant achievements occurred in 2004. Bosnia and Herzegovina ratified the CEATS Agreement, which then entered into force, enabling EUROCONTROL to proceed with the process of acquiring materials relating to the building and installation of the systems which will support the operations of the CEATS Upper Area Control Centre (UAC) in Vienna.

A number of critical deliverables relating to the Centre were approved during the year, including:

- CEATS UAC Operational Concept Document;
- CEATS UAC Operational Requirements document;
- CEATS Airspace Plan;
- CEATS UAC Building User Requirements; Document 1<sup>st</sup> edition;
- CEATS UAC Human Resources Concept Document;
- Initial Guidelines for the CEATS UAC ATM system Document.

The acquisition phase will provide for the contracts for the CEATS UAC building and for the air traffic management (ATM) system to be launched and implemented in accordance with the procurement strategy adopted by the CEATS Coordination Group. The major acquisition activities are organised fully in line with the major concepts as defined during the Definition phase, including the conceptual statements on safety and contingency. Further development of the Contingency Plan and Safety Management System will take place with the aim of satisfying the needs of CEATS stakeholders and their requirements.

# REGIONAL ATC



Other achievements included:

- Approval of the first version of the Overall Target Architecture, which takes into account the impact on existing systems.
- The CEATS Research, Development and Simulation Centre (CRDS) in Budapest reached full maturity in terms of simulation capabilities by successfully running challenging real time scenarios such as the CEATS Data Link and Contingency simulations. These were undertaken with the active participation of air traffic controllers from CEATS region air navigation service providers (ANSPs) and with support from the EUROCONTROL Experimental Centre and Maastricht UAC.
- In line with the Ministerial resolution of June 2001 a Global Cost Reassessment of the CEATS programme was launched in 2004 and is currently being finalised by EUROCONTROL, based on data collected from all of the CEATS ANSPs.

Good communications on the CEATS Programme are especially important, and we are constantly working to improve our communications with our main stakeholders, the CEATS States, ANSPs, the European Commission and bodies such as the International Air Transport Association, the International Federation of Air Traffic Controllers Associations and other relevant associations and social partners which represent the future staff of the CEATS UAC.

## CEATS status

- The CEATS Strategy Planning and Development Unit, located in Prague and charged with implementing the CEATS UAC, has been operational since 1 November 1999.
- The CEATS Research, Development and Simulation Centre, located in Budapest, has been operational since 1 July 2001 and has already carried out many simulations relating to future CEATS activities.
- The CEATS Training Centre is foreseen to be developed in Forlì, Italy.
- The CEATS Upper Area Control Centre, the centrepiece of the CEATS Programme, will come on-line gradually in Vienna.

# SUPPORT TO REGULATION

## REGULATORY COMMITTEE

The Regulatory Committee (RC) was created in 2002 by the EUROCONTROL Commission to provide an independent expert opinion on air traffic management rules developed by EUROCONTROL.

During 2004, under the Chairmanship of Mr Ole Asmussen, the RC, supported by the Regulatory Unit (RU), was primarily concerned with preparing for and addressing the requirements arising from the Single European Sky (SES) regulations.

Following the entry into force of the SES legislative package on 20 April 2004, the European Commission (EC) issued to EUROCONTROL a series of mandates to develop draft implementing rules and other supporting material.



To ensure that its regulatory work would take place in full alignment with the SES regulations, the RC developed an initial version of the EUROCONTROL Regulatory Work Programme (RWP) for 2004, based on the best anticipation of the SES requirements. Following the arrival of the first mandates, an update of the 2004 RWP (to version 2.0) was prepared for adoption by the Provisional Council.

Also during the year, the RC continued supporting the implementation of the SES regulations by identifying possible future mandates. These included aeronautical data integrity, 8.33 kHz channel spacing and Air Traffic Flow Management (ATFM).

In addition to the draft implementing rules developed in the framework of the SES regulations, the

# SUPPORT TO REGULATION

**The regulatory activities of EUROCONTROL are aimed at supporting the establishment of the Single European Sky (SES) as well as the development of a consistent pan-European ATM regulatory framework.**

**These activities are mainly driven by the developments and requests of the SES, through mandates given to EUROCONTROL by the European Commission (EC). Draft regulatory proposals are**



RU also launched the following EUROCONTROL consultations in 2004:

- An Advanced-EUROCONTROL Notice of Proposed Rule-Making (A-ENPRM) consultation on ATFM
- A EUROCONTROL Notice of Proposed Rule-Making consultation on a revised draft of the EUROCONTROL Regulatory and Advisory Framework (ERAF)

The purpose of an A-ENPRM is to seek industry comment on whether EUROCONTROL should initiate a rule change on a particular matter. The A-ENPRM on ATFM took into account the trend towards air traffic flow and capacity management. Its results have been transmitted to the EC to help define the scope of an expected mandate on ATFM.

The purpose of the ERAF is to define an appropriate structure for EUROCONTROL regulatory and advisory material which is fully consistent with the legal order of the European Community. In particular, it will allow for straightforward transposition of Community Regulations into EUROCONTROL rules and further transposition of the latter into the legal framework of the EUROCONTROL Member States. It will be used in particular to support the implementation of the SES.

**prepared jointly by the Regulatory Unit and relevant Agency services, mainly the Programme for Enhancement of European Air Traffic Management, the Central Flow Management Unit and the Central Route Charges Office.**

**Development of regulations includes formal consultation using the mechanisms of the EUROCONTROL Notice of Proposed Rule-Making process, before proposals are finalised.**

**EUROCONTROL'S regulatory activities encompass:**

- Preparation of draft regulations
- Supporting their implementation
- Supporting Member States and the EC in monitoring implementation
- Supporting Member States and the EC in sharing best regulatory practices

## SUPPORT TO REGULATION

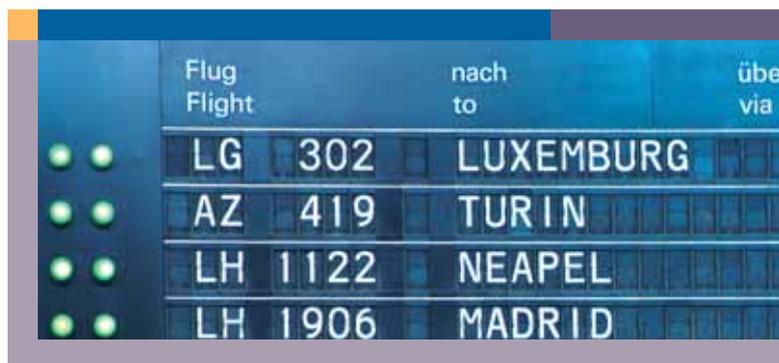
### SAFETY REGULATION COMMISSION

The Safety Regulation Commission (SRC) was established in 1998 by the EUROCONTROL Commission to ensure consistent high levels of safety in air traffic management (ATM) within the European Civil Aviation Conference (ECAC) area. Composed of senior ATM safety experts, the SRC is responsible for developing harmonised safety regulatory objectives and requirements for the European ATM system, to be implemented and enforced by the Member States. To fulfil these functions the SRC is supported by the Safety Regulation Unit.

Major progress was made during the year, under the chairmanship of Mr Martin Radusch, across a wide range of safety programmes and initiatives, the vast majority in support of the European Strategic Safety Action Plan.

Harmonisation of Safety Regulation at national level is achieved through the implementation of EUROCONTROL Safety Regulatory Requirements (ESARRs). A significant step forward in 2004 came with the approval of ESARR 1 – Safety oversight in ATM – which provides a European benchmark for the safety oversight responsibilities of national regulatory and supervisory bodies. This means that the initial set of EUROCONTROL safety regulations in ATM is sufficiently complete to allow more concentrated focus on implementation issues.

To further strengthen regulatory implementation, however, close cooperation was undertaken with the European Commission resulting in the transpo-



sition of major parts of the ESARR framework into European Community law, both through the Common Requirements for ANS Service Provision, and other ATM – related Directives.

The formal monitoring of ESARR implementation has proved to be an essential aspect of safety improvement. The first application of the ESARR Implementation Monitoring and Support (ESIMS) Programme was concluded in mid-2004, following its application to non-EUROCONTROL ECAC Member States. This phase, involving 37 ECAC States as well as EUROCONTROL's own Agency Safety Oversight office, has provided information which continues to be invaluable in maximising the effectiveness of follow-up work by States, and the support activities of EUROCONTROL.

A key area of work for the Safety Regulation Commission in this area has been the project for the development of aviation safety and air traffic control in the Balkan region, funded through a Grant Agreement with the European Community within the framework of the Community Assistance for the Reconstruction, Development and Stabilisation (CARDS) Programme. In addition, further safety workshops have been delivered on a sub-regional basis within ECAC, and with international organisations in neighbouring regions.

Initial planning for the second phase of the ESIMS Programme was concluded in late 2004 and was approved by the EUROCONTROL Provisional Council for re-launch in mid-2005. This will involve an enhanced, audit-based approach which will also be conducted in coordination with the International



Civil Aviation Organization (ICAO) Universal Safety Oversight Audit Programme. This coordination, which is embodied in a Memorandum of Cooperation with ICAO, will ensure maximum mutual benefit from audit activities, optimised use of resources and minimised audit interventions at State level.

2004 also saw the implementation of further initial stages of the Safety Regulatory Training Programme (SeRT). As well as continued ATM Safety Audit training, basic awareness courses on the European aviation safety regulatory environment are now in place. Advanced training courses addressing ESARR 2 Safety Measurement and Improvement Programme – have also now been delivered, with training covering further ESARRs being developed and implemented in subsequent years.

The wide range of Safety Regulation Commission activities is detailed in its Work Programme, the latest version of which was approved by the Provisional Council in 2004, and is available on the EUROCONTROL website.

# ADVISORY BODIES

## PERFORMANCE REVIEW COMMISSION

Established in 1998, the Performance Review Commission (PRC) is an advisory body to the governing bodies of EUROCONTROL. It reviews the past and predictable future performance of European Air Traffic Management (ATM) and submits recommendations for action.

The PRC comprises 12 independent members with senior managerial and technical experience of aviation.

The PRC produces annual Performance Review Reports, reviewing European ATM performance under the Key Performance Areas of Safety, Capacity/Delays, Flight -efficiency and Cost-effectiveness. The PRC also produces annual benchmarking reports of Air Navigation Service Providers (ANSPs) cost-effectiveness, as well as ad hoc reports.



A list of the PRC's recommendations and their implementation status can be found on the PRC web site <http://www.eurocontrol.int/prc> together with details of all PRC reports.

### 2004 Highlights

In 2004, the PRC held six meetings under the chairmanship of Mr Keith Williams and produced three major reports, outlined below.

- The seventh Performance Review Report (PRR 7) addresses the performance of the European ATM system in 2003 under the Key Performance Areas of safety, delays and cost-effectiveness.

# ADVISORY BODIES

**In the revised Convention, special emphasis is given on the one hand to the performance of the Air Traffic Control System and on the other hand to the cooperation between civil and military aviation.**

**The Performance Review Commission, consisting of independent dignatories of civil aviation and assisted by a unit in the Agency, compile each year reports on the performance of the system on issues of safety, efficiency and capacity.**



- The PRC attaches great importance to full consultation with interested parties. PRR 7 was discussed in open forum on 1 March 2004. Feedback was taken into account by the PRC when developing its recommendations, which were submitted to the Provisional Council and Commission in April 2004.
- PRR 7 proposed a European cost-effectiveness target to reduce overall unit costs by 14% from 2003 to 2008, whilst maintaining standards. It is not envisaged as an individual objective for each ANSP. The Provisional Council agreed that a European cost-effectiveness target should be set as a matter of priority.

- The ACE 2002 ANSP Benchmarking Report analyses the cost-effectiveness and productivity of European ANSPs in 2002, focussing on the costs of ATM/CNS provision at ANSP level and analysing productivity at both ANSP and Area Control Centre (ACC) levels.

The analysis was carried out with the assistance of a working group, which included ANSP representatives. This enabled the participants to develop a shared understanding of the accuracy of the data, the underlying assumptions and how the data should be interpreted

- The PRC conducted a detailed comparison of the cost of providing Aeronautical Meteorological Services in Europe, in consultation with concerned parties.

The draft final report was discussed in open forum on 11 May 2004 and recommendations were submitted to the Provisional Council in July 2004.

The PRC plans to carry out further work on Aeronautical Meteorological costs at some point in the future.

**The Civil/Military Interface Standing Committee (CMIC) consists of high-ranking air force officers, as well as civil ATC experts, of all Member States. Its function is to provide advise on military implications of EUROCONTROL activities and to report to the Provisional Council.**

### THE CIVIL/MILITARY INTERFACE STANDING COMMITTEE

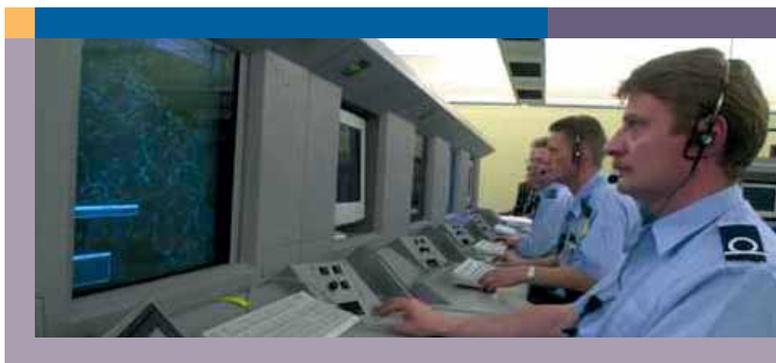
EUROCONTROL's efforts to increase the efficiency of European air traffic management (ATM) has clear implications for the relationship between civil and military aviation. The Civil/Military Interface Standing Committee (CMIC), created as part of the Revised Convention, provides inter alia advice on the military implications of the Organisation's various activities. It also examines the specific needs of military aviation and advises ATM planners on the national security aspects of future planned developments. The CMIC is composed of civil and military representatives at senior executive level from EUROCONTROL Member States.

#### 2004 Highlights

On 1 January 2004, Brigadier General Wolfgang BALTES, currently Deputy Commander of the 1st German Air Division, took office as CMIC Chairman for a period of two years.

In accordance with its advisory role in the preparation of decisions, the Committee was consulted on or informed of a number of Agency initiatives and programmes, including:

- The proposed future military ATM structure, including the establishment of the Military Domain and Military Team, management structures aimed at enhancing military representation within EUROCONTROL
- Military involvement in the Mediterranean Free Flight (MFF) programme. The CMIC urged for improved military participation in MFF and underlined the importance of civil/military cooperation in pre-operational concepts and the development of new ATM technologies
- Airborne Collision Avoidance System (ACAS) II, Phase II. The Committee discussed the Implementation Plan and relayed information to the operational units concerned
- Dynamic Management of European Airspace Network (DMEAN). The CMIC recommended the Concept of Operations and Master Plan for submission to the Provisional Council and pledged support for continuing military participation during the next two phases of DMEAN development
- EUROCONTROL Safety Issues: The CMIC adopted the first EUROCONTROL Safety Regulatory Requirement (ESARR 1 – safety oversight in ATM). The Committee's military-only subgroup (MILHAG) discussed the European Commission's draft on air traffic controller licensing versus the existing ESARR 5, with particular reference to its implications for the military
- The CMIC agreed the need for harmonisation of the Mode S transitional arrangements for State aircraft, eventually leading to the acceptance of these arrangements by the military authorities of Mode S implementing States





- The Committee called for greater civil/military cooperation and dovetailing of available expertise with regard to the ATM Security Domain Activities and Strategy

Involvement in ongoing Agency programmes continued, including:

- Reduced Vertical Separation Minima
- EUROCONTROL's Exchange of Civil-Military ATM Information and Coordination project
- 8.33 kHz channel spacing vertical extension
- The ATM Master Plan
- Adapting the European Convergence and Implementation Plan to Single European Sky (SES) regulations and implementing rules
- SES Mandates in general. The CMIC is awaiting involvement in the formal stakeholder consultation

Provisional Council support was obtained for the streamlined reporting of incidents of prolonged loss of communication through National Air Traffic Services regulators in order that EUROCONTROL can establish the cause of these failures and propose remedial action.

Some CMIC members from the core area created an informal conference of senior officers in charge of military ATM, named the European ATM Military Directors Conference (EURAMID). It plans to meet once or twice a year to discuss military ATM requirements in general. At its meeting in June 2004, EURAMID members invited all Member States to join the group.

### **The Military Unit**

In 2004, Member States and EUROCONTROL put special emphasis on civil/military activities. The most significant achievements of the EUROCONTROL Military Unit were the development of a Military Domain Action Plan and the setting up of the Military Team, which chairs.

The Military Domain Action Plan identifies the scope of activities and priority tasks of the Military Unit. Its content is in line with EUROCONTROL strategy and activities are conducted within the framework of the institutional working arrangements.

The Military Team strengthens the link with national military experts and guarantees total consistency between deliverables and expectations on military issues. As a matter of priority, in 2004 the Military Team looked into the harmonisation of

## ADVISORY BODIES

Operational Air Traffic (OAT), the development of performance indicators on the use of airspace, specifications for the use of UAVs flying as OAT, the drafting of a communications, navigation and surveillance (CNS) interoperability roadmap, the development of interoperability requirements for OAT flight data flows and the definition of transitional arrangements for State aircraft for Mode S.

The Military Unit was also fully involved in the development of implementing rules supporting the SES regulation and is now offering its expertise to the recently launched definition phase for the SES Implementation Programme.

In close cooperation with Member States, the Military Unit is now dedicating most of its time to the development of concrete deliverables for the benefit of all airspace users in addition to its traditional role of providing expertise to other EUROCONTROL domains and units.

### Perspectives for 2005

- The Military Unit, monitored by the Military Team, will study the ATM perspectives of Unmanned Aerial Vehicles (UAVs), with the aim of establishing EUROCONTROL specifications for the use of UAVs outside segregated airspace
- The CMIC will process the findings from the feasibility study carried out for EUROCONTROL into the production of a performance measurement framework for use in a military context. The first progress report from trials with pilot nations is expected



- Regular interfacing with the Safety Regulation Commission – a task now delegated to the Military Unit and the Safety Regulatory Unit at preparatory level in the Agency
- Use of the European Model for Strategic ATM Investment Analysis in establishing a military cost benefit analyses. These will be examined by pilot nations in a trial run in 2005
- Validation of the Military Key Performance Indicators (KPIs) following on from the KPI Implementation Study which commenced in October 2004
- Preparation and presentation of the CNS interoperability roadmap
- Harmonisation of Operational Air Traffic (OAT) rules

With the Military Team and EURAMID now operational, 2005 promises to be a very productive year, in particular for military ATM. The CMIC is therefore optimistic that there will be further enhancements in the use of limited European airspace.



## AGENCY SAFETY REGULATORY OVERSIGHT UNIT

The Agency Safety Regulatory Oversight (ASRO) Unit exercises the applicable safety regulatory and oversight functions over the safety critical activities of the Agency, and acts as a Designated Supervisory Authority in the context of the application of ESARRs by the Agency.

In this respect, the Unit develops proposals for the creation and implementation of common rules, in close cooperation with the parties concerned. The rules pertain to the provision of air traffic services by, or through, EUROCONTROL.

To underline the separation of the Agency's oversight and service provision functions, the Director General of EUROCONTROL established new terms of reference for the ASRO Unit on 1 June 2004. They clarify the role and responsibilities of the Unit, which now reports directly to the Director General.

The responsibilities of the Unit are to:

- Identify the international, national and internal safety rules and procedures applicable to the safety-critical activities of the Agency and oversee, monitor and enforce, where appropriate, their implementation
- Collect and maintain updated versions of the applicable regulatory documentation necessary for the execution of its tasks

- Prepare and propose EUROCONTROL internal safety rules to the Director General in conformity with existing international and national legislation
- Review and audit the safety processes, systems and procedures related to the safety-critical activities of EUROCONTROL
- Act as the focal point for safety oversight, monitor relevant developments in the domain of ATM safety regulation and oversight and submit proposals where appropriate. In particular, on behalf of the Director General, liaise with and report to States which have delegated ATS responsibility to EUROCONTROL
- Issue certificates of competence to EUROCONTROL air traffic management personnel, in accordance with the appropriate international licensing standards and procedures
- Collate and analyse relevant safety data and investigation reports for trend analysis and formulate appropriate recommendations.

# HUMAN RESOURCES

## Main initiatives

Central to EUROCONTROL's provision of a safe, efficient and cost-effective air traffic management system is its ability to attract and retain high-quality staff who are able to respond to the rapidly changing demands of the air transport industry.

A well balanced human resources policy is an essential component of this and in 2004 EUROCONTROL continued modernising and updating its human resources services. This included reform of the pension system, discussions on salary adjustment and an ongoing programme of Administrative Reform.

During the year, significant progress was made on these three key issues. This was essential not only to ensure the Agency's continued success but also in enabling it to continue to attract and retain a highly qualified and motivated workforce.



Another of the main priorities during 2004 was continued investment in staff to ensure a competent, committed and competitive workforce.

A new Corporate Management Training Programme was developed with the Management Centre Europe in Brussels and the first phase was launched during the year for junior, middle and senior managers. The intention was to develop and apply a common EUROCONTROL approach to management skills. It was fully aligned to meeting EUROCONTROL's needs while, at the same time, reflecting best management practices.

Increased emphasis was also placed on internal communication on human resources-related matters. Regular 'Info Flashes' on human resources topics were issued to all staff and information sessions on important issues such as salaries, pensions and the review of conditions of service. The Agency's internal magazine, Insight, also gave voice to the views of the staff. A pilot project was launched to provide pensioners

**Management of resources is an integral part of EUROCONTROL's effort to ensure that its work is fully supported, in both human and financial terms.**

**The main challenge for the Human Resources Directorate during 2004 was to address and to make significant progress on three key issues, namely review of salary, pensions and conditions of service. This was essential not only to ensure the Agency's continued success but also to enable it to continue to attract and retain a highly qualified and motivated workforce. These key issues were all tackled under the heading of EUROCONTROL's Administrative Reform.**

**In line with best practice, EUROCONTROL provides a Corporate Governance statement each year and in 2004 this included the elaboration of business plans for all aspects of the Agency's activities. This will improve management efficiency, providing for better concentration of resources where they are needed.**

**Good financial management is central to the successful functioning of EUROCONTROL and depends on transparency, accountability and cost-effectiveness. In January 2004 the first meeting of the Standing Committee on Finance (SCF) was held, and has made significant progress in consolidating EUROCONTROL's budget and five-year programme in order to provide stability and long term predictability. Another develop-**



with access to relevant information on the Agency's intranet. Further developments are planned for 2005.

HR reports of general interest, and specifically for managerial purposes, were further developed in accordance with specified needs. Data on posts, staff planning, grading structure, gender, nationalities, etc. were periodically updated and made available on the Agency's internal website in order to provide a sound basis for management decisions.

Social dialogue continued to be a key area, with particular regard to consultations on important topics such as the pension scheme, salary method and HR reform. A new Central Staff Committee and local Staff Committees were elected in 2004.

The Human Resources Directorate in Brussels considered a plan for streamlining the recruitment process. The Directorate has also been investigat-

ing the possibility of implementing e-recruitment as soon as possible. Changes to the recruitment procedure for student controllers, involving selection and training, remain key ingredients in the provision of safe and cost effective air navigation services in Europe.

EUROCONTROL was the initial user of the First European Air Traffic Controller Selection Test (FEAST) package, for the selection of student air traffic controllers at the Maastricht Upper Area Control Centre. FEAST was developed by the ATM Strategies/Human Factors Management, along with national experts, and represents an integrated approach to measuring the cognitive abilities and skills of candidates for ATC jobs. It is complementary to existing selection tools such as the interview and assessment centres within EUROCONTROL. DHR, working in close collaboration with other Agency-wide services, is proud to have contributed to this success.

**ment was the introduction of the Basic Financial Information Package, providing increased transparency in the use of Agency resources, and the establishment of the SCF as advisor to the Provisional Council on Audit Board Transparency Reports.**

**EUROCONTROL introduced the EFQM model back in 1997, when it became a member of the EFQM and drafted its Quality Policy. The EFQM Model was used for Self-Assessment initiatives taken in some Directorates. This allowed for familiarisation with the model but resulted in variable progress in introducing European good practice within the Agency. Not all Directorates were yet implementing improvement actions and achieving measurable results. In 2001 the**

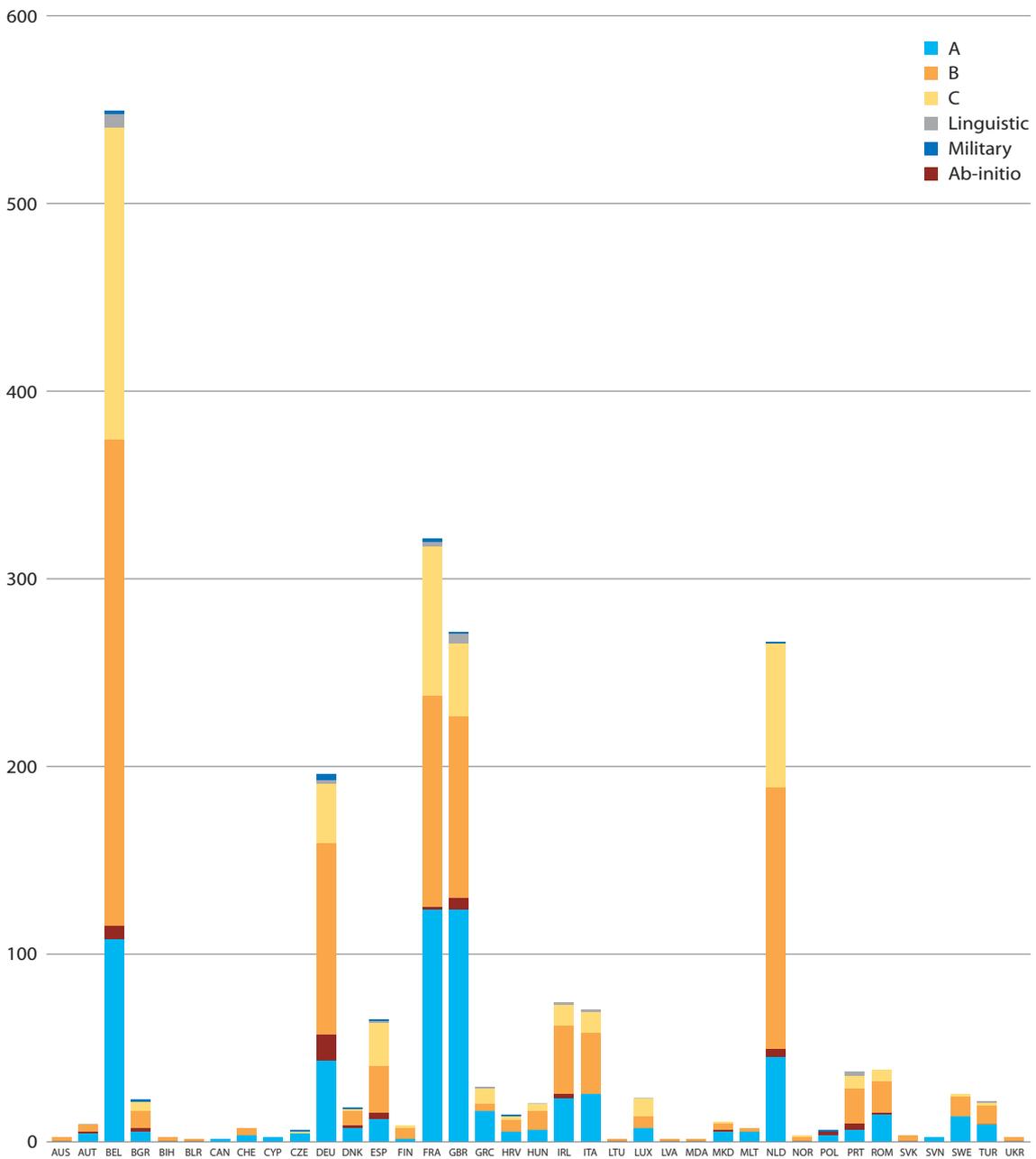
**Quality Policy was reviewed and became the mandatory Agency Excellence Policy and the Agency Group for Excellence (AGE) was created with the aim to coordinate continuous improvement throughout the Agency. In 2002 senior management decided to adopt a cross-Agency approach to Excellence by setting a corporate objective: to achieve the EFQM Recognition for Excellence (R4E) award for the Agency in 2005. This project is championed by the DG and all the Directors and carried out by a Task Force of AGE. The application for R4E will be submitted to the EFQM by June 2005 and the final assessment and site visit by EFQM assessors will take place in September 2005. The success of this initiative will contribute to enhance the image of the Agency with its stakeholders.**

# RESOURCES

## HUMAN RESOURCES



Breakdown of serving staff by nationality and grade





A new payroll tool was integrated into the Human Resources database, completing a large-scale project which had been underway for more than a year. The tool increases the transparency, flexibility and efficiency of the payroll management system.

Improvements in the Agency's Sickness and Accident Insurance scheme were implemented during the year, following a three-year improvement plan. Further enhancements in business processes are planned to increase the scheme's stability. A customer satisfaction survey launched in November 2004 confirmed the positive perception of these developments.

2004 also saw the stabilisation of a reorganised structure within the Human Resources Directorate in Brussels. This reorganisation strengthened key support services. Senior appointments for core human resources areas were also made to enhance the efficiency, performance and customer focus of the Directorate.

One of the main objectives of an HR function is to deliver services to the customers as and when required. In this respect, it is crucial to measure customer satisfaction. Areas identified by customers for improvement during the 2004 survey included the basis for promotion, career development, involvement in the development and implementation of human resources processes, performance appraisal and mobility. The results will be considered as part of an action plan during 2005.

A staff satisfaction survey was also carried out Agency-wide in 2004. Overall, satisfaction has

## 2004 Highlights

### > Pensions

**In November, a historical decision was taken by the 34 Member States to reform the EUROCONTROL pension system.**

**This provides for:**

- **Increased contributions by employer and employees (about 20% for the Agency and 10% for staff)**
- **Money to be set aside in a Pension Fund and invested**
- **Reduction of past obligations by Member States to zero through increased payments into the Fund over 20 years**
- **Limited downsizing of pension benefits**

**If no action had been taken, pension expenditure would have reached up to 170 million per annum, equal to 35%-40% of EUROCONTROL's budget. The decision to reform the system means that expenditure will only reach about half that amount.**



### > Salaries

**2004 was also a landmark year for the EUROCONTROL salary system, with approval, effective from 1 July 2004, to calculate salaries in the same way as the European Union.**

## RESOURCES

### HUMAN RESOURCES

increased slightly. However, there are various areas for improvement such as advancement and personal growth, organisational clarity, communication and leadership. An action plan to enhance these areas will be drawn up and discussed with managers, staff and staff representatives.

Increased emphasis was put on improved customer relations and their interface with the Human Resources Directorate. A first Service Level Agreement was signed between the Directorate of Human Resources and the European Air Traffic Management Service Business Unit, with the aim of improving the interface and provision of services between the two. The human resources requirements specified by the customer will provide a sound basis for ongoing planning and review, as well as being a model for similar agreements with other Service Business Units.

### Key figures in the area of recruitment:

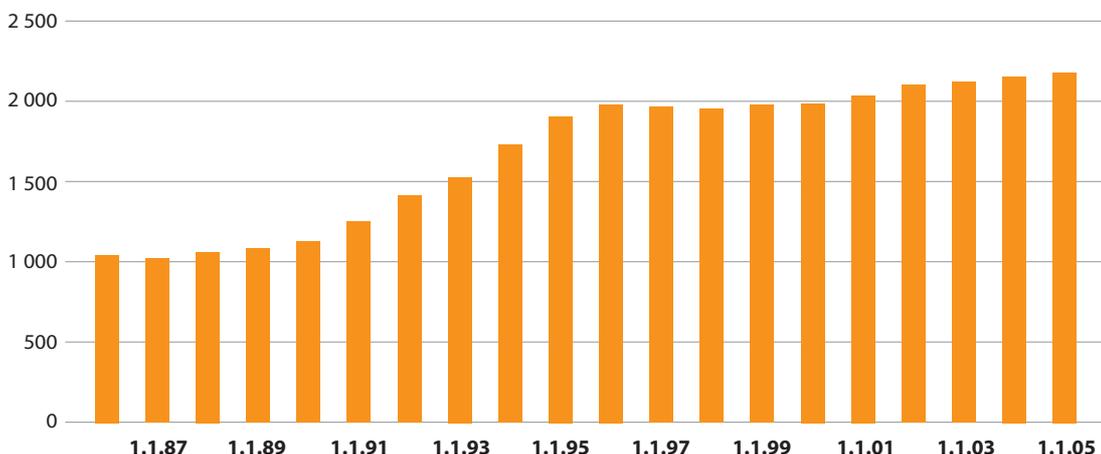
- 31 Notices of Competition published
- 4,320 external applications processed
- 536 internal applications handled
- 130 internal transfers processed
- 9,996 items of correspondence handled

### The EUROCONTROL workforce

On 31 December 2004, EUROCONTROL's workforce comprised 2,138 serving staff, complemented by external effort of 565. Overall, 37 nationalities work in the Agency's seven European sites at Brussels, Budapest, Brétigny, Karlsruhe, Luxembourg, Maastricht and Prague.

The workforce benefited from improved manpower planning, a reduction of external effort with less "body shopping" and more tasking contractors, plus the ongoing application of the job management policy, which ensures the right level for each job Agency-wide.

### Trend in staff complement (filled posts)





During the year, EUROCONTROL welcomed 106 new staff members, while there were 74 retirements. Interest in finding employment with the Agency remains keen, and there is also plenty of internal activity, with existing staff looking for advancement by competition or internal transfer.

### Priorities for 2005

- Establish clearer policies and a revised human resources framework
- Introduce a staff category of “contract agents” for support or core activities
- Review and improve the staff development / training process
- Review and improve the recruitment process
- Strengthen involvement of Directorates in human resources activities
- Strengthened “fact-based” management through more systematic and regular reporting on all critical human resources issues

### > Administrative reform

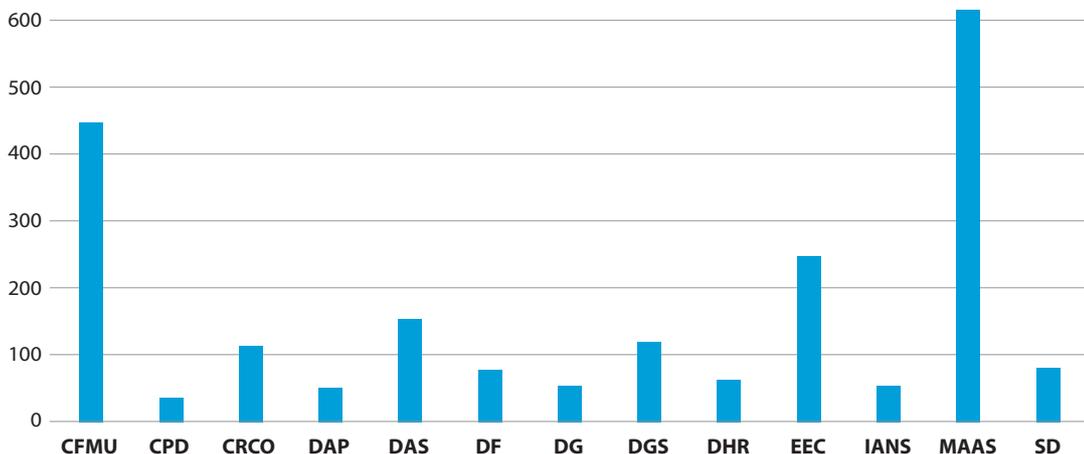
EUROCONTROL undertook a comprehensive reform of its Human Resources system ('Administrative Reform').

Salaries and pensions were the first and most fundamental part of this and discussions with Member States and EUROCONTROL social partners is now concentrating on:

- Improved performance-related HR management
- Review of performance-related benefits
- Review of general employment conditions
- Review of social policies

This aims to continue to attract excellent international staff while at the same time enhancing cost-efficiency. The recent administrative reform at the European Union is taken as a benchmark. Discussions will continue in 2005.

**Breakdown of serving officials by Directorate**



# CORPORATE GOVERNANCE

EUROCONTROL bases its decision-making and monitoring on the principles of good corporate governance. Transparency is of prime importance, and is recognised in the EUROCONTROL Mission Statement, Contract Regulations, Financial Regulations, and in its financial reporting to Member States, stakeholders and the Audit Board.

## Internal control

Executive responsibility for internal control is vested in the Director General. The system exists to ensure that Agency objectives are achieved efficiently and economically, and in compliance with EUROCONTROL's regulations. It is designed to manage rather than eliminate the risk of failure to achieve business objectives.

The Agency's internal control system comprises the following elements:

- Financial, Contract and Staff Regulations
- Annual Budget and Five-Year Programme
- Business Plan for each Directorate
- Decisions of the Director General or Directors, organising the Agency, allocating specific responsibilities and delegating powers
- An accounting system
- Segregation of duties between the functions of fund managers, authorising officers, accountants and treasurers
- Corporate risk management
- An internal audit function
- Performance measurement systems and activity reports
- Annual Accounts



## Corporate risk management

EUROCONTROL has designed risk management systems to identify, assess and, where necessary, take action to counteract or mitigate any risks associated with its activities. Corporate-wide guidance on risk management has been developed. Risk management is an integral part of management activity, and is being integrated into the business planning process.

In 2003, the Agency's risk management processes were reviewed and, while identifying further improvements, which are now being implemented, concluded that it has a generally sound approach towards risk management. The corporate risk management process continued to be reviewed and improved during 2004.

## Internal Audit

EUROCONTROL's Internal Audit Unit oversees an effective system of internal controls, designed to help the Agency meet its objectives. Its scope includes:

- Ensuring the reliability and integrity of financial and operational information
- Ensuring the effectiveness and efficiency of operations
- Safeguarding assets
- Compliance with laws, regulations and contracts,
- Assessment of risk management processes.

# RESOURCES



The Head of Internal Audit, whose appointment by the Director General is approved by the Provisional Council and the enlarged Committee for Route Charges, reports directly to the Director General. He may bring matters which in his view are significant to the attention of the Audit Board, the Provisional Council and the enlarged Committee.

#### **External Audit**

The Audit Board examines and reports annually on the Agency and the Route Charges System accounts and reports to the Commission, via the Provisional Council. With regard to the financial management of the Route Charges System, it reports via the enlarged Committee. The Audit Board also reviews the level of transparency of the Agency's procedures and decisions.

The Board is independent of the Agency and has its own financial resources, approved by the Commission. It is composed of six Members designated by six contracting States, on a rotating basis, for a period of four years. The Rules of Procedure of the Audit Board stipulate that its members shall be professional auditors. Board members are not paid by the Agency, but are refunded in full for their travel expenses.

#### **Annual accounts**

EUROCONTROL produces budgetary accounts presenting the execution of the budget and financial accounts, showing the financial position and the financial performance of the Agency. The budgetary and financial accounts are produced in accordance with the principle of a true and fair view.

The Accounts of the Agency and of the Route Charges System are audited by the Audit Board, assisted by external consultant auditors. The Annual Accounts, including the audit opinion, are submitted to the Commission via the Provisional Council. The Commission gives a final ruling on the Accounts and decides on the discharge to be given to the Director General in respect of his financial and accounting management.

### **Appointment of staff, and remuneration**

EUROCONTROL staff are appointed by the Director General following recommendations to him, as a result of a rigorous recruitment and selection procedure involving selection boards, with representatives from management and the staff committee.

In accordance with EUROCONTROL Staff Regulations, any staff member wishing to perform any professional external activity must gain the prior approval of the Director General, and further measures are in place to manage potential conflicts of interests of Agency staff.

The system of staff remuneration, including that of the Director General and the Directors, is approved by the Commission and is linked to the method used by the European Commission. In line with the public-sector nature of the Agency there are no bonuses or discretionary payments to staff.

# FINANCIAL MANAGEMENT

EUROCONTROL is committed to achieving the highest levels of transparency, accountability and cost-efficiency in utilising the resources put at its disposal.

During 2004, the Agency, in close consultation with its Member States, auditors and the rest of its stakeholders, achieved significant improvements in its continuing journey to excellence in financial management.

Financial information for the year is contained in the Chapter starting on page 100.



## Resolution of long outstanding issues

During the year, significant steps were taken to resolve outstanding issues, helping to ensure that EUROCONTROL's finances are sustainable in the long term. These included:

### **Application of the International Accounting Standards**

A decision was taken to apply the International Accounting Standard (IAS) 38, to the capitalisation of intangible assets. In November 2004, following an SCF proposal, the Provisional Council adopted the decision to fully apply IAS 38 to the capitalisation of intangible assets, as from 1 January 2006. This decision followed another, also taken by the Provisional Council, to stop the capitalisation of revenue expenditure under capitalised projects, as from 1 January 2004. Special amortisation plans have been approved in both cases in order to smooth out the impact of such measures on Member States' contributions. These decisions will result in a substantial reduction of the Agency's debt, as had been requested by Member States, and will facilitate the sustainability of the Agency's finances in the long term.

In close cooperation with its Internal and External Auditors, EUROCONTROL is analysing the applicability of the rest of the IAS standards to the Agency Accounts, including IAS 1 on accrual accounting. It will present the results to the SCF in 2005. The Agency is also considering possible amendments to the Financial Regulations, which might be necessary following the introduction of other IAS standards.



### Creation of the pension fund

In November 2004, the Provisional Council took a decision to resolve the longstanding issue of EUROCONTROL pensions. The progressive retirement of staff hired in the early years of the Agency's existence has created an increasing imbalance between the yearly payments to the pensioners and the contributions of the Agency and the active staff to the pension scheme. In recent years this imbalance has represented a considerable, and growing, burden on the budget and would have continued to increase for the foreseeable future unless decisive measures were taken.

The creation of the pension fund aims to restore the basic equilibrium between the assets and obligations of the pension system. A special plan to rebuild pension fund assets, involving contributions from Member States over the next 20 years, has been agreed. This plan separates the contributions of Member States, which are aimed at defraying pensions obligations, from those which cover the rest of the budgetary needs. This liberates the regular Agency budget from the considerable yearly increases which had been experienced while pension payments were not segregated from other budgetary obligations.

### Reduction of the gap between debts and assets

During the Advisory Financial Group (AFG) meeting in September 2003, Member States reiterated their support for the policy of aligning the fixed assets and liabilities represented by bank loans, as an essential step towards achieving long term financial stability for the Agency.

At this meeting, it was noted that the gap between assets and liabilities would reach €33.0 million by the end of 2004. EUROCONTROL is committed to finding efficiencies to close this gap by the end of 2008, without increasing credits for the repayment of the loans forecast in the Five-Year Plan.

In 2004, EUROCONTROL was able to devote additional amounts, over and above those foreseen in the Budget, to amortise its bank loans. This has enabled the gap to be reduced to around €21.0 million. By doing so, the Agency not only fulfilled its commitment to progressively reduce the gap, but put itself in an excellent position to meet its target of reducing the imbalance to zero by the end of 2008.

## 2004 Highlights

**The Standing Committee on Finance (SCF) was created in November 2003 by a Decision of the Provisional Council and held its first meeting in January 2004.**

**This SCF, under the chairmanship of Mr Michel Wachenheim, reports directly to the Provisional Council. Highlights of its first year of work include:**

- **Consolidation of the system of parameters for establishing the Agency Budget and Five-Year Programme (FYP). This system has been used to prepare the 2005 Budget and will also be used for the 2006 Budget and the 2006-2010 FYP. It aims to provide planning stability and long-term predictability to the budget, for the benefit of the Agency and the Member States.**

## RESOURCES

### FINANCIAL MANAGEMENT

#### Corporate financial governance

In line with best practices, the Agency's Accounts contain a statement on Corporate Governance of the Organisation and the Agency. This statement takes into account the Agency's practices on corporate risk management, including the recommendations of the 2003 Audit Board's Report.

EUROCONTROL has strengthened the accountability of Budget Fund Holders, through a Decision of the Director General, issued in late 2004. This Decision is also aimed at increasing the effectiveness of internal control systems.

EUROCONTROL has now completed the business plans for all its Business and Support Units. Furthermore, it is in the process of completing its first Agency-wide Business Plan, in line with the strategic priorities established by the Provisional Council in November 2004.

The Agency continued in 2004 to adhere to the model for achieving excellence of the European Foundation for Quality Management. Significant progress was made and in 2005 EUROCONTROL will apply for the Recognised for Excellence Award (R4E) for the entire Agency. In addition, the Maastricht UAC and Central Flow Management Unit are working towards achieving the relevant ISO certifications.

An efficient management tool has been developed which allows the General Meeting of Directors to closely monitor trends in budgetary expenditure. For staff expenditure the so-called Staff Monitoring Tool facilitates management of human resources. For the rest, there are regular reports which allow for budgetary appropriations to be reviewed.



#### Efficiency improvements

During 2004, the Agency continued its efforts to reduce the portion of its resources devoted to support activities (overheads), increasing the amount dedicated to delivering its main services and programmes.

The impact of applying the -3% Efficiency Factor incorporated in the calculation of its Budget growth has been integrated into the 2005 work programme. EUROCONTROL will be informing Member States about the impact of the continued application of this Efficiency Factor throughout the Five-Year Programme.

In spite of budget restrictions, the Agency was able to restructure its 2004 work programme to accommodate the additional tasks required by implementing the Mandates entrusted to it by the European Commission in support of the development of the Single European Sky Legislation. In this same spirit, EUROCONTROL will also accommodate the work required by the Definition Phase of the ATM Master Plan, also known as SESAME.



In its continuous search for efficiency, the Agency outsourced a considerable part of the MIS Support activities in 2004, through a contract with an international consortium which will exceed €40 million over the next five years.

- **Utilisation of an agreed high-level Basic Financial Information Package for screening the annual budget. This Package aims to increase the consistency and traceability of financial information provided for budgetary discussions, permitting a comprehensive overview of significant financial issues. One of the main innovations is the introduction of a functional presentation of the budget, increasing transparency on the use of budgetary resources.**
  
- **Establishment of the SCF as the body which provides advice to the Provisional Council on the Transparency Reports of the Audit Board. A modification of the Terms of Reference of the SCF was approved by the Provisional Council, entrusting it with reviewing the Audit Board's reports. During 2004, the SCF reviewed the Audit Report on Intangible Assets and the proposals put forward by the Agency. Its recommendations were instrumental in the decision, taken by the Provisional Council, to apply the International Accounting Standard (IAS 38) to the Agency's Accounts.**



**The format of the Annual Accounts was again revisited in 2004, with the aim of making them more transparent and meaningful. The presentation of the Accounts is now aligned with the best practices of similar organisations.**

**The Annual Accounts include a full Chapter on the calculation of the EUROCONTROL cost-base for 2003, reconciling them with the final cost-base and providing full transparency on the Agency's costs, which are ultimately charged to the airspace users. This allowed the Agency to present a document based on a transcription of the relevant pages of the 2003 Annual Accounts for inclusion in the Route Charges cost-base, ensuring maximum transparency and consistency in this key area.**



**The Chapter on Corporate Governance was fully reviewed to offer a more comprehensive view of the Agency's practices.**

**The 2003 Annual Accounts include the Audit Certificate issued by the Audit Board, following the practice initiated in the 2002 Accounts.**

# FINANCIAL INFORMATION

## Foreword

In the increasingly complex and challenging environment in which EUROCONTROL operates, cost-effective methods and practices are vital to the smooth operation of the Agency and the efficient conduct of EUROCONTROL's international affairs.

## Annual accounts

In accordance with its Financial Regulations as amended in 2002, the Agency publishes its 2004 Annual Accounts by 30 June 2005. These accounts include the opinion of its external auditors, the EUROCONTROL Audit Board.

The financial information that follows is a summary of the data that are included in the Annual Accounts.

## Financing mechanism

The annual budget of the Agency is established on the basis of the cash flows needed to support planned expenditure. It is subdivided into Parts, which each have their own financing mechanisms.

**Chart 1** shows the financing mechanism of Parts I & IX, II, III and VI of the budget.

- **Parts I and IX** include the European Air Traffic Management Programme (EATM), the Central Flow Management Unit (CFMU), the Experimental Centre (EEC), the Training Institute (IANS), the Performance Review Unit (PRU), the Regulatory Unit (RU), the EAD Services, the Military Unit, the Safety Regulatory Oversight Unit, the Safety Regulation System, the External Audit, together with all the logistic services. It is mainly financed by contributions from the 34 Member States (operational expenditure) and bank loans (capital expenditure) with some minor receipts for special services provided on request.
- **Part II** includes the Central Route Charges Office (CRCO), which is financed from a handling charge on the route charges collected via the system.
- **Part III** includes the Maastricht UAC, which is owned and operated by EUROCONTROL on behalf of Belgium, Germany, Luxembourg and the Netherlands. It is financed by contributions from these four States and, for a part of the capital expenditure, pre-financed by Part I.
- **Part VI** includes the Central European Air Traffic Services (CEATS) project, which is financed by contributions from the participating States, i.e. Austria, Bosnia and Herzegovina, Croatia, the Czech Republic, Hungary, Italy, Slovakia and Slovenia and by bank loans for the capital expenditure.

## Chart 1: Statement of sources and application of funds in 2004 (in € '000)

### PARTS I and IX: EATM, CFMU, EEC, IANS, PRU, SRU, RU and logistic services

- Operating expenditure financed by contributions from 34 Members States

#### Opening balance

In favour of States (01.01.04) **87**

#### Sources of funds

+

Contributions received

France	56 580	16.8%
Germany	55 648	16.5%
United Kingdom	51 661	15.3%
Italy	34 851	10.3%
Spain	29 112	8.6%
Netherlands	10 076	3.0%
Belgium	9 413	2.8%
Sweden	8 810	2.6%
Switzerland	8 466	2.5%
Portugal	8 386	2.5%
Turkey	8 269	2.5%
Austria	7 850	2.3%
Greece	6 916	2.1%
Remaining States	41 176	12.2%

**337 214**

#### Application of funds

-

Staff expenditure (net)	207 364	61.9%
Repayment of loans	76 498	22.8%
Operating expenditure (net)	39 659	11.8%
Interest paid on loans	11 687	3.5%

**335 208**

#### Closing balance (31.12.04)

=

Balance in favour of States **2 093**

- Capital expenditure financed by bank loans

#### Opening balance (01.01.04)

Loans still to be drawn down against 2003 expenditure **-43 719**

#### Sources of funds

+

Drawdown of loans	57 500	99.9%
Sale of assets	7	0.1%

**57 507**

#### Application of funds

-

Capital expenditure: tangible	23 784	34.6%
Capital expenditure: intangible	40 447	58.8%
Pre-financing MUAC investments	4 594	6.6%

**68 825**

#### Closing balance (31.12.04)

=

Loans still to be drawn down against 2004 expenditure **-55 037**

#### Budget performance (in €'000)

	Actual	Budget	%
Expenses financed by contributions	335 208	339 734	98.7%
Expenses financed by bank loans	68 825	78 614	87.5%

The closing balance in favour of States as at 31.12.04 will be deducted from the contributions to be paid by the States in 2005

The amount of loans still to be drawn down against 2004 capital expenditure will be drawn down during 2005

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**PART II: CRCO**

- Operating and capital expenditure financed by handling charges levied on route charges

**Opening Balance (01.01.04)**

Due to Part I - 930

**Sources of funds** +

Transfer to Part I from Handling charges on route charges 20 107

**Application of funds** -

Staff expenditure (net)	13 335	72.1%
Operating expenditure (net)	4 482	24.2%
Capital expenditure	681	3.7%

18 498

**Closing balance (31.12.04)** =

Balance due by Part I 679

## PART III: Maastricht UAC

- Operational expenditure financed by contributions from the 4 Member States

### Opening Balance (01.01.04)

In favour 4 States	3 585
In favour Germany OAT	136
Balance in favour of States	<b>3 721</b>

### Sources of funds +

Contributions received

Germany GAT	33 689	41.3%	<b>81 528</b>
Belgium	26 696	32.7%	
Netherlands	17 170	21.1%	
Luxembourg	826	1.0%	
Germany OAT	3 157	3.9%	

### Application of funds -

Staff expenditure (net)	70 247	89.8%	<b>78 267</b>
Operating expenditure (net)	8 020	10.2%	

### Closing balance (31.12.04) =

In favour 4 States	6 715
In favour Germany OAT	267
Balance in favour of States	<b>6 982</b>

- Capital expenditure financed by contributions from the 4 Member States and by prefinancing from Part I

### Opening Balance (01.01.04)

In favour 4 States	0
In favour Germany OAT	- 117
Balance in favour Germany OAT	<b>- 117</b>

### Sources of funds +

Contributions received

Germany GAT	5 603	28.4%	<b>19 688</b>
Belgium	4 441	22.6%	
Netherlands	2 858	14.5%	
Luxembourg	137	0.7%	
Germany OAT	2 055	10.4%	
Prefinancing MUAC investments	4 594	23.4%	

### Application of funds -

Capital expenditure 4 States	17634	90.2%	<b>19 546</b>
Capital expenditure Germany OAT	1 912	9.8%	

### Closing balance (31.12.04) =

In favour 4 States	0
In favour Germany OAT	259
Balance in favour of Germany OAT	<b>259</b>

The closing balance in favour of States as at 31.12.04 will be deducted from contributions to be paid by the 4 States and by Germany OAT during 2005

# RESOURCES

## FINANCIAL INFORMATION

### PART IV: CEATS

- Operating expenditure financed by contributions from the 8 CEATS Member States

#### Opening Balance

In favour of States (01.01.04) **2 002**

#### Sources of funds

+

Contributions received

	Amount € '000	%
Hungary	2 167	22.3%
Austria	2 471	25.4%
Slovenia	241	2.5%
Czech Rep.	1 548	15.9%
Italy	1 608	16.6%
Slovak Rep.	626	6.4%
Croatia	1 053	10.9%
<b>Total</b>	<b>9 714</b>	

#### Application of funds

-

Staff expenditure (net)	7 701	77.8%
Operating expenditure (net)	2 186	22.2%
<b>Total</b>	<b>9 887</b>	

#### Closing balance (31.12.04)

=

Balance in favour of States **1 829**

- Capital expenditure financed by bank loans

#### Opening Balance (01.01.04)

Loans still to be drawn down against 2002 and 2003 expenditure **- 2 307**

#### Sources of funds

+

Drawdown of loans

**2 500**

#### Application of funds

-

Capital expenditure intangible	470	41.1%
Capital expenditure tangible	674	58.9%
<b>Total</b>	<b>1 144</b>	

#### Closing balance (31.12.04)

=

Loans still to be drawn down against 2004 expenditure **- 951**

*The amount of loans still to be drawn down against 2004 Capital expenditure will be drawn down during 2005*

## Consolidated balance sheet

The consolidated balance sheet comprises the assets and liabilities of all EUROCONTROL Parts (including PART I, PART II (CRCO), PART III (MUAC), PART IV (Special Annexes), PART V (Sickness Fund), PART VI (CEATS), PART VII (Unemployment Fund), PART VIII (Pension Fund) and PART IX (CFMU)).

### Assets (in €'000)

	2003	2004
Intangible fixed assets	159 350	138 103
Tangible fixed assets	262 730	245 813
Work in Progress	18 493	33 025
<b>Total fixed assets</b>	<b>440 573</b>	<b>416 941</b>
Current assets	929 167	984 425
<b>Total assets</b>	<b>1 369 740</b>	<b>1 401 366</b>

### Liabilities (in €'000)

	2003	2004
Net financial position	28 168	25 473
Liabilities with banks	396 555	375 412
Current liabilities	945 017	1 000 481
<b>Total liabilities</b>	<b>1 369 740</b>	<b>1 401 366</b>

### Commitment to long-term financial equilibrium

EUROCONTROL has in place a policy for its long term financial equilibrium, which pursues the alignment between its liabilities with banks and its total fixed assets. The respective amounts, at the close of 2004 were the following:

- Liabilities with banks, including both current liabilities (€375.4 million) and future liabilities, in respect of 2003 budgetary year (i.e. €55.0 million), amounting to a total of €430.4 million;
- Fixed assets (€416.9 million) including €409.7 million belonging to PART I, III and IX, which will be recovered in the subsequent years, through the EUROCONTROL cost-base mechanism.

The Agency has committed with its Member States to close the gap between assets and liabilities (i.e. €20.7 million) by the end of 2008. This alignment is aimed at ensuring that there are sufficient assets to be recovered by the Route Charges System through the mechanism of amortisation, to repay the liabilities with the banks.

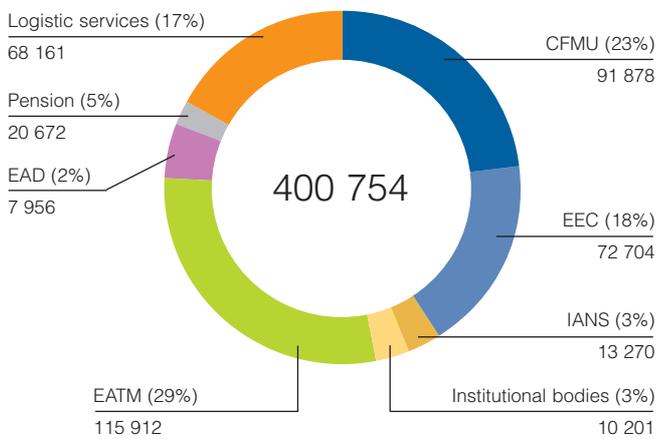
### Current assets and liabilities

The current assets and liabilities are mainly generated by CRCO activities (debtors with the users and creditors with the Member States).

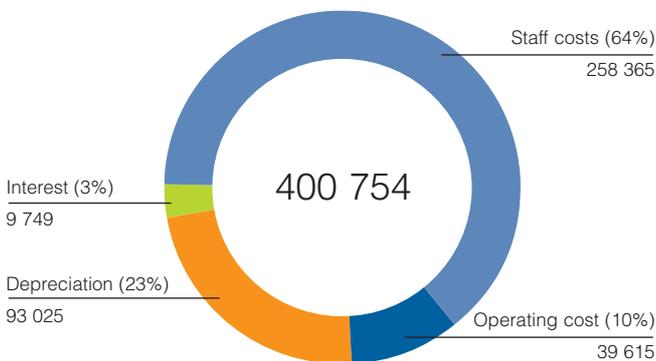
# RESOURCES

## FINANCIAL INFORMATION

### Cost of Parts I and IX per establishment in 2004 (in €'000)



### Cost of Parts I and IX breakdown by type in 2004 (in €'000)



## EUROCONTROL costs

In accordance with ICAO rules, each Member State includes its own share of EUROCONTROL's costs in its individual cost-base. Although there is therefore no separate EUROCONTROL cost-base or unit rate as such, the Agency is very conscious of the cost pressures to which users are subject.

### 1. Cost of Parts I and IX: EATM, CFMU, EEC, IANS, PRU, SRU, RU and Logistic Services

EUROCONTROL costs (Parts I and IX) accounted in 2004 for 7.6% of the total en-route costs, while in 2003 they accounted for 7.8%, therefore in 2004 there was a reduction of 3.5% over the previous year.

The trend in EUROCONTROL's charges to the air-space users is measured by the following two variables:

- the cost per kilometre overflown (which is the approach adopted by the Performance Review Unit).

The EUROCONTROL cost per kilometre in 2004 was €5.6 cents per kilometre overflown, while in 2003 it amounted in real terms to €5.9 cents, therefore in 2004 there was a 5.3% reduction over the previous year.

- the cost per service unit (the combination of distance and aircraft weight used for charging purpose).

The EUROCONTROL cost per service unit in the Route Charges System in 2004 was €4.25. The cost in 2003 was, in real terms, €4.49, therefore in 2004 there was a reduction of 5.6% over the previous year.

**Trend of total costs (Parts I and IX) in €'000**

	1997	1998	1999	2000	2001	2002	2003	2004
Staff costs (gross)	168 683	166 070	175 578	195 636	204 982	218 520	231 910	258 365
Operating costs	27 448	23 102	18 789	22 173	33 642	35 320	35 286	39 615
Depreciation	46 945	59 329	69 915	81 162	79 246	96 866	108 145	93 025
Interest	17 001	17 190	14 726	16 604	14 046	12 821	11 561	9 749
<b>Total EUROCONTROL cost</b>	<b>260 077</b>	<b>265 691</b>	<b>279 008</b>	<b>315 575</b>	<b>331 916</b>	<b>363 527</b>	<b>386 902</b>	<b>400 754</b>
% i/i-1		2.2%	5.0%	13.1%	5.2 %	9.5%	6.4%	3.6%
<b>Total en-route costs</b>	<b>3 590 179</b>	<b>3 851 008</b>	<b>4 213 444</b>	<b>4 501 196</b>	<b>4 826 986</b>	<b>4 918 849</b>	<b>4 939 938</b>	<b>5 258 573</b>
%i/i-1		7.3%	9.4%	6.8 %	7.2 %	1.9%	0.5%	6.4%
<b>EUROCONTROL portion</b>	<b>7.2%</b>	<b>6.9 %</b>	<b>6.6 %</b>	<b>7.0 %</b>	<b>6.9 %</b>	<b>7.4%</b>	<b>7,8%</b>	<b>7,6%</b>

**Trend of cost per km (Parts I and IX)**

	1997	1998	1999	2000	2001	2002	2003	2004
<b>Total EUROCONTROL cost (€'000)</b>	<b>260 077</b>	<b>265 691</b>	<b>279 008</b>	<b>315 575</b>	<b>331 916</b>	<b>363 527</b>	<b>386 902</b>	<b>400 754</b>
Total kilometres flown (million)	5 018	5 567	6 099	6 435	6 448	6 415	6 713	7 186
Nominal unit cost (€/km)	0.0518	0.0477	0.0457	0.0490	0.0515	0.0566	0.0576	0.0557
Inflation factor applied	1.7%	1.3%	1.2%	2.1%	2.1%	2.2%	2.1%	
<b>Real unit cost (€2004/km)</b>	<b>0.0587</b>	<b>0.0531</b>	<b>0.0503</b>	<b>0.0533</b>	<b>0.0549</b>	<b>0.0591</b>	<b>0.0588</b>	<b>0.0557</b>

**Trend of cost per service unit (Parts I and IX)**

	1997	1998	1999	2000	2001	2002	2003	2004
<b>Total cost (€'000)</b>	<b>260 077</b>	<b>265 691</b>	<b>279 008</b>	<b>315 575</b>	<b>331 916</b>	<b>363 527</b>	<b>386 902</b>	<b>400 754</b>
Total number of service units (million)	65.0	71.0	77.9	82.4	82.5	82.0	87.9	94.3
Nominal cost (€/service unit)	4.00	3.74	3.58	3.83	4.02	4.43	4.40	4.25
Inflation factor applied	1.7%	1.3%	1.2%	2.1%	2.1%	2.2%	2.1%	
<b>Real unit cost (€2004/ service unit)</b>	<b>4.54</b>	<b>4.17</b>	<b>3.94</b>	<b>4.16</b>	<b>4.28</b>	<b>4.62</b>	<b>4.49</b>	<b>4.25</b>

## **2. Cost of Part III – Maastricht UAC**

In accordance with ICAO rules, the 4 Member States include their own share of the Maastricht UAC costs in their individual cost-base. The increase in costs of Maastricht UAC from 2003 to 2004 has been limited to 1.7%, well below the traffic growth.

## **3. Cost of Part VI – CEATS**

So far, there has been no cost-base for CEATS. CEATS Member States include in their own cost-base the contributions that they pay to EUROCONTROL (i.e. €9,714,000 in 2004).

## **4. Cost of Part II – CRCO**

Part II does not generate costs to be charged to the cost-base of Member States, since the costs of the service are recovered through a handling charge levied on every bill recovered through the system. This charge is around 0.37% of the total amount billed.

**Trend of total costs (Part III – Maastricht UAC) in €'000**

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Staff costs	57 178	59 660	64 310	69 244	80 782	88 263	92 841	93 172
Operating costs	3 998	3 970	4 560	5 389	5 424	3 506	3 093	4 564
Depreciation	5 453	6 336	7 456	7 857	8 820	9 343	11 916	12 367
Interest	2 441	2 440	2 055	2 019	1 623	1 444	2 329	1 938
<b>Total cost</b>	<b>69 070</b>	<b>72 406</b>	<b>78 381</b>	<b>84 509</b>	<b>96 649</b>	<b>102 556</b>	<b>110 179</b>	<b>112 041</b>
% i/i-1		4.8%	8.3%	7.8%	14.4%	6.1%	7.4%	1.7%

# ACRONYMS & ABBREVIATIONS

4D	Four dimensional
5A	Attitudes to Aircraft Annoyance Around Airports project

## A

ACARE	Advisory Council for Aeronautics Research in Europe
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ACE	ATM Cost-Effectiveness report
ADS	Automatic Dependent Surveillance
ADS-B	ADS-Broadcast
A-ENPRM	Advanced-EUROCONTROL Notice of Proposed Rule-Making
AFG	Advisory Financial Group
AGC	Air-Ground Communication
AGAS	European Action Group on ATM Safety
ANS	Air Navigation Service
ANSP	Air Navigation Service Providers
ANSV	Agenzia Nazionale per la Sicurezza del Volo (Italy)
AO	Aircraft Operator
APT	Airport Throughput
ARTAS	ATM Surveillance Tracker and Server System
ASAP	Alternative Slot Allocation Procedure
ASAS	Airborne Separation Assistance Systems
A-SMGCS	Advanced-SMGCS
ASRO	Agency Safety Regulatory Oversight
ASTAC	Aviation Safety and Air Traffic Control
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATFCM	Air Traffic Flow and Capacity Management
ATM	Air Traffic Management
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit
AUS	Australia
AUT	Austria
AVENUE	ATM Validation Environment for Use towards EATMS

## B

BANC	Baltic Air Navigation Cooperation
BEL	Belgium
BFU	Bundesstelle für Flugunfalluntersuchung
BGR	Bulgaria
BIH	Bosnia and Herzegovina
BLR	Belarus

## C

CAATS	Cooperative Approach to Air Traffic Services
CAMES	Cooperative ATM Measures for a European Single Sky
CAN	Canada
CARDS	European Community's Assistance for Restructuring, Development and Stabilisation Programme
CARE	Cooperative Actions of Research and Development in EUROCONTROL
CASCADE	Cooperative ATS through Surveillance and Communications Applications Deployed in ECAC
C-ATM	Cooperative ATM
CDM	Collaborative Decision-Making
CEATS	Central European Air Traffic Services
CFMU	Central Flow Management Unit
CHE	Switzerland
CMIC	Civil/Military Interface Standing Committee
CNS	Communications, Navigation, Surveillance
COCA	Complexity and Capacity study
CORA	Conflict Resolution Assistant
CPD	CEATS (Budapest and Prague)
CPDLC	Controller/Pilot Datalink Communication
CRCO	Central Route Charges Office
CRDS	CEATS Research, Development and Simulation Centre (Budapest, Hungary)
CSPDU	CEATS Strategic Planning and Development Unit (Prague, Czech Republic)

CYP Cyprus  
CZE Czech Republic

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## D

DEU Germany  
D-FIS Datalink Flight Information Service  
DFS Deutsche Flugsicherung GmbH  
DGS Directorate of the General Secretariat  
DHR Directorate Human Resources  
DMEAN Dynamic Management of European  
Airspace Network  
DNK Denmark

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## E

EAD European AIS Database  
EATM European ATM  
EC European Community/Commission  
ECAC European Civil Aviation Conference  
ECCG Experimental Centre Consultation Group  
ECIP European Convergence and  
Implementation Plan  
EEC EUROCONTROL Experimental Centre  
eDEP Early Demonstration and Evaluation  
Platform  
eFDPS European Flight Data Processing System  
EFQM European Foundation for Quality  
Management  
EGNOS European Geostationary Navigation  
Overlay Service  
ELS Elementary Surveillance  
EMAC Europe Middle-East Air Traffic  
Management Coordination  
ENPRM EUROCONTROL Notice of Proposed  
Rule-Making  
ERAF EUROCONTROL Regulatory and Advisory  
Framework  
ERRIDS European Regional Renegade Information  
Dissemination System

ESA European Space Agency  
ESARR EUROCONTROL Safety Regulatory  
Requirement  
ESCAPE EUROCONTROL Simulation Capability  
And Platform for Experimentation  
ESIMS ESARRs Implementation Monitoring and  
Support Programme  
ESP Spain  
ETFMS Enhanced Tactical Flow Management  
System  
ETNA Extranet to National Administrations  
EU European Union  
EURAMID European ATM Military Directors Conference  
EUROCAE European Organisation for Civil Aviation  
Electronics

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## F

FAA Federal Aviation Administration (USA)  
FAB Functional Airspace Block  
FDPS Flight Data Processing System  
FEAST First European Air Traffic Controller  
Selection Test  
FIN Finland  
FMP Flow Management Position  
FMTP Flight Message Transfer Protocol  
FRA France  
FUA Flexible Use of Airspace  
FYP Five-Year Programme

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## G

GAT General Air Traffic  
GBR United Kingdom  
GNSS Global Navigation Satellite System  
GRC GreeceHR Human Resources

## ACRONYMS & ABBREVIATIONS

### H

HRS	Human Resources Programme (EATM)
HRV	Croatia
HUN	Hungary

### I

IANS	Institute of Air Navigation Services (Luxembourg)
IAS	International Accounting Standards
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFPS	Integrated Flight Plan Processing System
IFPU	Integrated Flight Plan Processing Unit
IFR	Instrument Flight Rules
IN	O Innovative Research
IRL	Ireland
ISO	International Organisation for Standardization
IT	Information Technology
ITA	Italy
ITV	Intelligent Time Vectors

### J

JAA	Joint Aviation Authorities
JPB	Joint Programme Board

### K

KPI	Key Performance Indicator
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### L

LCIP	Local Convergence and Implementation Plan
LMS	Learning Management System
LTU	Lithuania
LUX	Luxembourg
LVA	Latvia
LVNL	Luchtverkeersleiding Nederland (NL)

### M

MDA	Moldova
MFF	Mediterranean Free Flight
MKD	former Yugoslav Republic of Macedonia
MILHAG	Military Harmonisation Group
MIS	Management Information Service
MLE	Maastricht Legal Experts Task Force
MLT	Malta
MMS	Maastricht UAC Management System
MODE S	Mode Select (SSR Selective Interrogation Mode)
MTCD	Medium-Term Conflict Detection
MUAC	Maastricht Upper Area Control Centre

### N

NASA	National Aeronautics and Space Administration
NATO	North-Atlantic Treaty Organization
NATS	National Air Traffic Services (UK)
NCD	Network Capacity and Demand the Netherlands
NLD	the Netherlands
NOR	Norway
NUP-2	Network Update Programme

### O

OAT	Operational Air Traffic
OATA	Overall ATM/CNS Target Architecture
OCD	Operational Concept Document
OJT	On-the-Job-Training Instruction

### P

POL	Poland
PRC	Performance Review Commission
P-RNAV	Precision RNAV
PRR	Performance Review Report
PRT	Portugal
PRU	Performance Review Unit

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**R**

R4E	Recognised for Excellence Award
RA	Resolution Advisory
RADA	Regional Air Services Department Association
RC	Regulatory Committee
R&D	Research and Development
RNAV	Area Navigation
ROM	Romania
RPL	Repetitive Flight Plan
RU	Regulatory Unit
RVSM	Reduced Vertical Separation Minimum/Minima
RWP	Regulatory Work Programme

**S**

SAFEE	Security of Aircraft in the Future European Environment
SAND	Safety Assessment for New Designs
SARS	Severe Acute Respiratory Syndrome
SATSA	Swedish ATS Academy
SCF	Standing Committee on Finance
SBU	Service Business Unit
SEAP	South European Pre-Implementation ADS Program
SEE	Society Environment Economy
SeRT	Safety Regulatory Training Programme
SES	Single European Sky
SESAME	Single European Sky Implementation Programme
SMGCS	Surface Movement Guidance and Control System
SMS	Safety Management System
SRA	Strategic Research Agenda
SRC	Safety Regulation Commission
SRU	Safety Regulation Unit
SSAP	Strategic Safety Action Plan
SSP	Sector Safety and Productivity
SSR	Secondary Surveillance Radar

SVK	Slovakia
SVN	Slovenia
SWE	Sweden

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**T**

TBS	Time-Based Separation
TCAS	Traffic Alert and Collision Avoidance System
TDH	Training Development and Harmonisation unit
TIS	Traffic Information System
TIS-B	TIS-Broadcast
TMA	Terminal Control Area
TP	Target Positions
TUR	Turkey

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**U**

UAC	Upper Area Control Centre
UKR	Ukraine

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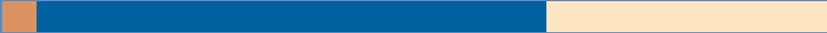
**V**

VCI	Voice Change Instructions
VHF	Very High Frequency

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**W**

WRC	World Radio Conference
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