



**EUROCONTROL EXPERIMENTAL  
CENTRE**

**EFQM SELF-ASSESSMENT  
2004**

AWARD SIMULATION APPROACH

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## DOCUMENT APPROVAL

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## OVERVIEW

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### Context of this submission

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This submission document represents the 6<sup>th</sup> EFQM self-assessment that the EEC has carried out since the first self-assessment in 1998. See the section [Journey to Excellence](#) below for highlights. The feedback from the 2003 self-assessment has been absorbed and assimilated by the EEC and has been used to improve EEC functioning and operations.

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### History

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The EUROCONTROL Experimental Centre (EEC) was officially established as an external service of the EUROCONTROL Agency on 10 June 1963. The initial responsibilities were defined as:

- operational research and the testing of ATC methods
- operational demonstrations of the validity of the ATC system proposed
- operational and technical evaluation of control centre equipment

The EEC was the first establishment in the world to execute a totally digital real time simulation for ATC.

The resources and scope of the EEC have been gradually increased over the years and the EEC has become a leader in the provision of ATM simulation services and a major ATM/CNS R&D centre.

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### Changing market context

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From its inception and for most of its existence, the EEC has been in a stable public service environment. Despite fluctuations, the steady European economic growth has produced a steady growth in the demand for air travel with a consequent requirement for ATC systems to constantly deliver commensurate increases in capacity. This constant renewal and upgrade of ATC systems and airspace organisations has led to significant investments at the EEC both for research and development and for ATC simulations and the demand has usually exceeded the EEC's work capacity.

Competition for the EEC has been virtually non-existent since both ATC service provision and national research and development centres were government activities. Since the beginning of the '90s, many States have privatised or corporatised their ATS

providers and/or their R&D Centres. The EEC now finds itself in an environment where competition and the need to demonstrate cost effectiveness must be carefully married with collaboration to ensure the most efficient use of the overall European investment in ATM research and development. The challenge for all is to increase capacity and reduce delay whilst maintaining levels of safety.

In this context, the EEC has regularly reviewed its position and role in its operating environment. Extensive discussions with the main stakeholders, through the EEC Consultation Group take place to define for each type of activity the funding, the work allocation mechanisms and the EEC's role.

The EEC does hold a unique position, being the only European ATM R&D establishment, but nevertheless in many aspects it is a peer among several players.

In more recent years, the European Commission (EC) has emerged as a key political influence on the future of ATM. The EEC Leadership has recognised this and has sought to position the Centre to bring maximum advantage to the ATM research community.

Our presence within international consortia has increased visibility on EEC competencies amongst the research and industrial communities and has led to a strengthened recognition of the unique role that the EEC now occupies.

The EEC Management believes that this must be accompanied by a consolidation of research efforts within the Agency and has proposed a Eurocontrol Research Directorate. Plans for the establishment of this Directorate have been detailed and discussed with the EEC stakeholders. The plans are currently under discussion with the DG.

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### Business of the EEC

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The mission of the EEC is to play a leading role in driving research relevant to the safe, efficient, and environmentally sustainable management and operation of the European ATM system.

The vision of the EEC is encapsulated as "constantly aware of the needs of citizens in the 21st century, and being at the centre of the European ATM research network, the EEC drives research to ensure timely delivery of the

evolutions to the ATM component of the European transport system”.

Clearly understanding our stakeholders and establishing a common perspective is of utmost importance to help achieve our mission. Our key stakeholder groups are shown below and described in chapter 2.



Figure Overview - 1

We deliver our mission through 5 research areas:

EEC Research Areas (2004)	
APT	Airport throughput
INO	Innovative research
NCD	Network Capacity and Demand management
SEE	Society, Environment and Economy
SPP	Sector Safety and Productivity

Figure Overview - 2

Our activities are organised as studies controlled by validation planning and producing prototypes, analyses and reports.

A major validation means is simulation, ranging from analytical modelling through to real time simulation and field trials. Simulations are now principally focused on the validation of concepts rather than the operational improvement of current ATM systems.

Up to 2004 an important EEC activity has been software development - of simulators, tools, middleware, and prototype components of ATM systems. However 2004 sees concrete steps towards outsourcing many of these activities, now identified as non-core business activities.

In assisting the fulfilment of our mission, the work of the EEC is organised as a set of projects, and a project is managed by one of the research areas. Each research area has a Portfolio of projects. The totality of projects

constitutes the work programme. The following types of deliverable are project outcomes:

- Reports
- Models and Methodologies
- Simulators
- Tools
- Prototype ATM system components
- Demonstrators
- Publications in learned journals and conferences

Projects in the EEC work programme address different periods in the research time spectrum, from short term through medium term to long term. Experience shows that there is normally a constant of 10-20 years to bring new concepts into operations.

Some projects deliver benefit in the short term. For example, NCD provides a unique capacity planning service to the ATM community to deliver ATFM delay forecasts and yearly capacity plans and to set short-term capacity targets for ANSPs. Other projects explore the feasibility and benefits of new airspace organisations, and new working methods as applied to current operational systems, and recommendations are often implemented in the short term.

Most of the other research areas are concerned with medium to long term research. One example, and a key EEC project is COSPACE. Its objectives are essentially to determine the operational feasibility, applicability, and potential benefits, in terms of safety, capacity and overall efficiency, of partial delegation of separation assurance from ground ATC to aircrew. This line of research could be delivering the expected operational benefits by 2015.

The EEC develops a large range of software applications for its own use. It is not the business of the EEC to develop and deliver operational products; that is the business of industry, but simulators, tools, prototypes and demonstrators which achieve a high level of maturity can interest the ATM community at large. These spin-off products are made available normally free of charge.

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### Funding and Resourcing

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All 2004 budget figures in this report correspond to the state at the time of writing. The budget of the EEC is a component of part 1 of the Agency budget, which is funded by Member State contributions according to Agency rules. In 2004 this amounts to 56.15 MEUR and covers

staff costs, operating expenditure and investment credits.  
This EEC budget is augmented by approximately 20 MEUR in the form of delegations from other sponsors, both internal and external to the Agency, in payment for work done.

Budget delegations	
Origin	Amount (MEUR)
Internal funding	10.880
External funding	9.132
EEC funding	56.159
<b>Total</b>	<b>76.171</b>

Figure Overview - 3

With the addition of delegations, the total budget managed by the EEC in 2004 is approx 76.17 MEUR.

Funds are allocated to each research area, research enabler and support service based on agreed plans in the Business Plan complemented by subsequent negotiation during budget execution. The EEC staff complement is 268 budgetary posts. Due to budgetary restrictions at Agency level, the EEC is authorised to fill 248 posts. 245 posts are currently occupied. This staff complement is supplemented with approximately 200 external persons made up of contract staff, students and seconded staff from national administrations. This number is expected to reduce during 2004 as outsourcing of tasks and activities becomes more common.

The EEC building is set on a site of some 90.000 square metres. It has a total floor space of some 15.000 square metres which comprises

office space, meeting rooms, a conference facility, experimental rooms and workshops, in addition to a showroom and the real time simulation area consisting of two control rooms, a demonstration room and a pilot room.

## EEC Organisation

The EEC work programme is split across 5 research areas with an objective to develop a clear and concise set of research area portfolios, fully consistent and contributing to the European ATM Master Plan. Research Area Managers ensure synergies and coherency amongst the activities within their area and ensure inter-directorate co-ordination at the working level and deliver outcomes to customers.

The Centres of Expertise (CoE) assemble the professional skills and knowledge required for specific domains. A centre of expertise provides skills to projects and services in research areas and research enablers as the needs arise. Each centre is led by the Head of CoE, who ensures that adequate levels of resource skills, knowledge, methods and facilities are available to support the Research goals.

Key methodologies such as safety, validation, software engineering, reside in centres of expertise and are developed and promoted and supported by the centre of expertise. These key methodologies are applied across all core business projects.

Research Enablers contain services and projects which deliver outcomes to other units of the EEC.

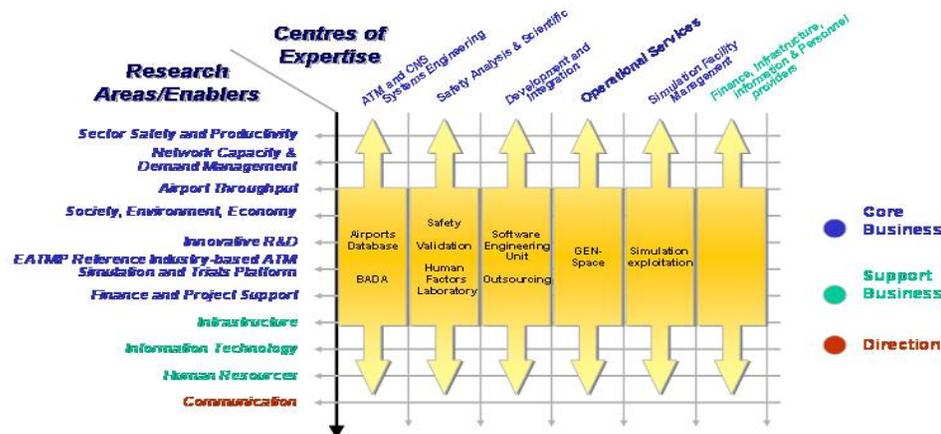


Figure Overview - 4

## Governance

The EEC is an external unit of the EUROCONTROL Agency. The Director of the EEC (DEEC) is responsible to the Director General (DG) for the efficient operation of the EEC.

The following diagram shows the positioning of the EEC within the Agency.



Figure Overview - 5

We see the Governance of the EEC from 3 perspectives:

### Agency Perspective

Three Agency committees exist to assist the DEEC in matters of strategy, business plan, and investment proposals.

The EEC is overseen by the EEC Management Board (EEC MB), which sets and approves the EEC strategy to direct EEC activities.



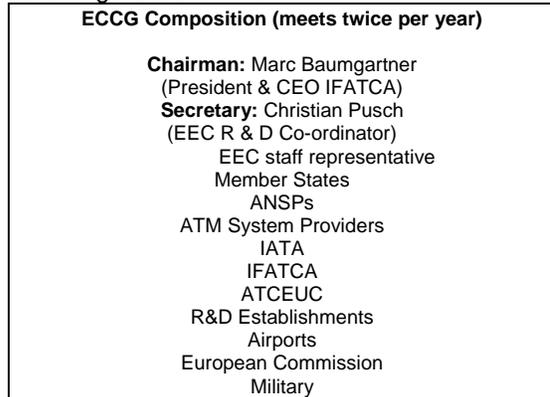
The EUROCONTROL Programme Appraisal Committee (EPAC) is the investment Board at Agency level. It reviews investment proposals, being programmes, projects, services or simply equipment acquisitions, whose total capital value exceeds 5MEUR (this financial threshold being 1MEUR in some specific cases).

For work which the EEC conducts for EATM (by means of delegation), the DEEC is functionally

responsible to SDE. EATM is managed by the EATM Management Committee (EMC) of which SDE is the chairman. EMC meet approximately 9 times per year.

### Stakeholder Perspective

The Experimental Centre Consultation Group (ECCG) is the principal forum for consulting our stakeholders. The ECCG is an official entity of EUROCONTROL, established in 1998 in order to advise the DG on the role, strategy and performance of the EEC. Stakeholder consultation is an essential step in the Business Plan lifecycle; the Business Plan is amended following ECCG advice.



The establishment of the joint EUROCONTROL – European Commission Programme Board (JPB) is planned to assure a steering and management function of research within a rolling, multi-annual European ATM Master Plan.

### EEC Internal Perspective

Internally, the EEC is managed by a team of Senior Managers, shown in figure overview-6.

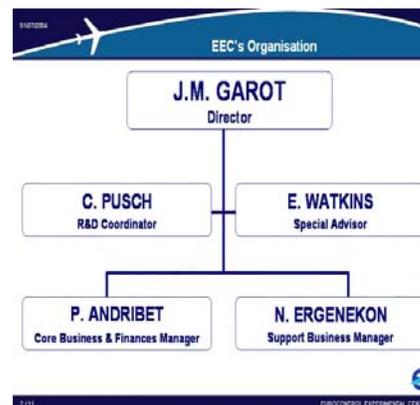


Figure Overview - 6

## Journey to Excellence

EEC's journey to excellence – pre 2000	
Year	Highlights
Pre 2000	<ul style="list-style-type: none"> <li>• World leader for the provision of ATC real time simulations</li> <li>• Jean-Marc Garot appointed as director</li> <li>• Hierarchical organisation flattened</li> <li>• EEC mission and vision</li> <li>• Organisation focusing on projects and stakeholders</li> <li>• Pilot staff performance appraisal</li> <li>• Focus on organisational development and leadership</li> <li>• ECCG created</li> <li>• Restructure of support services, core and middle management</li> <li>• EFQM self-assessment 1 &amp; 2</li> <li>• Business Plan v1.0 approved by DG</li> <li>• Stakeholder survey implemented</li> <li>• Staff satisfaction survey 1</li> </ul>

EEC's journey to excellence – 2000 to 2004	
Year	Highlights
2000	<ul style="list-style-type: none"> <li>• Matrix organization implemented</li> <li>• Business Plan v2.0 approved by DG</li> <li>• EFQM self assessment 3, score 306</li> <li>• Building renovation completed</li> <li>• Staff satisfaction survey 2</li> <li>• Budget checkpoints incorporated in budget management process</li> </ul>
2001	<ul style="list-style-type: none"> <li>• Think-tank</li> <li>• Business Plan v3.0 approved by DG.</li> <li>• Major process improvement</li> <li>• IT facilities management</li> </ul>
2002	<ul style="list-style-type: none"> <li>• Business Plan v4.0 approved by DG</li> <li>• Major revision of strategy</li> <li>• EFQM self assessment 4, score 350</li> <li>• Matrix extension</li> <li>• Major process improvement</li> <li>• Staff satisfaction survey 3</li> <li>• Stakeholder survey 3</li> <li>• Values project</li> <li>• Internal communications improvements</li> </ul>
2003	<ul style="list-style-type: none"> <li>• EFQM self-assessment 5, score 402</li> <li>• Staff satisfaction survey 4</li> <li>• EEC reorganisation in line with strategy</li> <li>• Support web site created – increased process mapping</li> </ul>
2004	<ul style="list-style-type: none"> <li>• Discussions underway for establishing a research directorate</li> <li>• EEC make convincing effort to focus on stakeholders, partnerships, alliances</li> <li>• Stakeholder Segmentation Model – Drafted</li> <li>• Outsourcing of non-core activities</li> <li>• EFQM self-assessment 6</li> <li>• Staff satisfaction survey 5</li> <li>• New mission, vision and common values agreed upon</li> <li>• Stakeholder survey 4</li> <li>• Business Plan V5.0 approved by DG</li> </ul>



# 1 LEADERSHIP

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*Excellent leaders develop and facilitate the achievement of the mission and vision. They develop organisational values and systems required for sustainable success and implement these via their actions and behaviours. During periods of change they retain a constancy of purpose. Where required, such leaders are able to change the direction of the organisation and inspire others to follow.*

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## **1a Leaders develop the mission, vision, values and ethics and are role models of a culture of Excellence**

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The mission and vision of the EEC were developed in 1995 through a process of staff consultation and wide debate led by Senior Management. The resulting vision expressed the fundamental values of the EEC culture. Since then the European Commission (EC) has emerged as a key political influence on the future of ATM. The EEC Leadership has recognised this and has sought to position the Centre to bring maximum advantage to the ATM research community. The EEC Management believes that this must be accompanied by a consolidation of research efforts within the Agency and has proposed a Eurocontrol Research Directorate. Plans for the establishment of this Directorate have been detailed and discussed with the EEC stakeholders. The plans are currently under discussion with the DG. These changes are reflected in the new Vision and Mission statements expressed in version 5 of the EEC Business Plan (see Overview).

The EEC has been a driving force in the move toward a single European ATM Research Agenda. An ATM Master Plan is under development by Eurocontrol and the European ATM Industry with active support from the EC. It will incorporate the contributions from the various strategic plans of the last few years, from Eurocontrol's ATM2000+ to the ACARE 2<sup>nd</sup> Strategic Research Agenda. The mission and vision are systematically deployed to all EEC activities via the strategy and work programme and are reviewed on an annual basis as part of the Business Plan revision cycle.

The Task Force established in 2002 to investigate more closely the values of the EEC, produced a detailed analysis of the results of a staff survey. The questionnaire, which over 100 staff completed, considered the current perceived values of the EEC and the desired future values. This work has continued with a co-ordinated communication campaign and the

establishment of 3 working groups to develop some of the themes identified. The aim of the project, which was initiated by the Director, is to improve collective understanding and move the EEC towards the common goals.

Major improvement actions such as strategy reviews, organisational realignments, outsourcing, facilities management, drive for business excellence etc., have been triggered by senior management. Although most improvement projects within the EEC are generated from the regular review activities they are also produced from spontaneous staff contributions to their managers or via the EEC Suggestions Box. The Core Management Special Advisor is a member of the suggestions box board.

Effectiveness of leadership is reviewed through a series of questions in the Staff Satisfaction Survey (SSS), and also through the annual performance appraisal process. Core management reviews are organised twice a year in preparation of the EEC Management Board (EMB) meetings. Recent meetings have been focussed on the EEC proposals for an R&D Directorate but there is always the underlying goal to review and improve the effectiveness of EEC leadership. The EMB conclusions are reported on at the twice-yearly All-Staff meetings. Informally, leadership effectiveness is also reviewed through the culture of the EEC, which encourages personal interaction and wide use of the electronic newsgroups.

Trust and empowerment are key elements of the EEC organisation. The current matrix organisation is the consequence of a series of reviews undertaken since 1995. Such an organisation encourages empowerment, which can be further developed through coaching and training. In response to the results of the 2002 SSS, HoCoE and some CM have participated in specific coaching events in order to improve strategic thinking and communication. Project and unit managers at the EEC have full responsibility for budget and staff and other resources and are accountable both horizontally and vertically through quarterly portfolio and budget reviews. Similarly, people managers have been encouraged to extend the

performance appraisal process by holding intermediate review meetings with their staff and this has become standard practise in each Centre of Expertise.

The EEC adopted an approach of continuous improvement over fifteen years ago. This initially used total quality principles and then transitioned to continuous improvement when the activities were formalised around the EFQM model and techniques in 1998. Throughout this period, staff members have been encouraged to participate in improvement projects on a voluntary basis. Senior managers also will lead or participate in improvement projects.

Appropriate training was provided through the quality module of the project management training and more recently through specific EFQM training: both introductory and assessor training. In 2003 and 2004, five middle managers have followed the EFQM self-assessment training and three others have qualified as EFQM European Excellence Assessors.

This document has been produced by a team of 7 people, all volunteers, who are drawn from different EEC units. Many other people contributed to the development of the report via interviews and by supplying data for the results chapters of the report.

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**1b Leaders are personally involved in ensuring the organisation's management system is developed, implemented and continuously improved**

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The organisational structure and operation have been assessed and reviewed on an annual basis with the participation of representatives of senior and middle management. The 2001 review led to improvement actions in the area of internal communication (see [3d](#)) and project management, portfolio reviews (see [2d](#)) and contract management (see [4a](#)). A Strategy Task Force was convened by the Director in 2002 to consider the strategy to be adopted by the EEC in response to the rapidly evolving ATM Research environment. The Task Force was composed of staff selected by the Director on the basis of their contributions to Intranet discussions.

By the start of 2003 in response to the Task Force's report "Proposed EEC reorientation v2", six Research Areas were established to implement the new strategic direction and to align with a simultaneous EATM reorganisation.

The core research activities of the EEC are undertaken in the main Research Areas, APT, NCD and SSP. These are supported by 2 Research Areas involved in more prospective research, INO and SEE and an enabler unit focussing on the provision of simulation facilities. The EEC "reorientation" was approved by the EUROCONTROL Director General in Decision N° VII/1(2003) on 13 January 2003.

The ability to respond to the evolving environment demonstrates the effectiveness of the EEC's matrix structure to accommodate change and reflect the needs of its stakeholders.

Since 1997 the EEC has adopted the industry best practise of using a Business Plan to communicate and deliver strategy. The Director General approved the first EEC Business Plan in 1999, after wide consultation with external stakeholders and Agency staff. The Business Plan explains the strategy and indicates how it is deployed throughout EEC operations via the work programme and support activities. This is further supported by the matrix organisation. The Business Plan process ensures that the Business Plan is assessed and reviewed on an annual basis linked to the annual budgetary cycle. The EEC Business Plan has been used as a model throughout the Agency.

Since 2002, triggered by self assessment feedback, there has been a drive by Senior Management to establish a framework of key processes (see [2d](#)). Several processes have been documented and process owners clearly identified (e.g. Promotions [HR], Budget [FIN], Contracts [PSO]). Processes are documented on the Intranet. A "How to" Guide, has been developed to facilitate access to Intranet information including processes, along with a process-indexing mechanism, accessible from the Intranet home page.

Assessment and review of processes is becoming more widespread. There are annual reviews of the business planning process and the promotion process. Many processes especially in finance, procurement and human resources are mandated at the Agency level. In such cases the EEC seeks, through appropriate training, to ensure that EEC staff understand and correctly apply Agency processes. Training material has recently been developed on the subjects of outsourcing and procurement to help project managers deal with changes to Agency procedures.

The EEC has driven the introduction of process improvements at the Agency level for

performance appraisal, business planning, staff planning, budget-monitoring and framework contract.

For over a decade the EEC has been measuring performance indicators linked to the delivery of simulations, which has been its core business since the establishment of the EEC in the early 1960s. More recently and due to the introduction of the Business Planning process, a more systematic approach to performance indicators has been initiated and these constitute chapter 7 of the current Business Plan. Performance indicators are co-ordinated at the level of the Agency and are assessed and reviewed by middle management and the KPI owners on a quarterly basis. Systems have been developed to support the measurement of these performance indicators.

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### **1c Leaders interact with customers, partners and representatives of society**

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All EEC leaders are encouraged to network with stakeholders on a regular basis in order to keep abreast of changing needs and expectations. Stakeholder involvement is paramount throughout the project lifecycle in order to ensure continued alignment with their evolving needs. Specific project activities provide the opportunity for full stakeholder involvement and these are supported by the provision of adequate funding for visits to stakeholder sites.

A special programme of VIP visits to the EEC was started in 2000 and is led by the DIRECTOR. CEOs of stakeholder organisations are regularly invited to visit the EEC and explore opportunities for collaboration. These visits help the EEC to better understand the views of its stakeholders and provide an opportunity to explain EEC and Agency strategy. A database of these visits has been maintained since 2003.

A stakeholder survey, introduced in 1997, is carried out every two years. This is used to assess alignment of EEC strategy, to measure stakeholder satisfaction and to obtain stakeholder perception of EEC operations and performance. Improvement actions are planned and implemented based on the results of the survey. A feedback brochure is sent to all stakeholders to thank them for participating in the survey and to provide them with a summary of the main findings and planned actions.

The Experimental Centre Consultation Group (ECCG) was established in 1998 to advise the EEC and the Director General on the role,

strategy and performance of the EEC (see [Overview-Governance](#)). The ECCG is the only forum for debate that is dedicated to all EEC stakeholders. The principal working papers are the draft Business Plan of year *n* and the Annual Report of year *n-1*. The Business Plan is modified as a result of the stakeholder advice before being submitted to the EEC Management Board and the Director General for final approval. Each meeting agenda includes one or more special themes e.g. safety, environmental issues, flow management or economic issues. The ECCG is always encouraged to give advice to the EEC in order to improve performance, whether technical, operational, organisational or managerial. Recommendations to this effect are recorded in ECCG meeting minutes.

Partnership is of paramount importance to a research organisation and is identified as one of the EEC key objectives (see Business Plan v.5<sup>1</sup> plus sections [4a](#), [9a](#) and [9b](#)). The EEC strategy to ensure that its activities respond to the global needs of ATM is to develop and maintain clear partnerships with:

- other research establishments (including Universities),
- the ATM system supply industry,
- ATM service providers
- Airspace users and,
- EATM, our number one stakeholder.

Our relations with the European Commission (EC) are particularly important. Since 1999 the EEC has provided a staff member on secondment to the EC to consolidate this partnership. The EC's high regard for the EEC is indicated by the recent move to establish a Joint (EEC-EC) Programme Board (JPB) to oversee all ATM R&D in Europe.

Partnership is important in those areas where outsourcing has been used to improve EEC performance. The use of outsourcing is well established in the support activities and is now increasingly being applied by core business units. These partnerships are subject to regular assessment and review with the partners in order to identify areas for improvement and to organise joint improvement actions.

The use of a framework contract, has greatly improved the procurement of contractor support especially for core business. The EEC pioneered this technique in the Agency. Now

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<sup>1</sup>

[http://www.eurocontrol.int/eec/publications/Business\\_Plan\\_V5.0.pdf](http://www.eurocontrol.int/eec/publications/Business_Plan_V5.0.pdf)

several other directorates have adopted a similar framework contract.

Senior managers fully support and participate in joint improvement actions with other Agency directorates. Some examples are:

- DEEC initiated regular meetings with other Agency Directorates in order to identify ways that the Agency as a whole can improve. Through this mechanism the EEC has succeeded in transferring best practice to the rest of the Agency in the domains of human resources, finance, and technology.
- Business Plan Task Force which seeks to harmonise the business planning process throughout the Agency
- Improvement of the performance appraisal process
- Improvement of contractor procurement through the framework contract
- Promotion of an Intranet culture in the Agency
- Improvement of dialogue with unions and staff committee throughout the Agency

Many of these actions have necessitated strong senior EEC management participation in order to lobby for their adoption at the level of the Agency.

The EEC's senior management have adopted the following approach to recognise stakeholder contributions:

- Explicit recognition and thanks from the Director in the Introduction to the EEC Annual Report
- Written acknowledgement of valuable stakeholder participation included in project reports.
- Personal recognition and thanks at end of project events, delivered orally by the Director or other manager.

Participation in conferences and seminars is fully supported by EEC senior management as a key means to disseminate and discuss research results. In 2001 a policy decision was taken to increase the EEC's publication of research papers. Business areas were encouraged to publish their research and budget was increased to allow greater participation in conferences. Researchers regularly submit and present papers to conferences and seminars (see [6b](#)). The EEC has presented its continuous improvement strategy at both internal and external Quality Seminars to participants from all over Europe.

The Director regularly speaks on the subject of ATM research and development at important conferences in the ATM community and has

participated as expert witness in two debates broadcast on radio. He has also participated as an authority on ATM in four colloquia at the French parliament.

The EEC is co-sponsor and co-chair of the USA/Europe Air Traffic Management R&D Seminar, organised every 18 months, alternately by the US Federal Aviation Administration or the EEC. Around 150 researchers from both sides of the Atlantic participate.

One of the five main research orientations of the EEC strategy concerns the sustainable growth of the aviation industry. A dedicated research area has been established to address the environmental and societal impact of aviation. The research concerns four main threads:

- Noise an air quality nuisance around airports
- Fuel burn and emissions
- Social attitudes to aviation
- Sustainable aviation

Environmental impact is considered from the start of concept development. The EEC strategy is to increase funding of this research area.

Senior management has supported the introduction of recycling measures at the EEC. These are reported in chapter 8.

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#### **1d Leaders reinforce a culture of Excellence with the organisation's people**

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Communication and motivation have been identified from reviews as being key enablers of a culture of excellence. The EEC policy is to encourage transparency and to maximise access to information. EEC senior management regularly communicates the mission and strategy, primarily through the Business Plan which is available to all on the EEC Intranet.

Middle Management meetings take place every two weeks, led by a senior manager. There are dedicated meetings for core business, support, people management and general communications (see [3d](#)). Minutes of each meeting are published on the Intranet within a week. There are in addition, quarterly meetings to review the detailed implementation of the strategy and budget usage and reallocate resources as necessary. The Director comments the EEC political context and strategy in the twice yearly all staff meetings in June and December.

The Director General is invited to the EEC once or twice per year in order to speak to the staff

about corporate political, institutional, operational, and strategic issues, as well as specific EEC issues.

The EEC has adopted an approach of high transparency and open communications. Staff are informed on political issues affecting EEC strategy. Extensive use is made of electronic mail, electronic newsgroups and the Intranet where strategy is debated and clarified as needed. Senior managers and especially the Director actively participate in these debates and respond to questions, comments, and criticisms. Debate and diverse opinions are encouraged both on the Intranet and in management meetings and everyone has the opportunity to air their views.

Senior managers' doors are always open and people are encouraged to come and talk whenever they wish. Managers' electronic agendas are visible to all staff so that appointments can be made easily. Managers at all levels communicate personal objectives and targets to staff during the annual performance appraisal, in order to deploy strategy throughout the organisation.

The annual appraisal is also an opportunity for debate with line managers at all levels. This is a 180 degree appraisal where appraisees are encouraged to comment on management behaviour and offer constructive criticism.

Senior management has implemented a training policy in order to help people in the achievement of the EEC business objectives. A scholarship system has been put in place to encourage staff who wish to undertake further study in their own time for personal development (see [7b](#)). A secondment policy enabling suitable staff to work for partner organisations for limited periods has also been supported.

Similarly, mobility opportunities within the Agency are recognised as an important staff motivator and such moves are encouraged by EEC senior management and supported where necessary by retraining. A key performance indicator tracks skill reorientation (see [9a](#)).

Recognition is an essential aspect of a modern HR policy and the EEC leadership takes every opportunity to show their appreciation. The annual promotion round is the formal way to recognise individuals although this is limited by budgetary and other constraints. Often both individual and project team performance is recognised through a simple statement of thanks from the Director or a senior manager.

The author of the best suggestion from the Suggestions Box, elected annually by an all staff vote, is presented with a prize by the Director at the all staff meeting in June.

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### **1e Leaders identify and champion organisational change**

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Since 1995 the EEC has undergone 4 major re-organisations, each time driven by the Centre's management in response to the changing external environment. These re-organisations have been accomplished with a high level of staff consultation. Individuals have been encouraged to contribute their own ideas on the organisation of the Centre and consensus has been sought through discussion.

The effective delivery of change is ensured initially through thorough preparation via planning and especially communication to explain to staff the reasons and the plans. All communication channels described in section 3d are used. This is illustrated by the implementation of the outsourcing policy which required reallocation of staff to different tasks and was therefore planned with HR and the CoEs to ensure that the required mobility and retraining were available.

Another example can be seen in the recent change in policy on the use of external resourcing. Although driven by changes in French employment law, Senior Managers have acted quickly to adapt to the new requirements. In doing so the EEC has been able to apply systematic use of tasking contracts and a more professional way of working. The changes were communicated to all staff and in particular project managers and provisions have been made for a specific training course on the implication of the employment law.

Communication has been identified as a key success factor for the EEC. It was decided to reinforce the role of the various management meetings as a means of ensuring communication in both directions. The CM maintains a regular CM News item on the home page of the Intranet. This is updated weekly. DEEC, and to a lesser extent some senior managers, dialogue directly with the staff through the electronic newsgroups.

EFQM Self-assessment has been an essential means to stimulate and involve staff in improvement and to identify and implement improvement actions. After each self-assessment, staff are encouraged to lead and

contribute to improvement projects and managers are committed to release staff to work on improvement projects. Senior and middle management lead by example and participate in improvement projects.

## 2 POLICY AND STRATEGY

*Excellent Organisations implement their mission and vision by developing a stakeholder focused strategy that takes account of the market and sector in which it operates. Policies, plans, objectives, and processes are developed and deployed to deliver the strategy.*

### 2a Policy and Strategy are based on the present and future needs and expectations of stakeholders

EEC policy is focused on value creation in the Air Traffic Management segment of the European Air Transport System. Policy and strategic actions are based on analysis of the regulatory and technical objectives set out in the European Commission white paper on European Air Transport policy [2001], the work of the Advisory Council for Aeronautics Research in Europe (ACARE) [started 2002], the EUROCONTROL ATM2000+ Strategy, and the continuing evolution of the air transport sector..

EEC policy is reflected in the Mission and Vision (see [Overview](#)) and in particular is the “development and validation of Operational Concepts” targeted at the 2012 and 2017 deployment dates of the proposed European ATM Master Plan.

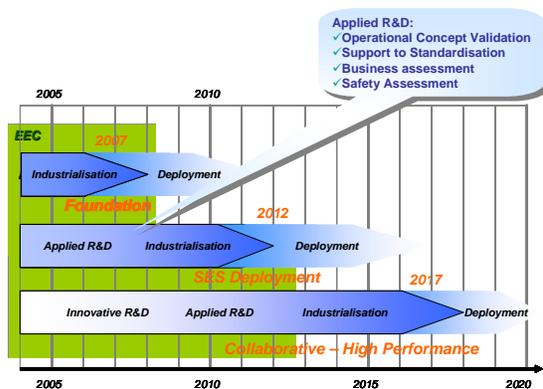


Figure 2a-1 European ATM Master Plan

Strategic actions to achieve this policy have been confirmed by the Experimental Centre Consultation Group (ECCG) and these are:

- With ATM industry partners:
  - Establish European ATM Master Plan.
  - Develop and validate the European Operational Concepts associated with the master plan, starting with 2012.
  - Institute a collaborative partnership scheme to achieve our policy.
- Focus on “niche” internal research activities.
- Outsource research enablers such as simulation facilities, and validate component specifications to develop greater industry understanding of the proposed operational concepts and associated system support tools.
- Build alliances to integrate European ATM Research to exploit external resources.
- Promote innovation in ATM research by developing an ECAC wide network of research establishments and academia to increase innovation in ATM research.

The Experimental Centre has proactively contributed to develop the ATM industry wide programme proposal (SESAM) to define the Master plan with the European Commission, Eurocontrol Head Quarters and European Aerospace industry representative body, Aerospace, System & Defence (ASD).

The Centre’s organizational strategy is focused on supporting our policy goal. Our work programme is being aligned with the proposed master plan to ensure core business is focused and our human and

technical resources are oriented and developed accordingly.

This stakeholder interaction has clarified our focus on operational concepts and validation, and development of collaborative partnership and alliances to take advantage of European wide technical and research resources and competencies.

Strategic partnerships are managed through a number of processes which are noted below and described in detail in section 4a:

- ECCG
- Joint Programme Board (JPB) [planned]
- External projects e.g. European Commission Research and Trans European Networks
- Memorandum of Cooperation with the US Federal Aviation Administration
- Links to professional organisations such as The International Federation of Air Traffic Controllers Associations (IFATCA), European Association of Aerospace Industries (AECMA), and the European Organisation for Civil Aviation Equipment Manufacturers (EUROCAE).

The Experimental Centre Business Plan is the vehicle for articulating policy and strategy. Its development provides an opportunity to gather stakeholder input for policy and strategy formulation to address stakeholder needs and expectations.

Collecting stakeholder input to policy and strategy and associated feedback occurs through:

- The ECCG;
- Project contact with customers and stakeholders;
- Stakeholder/market survey;
- Consultation with the European Commission, Eurocontrol Domains and Strategy units;
- Market watch;
- Research co-ordination and external conferences;
- Direct visits to stakeholders.

The stakeholder survey is conducted every two years to identify future stakeholder

needs and their perceived satisfaction with the Experimental Centre's performance. Additionally, the Experimental Centre Consultation Group members are surveyed to illicit further understanding of needs and performance. Results of perception surveys and accolades etc. are presented in section 6a.

Survey results are fed into the Strategy and business cycle process (see [2c](#)).

The process of collecting input for policy and strategy definition has further clarified our stakeholder segments and associated activity (markets).

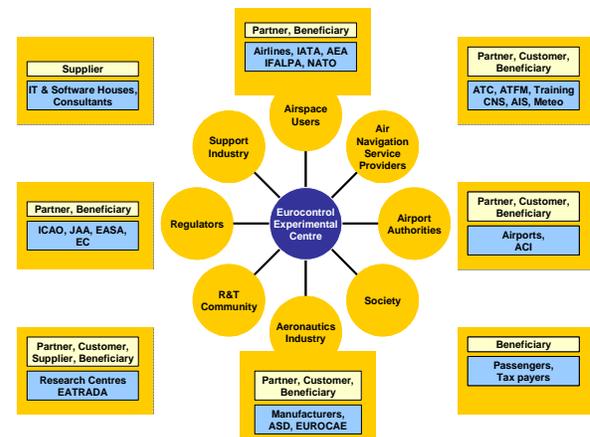


Figure 2a-2 Stakeholder Segmentation Model

Some of our products can be made available to our members without charge which can lead to market distortion as we are an inter-governmental organisation with funding sources originating from Eurocontrol Members.

Feedback from stakeholders has focused corporate governance to address this issue by:

- Including senior 'competing' organisation representatives in the Consultation Group;
- Avoiding direct competition with other European ATM research organisations who are increasingly obliged to compete on a commercial basis, marketing and selling their expertise and products to common stakeholders.

Due to the reduction in research finance by many European Governments our ATM research partners are taking action to restructure and reduce costs. Consequently, the Experimental Centre is increasingly regarded as a source of finance and a coordinator of European ATM research. This is further supported by our efforts to establish the European master plan definition programme and the Joint Programme Board with the European Commission.

We are addressing our partners' financial concerns (see [4a](#)) by proactively targeting the outsourcing and industrialisation of:

- Services;
- Simulation facilities;
- Components/products;
- ATM research,

This is also seen as an active way to build a research network to further stimulate creativity and diversity in ATM research. Related measures are provided in section 9a.

We continue our support of the Central European Air Traffic Services Research development and Simulation Centre in Budapest as another way of supporting stakeholders needs, in this case through geographically de-centralising research to a "sister" Centre.

During 2003 and 2004 the Director chaired the ACARE Sub-Team 2 (Air Traffic Management) which addressed European Aeronautics research requirements beyond the year 2020. This collated data which will lead to an innovative ATM research programme, integrated into the European ATM master plan further addressing stakeholders needs for organised and sustainable European ATM research.

Based on our understanding of future ATM needs and trends we are updating our staff plan to identify skills and competency evolution. Staff requests for career evolution as well as development and training needs captured in the annual staff appraisal process will be used to plan for training and intra-centre mobility to facilitate

staff migration to key roles in support of policy.

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## **2b Policy and Strategy are based on information from performance measurement, research, learning and external related activities**

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Data gleaned from the stakeholder sources identified in section 2a is a rich source of information used to understand customer needs.

The social, economic and environmental business area has undertaken studies to understand public knowledge and perception of ATM to identify trends and impediments that may constrain future evolution. Particularly important is environment where noise nuisance and pollution has become a driver for research.

Studies related to European ATC current day performance and future ATC capacity and demand forecasts concerning constraints to growth are provided to Agency stakeholders and internal projects to define future scenarios.

Inputs from the Balanced Scorecard (see [9a](#)) and from buy-in to the KPI process achieved during the annual performance appraisal process have become important measures of strategy implementation.

During 2004 a safety policy was introduced confirming the EEC commitment to fully integrate safety in its activities. We are also actively engaged in developing internal policy on environment, legal and safety issues through the appointment of an occupational health and safety at work officer.

On the creative side, internal 'brainstorming' sessions continue to encourage staff to express on various ATM issues. Many of the ideas captured in these sessions are integrated into our strategy e.g. discussion on values have resulted in a revised EEC "vision and mission".

Our focus on the evolution of new technologies will see the implementation of WiFi system, supporting mobile discussion

and working practices in the Centre. Our “ATM show room” is used to permanently demonstrate the Centre’s research output and a new series of “hands on training” sessions (GENSPACE) have been developed to provide “non operational” ATM industry people with operational “learning.”

Our Innovative Research area looks into new, and sometimes radical, technologies with the expectation that some of results can be fed into our work programme. This has provided increased contact with universities, where academics are actively encouraged, sometimes through financial support, to engage in research in ATM (see 9a). Accolades received are evidence of the standing of EEC innovative research within the ATM research community (see 6a).

The annual R&D symposium provides a forum where current trends and future prospects of European activities are discussed. US contributors are invited to these meetings and output is fed-back into research thinking.

Market watch contributes to our understanding of market evolution. This reviews air transport trade magazines, specialised and general press, company annual reports, of company and organisation web sites (e.g. European Commission). Articles and papers are systematically placed on the web and distributed to senior management.

Our political knowledge and links to the European Commission and Industry provides three avenues of influence in European policy:

- European Master Plan: implementation of the Single European Sky, and the Group of Personalities 2020 Vision (resulting in the SESAM Single Sky project to define the implementation programme).
- ACARE R&T Research Programme leading to the European Commissions 7<sup>th</sup> Framework Programme.
- Joint Programme Board to integrate European research strategy.

These initiatives will significantly impact the Experimental Centre and European Research by focusing all ATM stakeholders on common concepts whilst exploiting the EUROCONTROL and European Commission research financial monopoly.

Visits to Member States research facilities have alerted the Centre to trends, methods and technology that can be adopted to maintain our position in European ATM research.

Comparison of our strategy with that of other institutions is made through the ARDEP database, a Europe-wide census which collects and categorises information on research projects in Air Traffic Management. This identifies research duplication and gaps in current activities. The EEC has taken over the management of ARDEP in 2004.

A point of concern is value for money in ATM research. Recent ATM symposiums highlighted that end users (airlines) perceive ATM research does not deliver! Learning from this is evidenced by our increased contacts with airlines, including low cost carriers. This has included funding an airspace “users group” in support of the larger European Commission research projects in which we participate.

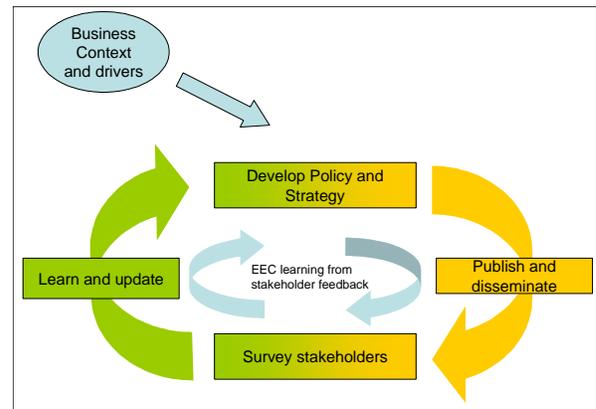


Figure 2b-1 Feedback loop learning process

The diversity of ATM research has led to a perceived lack of leadership in the industry. We are addressing this through SESAM and the planned Joint Programme Board.

We are deploying across all research areas an ATM impact process to estimate the

relative potential impact on ATM of projects and the degree of acceptance by key stakeholders.

- Step 1, internal assessment of impact
- Step 2, testing with key stakeholders
- Step 3, update impact, and based on project costs amend the work programme

Initial results are provided in section 9a.

The annual EEC activity report renders our performance visible to our senior stakeholders in the Experimental Centre Consultation Group, who participate in the Agency approval cycle thus closing the loop on understanding external perception of our image.

### 2c Policy and Strategy are developed, reviewed and updated

Our strategy and policy development is based on:

- Our legacy of skills and experience embodied in existing strategy,
- Moderation and amendment by stakeholder feedback,
- Continuous review in the light of a changing business context.

This is defined in our strategy and business cycle process depicted in figure 2c-1.

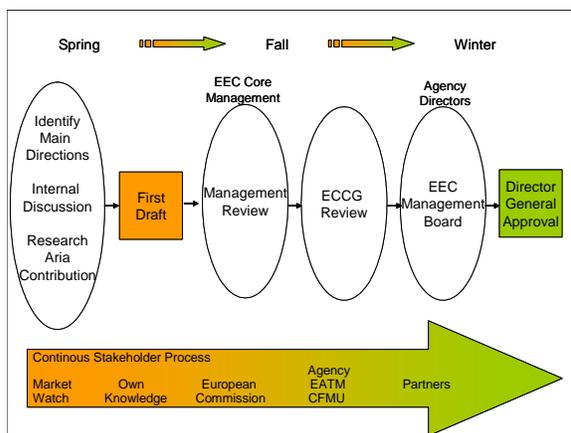


Figure 2c-1 Strategy and business cycle process

Our Business Plan is the principal expression of EEC policy and strategy. The process starts with gathering strategic inputs

from the stakeholder process described in 2a above, enhanced by internal meetings. The working-level guardians of policy and strategy are the research areas and each area has a strategy and portfolio focused to contributing to the Centres policy and strategy. Mission and Vision are reviewed annually as part of the process. Both were modified in 2004 as a result of the work of a special task force. The updated versions reflect better the contextual evolution described in the overview and link more strongly to the updated policy and strategy. Critical success factors in the form of key performance indicators are also reviewed at least annually to ensure that they measure the updated policy and strategy. In 2004 work is currently focusing on procurement indicators which can lever the outsourcing strategy (see 9a).

Examples of policy and strategy updates in 2004 are:

- We have aligned the EEC in support of the proposed Industry-led European ATM Master Plan for the implementation of the European Commissions regulations covering a Single European Sky
- As part of our outsourcing and industrialisation strategy we have targeted 60% of our available research investment (over three years) towards industrialisation of products and outsourcing of research. This is further described in section 4a
- Stakeholders expect increasingly rapid results, since they themselves are subject to short-term commercial constraints. Support through fast turn-around activities includes analysis of one-year delay figures and forecasts and direct support to air traffic service providers when they wish to prototype and test new controller interface designs
- We balance long term and short term research by ensuring that we maintain the level of resourcing for

long term innovative research (see [9a](#)), while focusing other research areas on the medium term of the ATM Master Plan.

A six monthly portfolio review process covering research area projects, staffing and financing is used to collect strategy input, facilitate implementation of current policy and alignment to the updated work programme. The ACB tool<sup>2</sup> is the main repository for all project related information used in portfolio reviews (see [4b](#)).

Twice yearly management away-days involving core management, research area managers and heads of Centres of Expertise are held to discuss and evolve key strategy.

In light of our work plan focus on the proposed European Master plan, our competencies and capabilities will evolve. The EEC staff plan will take account of this need, helped by staff preferences captured in the appraisal process. The staff plan is reviewed at least annually and is monitored regularly in the two weekly RAMM meetings.

Our suppliers and partners are updated through the Experimental Centre Consultation Group and through direct consultation on specific strategy focus. The most recent Industry work shop addressed the outsourcing of the Centre's simulation facilities; feedback from this will set the framework for the outsourcing process.

Relevance and effectiveness of policy and strategy is evaluated through the consultation processes described in section 2a.

Work started in 2003 and continued in 2004 to establish an ISO18001 compliant environment management system which will ensure compliance with all applicable legislation. The recycling process has also been strengthened through partnership with the supplier of the building maintenance and cleaning service. Results are provided in section 8.

<sup>2</sup> The EEC Information Management System (Access to Business information)

## 2d Policy and Strategy are communicated and deployed through a framework of key processes

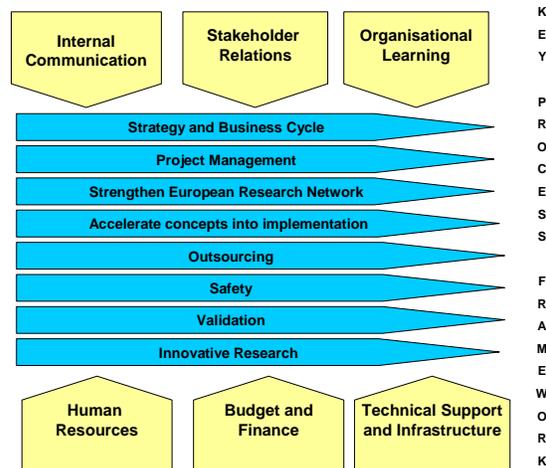


Figure 2d-1 Key process framework

Key processes are the horizontal arrows in figure 2d-1. They are identified and designed to deliver the key elements of policy and strategy as described in the overview and in section 2a, and they link to the measurement framework depicted in figure 9a-1.

Key processes are reviewed on an annual basis as part of the Strategy and business plan cycle process described in section 2c. A strategy and policy evolution requires a corresponding evolution in the key process framework. Key Process development and review is led by the Core Manager responsible for quality in collaboration with the process coordination manager. Proposals are further developed and validated by the project management support office and middle managers in the WMM.

Prior to 2004, processes were documented informally and were accessible on the Intranet. During 2004 a new approach was launched in order to formally document processes in conformity with applicable ISO standards. Work started on the security and occupational health and safety processes and will continue with the support processes and the core business processes including the key processes.

### **Communicating policy and strategy internally**

Internal processes for communicating policy and strategy are:

- Bi-monthly Work Programme Management Meetings (WMM) to exchange information and align the work programme
- Twice yearly all-staff meetings, where key initiatives are explained,
- Quarterly Enlarged Management Meetings (EMM – for all middle managers).
- All staff Weekly Information Corners (WIC) which are periodically dedicated to the work of a particular research area.
- Internal news discussion groups include: EEC management, Air Traffic Control and Management, infrastructure, social and staff issues. Contributions to these groups are often directly related to strategy issues.

Every person working at the Experimental Centre has direct access (via his or her desktop computer) to the Intranet, on which a wide range of strategy-related information is accessible.

The principal instrument for communicating strategy and policy is the Business Plan which is a public document and readily available to all staff. Heads of research areas and centres of expertise cascade the information down to individual units.

### **Communicating policy and strategy externally**

Externally closing the loop to strategy setting is achieved by communicating our policy and strategy via the business plan which is available on the [external web site](#). The quarterly external newsletter, also available on the external web, highlights recent research results and events in addition to policy and strategy evolutions.

Core and research area managers participate at numerous major external conferences such as ATC Maastricht, European R&D Symposium, and FAA / Eurocontrol ATM R&D forum. The Director is invited to high level forums e.g. “Les

retombes économiques et fiscales des grands sites aéroportuaires française.”

The Experimental Centre hosts a large number of International and European working groups such as RTCA and EUROCAE and involving direct and indirect stakeholders. The Centre also hosts the IRAB – Innovative Research Advisory Board.

A yearly activity report is distributed to all stakeholders. Policy and strategy are explained in addition to the reporting of research results. The activity report is available on the external web site.

All visitors receive presentations of our policy and strategy and results. These are standard power point files which are available to all through our internal computer network to ensure that the same message on policy and strategy is being given to all visitors.

Policy and strategy is communicated to key stakeholders at the twice yearly ECCG meeting

### **Tracking progress**

Progress is tracked through portfolio reviews (see [2c](#)), and through the key performance indicator (KPI) reviews, and through regular project reviews.

KPI owners meet together on a quarterly basis to review the balanced scorecard (see [9a](#)). Achievements to date are examined and projected end of year results are checked to determine if progress is on track and, if necessary, what corrective action to initiate.

The main responsibilities of KPI owners are:

- Owning and managing associated process
- Yearly target proposals
- Regular monitoring and reporting progress towards the announced target
- Alert issue if process is inadequate and corrective action proposal.

The main KPI support tool is ACB (see [4b](#)).



### 3 PEOPLE

*Excellent organisations manage, develop and release the full potential of their people at an individual, team-based and organisational level. They promote fairness and equality and involve and empower their people. They care for, communicate, reward and recognise, in a way that motivates staff and builds commitment to using their skills and knowledge for the benefit of the organisation.*

#### 3a People resources are planned, managed and improved.

The EEC has 268 budgetary posts, although due to Agency budgetary restrictions it is authorised to fill only 248 of these. Currently, 245 posts are occupied. The combination of contractors, national experts, temporary workers and students accounts for approximately 200 additional persons present on site. Just over half of the staff members are French (55.14%), the remainder being made up of nationals of 16 of the EUROCONTROL member states. It was highlighted by the Internal Auditor that 17 Member States are not represented among EEC staff which led to an agency being used in recent recruitments to encourage applications from the non-represented States.

Of the 245 staff, 82 are female, and 163 are male. The breakdown by grade is as follows: A – 96 (87 male, 9 female), B – 95 (61 M, 34 F), C – 52 (13 M, 39 F).

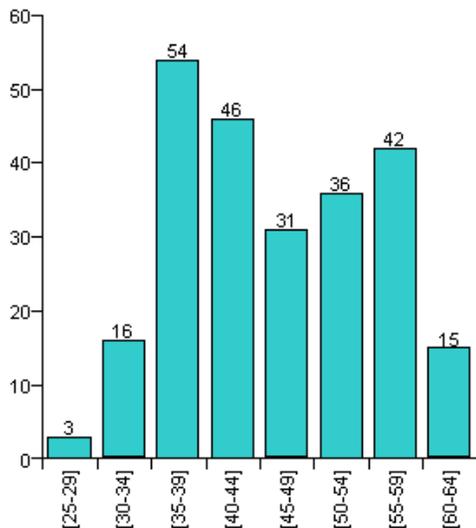


Figure 3a- 1

The age pyramid of the EEC indicates some cause for concern. Even assuming that all personnel remain until retirement age of 65, fifty-seven staff will leave within 10 years. The average age of the 27 staff recruited since the beginning of 2001 is 34.5 years, in line with the

policy of recruiting experienced professionals. An option available to the Agency but which has been rarely used is that of filling vacant posts with a fixed term contract. This could be attractive for recruiting younger people onto pure research jobs which may not be sustainable in the long term.

EEC staff work at the Bretigny site. However with several projects shared across Directorates, the need to facilitate inter-directorate working has been identified. The EEC, in cooperation with EATM, is developing a process to encourage prolonged missions by EEC staff to other Directorates and vice versa. Secondment to national administrations, the European Commission or industry is also encouraged.

#### Resource Allocation - The Staff Plan

The Resource Allocation Management Meeting, RAMM, reviews and revises the skill families present at the EEC. The Staff Plan describes the skills of each staff member and maps these against the current and foreseen needs of the different functional units, thus allowing identification of mismatch between supply and demand of skills. Furthermore, using the strategy given in the EEC Business Plan, skill requirements of the Research Areas and Support Units over the next 5 years can be predicted. Staff turnover through retirement and requests for re-assignment are also accommodated in the Staff Plan. The end result is a clear plan of how the needs of the EEC can be met over the next 5 years through recruitment, re-training and internal mobility.

Following the twice-yearly Research Area and Support Unit portfolio reviews, the Staff Plan is updated and validated against the constraints of the current budgetary restrictions and skill profile of EEC staff.

A recruitment strategy has been established to meet the skill shortages identified by the Staff Plan. A list of recruitment priorities has been agreed, along with a timetable based on the anticipated retirements of the next 5 years. The application of this process, agreed by DHR and DG, has enabled the EEC to streamline the recruitment process.

ACB is used to monitor the EEC's work programme and budget, and supports the application of the Staff Plan. ACB contains information on all the active projects of the EEC, and tracks which staff are assigned to which projects and over what duration. The allocation of staff to CoEs is extracted from the HiRIS<sup>3</sup> data base. Project Managers can also use the tool to register resourcing requirements.

### **HR Tools and Processes**

HR processes at the EEC are owned by the Human Resources Management (HRM) Support Unit. These processes include Recruitment, Training and those related to Staff Administration. The HR database HiRIS contains comprehensive information on staff members and is updated by HRM staff. Graphical presentations of the staff demographics are updated weekly on the EEC Intranet. In 2003, a number of processes were decentralised from DHR, facilitating the update of personal and organisational data. These were: 1. management of part-time working, 2. change of personal address, 3. internal transfers of staff, 4. voluntary resignation.

Many HR processes and procedures are documented on the Intranet under the "Services" section. An EEC recruitment process and an internal mobility process have recently been adopted with DHR approval, while work is almost complete on the draft stage of a process aimed at managing prolonged missions to and from other Agency Directorates (see 3a). A tool to improve the efficiency of process development and documentation is being tested using two existing EEC processes. This graphical tool has already shown improved process management in another Agency Directorate.

HRM is conscious of the need to continuously improve cooperation and coordination with DHR. To facilitate this, the Deputy Head of HRM, who acts as the point of contact for discussion with DHR concerning HR processes and legal issues will spend a week working in DHR.

### **Staff Satisfaction Surveys**

Staff Satisfaction surveys have been performed at the EEC in 1998, 2000, 2002 and 2003. Response rates in the first two were relatively low possibly due to the design of the survey and concerns over confidentiality. In 2002 a standard Agency survey was used and measures taken to assure anonymity of all respondents. The result was an exceptionally high return rate of 85%: which is one of the best in the Agency. The

return rate for 2003 fell to 58% which could be explained by a change in the method for collecting responses. Staff members were responsible for sending the questionnaire directly to IPSOS, whereas in 2002, the Heads of CoE played a role in encouraging staff to return the completed form to them. Results are communicated to everyone through reports posted on the Intranet and through presentations at All-Staff meetings, management meetings, and at a Weekly Information Corner. Improvement actions are derived and all people are encouraged to participate in improvement projects. Results of staff satisfaction surveys are provided in section 7a.

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## **3b People's knowledge and competencies are identified, developed and sustained**

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### **Matrix Organisation**

One of the objectives of the EEC re-organisation was to better manage and develop the competencies of those working here. The key element in achieving this is the Centre of Expertise (CoE). Whereas staff members are allocated to one or more Research Areas or Support Units for their day-to-day work, they also belong to a CoE, according to their area of competence. The Head of the Centre of Expertise (HoCoE) is responsible for the career management and personal development of each staff member. In addition, the HoCoE has the role of anticipating the EEC's requirements in terms of skills and ensuring that staff members are trained appropriately. A skill reorientation KPI has been developed and is currently being reviewed.

### **The Training Service**

The Training Section is responsible for the development and management of the EEC Training Plan. The aim of the Training Plan is to identify training needs according to the EEC strategy, while at the same time, recognising individual training needs. A Training Coordination Committee (TCC), chaired by HRM, was created to manage the Training Plan and the training process. The link between the Business Plan, the Staff Plan and the Training Plan is being consolidated, leading to the development of a more coherent and planned training strategy. In parallel, a Task Force has been set up to monitor training effectiveness.

The Performance Appraisal process is an opportunity for our staff to discuss their individual training needs with their managers.

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<sup>3</sup> Agency personnel database

These requirements are fed into the training plan. New arrivals without an ATM background are obliged to follow the 'Introduction to ATM', course, ensuring that they acquire a basic knowledge of the business. Support is also provided through the Training Plan to staff wishing to increase their aeronautical competencies including flying training to Private Pilot Licence (PPL) level.

Personnel have access to training support via the Educational Assistance and Scholarship programmes. Those who wish to undertake studies in their own time, relevant to their professional development, are encouraged to do so. They receive financial support from the training budget and are entitled to time off work for the preparation and sitting of examinations.

#### **The Performance Appraisal process**

Annual Performance Appraisal has been mandatory in Eurocontrol since 1998 although there has been some evolution in the process used. In fact it was the EEC which initiated the use of Performance Appraisals in 1996. Prior to that date there was a system of annual assessment but no formal dialogue. The current procedure entails an interview and written report. Agency regulations require that each official must have an appraisal every two years. In practice, appraisals take place at least once a year. A guide book has been produced by DHR and training courses for Appraisers provided. All members of staff participate in the process except those who would be retiring in the next 12 months if they request not to (see [Retirement](#)).

As part of the EEC's Values project, the Performance Appraisal process has been discussed with a view to improvement. The PA will be targeted at behaviour (values) as well as technical performance. It is also planned to produce a questionnaire on the PA process so that staff may evaluate the usefulness of the process to them as individuals.

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### **3c People are involved and empowered.**

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#### **Director's Policy facilitates involvement**

Since his arrival in the EEC the Director has insisted on the importance of openness and visibility to encourage people to be involved and to facilitate empowerment. Staff Representatives are present at certain management meetings and participate in the development of processes and procedures.

All senior managers operate an open-door policy, and with the exception of the Director,

their electronic agendas can be consulted by staff.

#### **Involvement of people in re-organisations**

Employees participated in the definition of all re-organisations. For example, during the 1995 re-organisation, staff members were invited to sign-up to the CoE of their choice. A Working Group comprising a broad range of staff managed the re-organisation of 2000 and another was tasked in November 2002 to review the effectiveness of the new EEC structure. The so-called Think Tank was supported by an external facilitator and produced a series of recommendations which have since been implemented in the latest re-organisation which came into effect in January 2003.

#### **Personnel engage in outside activities**

The EEC encourages its staff to engage in outside activities which are beneficial both to them and to the agency. Under Agency rules, staff wishing to engage in outside activities, whether remunerated or not must request authorisation from the Director General. The EEC is discussing with DHR the possibility of providing assistance to staff in such cases by allowing them to carry out the activity during work hours. Three members of staff have recently qualified as European Quality Award assessors.

#### **Staff Committee**

Members of the local Staff Committee (SC) are elected for a two year period. The SC is made up of 2 representatives of each of the three staff categories (A, B and C) elected by secret ballot of all staff.

The SC initiative to provide day-care facilities for children, the Eurokids project, is further described below and in [8a](#).

#### **Unions**

Two unions are currently recognised at the EEC. It is EEC policy:

1. to enable the unions to function effectively for the benefit of the staff and of the EEC in general,
2. to develop and sustain a meaningful and constructive dialogue between management and unions.

Union meetings are held during working hours: one annual general assembly and ad hoc meetings on particular topics as required. The unions are an essential partner in the social dialogue between staff and Agency. There are on average 4 consultation meetings per year between DEEC and the unions at the EEC. Finally the unions are allocated a slot at the twice yearly all staff meetings and at the

quarterly EMM. In 2002, the principle union at the EEC (USEF) was allocated a full-time secretary in keeping with Agency policy.

#### **ECCG (see 1c)**

An elected EEC staff representative attends the ECCG meetings and reports back to staff by means of a newsgroup posting. This is an important way of involving staff directly in stakeholder consultation.

#### **Suggestions Box**

The suggestions box, started in June 2000, is an important vehicle to stimulate staff to formulate and propose improvements. It is recognised that staff on the front line are best placed to identify opportunities for improvement. Suggestions are managed by an Intranet application and everyone can monitor suggestions which have been proposed and their implementation state. A suggestions board comprising staff volunteers, a representative of the staff committee, and a representative of core management, facilitates the implementation of suggestions. The best suggestion, elected annually by an all staff vote, receives recognition with a certificate and prize which is presented by the Director at the all staff meeting in June. Results are provided in section 7b.

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### **3d People and the organisation have a dialogue.**

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#### **Communication**

The three pillars of the EEC's internal communication are:

1. Informal communication,
2. Management meetings and
3. Publishing and electronic communication.

The objective of informal communication is to promote exchange of information and open discussions by providing opportunities for staff to meet and discuss in the Cafeteria, the Canteen, through the AIPE clubs and activities, in the Language courses and in Conferences open to all staff.

The management meetings are:

- RAMM – Resources Allocation Management Meeting – allocating staff to projects and prioritising recruitments.
- WMM – Work Programme Management Meeting – a forum for reviewing the portfolios of the various Research Areas.

- TCC – Training Coordination Committee – defining training requirements, managing the training budget.

An All-Staff meeting is held twice yearly in June and December, and Centres of Expertise hold meetings once per month.

The objective of publishing and electronic communication is to develop and maintain an integrated information system for the EEC based on the principles that non-confidential information should be accessible as early as possible, and that all staff deserve trust and should be informed.

The EEC makes active use of its Intranet. The home page includes a list of forthcoming events, latest news and publications. Staff in HQ regularly log on to the EEC site to receive the latest information on a wide range of Agency issues. Moderators have been assigned to each of the internal newsgroups where there are frequent debates. Moderators are staff members whose role is to generate discussion and ensure that replies are given to any questions raised. A Newsgroup policy was published in October 2003. The EEC has recently taken the initiative to produce two publications, the Experimental Centre News for external circulation and focusing on ATM issues, and an internal newsletter, EEC News. Each edition of the EEC News contains a number of features and includes an interview with a member of staff.

#### **Communication Channels**

An Internal Information Monitoring Group (IIMG) was established in 2003. One of its first actions was the introduction of the Weekly Information Corner (WIC) which takes place on Tuesdays outside of holiday periods as an additional forum for two-way communication between staff and management.

A Core Management column is published weekly on the Intranet, giving information on a wide range of current topics. It has also been used to present new members of staff, with a photograph and a personal introduction written by the new staff member.

An internal communication survey has been carried out and several improvement actions adopted. These include:

- all new arrivals are given an introduction to the communication tools
- improve internal search engines
- make known the role of Newsgroup animators
- improve organisation of the Support Services pages

- publish EEC News on paper as well as electronically
- publish a Newsgroup Charter

A television set is installed in the cafeteria and is permanently on "EuroNews". It is also used to good effect during major sporting events such as the World Cup, where staff can take time to watch their favourite teams in action. There has been no negative impact on productivity noted, indicating a responsible use of the facility.

The management open door policy referred to in section 3c above also provides a valuable communication channel between management and staff.

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### **3e People are rewarded, recognised and cared for.**

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#### **Promotions**

Working conditions and remuneration at the EEC are good. Levels of staff satisfaction are high compared to other benchmark organisations. However there is some discontent with the rewards and recognition possibilities. Currently, the only means to reward good performance is through the annual promotion process. The Agency allows for a maximum of 20% of promotable staff to benefit each year. However due to the peculiarities of the Agency slot allocation system there are generally more promotion possibilities at A-grade level as compared to B and C grades, leading to frustration at the lower grades. The EEC has made considerable effort in the past to rectify the imbalance in the number of promotions given to A-grade staff in comparison with B and C grade staff. The Director EEC and the Staff Committee attach high importance to ensuring as far as is possible, an equitable distribution of promotions across the grades. The contribution of staff to collective activities outside their normal professional activities is taken into account as secondary criteria for promotion. The EEC ensures the greatest possible level of openness in how the process is handled locally and continues to support efforts to have the process revised at the Agency level.

#### **Job Management**

The objective of this project was to develop clear and standardised information on all Agency jobs, and to ensure that individual staff members are assigned the grade which corresponds to the actual work they are doing. The results further illustrate the principle of empowerment which exists at the EEC, whereby capable people are

allowed to take on responsibilities which would normally correspond to a higher grade.

#### **Safety at Work and the Welfare Officer**

A Welfare Officer was under contract at the EEC from 1996 until 2001 when a staff post was accorded. The Welfare Officer is active in the integration of newcomers but is also available to all staff with personal or family difficulties. A post was also created for a Safety and Prevention and Protection at Work Officer. Several benefits have already been seen such as regular fire drills, and staff training as fire wardens and first-aiders.

#### **Flexitime and Home-working**

The EEC operates a system of flexible working hours. The system is popular with most staff as it allows the recuperation of 1 day's overtime per month as a leave day, and allows flexibility in start and finish times.

A pilot study of the use of home-working was run during 2001 with 5 staff volunteers participating. In 2002 the pilot scheme was extended with quarterly reviews of the impact of this way of working on the staff member and their colleagues. Following another review in 2003, the facility is now available to staff on an ad-hoc basis which allows staff to work in this manner on up to 30 days per year and for specific tasks. Results are provided in section 8a2.

#### **Building improvements**

The EEC building was completely renovated over a period of 2 years from 1998 to 2000. The working conditions are now excellent, and in the latest phase of improvement, air-conditioning was installed in the 1995 extension. Another simple but effective innovation has been the installation of water fountains in all conference rooms.

#### **Retirement**

The Agency offers a one week conference dedicated to life after work, to all staff contemplating retirement and their spouses. HRM has put in place exit interviews for personnel who are retiring or resigning. This is voluntary for staff and has so far been well received, with positive feedback from some long-serving members of the organisation. HRM has also taken the initiative to give a small gift to all staff retiring. While often immediate colleagues organise a leaving party with the usual collection to purchase a gift, it became apparent that some staff were leaving quietly after many years of service, and with nothing to mark the event. Sometimes this is through personal choice, but nevertheless it was felt

appropriate to make a formal gesture on behalf of the 'Organisation'.

#### **Environment, health and social responsibility**

To promote world environment day on June 5, a series of exhibitions and events was organised to raise staff awareness of environmental issues. The participation level was good and the feedback was positive. The results will be used to prepare a similar event in 2005.

An environment audit identified one lack of conformity with the French environment law. Appropriate measures have been taken to remedy this.

An EMS (Environmental Management System), satisfying the requirements of ISO Standard 14001, is being set up. The aim is to control the impact of our activities and services on the environment and to monitor improvement of our environmental record. The project is set to last between 18 and 24 months.

A Health Promotion Day was held in June this year with the aim of informing staff on issues such as healthy eating, taking exercise, avoiding stress and relaxation.

The Staff is encouraged to engage in charitable activities for which the EEC provides the necessary facilities. One member of staff took the initiative to start a campaign to collect plastic bottle tops which are used to finance wheelchairs for disabled people. The EEC provided the collection bins which are placed at a number of locations around the building into which staff can deposit their tops (see [8a](#)).

#### **The family is important**

While the integration of new staff is given high priority by the EEC, special attention is given to the needs of the family unit, with assistance and advice on accommodation and schools. The process is managed jointly by HRM and the Welfare Officer, and begins before the new staff member arrives. A welcome guide with comprehensive information on a wide range of subjects such as housing, schooling, transport etc., is maintained and updated by HRM and the Welfare Officer.

Activities were organised at the EEC in April this year to show the children of staff what ATM was all about. 'ATM for Kids' gave 55 children some hands-on experience of aviation and air traffic control and their impact on safety and the environment. About 20 staff participated in the preparation of the project and in the organization

on the day. The organisers intend to repeat the exercise extending it to include spouses of staff.

The Eurokids project continues to be a great success. A partnership was created with a local employer, the French national rail company SNCF, to ensure the viability of a local children's activity centre. The activity centre was threatened with closure because of a reduction in the numbers of children. The Eurokids project has delivered benefits on all sides, to local children, and to the children of EEC staff. The increase in the numbers of children has ensured the sustainability of the activity centre and has enabled more ambitious and interesting activities to be undertaken.

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## 4 PARTNERSHIPS AND RESOURCES

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*Excellent organisations plan and manage external partnerships, suppliers and internal resources in order to support policy & strategy and the effective operation of processes. During planning and whilst managing partnerships and resources they balance the current and future needs of the organisation, the community and the environment*

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### 4a External partnerships are managed

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#### Identifying Key Organisation & Community Partnership Opportunities

The accession of the European Commission to EUROCONTROL in 2002, followed in 2003 by an Agreement for Co-operation between the two institutions established the conditions whereby the Eurocontrol Experimental Centre could act as a focal point in the coordination of European ATM Research.

Throughout 2003, in full consultation with the stakeholder community, the EEC prepared itself for the challenges that a leading role in the organisation and management of European ATM Research entails.

Both EUROCONTROL and the EC have been seeking to minimise duplication and achieve a high degree of complementarity and reciprocity in the execution of their respective ATM research programmes.

The EEC contributes to the Commission's activities by providing expertise, resources and facilities to the European Research Framework Programmes (FP). The FP aim to strengthen the scientific and technological basis of industry and encourage its international competitiveness while promoting research activities in support of other EU policies.

New management tools have been introduced for the 6<sup>th</sup> FP to ensure coherent project funding over a longer time frame greatly facilitating the assembly of the "critical mass" of expertise, resources and activities needed to achieve its ambitious objectives.

The EEC has actively participated in the preparation of some seven proposals aimed specifically at reinforcing its own strategic orientations, five of which were successful and are currently under final contract negotiations.

The EEC supported the International Co-operation Programmes initiated by the European Commission, through the organisation of, and participation in, seminars and workshops, aimed

at providing greater insight into European research activities.

In particular the EEC is a key partner in the EC 5th FP Gate-to-Gate project, launched in 2002, and the 6th FP C-ATM project, launched in 2004. Both of these bring together EEC, key industries, national ATC service providers and Research Centres to define and validate the future European ATM system.

A specific partnership has been developed with the FAA to make sure that research results are harmonised and comply with the need for a common global Air Transport infrastructure. Under a Memorandum of Cooperation (MoC), a series of Action Plans has been developed covering a range of topics including communication techniques, flow management issues, ATC working methods, wake vortex issues and safety.

The practical development of the cooperation is performed through Technical Interchange Meetings, which allow an exchange of views as well as sharing of data, methods, and software. The MoC is managed by an R&D Committee which undertakes bi-annual reviews of progress made in the Action Plans. The Committee comprises staff from the FAA and EUROCONTROL (EEC and EATM/ESC) as well as the national research centres. The MoC itself is currently under review with the aim of both simplifying and enlarging it.

The European Association of Aerospace Industries (AECMA) represents the aerospace industry in all matters of common interest. EUROCONTROL and AECMA established formal working relations through a bilateral steering group in which the EEC is actively involved. Its aims are to identify, propose, promote and monitor an ATM Master Plan covering joint initiatives aimed at a pragmatic implementation of the European Single Sky.

The Boeing Company has decided to stop its initiative committed to the development of a new ATM system. Nevertheless the EEC has maintained its excellent working relations with Boeing through the exchange of staff and

through the development of aircraft performance modelling. In particular Boeing provides the EEC with the data needed for BADA (Base of Aircraft Data).

The European Organisation for Civil Aviation Equipment (EUROCAE) is a forum where administrations, airlines and industry meet to discuss technical issues. The EEC actively participates in some of the working groups.

### **Structuring Partnership to Maximise Value**

The EEC was instrumental in progress toward the establishment of a Joint Programme Board (JPB) between the EC and Eurocontrol. The combined research budgets of these two organisations cover in the order of 80% of budget spent in Europe for ATM research. The JPB will be responsible for coordinating the funding of research to meet the requirements of the ATM Master Plan.

Established 6 years ago, the Experimental Centre Consultation Group (ECCG) is the main forum for EEC stakeholder consultation (see [Overview-Governance](#)). The ECCG met 9 times between May 1998 and April 2004. The Terms of Reference of this stakeholder group are currently under revision due to the evolution of the research landscape. They will strongly depend on both the evolution of the role of the EEC and the JPB.

The EEC is developing a Stakeholder Segmentation Model which will allow a more systematic identification of potential strategic partners and facilitate formal communications with them. It will be regularly reviewed by the EEC Management. The model is used to drive the bi-annual Stakeholder Satisfaction Survey which provides the EEC with important feedback on its perceived performance (see [2a](#) and [6a](#)).

### **Forming value-added supply chain partnerships**

Since 1996 the EEC procures external assistance using a 'framework contract' with industry consortia. The objective of the contract is to set up partnerships with the consortia that are able to provide support to EEC in the execution of its work programme. The contract is renewed every 3 years, most recently in April 2002. A new call for tender will be launched this year for the period starting in 2005.

The emphasis in using external assistance is put on fixed-price tasking undertaken mainly at the suppliers' sites. This encourages our partners to

understand our needs and focus on deliverables. Note also that tasking on suppliers' sites is a prerequisite to an increased partnership with external Research Centres and Industry.

### **Identifying Partner Core Competencies**

The development of partnerships with industry is a cornerstone of EEC strategy. The EEC Business Plan contains an action to further develop co-operation with Industry. The EC-sponsored 5th FP, 6th FP and TEN-T projects encourage the involvement of Industry in the specification and development of EEC simulation platforms.

The EEC industrialisation policy is built on the findings of the Agency's Industrial Policy and Supplier Relations Task Group (1997) and its own Task Force on Industrialisation Policy (1998). The aim of both was to evaluate the different options to be considered for the deployment of research products by industry so that proper support, maintenance and training would be ensured by industrial partners. This EEC policy was widely presented to industry and was well received.

A framework was defined in co-operation with the legal service of EUROCONTROL HQ to address licensing and intellectual property rights issues. A standard licensing agreement was developed that can be used in most cases.

Notable successes of the industrialisation strategy have been the transfer of the AudioLAN product, an innovative voice-over-IP product, and the RAMS ATC fast-time simulation facility, both of which have been commercialised through a non-exclusive licensing agreement.

The monitoring of the industrialisation approach has been reinforced since the end of 2000 by initiatives to create dedicated User Groups. There are User Groups for AudioLAN, RAMS and the ESCAPE products.

The ESCAPE User Group was formed in 2002 to gather the users of the ESCAPE real time simulation platform (EEC, MUAC, IANS, CRDS, SICTA, and two ANSPs). The Group meets twice per year. A Service Level Agreement (SLA) between the EEC and the CRDS, IANS and MUAC has been drawn up. The support for the distribution of the simulation platform is provided by EEC/SFM. The service includes the provision of a hotline and a problem reporting channel.

The ERIS Research Enabler has started to work on industrialisation and industrial partnership, especially outsourcing. ERIS provides validation platforms including ESCAPE for the EUROCONTROL and EC ATM programmes. The development of all ERIS platform components is being outsourced to Industry in order to achieve:

- Cost-effectiveness from economies of scale and shared supplier costs,
- improved quality by using robust industrial solutions and professional procurement practices,
- Support from the ATM Industry of the AVENUE standard and its use in EC Single Sky validation.

Two other key EEC products, GASEL and ASMT are currently being outsourced to Industry.

### **Supporting mutual development**

The activities of the EEC directly contribute to the Agency programmes and are developed in close co-operation with the corresponding sponsors (EATM, MUAC, CRDS, IANS, CFMU, PRU, SRU).

These partnerships are formalised and supported by agreements such as EATM Project Delegation Agreements, Service Level Agreements and Project Charters. Progress is reviewed with sponsors at regular intervals.

There have also been exchange visits between EEC staff and staff from DHR to foster mutual comprehension and collaboration.

The CRDS is one of the support units of CEATS, which will establish a regional ATC system in central Europe starting in 2007. The EEC led the Agency project to implement the CRDS in Budapest and has helped the CRDS to initiate research activities and partnerships, including collaboration with Belgrade University. The EEC aims to establish a partnership with CRDS because of the common service they both provide and the opportunity to develop synergies.

The EEC makes regular visits to peer research establishments. Such visits are an opportunity to inform partner establishments on the strategy and the work programme as well as getting direct feedback on the approach. These contacts allow the EEC to refine its Business Plan prior to presentation to the ECCG and also provide the national research centres with the

occasion to prepare their contributions to the outsourced part of the EUROCONTROL research work-programme.

Emerging regions such as China and Asia are also monitored with regard to their contributions to ATM research and opportunities for cooperation.

### **Ensuring cultural compatibility**

Dedicated management training applied throughout the Agency helps management and project leaders to be responsive to multicultural aspects in projects and working groups. This training has been reinforced at the EEC by the EEC language training policy (see 3b).

### **Generating and supporting innovative and creative thinking through the use of partnerships**

The JPB will be responsible for all ATM Research coordination at the European level. This function was previously held by the Agency's R&D Review Group which was dismantled in 2003 in the light of the changing European ATM research environment.

Despite these changes, the data gathering process (the key element of any review) is still in place in the form of the ARDEP database. In 2004, the EEC took over management of ARDEP<sup>4</sup>.

A similar database (ARDA) has been established by the FAA to collect information on Aviation R&D in the US. This action is co-ordinated with the EEC and includes a common classification by domains of European and US R&D.

Efforts have been made in recent years to develop closer links with academia. Partnerships with universities are expected to ensure that a broad range of ATM fundamental research themes are covered in-depth.

These partnerships are concretized by either conventions sharing the resources and common research interest, or contracts with universities for an identified problem to be addressed. PhD studies focusing on exploratory or experimental aspects of the research topic have been sponsored by the EEC, with students based either at the University or at the EEC. All results are published annually in the EEC Innovative

<sup>4</sup> <http://www.eurocontrol.int/eatmp/ardep-arda/ardep.html>

Research Activity Report, and in international conferences with review boards. Once a year the students and doctoral students working at the EEC present their studies to the staff of the EEC in the form of posters and oral presentations.

### **Working together to Improve Processes**

To steer activities in the Innovative Research Area, an Innovative Research Advisory Board (IRAB) was set up in 2002, comprising three external prominent scientists, including University Professor from the US, and the Head of National Research Centre in ATM from Europe. All proposals for contracts and conventions with universities and research establishments are evaluated by the IRAB who provides comments and recommendations to start or to end the proposed study. Results of the studies are reviewed by the same board at least annually during the EEC Innovative Research Workshop. More detail of doctoral studies procedures is given in chapter 5.

The head of the INO Research Area is a Visiting Professor at the Francophone Institute for Computer Science in Hanoi thus strengthening the partnership between the EEC and the research community in Asia.

The US/Europe ATM R&D seminar, which convenes every two years, is another forum where the ATM community exchanges research results. A selection committee examines and selects research papers for inclusion in the seminar. A European ATM research symposium, convened equally on a two-yearly basis, complements the seminar by presenting to research management state-of-the-art and progress made in particular areas in ATM research. The papers and presentations are made available on an Internet site managed by the EEC.

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## **4b Finances are managed**

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### **Financial Planning in support of Strategy**

The budget of the EEC is prepared based on the Agency-wide annual cycle. The cycle starts in February of year N with a kick-off letter from Director General providing general considerations for the preparation of the Five Year Programme. These considerations include in particular the budgetary parameters proposed by the Standing Committee on Finance (SCF) and approved by the Members of the Provisional Council. Based on these parameters and

corresponding budgetary envelopes, the EEC submits a first draft - top down approach - which is elaborated on the basis of strategy described in the Business Plan and discussed with the ECCG members and the EEC Management Board. In May of year N, this draft is presented to Member States through the SCF. A more detailed approach needs to be provided in October of year N before submission to the Provisional Council meeting of November which approves the budget for year N+1.

### **Reporting Mechanisms**

The application of the financial regulations of the Agency is guaranteed at the EEC by clear procedures published on the Intranet and tools developed to facilitate their direct use by expense managers. The Financial Unit and the Project Support Office (PSO) provide support to the expense managers in the application of the procedures and in the use of the tools.

The Local Procurement Review Committee (LPRC) meets weekly to verify that financial regulations are followed and that procurements are in line with EEC strategy. The LPRC regularly issues KPI on the processes. The Financial Unit also provides support to Project Leaders/Expense Managers in the implementation of procurement requests. Approval for the procurement is given by the Head of the Financial Unit or by the Director EEC depending on the amount. Invoices are paid only after confirmation by the Technical Manager that a service or good has been delivered according to the contract.

Budget checkpoint meetings are organised on a quarterly basis to analyse the budgetary situation and reallocate credits where needed. Initial allocations to projects/activities are based on the agreed annual budgetary envelopes derived from the Business Plan as well as from a detailed procurement plan provided by project managers in the ACB tool.

Budget checkpoints serve as an important discussion forum where expense managers can raise any issue related to the management of the funds for which they are responsible, with financial experts and senior managers. KPI's have been defined to closely monitor financial processes (see [9b](#)).

The basis for all discussions during these meetings is the information (graphs/reports/KPI's) provided by the ACB tool which allows a detailed analysis of the financial management of the project. Particular emphasis is put on the

comparison between the planning and the actual status of commitments and payments.

The ACB tool has been developed internally in order to support the financial processes implemented at the EEC. New versions of the tool are produced regularly based on requirements captured by PSO, thus ensuring that ACB has become a highly efficient tool well adapted to the EEC budget monitoring process. However in order to improve the Agency-wide budget management the EEC will convert to PMS (Project Management System) tool, expected to replace ACB in 2005.

Over the last five years, we have seen an increase in the number of EEC projects co-financed with funding from other Directorates of the Agency but also from the European Commission. Support is provided by the Financial Planning and Analysis (FPA) unit in the monitoring of the associated budgets as well as in the establishment of effective relationships at the financial level with these partners. Regarding the European Commission funding, specific support is provided in order to promote a structured approach to all financial and contractual arrangements.

The travel service for EEC staff missions has been outsourced to a travel agent under the framework of the Agency Travel Policy.

In order to facilitate the reimbursement of mission expenses to staff, an agreement has been signed with a credit card company, which provides staff with corporate individual cards. An extensive partnership in this area significantly facilitates the invoicing of mission expenses.

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#### **4c Buildings, equipment and materials are managed**

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##### **Infrastructure management strategy**

Most aspects of the EEC infrastructure are managed as outsourced contracts, monitored by the TIG Support Unit. These include:

- Transport & Mail – including internal mail distribution
- Catering & Refreshments - provides lunch to over 250 people each day
- Reception Desk
- Cleaning – including a continuous cleanliness check during the daytime (and reporting of defective equipment).
- Gardening & Surroundings

- Data-processing & Office Supplies Store – including the reception and sign-in of deliveries to the EEC
- Office space management, removals and furniture
- Security

These contracts are regularly reviewed and improvements are proposed based on experience.

After analysis of the number of visitors and the telephone load, the receptionists' schedules were adapted as to better meet the internal and external customer requirements.

A strategy for the use and assignment of spaces was established by an EEC working group comprising members of TIG and the RAMM.

Security measures to be applied by the security company are defined in a handbook written by TIG. Access to the building is monitored by video cameras, although recordings can only be viewed by the Security Officer in the presence of the President of the Staff Committee.

Since 2001, for an initial period of 3 years, the EEC building maintenance has been let to an external company. This single outsourcing contract replaced over 30 individual contracts. The contractor keeps a representative permanently at the EEC site, and a team of 4 to 10 people as required. The maintenance is managed by means of a GMAO system (Computer Assisted Maintenance Management) which allows the monitoring of problems and provides maintenance checklists for each piece of equipment on the basis of information gathered during the renovation of the building. A hotline service is provided using a generic email address, and problems are tracked and solution reports are provided to the initiators of requests. In 2003, the call for tender for the new contract which defines KPI and service level agreements (SLA) was issued.

##### **Managing the Use of Assets**

The IT systems of the EEC are managed by the ITM Support Unit. EEC data processing needs are established in line with the business orientations and through dialogue with the functional units. Policy and strategy are documented in the IT Strategy Document which is updated once a year. Technology advances are systematically monitored and evaluated by ITM.

The IT service was outsourced in 2000 for a period of 5 years and is monitored by means of various procedures and meetings. A Steering Committee meets monthly to examine on-going problems and user requests as well as the evolution of the equipment stock. A Strategy Committee meets annually to review the overall status of the contract and to control evolutions. A Users Committee meets once a month with the objective to review the IT strategy, to propose evolutions, and discuss and validate IT approaches.

The renewal process for this contract was started in 2003 in close partnership with the appropriate technical and financial authorities of the Agency.

The procedures dealing with the services provided are being progressively documented and published through a web site on the Intranet.

ITM collaborates with Eurocontrol HQ in the management of specific information technology projects including Agency-wide corporate tools such as electronic mail and agendas and information security systems.

Infrastructure projects over 100K€ must be aligned with and reflected in the Business Plan. Once validated and the budget agreed, contracts may be initiated to prepare technical requirements, with possible sub-contracts to address specific requirements issues (security, supervision). An overall consultation for the main project is then launched on the basis of the technical requirements.

Smaller infrastructure projects, up to 100K€ are initiated on request formulated to TIG. Generally those projects are executed through an external contract.

A consultation group of staff representatives Groupe de Coordination Infrastructure (GCI) monitors all infrastructure projects to ensure that staff concerns and expectations are taken into account

Two important infrastructure projects were achieved during 2003, the first one particularly enabling partnership, the second one significantly improving working conditions of staff.

1. New conference room.

Lacking a suitable venue for hosting large meetings it was decided to convert two small meeting rooms and the adjacent corridor into a new conference room. Fitted with high technology audio-visual equipment, the new facility has a capacity for over 60 persons.

2. Air conditioning upgrade.

During the 2003 heat wave it was found that the air-conditioning installations were not powerful enough to maintain acceptable working conditions. An audit identified technical inefficiencies in the production of cold water. Work to replace the defective units was completed by the end of the year.

### **Managing Health & Safety**

A Health & Safety Management System (HSMS) makes it possible to manage the prevention of occupational risks associated with our activities. This includes the organisation and planning needed to develop and update the organisation's policy on occupational health and safety. The implementation of an HSMS has started in 2003 and is progressing well. The international standard OHSAS (Occupational Health & Safety Assessment Series) 18001 has been used as reference.

Two fire drills were organised in 2003. There is also an annual inspection of the EEC premises made by the Arpajon fire officers.

A new smoking policy was applied at the EEC in September 2003. It allows smoking only in predefined areas which have been specifically adapted to this use. This will result in the better protection of non smokers, EEC compliance with French law (Loi EVIN du 10 janvier 1991) and a reduction of the risk of fire.

A car traffic audit with the objective to improve road security in the surroundings of the EEC premises has been conducted. Several of the recommendations have been implemented; others will be implemented in 2004.

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## **4d Technology is managed**

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### **Identifying emerging alternative technologies**

The INO Research Area was created specifically to identify and evaluate alternative and emerging technologies in the light of their impact on ATM.

INO are currently investigating advanced display technology involving stereoscopic 3D visualization in partnership with Linkopings University in Sweden.

A technique used in video publishing, known as Water Marking, was applied to encode aircraft callsigns, winning the Innovation Award at ATC-Maastricht 2004.

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## **4e Information and knowledge are managed**

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### **A Strategy for Knowledge Management**

The EEC decided in 2003 to develop a Knowledge Management Environment based on People, Processes, and Technology, supported by a Sharing Culture. The aim is to increase efficiency by enabling smart decision-making, based on the right information used by the right expertise.

Starting with a review of existing EEC knowledge assets, a strategy for implementing KM was developed by the KANT project.

This KM Strategy is based on a smooth introduction of KM enablers increasing awareness of knowledge availability and providing people with the means to share knowledge more easily.

The initial KM enablers are:

- Communities of Practice - networks of people who come together to develop and share their knowledge in their common field for the mutual benefit. Three Communities have been launched on "Real-time simulation platforms", "Project Management", and "Safety".
- Babylon glossaries - Professional, thematic and linguistic glossaries to establish a common professional language.
- ATM Intelligence Watch - a mechanism that allows the collection of know-how from various domains. Different types of watch that will benefit the EEC have been identified along with the available support tools. A pilot watch will be conducted in 2004.

The KM team conducts regular reviews of the Communities of Practise to evaluate their activities and take corrective actions to maintain a high level of participation.

The EEC KM Strategy is in line with the Agency KM activities and support is provided to HQ in the implementation of the Content and Document Management Solution (CDMS). The EEC is represented and actively participating in the corresponding bodies at corporate level.

The possible integration of intellectual property rights into KM has been analysed. It has been decided that this is not an issue for the EEC at this stage.

### **Providing access to knowledge & information**

External as well as internal communication is managed by the MIM (Marketing and Information Management) Support Unit.

An annual EEC Activity Report is widely distributed to internal and external stakeholders of the EEC. The quarterly electronic EEC Newsletter is distributed to EEC Stakeholders. Within a short period of time it has become a highly-valued support for our external and internal communication. Audience is systematically monitored in order to measure the actual audience.

Information is also communicated through conferences, workshops and site visits. Brochures on the Centre and its activities are distributed and regularly updated. Standard slide presentations are used during these visits along with demonstrations in the operational rooms and the show-room.

The visitor database developed in 2002 and recording all the details of the visits has been completed. It contains now, not only details on the visits of 2003, but also all historical data back to 1995.

Interviews with the press and the media are coordinated with EUROCONTROL Headquarters and usually provided by the Director EEC.

External web sites are extensively used for communicating, either for general EEC information or for specific groups of ATM users. The design of the official EEC web site conforms to the corporate style definition.

EEC reports and notes are distributed to around 250 representatives of our stakeholders. Since 2001, taking into account the wider use of the Internet, the reports and notes are announced to our stakeholders by e-mail.

Special software has been installed in order to give staff access to the large number of photographs charting the long history of the Centre. Some 1500 pictures are available through this new tool.

### **Supporting Internal Communication**

Minutes of all management meetings are published on the Intranet within a week. Attendance at the Weekly Information Corners (WIC) is monitored and published on the

Intranet. An internal newsletter, *EEC News*, is issued four times a year since 2002. These two new media, as well as internal communication in general, are monitored by an Internal Information Monitoring Group (IIMG) to detect and respond to information needs and opportunities.

The Intranet Homepage includes a list of forthcoming events at the EEC, headlines of important events in ATM, and a weekly Management Column. It also includes an "Infocentre" where all information and working documents are accessible by category. Administrative, financial and general-purpose tools are also accessed via the Intranet.

The effectiveness of internal communication tools is regularly measured (read and write use of newsgroups, WIC attendance, etc.). An Internal Information Survey was carried out in 2003. The results are systematically taken into account by the IIMG for improvement actions, e.g. more WIC's dedicated to strategy.

A library service is available which offers subscriptions to periodicals, purchase of books, loan of books, as well as assistance for information search through databases. External database searching is co-coordinated with other Directorates. The use of the library service is measured (see [9b](#)).

Archives have been managed at the EEC since 1999. All movements are closely monitored and detailed statistics which are used for planning purposes are available (see [9b](#)). Tools and standards have been introduced to further improve the management of the EEC Archives.

## 5 PROCESSES

*Excellent organisations design, manage and improve processes in order to fully satisfy, and generate increasing value for, customers and other stakeholders.*

### 5a Processes are systematically designed and managed

#### Background

Formal process mapping and documentation started at the EEC in the early 1990s concentrating on real-time simulations which have been the Centre's main activity since its origins in the 1960s. Software is a major component of the real time simulator, and it was in order to improve software quality that a software engineering unit (SEU) was created in 1991. Thereafter SE standards and processes were gradually developed based on IEEE and DoD standards. Since 2000, in order to increase the overall effectiveness and efficiency of the EEC, process identification and documentation has been gradually extended to all activities. The EEC is strengthening its research role in partnership with the European Commission in order to build a more efficient European ATM research capability meaning the EEC is now focused on the validation of concepts rather than the improvement of current operational ATM systems. Consequently processes must now embrace the strengthened research dimension in addition to the simulation dimension. At the end of 2002 a specific process co-ordination unit was created in charge of defining, implementing, and improving processes.

#### Designing the organization's processes

The process co-ordination unit initiated a general process mapping to check the consistency of processes with the top level process framework which was developed in 2002, as well as identifying redundancies and possible gaps. A web-based matrix view of the process map was developed which includes identified processes, their owners and the supporting documents. This raises visibility and allows better identification of possible interface issues with our stakeholders.

Process Mapping 2002 - process groups	
People	Infrastructure
Finance	Strategy
Work Programme	Organisation
Communications	Stakeholder

Figure 5a-1

This process mapping work was further progressed in 2003 through the creation of the Support website where all relevant documents including processes were organized by activity, and were reviewed and updated. Process descriptions are organized in a distributed manner by activity, but an indexing process enables all processes to be easily listed. Processes are documented in structured MS WORD documents in order to facilitate maintenance since no special tool knowledge and no special training are required.

Support Web site - process groups 2003	
Management	Work Programme
People	Communications
Finance	Social Welfare
IT	Prevention and Protection (OHS)
Health and medicine	General Services

Figure 5a-2

The strengthened focus on research both from the management and execution point of view means that the key core business processes do not have the stability of the more classical support processes. In some cases, their innovative nature has required years of research with our partners to move towards process maturity. An example is the Operational Concept Validation Methodology (OCVM), which has been developed in conjunction with our European partners based on the results of the EC MAEVA project. Key core business processes are listed in figure 5a-3.

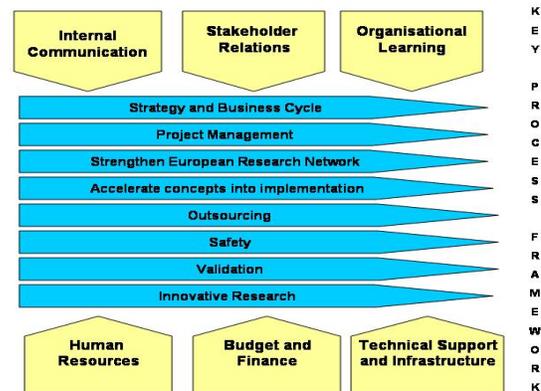


Figure 5a-3

The relationship between the key processes and EEC strategy is explained in *section 2d*.

The design of core business processes is led by a process owner and is characterized by the research necessary to develop the process. The process co-ordination unit participates in the work and ensures overall coherence within the process framework. The validation process was referred to above.

### Identifying process stakeholders and managing interface issues

Based on its mission, the EEC leads European ATM research and drives the European research network. Consequently all of its key core business processes have European scope and they can only be effective with full stakeholder involvement in the process development and evolution.

The validation methodology is applicable across all European ATM research and was developed with key stakeholders through European commission projects. Stakeholders participated in the project consortia.

The European ATM Master Plan alignment process seeks to align the EEC work programme with the MP. Because of the leading role of the EEC in research, our partners expect the EEC to lead the development of the research part of the MP, and this activity, in conjunction with the main stakeholders, the European Commission, and the ATM supply industry, is being driven by the EEC and is integrated with the internal work programme alignment.

Outsourcing is a key element of EEC strategy (see Chapter 2). The main purpose is to retain diversity in the European ATM research community and to foster the enhancement of Centres of Excellence in the European research network. Our key research partners are critical to the success of this process since they also have to evolve in order to develop their Centres of Excellence and to be in a position to respond in a timely and cost effective manner to the EEC calls for tender. They have been intimately involved in the process development. In the case of ESCAPE outsourcing, major workshops were organized where EEC and research partners contributed in order to obtain consensus and to converge on the best process.

Internal interface issues are managed by the group or groups which oversee the processes concerned. For example, the staff plan process – incorporated under Human Resources – key to EEC skill profile evolution, embraces several entities, processes, and activities in the EEC. The evolution of the process is led by the Head

of the ACE Centre of Expertise, but this work is coordinated also with the process co-ordination unit which supervises the research area portfolio reviews and which clarify outsourcing strategy and consequently which skills will be developed in house and which skills will be developed elsewhere in the European ATM research network.

### Process Management System

Consistent with the EEC matrix organization and the principle of subsidiarity, responsibility for a given process resides at the lowest appropriate level in the organizational structure. Importance of process ownership is reinforced by explicitly placing process responsibility in the tasks and objectives of the individual performance appraisal.

### Applying standards

External standards are used at the EEC to facilitate the implementation of processes and procedures and document standards. Figure 5a-4 provides an overview of external standard usage.

CORE BUSINESS PROCESSES	
Activity	Standard
All	EATM Handbook, internal standards
Safety culture	Industry safety culture maturity model
Safety Assessment	EATM Safety Assessment Methodology
Concept Validation	Operational Concept Validation Methodology
SUPPORT PROCESSES	
Activity	Standard
All	Internal standards
Software Engineering	IEEE 12207 ESA PSS-05-0
Quality systems	ISO 9000
Security Management System (planned)	OHSAS 18001
Environment management system (under development)	ISO 14001
Manual for site security	NF X 50-777
Prevention Plan	Decree No 92-158 of 20 February 1992. (legislation)

Figure 5a-4

### Process indicators and performance targets

Outcome measures have been developed for some processes through the work on key performance indicators. Such outcome measures are reviewed on a quarterly basis in the KPI reviews and the process is updated and improved as necessary. One recent example concerns the diversity KPI associated with the outsourcing key process where the KPI review

identified that we were missing the research part of a contract when the main supplier subcontracted part of the work to a research unit. The outsourcing process was improved accordingly.

Targets are set and reviewed for outcome measures where these are key performance indicators.

**Reviewing the process framework in view of delivery of policy and strategy**

The review of the key core business process framework takes place annually as part of the Strategy and Business Cycle process. Strategy is reviewed by core management, by the research areas and by the team responsible for the Business Plan review, updated and required adjustments to the organization and to the core business processes are initiated.

Regular assessments of the effectiveness of the core business processes take place in the research area portfolio reviews and in the WMM meeting which is the main meeting overseeing strategy, work programme and project progress.

**5b Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders.**

**Identifying and prioritizing opportunities for improvement**

The systematic approach to identifying and prioritizing for process improvement is embedded in the continuous improvement culture, and is therefore a continuous activity which is the duty of all members of staff and in particular process owners. The main sources of improvement are listed in figure 5b-1.

Main sources of process improvement	Frequency
Business Plan cycle	Annual
Portfolio Reviews	Each unit two per year
KPI quarterly reviews	Quarterly
People satisfaction survey	Annual
Annual self-assessment	Annual
Stakeholder survey	Every two years
ECCG feedback survey	Twice per year
Support unit & CoE reviews	Annual
Suggestions Box	Monthly review
Continuous improvement culture	Continuous
Matrix review	18 months

Figure 5b-1

The Business Planning process and the associated portfolio review process are the main core business drivers from the point of view of

planning and resourcing and implementation monitoring.

The overall continuous improvement cycle and the annual self-assessment are combined in one process which is depicted in figure 5b-2. This high level process diagram is used to explain the overall improvement cycle to staff. Prioritization of improvement opportunities is an important part of this process in order to generate a consolidated and realistic list of improvement actions. Input includes the self-assessment feedback report areas for improvement, the actions resulting from the people satisfaction survey and the list of ongoing improvement actions. Priorities are set based on potential for improvement, resourcing possibilities, degree of difficulty of implementation. The review is led by the Special Advisor (Core Management) in collaboration with other senior and middle managers. The prioritization takes place in the "consensus" box of figure 5b-2.

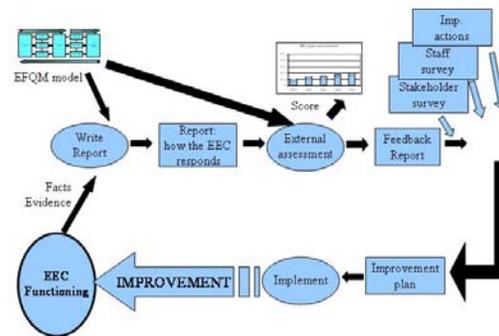


Figure 5b-2

**Using performance and perception results from learning to set priorities and targets**

Stakeholder satisfaction surveys (section 5e) have revealed that stakeholders require ever more information concerning projects and research results. This has prompted several iterations of review and improvement of the external communication processes. EEC reports, notes, annual report (section 4e) are now all available electronically on the external web site.

In order to further improve the timely delivery of project and research information to stakeholders, a process to compile and deliver a quarterly web based External Newsletter, was developed and deployed in Q2 2003 (see 4e). An e-mail praising the quality of the Newsletter has been received from NASA, one of the principal research centres in the US.

Project management method deployment has been monitored through the development of a project management quality indicator and a timeliness of milestones indicator. These are reviewed for each research area on a quarterly basis and corrective action is initiated if targets are not met. Aggregated results are provided in sections 6b and 9b respectively. An audit of project management maturity was completed in 2003 and improvement actions were identified and implemented.

#### **Innovative talents of employees and other stakeholders used for process improvement**

Innovation and creativity is stimulated at the EEC through the open and democratic trust culture and the flat matrix organisation. This has not only benefited core business activities but also support activities and continuous improvement. Opportunities for process improvement are sought from as many sources as possible, and have resulted in incremental changes and some breakthroughs.

The systematic improvement of the budget management processes is an example of the use of the innovative talents of employees for process improvement. In 2000 new financial regulations were introduced, including multi-annual budget planning so improved cash-flow planning processes were developed by the Core Business Manager and the budget management section. These improvements allowed an increasing awareness of budget status through internal communication, improved information, and training in the essentials of budget and finance for project managers. EEC budget usage performance is recognized as best in Agency. The integrated information system (ACB) created and developed in-house is providing support to the project planning and budget processes and is also supporting the procurement process since early 2003 (see [4b](#)). The use of this integrated tool by project leaders and business area managers has drastically improved the budget planning.

The self assessment process itself is a valuable source of process improvements. The 1998 self assessment generated an improvement action to develop a people satisfaction survey (section 3a). This was a breakthrough as far as the EEC was concerned. The process has evolved and from 2002, the people satisfaction survey uses a questionnaire which is common to the whole of the Agency. This will enable data to be aggregated and conclusions to be drawn for the Agency as a whole. The development of the people satisfaction survey is another example

where EEC innovative talent has led the Agency to overall improvement.

The learning culture ensures the establishment of focus groups when particular issues need to be addressed. A prime example is the values project instigated by the Director in Q3 2002. The objective of the project was to develop explicit values for the EEC. Focus groups drew in a wealth of individual innovative talent to help on this challenging project. The values implementation impacted many existing processes in order to embed the EEC values into the EEC culture.

The matrix organisation is assessed and reviewed periodically with a view to further improvement. In 2002, the matrix structure was extended to the support units and the core business matrix was aligned to better fit the proposed reorientation of the EEC towards a longer term strategy as proposed by the "strategy task force". The management structure of research areas was adapted to larger size units by setting-up management teams (early 2003).

Electronic newsgroups (section 3d) are a valuable source of improvements especially regarding improvements to the working environment. Senior management and Suggestions Board members regularly monitor newsgroups to identify potential improvements. In 2002, the newsgroups, as well as the minutes of management meetings, were the source of a semiotic analysis in the context of the EEC VALUES project (see [1a](#)).

The suggestions box (section 3c) is an established method for identifying and implementing improvements. Results are given in section 7b.

#### **Managing process change**

Process changes, depending on scope and complexity, use piloting, communication, and training to ensure a successful outcome to the change process.

Recent piloting examples are: the home working process which went through several trial iterations and major changes to IT procedures and systems which are again piloted on a population sample.

Communication normally takes the form of presentations given at different times and days in order to reach a maximum of the target population.

Training is the responsibility of the Heads of Centres of Expertise and the executive forum is the Training Co-ordination Committee (TCC) (see [3b](#)). The TCC meets monthly. Requirements for training to support process change are managed here in the Strategic Orientations section of the training programme. Training consists of the production of appropriate documentation such as guidelines and templates together with one or more training sessions to reinforce the written material. One recent example is the major change to the procurement procedures when tasking contracts were introduced to replace the majority of body-shopping contracts. A second on-going example concerns training support to the implementation of the research outsourcing strategy.

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### **5c Products and Services are designed and developed based on customer needs and expectations.**

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#### **Determining customer current needs and expectations**

Work at the EEC is organised in projects, ranging from large scale projects to portfolio of smaller studies. Unlike production-line companies, where the client is buying the end product, each of the EEC projects involves a great deal of interaction with stakeholders due to the required link of our research with field experience.

Stakeholder/market surveys (section 2a) seek to determine stakeholder satisfaction with the scope and structure of current EEC activities as well as their expectations for future activities. In 2002, the customer survey conducted by IPSOS included interview of a group of personalities as well as a parallel mirror survey of staff opinions (see [6a](#)).

ECCG meetings (see [2a](#)) are also used to validate re-orientations of EEC strategy, services, and products through the ECCG review and endorsement of the draft EEC business plan.

Feedback surveys are also used to identify improvements aimed at enhancing products and services. Two recent examples are the Budapest research conference survey 23-27 June 2003 and the Capacity Planning workshop survey 27-29 April 2004.

Some examples of EEC re-orientations based on the perceived future needs of stakeholders follow.

In 1998 a major initiative was launched to expand the partnership with the European Commission (EC) because of the increased importance given to ATM in the EC 4<sup>th</sup> framework programme for research and technological development. Because of its neutral and objective positioning, the EEC was able to respond to the ATM community requirement to provide a site for the development of the first instance of a European integration and validation platform for the future unified European ATM system. Further responding to the needs of the ATM community and the EC, the EEC work has been expanded and restructured into the ERIS programme which now also contains the Gate-to-gate-2005 project of the EC 5<sup>th</sup> framework programme.

In support of the ATM 2000+ strategy and in order to contribute to an increased understanding of safety risks in the European ATM system, safety activities have been gradually expanded at the EEC. The ATM Automatic Safety Monitoring Tool (ASMT) has been developed by the EEC. It provides an automatic monitoring facility for safety related occurrences based upon operational data and encourages the concept of automatic safety monitoring in a non-punitive safety culture. The tool entered into operations in August 2002 (MUAC). Several implementations of ASMT have been completed since 2002 and interest has been shown by other sites. This illustrates the alignment of the EEC strategy on safety with that of the Agency in supporting the member states.

#### **Designing and developing new products and services together with customers and partners that add value for the customers**

In many projects, our stakeholders are part of the project teams at our or at their premises. This gives a very direct and open feedback, and allows the client to have a direct influence on the end product during the process. Other forms of projects involve a high degree of partnership with members of consortia from industry and research bodies; the EEC has developed this ability to take part and manage this type of interaction.

Project outcomes are reports, demonstrators and prototypes. "Products" which do emerge from the projects are, as a general rule, made available to stakeholders free of charge. We also deliver open source products to industry, allowing them to commercialise and sell a new product.

All customer-related activities, based on projects, have commonly agreed project plans that are approved and signed by the client at the beginning of the project. These project plans are regularly submitted to peer-reviews by the business area managers, heads of centres of expertise and the work programme manager in order to assess their adequacy with the EEC overall strategy as well as to the customer/stakeholder needs. A change procedure ensures that changes can be agreed and accommodated based on mutual understanding. We use the result of each project to build up our know-how and expertise, in order to serve present and future customers.

The long development lead time and the enormous financial, regulatory, social, and operational impact of new concepts makes it mandatory to work extensively with all stakeholders when researching and developing new tools and systems. A very promising research area concerns the delegation of separation responsibility from the ground to the air. The work at the EEC comprises several inter-linked projects most of which are collaborative efforts where the EEC is an active partner. Mediterranean Free Flight (MFF) is a major project led by ENAV, and supported by EC TEN-T funding. AFAS and MA-AFAS are EC collaborative 5<sup>th</sup> framework projects with strong involvement of airframe manufacturers.

The EEC has provided extensive support to States for controller working position specification in preparation for new system procurement. The SWI project started in 1999 and took results provided by the DSI project as a model to start developments to define the HMI of the future en-route and approach controller working positions of the future Swisscontrol ATC system. A similar project is being undertaken with ENAV, the Italian ANSP.

#### **Understanding and anticipating the impact and potential of new technologies on products and services**

Technology watch is the role of the Research Area managers. Through conferences and routine contacts with other researchers and partners and through monitoring the specialized press, they keep abreast of new technologies which could potentially benefit ATM. The innovative research area (INO) carries particular responsibility for the blue sky aspects of technology watch. Investigations start with small feasibility studies which are expanded into larger projects if the avenue of research shows promise. It is critical to involve key partners and beneficiaries at an early stage in the lifecycle to

make an early assessment of eventual viability and acceptability. Two examples follow.

The EEC has been a major player in the original identification and subsequent development of the Automatic Dependent Surveillance (ADS) technology and the follow-up ADS-Broadcast (ADS-B) technology as applied to ATM. ADS-B is providing opportunities for new functionality such as ground situational awareness, airborne situational awareness. One of the highlights in 2003 was EEC support to certification of the first SAS Boeing 737 equipped with the Rockwell Collins ATN/VDL-2 avionics for controller Pilot Data Link Communications with MUAC.

On the advanced technology investigation front, in 2003, the study into the adaptation of digital watermarking techniques for pilot-controller VHF (Very High Frequency) voice communication has provided remarkable results that could open the door to significant short-term applications. Baptized Aircraft Identification Tag (AIT) the study demonstrated that aircraft identification, e.g. call-sign, can be automatically added as a digital signature to a voice air/ground communication without any modification to the existing equipment. In consequence the aircraft call-sign can be automatically detected through VHF communications thus enhancing security protection with a very promising low Message Error Rate. This work was conducted in collaboration with the University of Technology of Graz.

Using creativity, innovation and key competencies of internal people and external partners to design and develop competitive products and services

Creativity is the lifeblood of a research centre. It is fostered at the EEC through:

- the collaborative aspects and flexibility of the matrix organization
- partnership with universities and sponsorship of doctorates
- partnership with other research centres
- training

2004 sees two on-going training actions led by the TCC (see [3b](#)). Creativity training in French is being organized (following an English version in 2003) and a creativity workshop is being organized in collaboration with Headquarters. Creativity coupled with the consideration of the longer term stakeholder expectations has been the approach taken by the Strategy Task Force created in 2002 in order to identify potential conceptual orientations of EEC research. This has been achieved through the application of numerous structured brainstorming sessions for

idea generation and problem exploration within a multidisciplinary expert group. Training in structured brainstorm techniques (RANA) has also been provided.

The AIT project cited above is a first class illustration of collaborative creativity between EEC people and an external partner (University of Graz) where a simple idea and technology used in other sectors of the economy has been rapidly exploited with a great potential for rapid operational deployment and benefits to ATM.

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## 5d Products and Services are produced, delivered and serviced.

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### Producing products and services

The core business of the EEC is research and validation as depicted in the following high level project lifecycle.

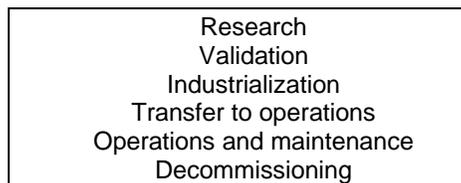


Figure 5d-1

The products delivered by the EEC are research results and validation results in the form of papers, reports, prototypes, demonstrators, simulators. EEC products are transferred to the entities responsible for the further steps of the lifecycle, starting with industrialization e.g. the ATM system supply industry, ANSPs, the airframe and avionics supply industry, depending on the nature of the product. Products are also transferred to research partners to further the general ATM body of knowledge.

To facilitate the transfer of research and validation results to the implementers, the EEC has adopted an approach whereby the implementer is involved as early as possible in the lifecycle through partnerships and consortia membership, and through the ERIS research enabler by progressively greater involvement of industry and ANSPs in ATM system component prototyping. Results are given in section 9a below.

Some research and validation products and services produced by the EEC are recognized by the ATM community as being sufficiently important, or unique or timely, that they are transformed into operational products and services delivered by the EEC to the customer.

Some examples of these research spin-offs are provided below. A complete list is provided in section 6b.

### Communicating the value proposition to existing and potential customers

Early buy-in to research ideas is obtained by early involvement of all concerned stakeholders explicitly in research projects. Stakeholders participate in specifying and validating the research. It is absolutely necessary that key beneficiaries and implementers accept the value proposition especially as the work matures and progresses along the lifecycle. If acceptance is not obtained, the line of research will be stopped.

The value proposition is also communicated to existing and potential customers via the normal external communication channels such as the external web site, the quarterly external newsletter, the annual report, stakeholder visits to the EEC, EEC staff visits to stakeholder sites etc.

A new estimated ATM impact approach to value proposition communication is being developed in 2004 whereby key projects and deliverables and packages are being plotted on a chart with horizontal axis the degree of acceptance of key beneficiaries and on the vertical axis the estimated benefit to ATM - one chart per research area.

### Delivering products and services to customers

The infrastructures provided by the ERIS and SFM units are used internally by research areas to achieve their objectives in terms of concepts and operational validation. The facilities allow the feasibility and benefits of new airspace organisations, new traffic flow management schemes, and new working methods and systems to be explored. The total lifecycle of a large real time simulation lasts up to 18 months. The ANSP customers are involved from the very beginning of the project to accurately specify the requirements, and controllers from the participating member states work at the EEC for up to 4 weeks during the simulation execution. The results of the project are a set of recommendations to improve the efficiency of the airspace under consideration. These recommendations are then considered for operational deployment by the participating ANSPs.

In the field of flow management research, the EEC is providing the Central Flow Management Unit and its stakeholders with a research

environment where the exploration of specific flow management issues can be performed. Such projects result in recommendation for new operational procedures as well as prototypes which are then raised to the standard of real time systems.

### **Servicing products and services**

There is one notable exception to the policy of focusing on research rather than the support of operational products, and this concerns the EEC real time simulation platform based on the ESCAPE, IPAS, and AudioLAN components. This simulation platform is probably the most powerful real time ATC simulation platform in the world, but its complexity is such that until now industrialisation is judged to be impossible. Instances are deployed at three Agency sites, Luxembourg, Maastricht, and Budapest (as autonomously as possible). The EEC has set up the SFM coordination cell which interfaces with remote sites to co-ordinate deployment of new versions and to provide a hotline service. ESCAPE deployment is further described in section 4a above. Further results concerning spin-off products and services are given in section 6b below.

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## **5e Customer relationships are managed and enhanced**

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When looking at each RA it becomes clear that the types of customers and the products are different for each RA and each Research Area Manager (RAM) is responsible for the improvements in his own RA.

The recording of customer details and contact management is now made through the deployment and use of an Agency contact database which allows clear view of the links to the numerous working groups. This contact database is used for generating the population for the stakeholder survey which is conducted once every two years.

On a project basis, the greatest numerical involvement of customers occurs in real time simulation execution where up to 40 controllers can participate in a real time simulation. After each simulation we ask the participating air traffic controllers to rate our performance.

### **Handling day-to-day feedback**

Feedback linked to research and validation activities follows a project rhythm rather than a daily rhythm. Feedback linked to operational services and products is the responsibility of the delivery unit and depends on the type of product

or service. A typical arrangement will include a customer service desk or hotline where first level queries are serviced and where problems are logged. Contact is usually by telephone or e-mail. A second level of support is provided by the appropriate technical teams. The customer is provided with feedback regarding the severity of the issue and the expected time to repair. Solutions will be delivered directly or will be incorporated into release cycles depending on the complexity.

### **Proactive involvement with customers in order to address their needs, expectations and concerns**

Proactive involvement of customers has been organised for customers of the ESCAPE real time simulation platform. User groups have been established and meetings are organised on a regular basis to discuss their needs and expectations with respect to platform support and also with respect to simulator functionality. This is further described in section 4a above. As explained in section 5d, day to day contact is assured by the SFM co-ordination cell.

At a strategic level, as explained in section 1c above, stakeholder VIPs are periodically invited to the EEC. The objective is to exchange views, to understand their needs and expectations, to present EEC strategy, and to explore opportunities for collaboration.

A high emphasis has been given to external communication; a long experience of EEC site visit showed the benefits of such a communication and an approach has been taken to reinforce communication with stakeholders and the media. The communication is targeted explicitly towards groups such as:

- ECAC members states representatives
- ATS service providers
- Airlines and airlines organisations
- Professional ATC and aeronautical organisations
- Aviation press
- Research establishments
- Industry
- European Union representatives and other international organisations

Guests are not only Europeans, but originate from a wide variety of countries world-wide including America, Japan, and China.

Visits of EEC staff to stakeholder sites also maintain and enhance stakeholder relations.

External contacts are enriched through participation to external events and seminars. The EEC is frequently the organizer or co-organizer of such events.

At the project level, project leaders and project team members are in regular or constant contact with customers and partners in order to clearly establish objectives and specifications and subsequently to ensure continued alignment with customer needs and expectations. Customer representatives are frequently integrated into project teams.

**Surveys and levels of satisfaction**

Stakeholder/market surveys (section 2a) are designed to provide satisfaction levels for different aspects of the stakeholder relationship such as EEC ability to deliver results on time, the professionalism of EEC staff. Results are detailed in section 6a.

The Project Support Office (PSO) manages the BP deliverable satisfaction process. Independent of the delivering Research Area and project, PSO sends a short satisfaction questionnaire to each customer after delivery of a BP deliverable. Results are fed back to the research area and project to identify areas for improvement.

Research projects using the real time simulation facility issue a satisfaction questionnaire to participants. The questionnaire comprises a core set of questions and a set of questions specific to the simulation used to analyse the quality of the real time simulation service. The SFM unit uses the results to identify areas for improvement.



## 6 CUSTOMER RESULTS

*Excellent organisations comprehensively measure and achieve outstanding results with respect to their customers.*

### 6a Perception Measures

#### Satisfaction with research results and validation results

Research results and validation results delivered to customers take the form of reports, specifications, research papers, prototypes and demonstrators. These deliverables are described in the business plan and are segmented by research area. The Business Plan deliverable satisfaction process is managed by the Project Support Office (see [5e](#)).

Overall satisfaction levels with BP deliverables			
	2002	2003	Target
Number of BP deliverables	81	77	n/a
Response rate	25%	36%	90%
Very satisfied	70%	52%	75%
Rather satisfied	25%	43%	
Not satisfied	5%	5%	

Figure 6a-1

The number of BP deliverables is noted only for administrative purposes. The way that the research and validation is best structured, planned and monitored determines the number of BP deliverables in a given year. The response rate to the satisfaction questionnaire sent by the Project Support Office is low but shows an improvement in 2003. We are continually striving to better implicate and better involve the upstream actors in the overall project lifecycle so that we can better gauge the usefulness and potential impact of our research and validation. Section [9a](#) describes a new approach to potential ATM impact which we have started in 2004. Regarding satisfaction with Business Plan deliverables, there is a shift in 2003 from [*very satisfied*] to [*satisfied*]. Closer involvement of stakeholders we believe will shift the satisfaction distribution back towards [*very satisfied*]. The [*not satisfied*] responses are mainly due to late delivery. We are addressing this issue by improving the project management processes.

The targets are set internally by the EEC. We consider that we should be able to get a response from the vast majority of customers, hence the high target figure. The target for [*very satisfied*] is a stretch based on past results.

#### Overall Stakeholder Satisfaction

The EEC aims to conduct a comprehensive stakeholder survey every two years in line with Agency policy. The 1997 survey was organized to gather data for the first EEC Business Plan. It concentrated on EEC positioning. The 1999 survey expanded the scope of the survey and this trend continued in 2002. In 2002 for the first time an internet-based survey was used. Prior to that date the EEC conducted a paper/postal survey. In the following table, satisfaction levels are the sum of [*completely satisfied*] and [*rather satisfied*].

Overall satisfaction with EEC performance					
	1997	1999	2002	2004	target
Overall satisfaction	73%	80%	82%		85%
Response rate	62%	30%	20%		30%
responds well to its mission	-	99%	98%		90%
Positioning	-	73%	72%		90%
Loyalty	73%	71%	94%		90%
Recommendation	-	-	95%		90%
Relations with EEC staff	86%	93%	95%		90%
Communications media		90%	89%		90%
Project management	61%	75%	85%		90%

Figure 6a-2

Not all subjects were addressed in earlier surveys. In general, satisfaction levels have been maintained or are increasing. Detailed results, segmented by Research Area, are obtained in order to target the detailed feedback. These detailed results are not reproduced in this report but are available in the Stakeholder Satisfaction Report.

Another stakeholder survey is currently being prepared and results will be available in Q4 2004.

Several factors contributed to the decrease in response rate over the three surveys. The 1997 survey was a pioneer and the novelty and the intense lobbying resulted in an exceptional return rate. The survey consultants clearly indicated that a result higher than 30% for a postal survey is exceptional. Because of the exceptional return rate of 1997, a significant decrease was expected in 1999. The decrease in 1999 and 2002 was also attributed to the lack of maintenance of the stakeholder database. This weakness is being tackled in preparation

for the 2004 survey by comprehensively reviewing the stakeholder database in collaboration with research area managers and project leaders.

### Qualitative market survey

In 2002 a qualitative market survey was carried out by a specialist consultancy, IPSOS. High-ranking managers in the air transport industry were interviewed to obtain their views on sector evolution, EUROCONTROL, and the EEC (see [2a](#)).

### ECCG Feedback

The Experimental Centre Consultation Group (ECCG) is the main consultation forum for EEC stakeholders (see [2a](#)). During the meeting participants are asked to complete a short satisfaction questionnaire, which addresses two separate issues:

1. The strategy and positioning of the EEC
2. The ECCG process

In the following table, satisfaction levels are the sum of [*completely satisfied*] and [*rather satisfied*].

ECCG feedback				
		2002	2003	target
	Response rate	70%	57%	90%
Strategy and positioning	EEC strategy is well focused on critical European issues	90%	61%*	90%
	EEC strategy fits well with other R&D programmes	71%	**	90%
ECCG process	Meeting style and subjects	95%	95%	90%

Figure 6a-3

The questionnaire also asks for comments. For example, in 2002 many participants asked to be better informed of EEC events and project results via a regular newsletter. To respond to this request the EEC now issues a regular web based external newsletter to all stakeholders (see [2d](#)).

#### Notes:

\* the lower level of satisfaction can be attributed to the difficulty of communicating the revised strategy focusing on the Master Plan.

\*\* question not explicit in 2003.

### Real-Time Simulation satisfaction

Real-time simulation is a validation tool which requires a very large investment in terms of technical equipment, funding, project staffing and controller involvement. A dedicated questionnaire is sent to sponsors after project

completion in order to obtain specific feedback. The table illustrates the results for the three largest real time simulations in 2002: LINK2000+, COSIBA, and TRAMS.

Real Time simulation sponsor satisfaction				
	2002			target
	Link 2000+	COSIBA	TRAMS	
Overall satisfaction	80%	85%	70%	80%
Project management	75%	75%	100%	90%
Meeting timescales	100%	100%	75%	90%
Meeting objectives	75%	75%	75%	90%
Simulation facilities	75%	75%	75%	90%
Analysis and reporting	50%	100%	25%	90%

Figure 6a-4

Results are not available in 2003 because the survey process is being redesigned to improve data capture, to store data on a central repository, and to facilitate systematic analysis.

### Conference organization

Conferences and symposia are indispensable vehicles of the research community dynamic. Conferences and symposia are organized both solely by the EEC and jointly with one or more research partners. Figure 6a-5 provides satisfaction levels for two of the recent most important conferences and symposia.

Overall satisfaction with conferences and symposia		
	Criterion	Satisfaction
Budapest 23-27 June 2003	Response rate	38%
	organisation	93%
	content	93%
Capacity planning workshop 27-29 April 2004	Response rate	100%
	Organization	84%
	content	81%

Figure 6a-5

## 6b Performance Indicators

### Research and validation

A process to track the timeliness of Business Plan deliverables has been in place since 2001. Figures for each project are aggregated by Research Area and are then averaged to produce the overall EEC performance indicator. Projects are reviewed at the initiation of each phase and at least twice per year. Research Area portfolios are reviewed twice per year. These review mechanisms coupled with the budget checkpoints which are held quarterly, enable problems to be detected early and corrective action to be initiated as necessary. The detailed Research Area results are not reproduced in this report.

Timeliness of BP deliverables			
2001	2002	2003	target
72%	69%	74%	85%

Figure 6b-1

### Real-Time Simulation Service at the EEC

Real-Time simulation is an important validation tool. The volume of the service delivered by the EEC to its customers is measured in terms of the number of hours available to the customer for acceptance, training and simulation. The quality of the service is measured as the achieved hours as a percentage of the planned hours. The measurement of quality of service will start in 4Q04.

Real Time Simulation service measures					
	2001	2002	2003	2004	target
Volume (hours)	795	900	920		1000
Quality	-	-	-		95%

Figure 6b-2

The target of 1000 hours is the theoretical capacity of the two operations rooms based on the average number of hours delivered to a customer in a simulation and the number of real-time simulations that the EEC can deliver in one year.

### Real-Time Simulator external deployment

The ESCAPE real-time simulator is deployed at 7 external sites. The most intensive use takes place at Budapest (CRDS) and at Maastricht. A hotline and service desk are provided for these two users. The EEC provides support on an *ad hoc* basis to other users.

ESCAPE service desk				
		2002	2003	2004
CRDS	TTs handled	8	16	20
MUAC	TTs handled	46	73	18
IANS	TTs handled	-	3	4

Figure 6b-3

#### Notes:

TT = trouble ticket.

### BADA Service

The Base of Aircraft Data (BADA) is an aircraft performance database. It is used for trajectory calculation and prediction in ATC simulations and on-line applications. BADA currently covers 280 different aircraft types which provide about 97% coverage of the European air traffic. The use of BADA is regulated through a licence agreement and the data files are provided to over 70 users worldwide (see figure 6b-4).

BADA user segmentation	
ANSP	13
Research ATM	22
Research airport	3
Universities	23
Industry	15
Total registered users	76

Figure 6b-4

In addition to the external usage shown in figure 6b-4, BADA is used by the air system of the ESCAPE real-time simulator, and is hence used implicitly wherever ESCAPE is deployed both within the Agency and at external sites (see [figure 9a-7](#)).

BADA licence requests			
	2001	2002	2003
	BADA 3.3	BADA 3.4	BADA 3.5
Licences granted	35	26	36

Figure 6b-5

### ACAS monitoring Service

The EEC provides an ACAS (Airborne Collision Avoidance System) monitoring service as part of the EATM ACAS programme. ACAS events are analysed to provide feedback to pilots and controllers, to investigate possible improvements to the algorithms and to identify airframes which have faulty ACAS units.

Resolution advisories collected from all sources					
1998	1999	2000	2001	2002	2003
1636	2405	3579	1624	1257	2386

Figure 6b-6

### Accolades

The innovative research area received several accolades during 2003 and 2004.

Paper	Author	Accolade
Full automation in high complexity airspaces	Rudi Ehrmantraut	Best paper for the ATM track at the 22 <sup>nd</sup> Digital Avionics Systems Conference, Indianapolis
Air-Rail Multimodal Transport from the Passengers Perspective	Antonia Cokasova	Best communication award at the US/Europe ATM research seminar, Budapest
Dynamic air traffic control wake vortex safety and capacity system	Peter Choroba	Best paper award at the TRANSCOM conference, Zilina
Aircraft Identification Tag Watermarking	Horst Hering	2004 Innovation Award. 2004 ATC Maastricht conference

Figure 6b-7

### Partnership added value

We generate intellectual capital for the mutual benefit of both sides in the partnership and for the benefit of the ATM research community at large by seconding EEC staff to partner organisations for periods of up to two years. Figure 6b-8 provides a list of partners which have benefited from these secondments in recent years.

Segmentation	Partner	Number of secondments
Research Community	FAA WJHTC	1
	NASA Langley	1
	European Commission	2
Aeronautics industry	Boeing	1
	Airbus	(Planned) 1
ANSPs	Skyguide, CH	1
	AENA	1

Figure 6b-8

## 7 PEOPLE RESULTS

Excellent organisations comprehensively measure and achieve outstanding results with respect to their people.

### 7a Perception Measures

Category	Satisfaction factor	1998	2000	2002	2003	Benchmark <sup>a</sup>
Overall results	Overall job satisfaction			86%	90%	lp85
Working conditions	Overall satisfaction with working conditions	73%		89%	92%	
	I have the resources and technology I need to do my job well	58%	56%	89%	92%	
	I can cope with the stress levels of my job	72%		92%	95%	
Advancement and personal growth	Overall satisfaction with advancement and personal growth			53%	61%	
	I believe I have the opportunity for personal development and growth	58%	38%	71%	82%	
	In my current job I have sufficient opportunities to receive training	65%		85%	82%	
	Staff are rewarded according to their job performance			23%	25%	
Leadership	Overall satisfaction with leadership through the direct manager	75%	70%	72%	80%	
	My manager is available when I need him			80%	86%	lp80
	My manager delegates adequate authority to me to do my job	84%	70%	88%	87%	
	My manager provides adequate coaching/guidance to me			70%	67%	
	Overall satisfaction with leadership by EEC core management			53%	62%	
	EEC core management demonstrates teamwork			39%	48%	
	EEC core management will act on problems identified though the survey			47%	61%	
Teamwork	Overall satisfaction with the personal and professional contact with my team colleagues	78%	70%	89%	89%	
	There is a good team spirit in the EEC	12%		56%	71%	
	I have good working relations with my team colleagues	73%		93%	97%	
	Successful team efforts are appropriately rewarded			24%	26%	
Responsibility and Job challenge	Overall satisfaction with responsibility and job challenge	79%	67%	83%	90%	
	The EEC makes good use of my abilities and skills			71%	74%	
	I have documented measurable objectives for the current year			68%	73%	lp72
Communication	Overall satisfaction with the level of communication			55%	74%	Isr37
	The information I need to do my job is readily available	76%	75%	76%	80%	
	Internal communication in the EEC is effective			46%	67%	
Organisational clarity	Overall satisfaction with organisational clarity			47%	60%	
	Mission, goals and objectives of the EEC are clear	70%	66%	70%	65%	
	I have a good idea of what is happening in other parts of the EEC			48%	58%	

Figure 7a- 1

The EEC has conducted three staff satisfaction surveys in 1998, 2000 and 2002. As a consequence of the EEC's first EFQM self-assessment in 1998, a 'people satisfaction' task force was formed and entrusted with developing a questionnaire for the EEC. The same questionnaire with minor modifications was used in 2000. The Agency has recognised the importance of staff satisfaction surveys and the 2002 survey was the first one to be conducted Agency-wide with a unique Agency developed questionnaire, thus allowing for comparison and

transparency within the Agency. This questionnaire was more comprehensive than the EEC local questionnaire but key questions remained enabling trend identification.

The conduct of staff satisfaction surveys is now part of the annual EEC operational cycle. The aggregated overall staff satisfaction and the response rate are both elements of the EEC balanced scorecard. The survey results are communicated internally, via the EEC's Intranet and at a dedicated weekly information corner for

<sup>a</sup> The coding of benchmarks in the last column is as follows: lp=IPSOS, Isr=ISR

all staff. A detailed and comprehensive action plan is set up and executed in order to address the issues identified by the survey results.

The list of measures which were taken as a result of the 2002 survey is provided in section 3a.

To promote world environment day in 2003, a series of exhibitions and events was organised to raise staff awareness of environmental issues. The participation level was good and the feedback was positive. The results will be used to prepare a similar event in 2005.

Similarly, a Health Promotion Day was held in June this year with the aim of informing staff on issues such as healthy eating, taking exercise, avoiding stress and relaxation.

The staff response to these two events is shown in Figure 7a-2.

Health & Environment Days	
Did you learn something about...	Yes
...the Environment (2003)	71%
...Heart Disease (2004)	45%
...the role of diet (2004)	47%
...relaxation methods (2004)	80%

Figure 7a- 2

## 7b Performance Indicators

### Staff satisfaction survey return rate

Staff satisfaction survey return rate					
1998	2000	2002	2003	Target	Bench-mark
33%	20%	86%	58%	60%	92%

Figure 7b - 1

The benchmark is Yellow Pages 1999.

The participation in the staff satisfaction survey is an important measure of staff involvement and motivation. Participation at the EEC is optional. The exceptionally high return rate in 2002 was due to a particular middle management initiative to explain to staff the importance of their opinion. Also in 2002 and for the first time, an external consultant (IPSOS) collected the questionnaires and performed the analysis. This would have contributed to the feeling that privacy was preserved and thus probably had a positive effect on the return rate. In 2003, there was a change in the process at Agency level given concerns about confidentiality in some

Directorates (concerns apparently not shared at the EEC). This year, individual staff members were responsible for returning the questionnaires directly to IPSOS, which could explain the difference in return rate as compared to 2002.

### Absences

Absences are a standard indicator of staff motivation. The EEC records two types of absence. Absenteeism is defined as the average number of days of unjustified absence per staff member per year. Sick leave is defined as the average number of days of justified sick leave per staff member per year.

Absences (days)					
	1999	2000	2001	2002	2003
Absenteeism	2.2	2.2	1.9	2.0	1.9
Sick leave	12.7	15.5	16.47	12.72	12.4

Figure 7b - 2

There is a small decreasing trend for both of the absence indicators. Regarding absenteeism, the EEC compares well with the UK national average for absenteeism which is 3.6%. For the EEC, 3.6% equates to 9 days per staff member per year.

### Accident levels

Two standard indicators are tracked, accident frequency and accident seriousness. Accident frequency is normalised and measured as the number of accidents per 1 million hours exposed. An accident is defined as an event at the place of work or on the journey to work which results in death or inability to work for at least one day. There were three accidents in 2002 all occasioned on the journey to work.

Accident frequency			
2000	2001	2002	2003
4.33	0.00	3.94	2.58

Figure 7b - 3

Accident seriousness is defined as the total number of calendar days lost per 1000 hours exposure (see [8a](#)).

Accident seriousness			
2000	2001	2002	2003
0.0173	0.0217	0.1955	0.0503

Figure 7b - 4

### Secondment

Currently there is one member of staff working at the Maastricht Control Centre, while another

has just returned from two years at the European Commission. It is expected that another staff member will shortly move to work with Airbus in Toulouse for a period of 2 years.

### Educational Support

Currently 2 staff members are availing of the support provided by the Scholarship scheme to follow higher educational courses such as MBA.

### Performance Appraisals

In 2003 93% of performance appraisals were completed.

Performance Appraisals Completed			
2000	2001	2002	2003
-	89%	90%	93%

Figure 7b - 5

### Communication

Attendance at the WIC varies according to the subject; however the accumulated average attendance so far in 2004 is 62.

WIC Attendance			
	2002	2003	2004
# of Meetings held	25	34	22
Maximum Attendance	127	140	106
Average Attendance	55	49	62
Minimum Attendance	23	23	32

Figure 7b - 6

The attendance is considered to be very satisfactory and the tendency is increasing.

### Training

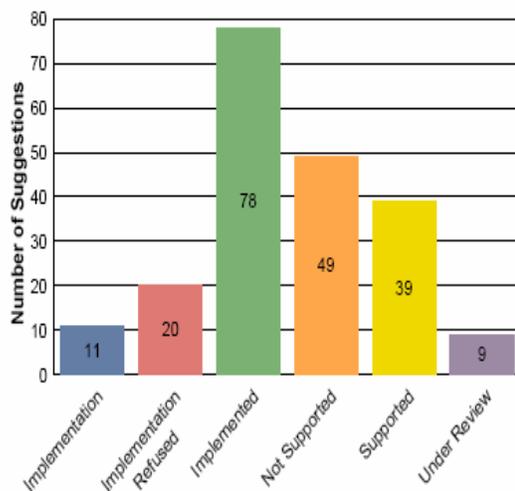
The EEC offers their staff professional training courses in areas relevant for their work. These courses encompass management and project management skills as well as ATM-specific issues, people issues and technical subjects. The figures are days training per staff member per year. The EEC performs well and is very close to the TNT benchmark.

Staff training						
1999	2000	2001	2002	2003	Target	Bench-mark
10.6	9.0	9.8	9.3	9	8	10

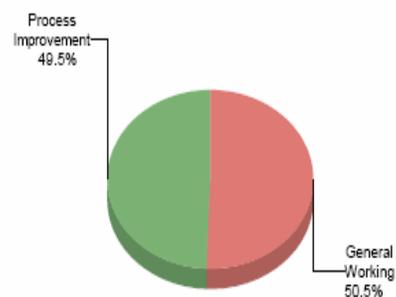
Figure 7b - 7

### Suggestions Box

#### Suggestions By Status



#### Suggestions by Process Type



**Total Number of Suggestions = 206**

The submission rate of suggestions to the suggestions box (section 3c) is well above industry standards. This is an indicator of high people motivation.

To date in 2004 there have been 6 suggestions.

Suggestions submitted					
2000	2001	2002	2003	Target	Benchmark
52	46	44	58	45	25

Figure 7b - 8

The benchmark is based on the figure of 40-50 suggestions per year per 1000 staff for the private sector. The figure for the public sector is 25 suggestions per year per 1000 staff. There are approximately 500 people on site at the EEC.

A set of KPI's and targets have been defined to monitor the implementation of suggestions.

### **Key Performance Indicators**

KPI One is defined as the percentage of Suggestions where the State is equal to "Implemented" or "Implementation Refused"

KPI One (%) = 47.6  
KPI One Target Value = 50%

KPI Two is defined as a percentage of Suggestions where the State is equal to "Implemented" or "Implementation Refused" or "Implementation"

KPI Two (%) = 52.9  
KPI Two Target Value = 75%

KPI Three is defined as the average time to treat a suggestion (State is one of "Implementation Refused" or "Implemented")

KPI Three (Days) = 67

### **Services provided to the EEC's people**

The EEC has recognised that moving to and living in a foreign country brings about some difficulties for their staff and thus encourages and initiates social activities and provides assistance to problems linked to expatriation. Often, spouses and family members are included in these activities. Foreign language courses are open to spouses and partners. Assistance is provided to newcomers to find accommodation, and to find work for spouses and partners.

The *Association Internationale du Personnel EUROCONTROL* (AIPE) serves as our social committee and provides social and sporting facilities for staff. This includes sports classes at the EEC, social activities, a spouses club, and special conditions for the purchase of cars, for insurance and bank accounts. The Club Evasion offers reduced airfares for staff on certain airlines. AIPE also organises festivities on a regular basis, such as barbecues and Christmas parties for staff and their families. The activities of AIPE are strongly encouraged by the EEC management.

AIPE subsidy (euros)		
2002	2003	2004
21000	21000	21000

Figure 7b - 9

Other benefits that EEC staff and contractors benefit from are free coffee from vending machines, flexitime, and personal telephone account for private calls. The tennis court on the EEC premises is available to staff and contractors alike and sports classes are offered in the EEC's gymnastics room during the lunch breaks.

### **Career progression**

The Agency promotion process usually allows approximately 30 staff to be promoted each year. In 2003 however, following the job management process, a total of 58 staff benefited from a career progression, either through a promotion to the next grade or through an internal competition for a post at a higher category (grade C to B or grade B to A).

## 8 SOCIETY RESULTS

Excellent organisations comprehensively measure and achieve outstanding results with respect to society.

### 8a Perception Measures

#### Involvement with the Communities

The EEC seeks to provide training opportunities for both local and international students. Internship duration varies from 2 months to 12 months.

Students at EEC		
2001	2002	2003
18	17	16

Figure 8a-1

The EEC also provides opportunities for school children: the majority of them are the children of staff members, aged from 12 to 14 years old, who want to know exactly what their parents do and what the EEC deals with. These students have to write a report about their personal experience for their school.

School Children at EEC		
2001	2002	2003
12	12	12

Figure 8a-2

The EEC has introduced a scheme to encourage staff to contribute small amounts of foreign currency to charity when they return from mission. A collection box is placed in the EEC main entrance. The charity "Secours Populaire" receives the donation. The figure in the table is in euros.

Donations to charity (euros)		
2002	2003	Target
224	250	↑

Figure 8a-3

An initiative of the Staff Committee to provide crèche facilities during the summer vacation, Eurokids, has been a great success and now runs during all school holidays and on Wednesdays. We have entered a partnership with another local employer, SNCF, the French national rail company, to ensure the viability of a local children's activity centre. The activity centre was threatened with closure because of a reduction in the numbers of children. The Eurokids project has delivered benefits on all sides, to local children, and to the children of EUROCONTROL staff. The increase in the number of children has ensured the

sustainability of the activity centre and has enabled more ambitious and interesting activities to be undertaken.

#### Eurokids

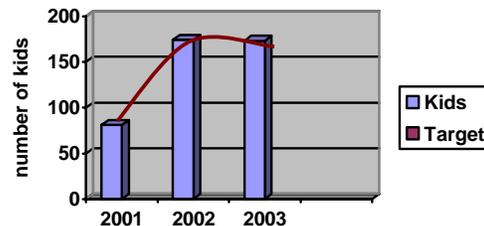


Figure 8a-4

There were mini trips organized in summer 2003 and 4 children took part in them.

#### Ecological impact

The EEC has pioneered the introduction of home-working in the Agency (see 3e). This facility gives significant added flexibility to staff that need it and it also has a positive impact on the environment by reducing the number of kilometres driven.

	2001	2002	2003	2004	Target
Number of staff home-working	5	15	24	45	↑
Estimated km not driven per month			3100	5700	↑

Figure 8a-5

The figure for printer paper consumption is decreasing because:

- ⇒ There are fewer people on-site
- ⇒ Research reports and notes are now made available and distributed electronically
- ⇒ Printing equipment has been continually upgraded to enable easy printing recto-verso and 2-up. Recto-verso printing is now the default printing mode.

Printer paper consumption/tons/yr					
1999	2000	2001	2002	2003	Target
19.5	18	16.5	15.2	14.3	↓

Figure 8a-6

## Reduction and elimination of waste and packaging

The EEC systematically measures waste. The approach was initiated in the course of 2001 when only partial measurement was conducted. The 2001 figure is an estimate. The overall tonnage shows a reduction in 2002 and 2003 due to the introduction of recycling measures.

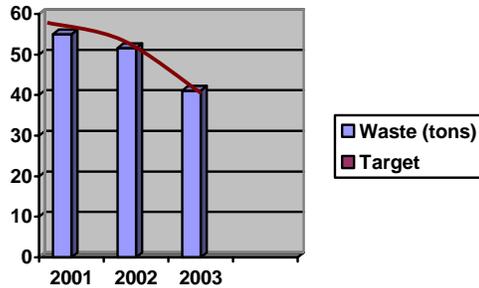


Figure 8a-7

## Usage of utilities

The water consumption figure for 2001 is an estimate since measurement was started during the course of 2001. The graph shows a steady decrease due to fewer persons working on site and measures taken to decrease water consumption including the installation of taps which switch off automatically and the installation of two-flush systems in the toilets.

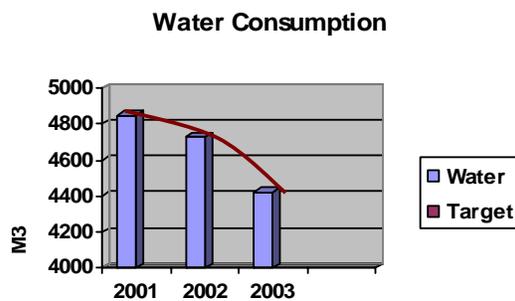


Figure 8a-8

Water consumption figures might rise in certain years due to the cleaning of the façade of the building.

## Water Purification

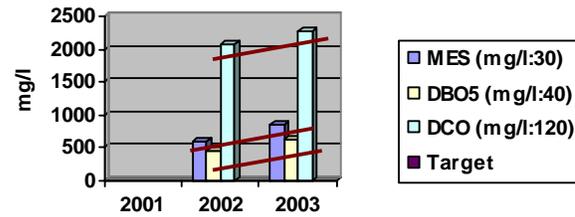


Figure 8a-9

### Key:

MES - Suspension substances: quantity in mg/l of solid particles, of mineral or organic nature, transported by the used water.

DCO - a measure of the organic pollution, to see the consumption of oxygen in mg O<sub>2</sub>/l.

DBO5 - biochemical components in Oxygen. Consumption of oxygen in mg O<sub>2</sub>/l during 5 days. Shows the result of the metabolism of the organic biodegradable pollution, by the micro-organisms present.

## Electricity

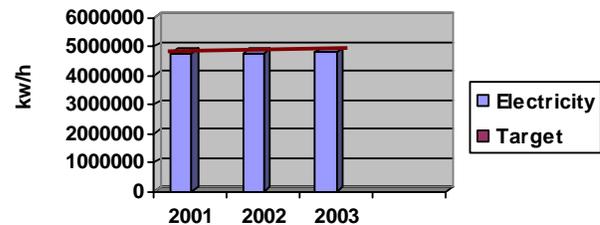


Figure 8a-10

## Recycling/Special Treatments

The EEC has several recycling initiatives listed below. The difference between 2002 and 2003 results can be explained by the introduction of a more efficient recycling/treatment management system at the end of 2002. This system gives more detailed and more correct information than previous manual attempts meaning that the figures shown below for 2002 were approximate only.

### Waste recycling

We have achieved excellent results within this area regarding the environment. We publish

these results monthly and continue implementing new ideas to improve.

Figure 8a-11

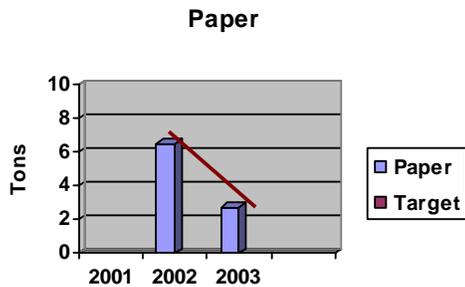


Figure 8a-12

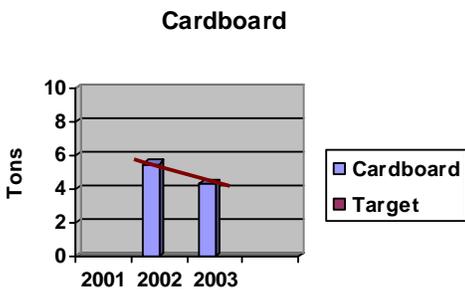


Figure 8a-13

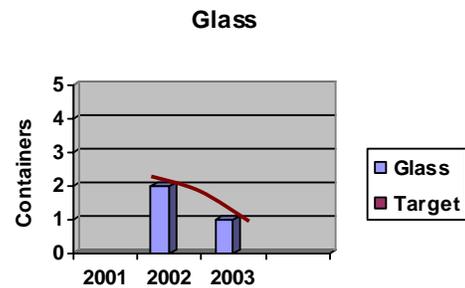
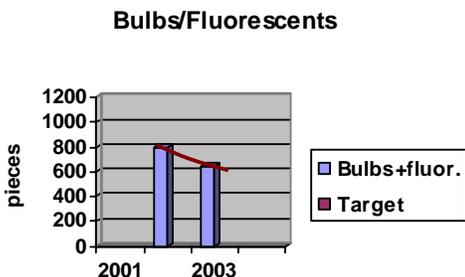


Figure 8a-14



brought regularly to the local waste collection/recycling site. The weight is estimated as being the average weight of a full container.

Batteries/kg/month (estimated)		
2002	2003	Target
20	50	↑

Figure 8a-15

### Toner cartridges

A specialised company (Les Cartouches Ramassées) collects all the inkjet cartridges and toners. The cartridges which can be reused are sent on to other specialist companies. Those which cannot be reused are sent to a specific site (SARP Industries) for ecologically friendly destruction.

Printer cartridge and toner ecological disposal				
2001	2002	2003	2004	Target
100%	100%	100%	100%	→

Figure 8a-16

### Voluntary services

Following the same pattern, some staff members have taken their own initiative in order to support not only the environmental policy but also the community by collecting the plastic tops from the bottles. These tops are recycled by an association called "Un bouchon - un sourire" which buys them again. The money obtained from this process, is sent to another association called "Handisport" for handicapped people.

Plastic caps (100 l bags)		
	2003	Target
Every two months	3	↑

Figure 8a-17

### Batteries

We encourage personnel to bring used batteries to the EEC and to deposit them in a container in the main cafeteria. They are

## Health Risks and accidents

One of the main activities is to have periodic inspections of the correct implementation of health and safety measures aiming at protecting staff and visitors from any risks (see [7b](#)).

In the last 3 years, the following accidents at work were recorded:

Accidents at Work			
	2001	2002	2003
<b>Accidents at workplace with incapacity</b>	2	3	<b>2</b>
<b>Accidents at workplace causing no incapacity</b>	1	1	<b>1</b>
<b>Accidents on the way to work</b>	66%	100%	<b>66%</b>
<b>Others</b>	33%	<b>0%</b>	<b>33%</b>

Figure 8a-18

## 8b Performance Indicators

### Co-operation with the community

Since 1998, and almost annually, one of our strategies in our involvement with the community is the development of cultural activities in promoting scientific research to young people. EEC counts on professional staff with wide experience to investigate potential innovation through collaboration with universities. The EEC programmes can be defined as follows:

Activities
Courses, seminars and lectures of scientific nature in air navigation (improvements in safety, capacity and efficiency)
Publication of the investigations carried out
Supervision of approximately 10 PhD students on-site per year. Each student stays up to 3 years.

Figure 8b-1

Participation of the staff
Programme chairman of the International Annual Conference in the French-speaking Computer Scientists
Programme chairman of the International Annual Conference on Research in air transport.
Coordination of ATM & Airport Area of the European Aeronautical Scientific Network (EASN)

Figure 8b-2

Cooperation (supported by Eurocontrol)	
Deputy Professor of the Institute for Computer Science (IFI)	Collaboration with the French –Speaking University Agency. Lectures in Computer vision (60h); introduction to Scientific Research (30h) at graduate level (Master of Science)
Invited Professor for lectures in computer vision at Ho Chi Min University of Technology , “L’Ecole Polytechnique de Saigon”	The last semester of Engineering degree (60h) is provided.
Official external member of the Examination Board of the University of Zilina, Slovak Republic	For the final Master Degree examinations & PhD examinations (4days/year)
Member of the Steering Committee at the Applied Mathematics Laboratory in the “Ecole nationale de l’aviation civile” in Toulouse.	(once a year)

Figure 8b-3

Cooperation (own initiative but approved by Eurocontrol)	
Human factors Seminar at Delft University in Holland, about Nuclear and Chemical Defence	Every 18 months (4 days seminar)
Consultant in the Nuclear Industry with Safety practices	Ten days per year
Consultant in the Defence Industry about Human Errors in Safety in United Kingdom	Ten days per year (students are brought to Eurocontrol in order to exchange knowledge and provide innovation)

Figure 8b-4

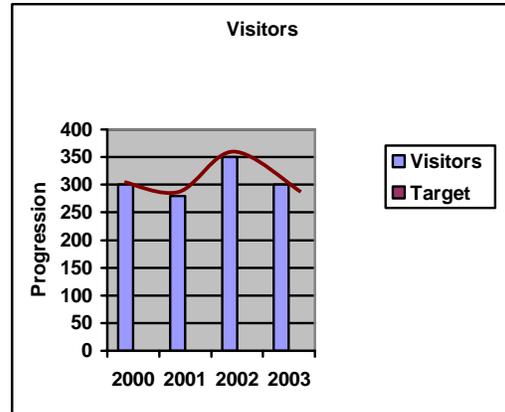


Figure 8b-6.

The increase in EEC activities is shown in the following chart.

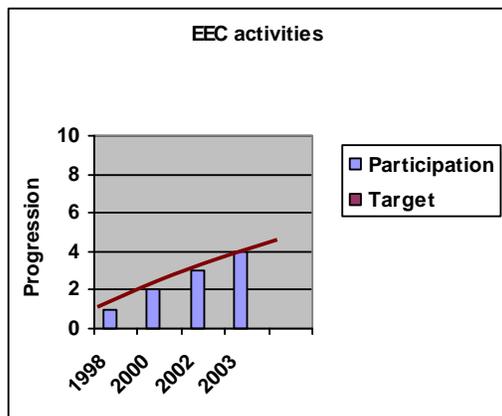


Figure 8b-5

## Visitors

EEC organises various official visits, during which between 250 and 350 guests are made welcome on the premises. In 2000 some prominent guests honoured the Inauguration ceremony of the renovated EEC building, by their presence, such as the Danish Minister of Transport or the French Minister for Infrastructure, Transport and Housing. Some institutions are very attracted by the training activities run in the EEC.



## 9 KEY PERFORMANCE RESULTS

*Excellent organisations comprehensively measure and achieve outstanding results with respect to the key elements of their policy and strategy.*

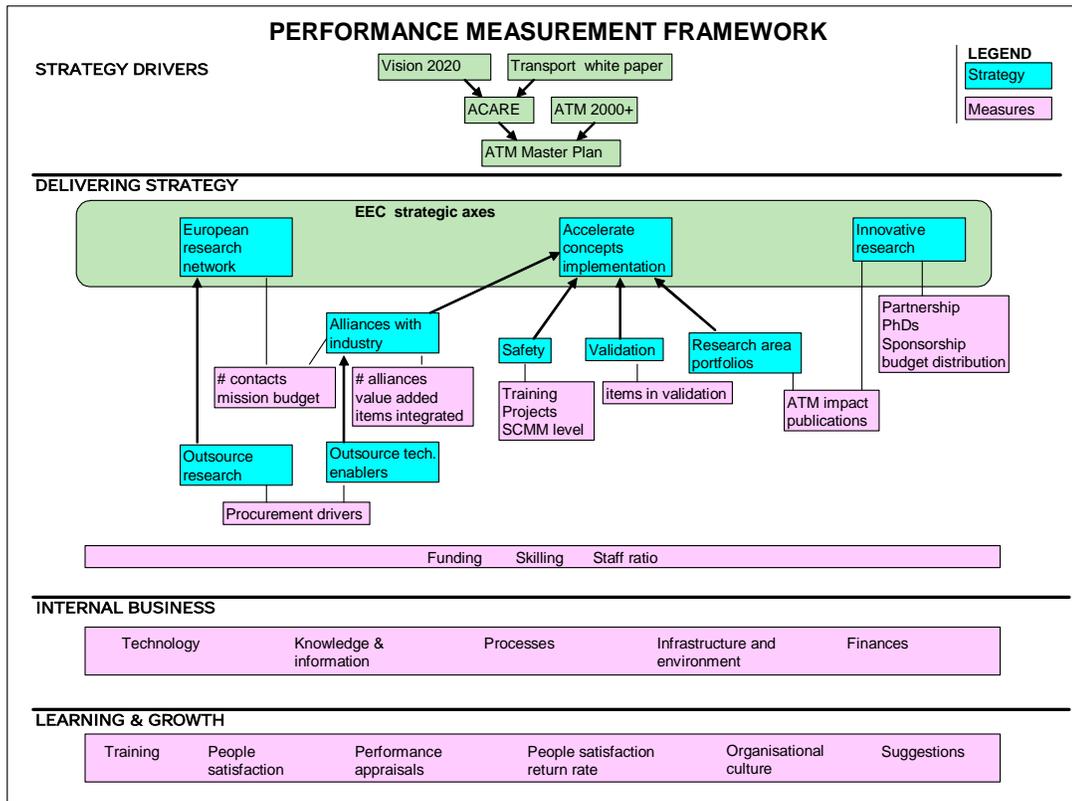


Figure 9a-1

### 9a Key Performance Outcomes

#### Funding the strategy

The fundamental enabler of strategy implementation is funding. Figure 9a-1 illustrates the main sources of funding.

Total EEC expenditure (MEuro)				
	2001	2002	2003	2004
Internal funding	13.8	13.2	12.7	10.880
External funding	1.2	3.0	4.6	9.132
EEC credits	61.0	58.5	55.1	56.159
Total expenditure	76.0	74.7	72.4	76.171

Figure 9a-2. [2004 figures are estimates]

Internal funding originates primarily from EATM, and is stable around 13Meuros. External funding originates primarily from European Commission Framework Programmes and Trans European Network programmes. EEC credits have been gradually reduced as part of the general Agency cost reduction measures. Nevertheless we try to maintain a high level of research funding by increasing external funding from outside the Agency.

Figure 9a-2 shows the distribution of core business funding across research areas and indicates that the EEC has largely succeeded in aligning funding with strategy by maintaining or increasing funding on the most important research areas.

Funding aligned with strategy					
Unit	2000	2001	2002	2003	Strategy
ACS	6.55	8.73	13.0	SSP 16.7	
ATI	3.83	4.82	3.0	CB CoE 2.5	
CNS	4.53	4.38	3.2	CB enabler 1.6	
<b>Total</b>			<b>19.2</b>	<b>20.8</b>	↑
SAF	1.72	1.94	3.00	SAS 3.1	↑
GNS	2.49	2.69	3.73	0	X
				APT 2.6	
ENV	0.86	1.84	3.14	SEE 3.4	↑
ERS	7.61	7.87	6.51	6.8	→
INO	2.49	3.50	3.18	3.4	↑
PFE	5.20	5.75	6.76	NCD 7.2	↑
SFM	3.96	7.68	3.29	3.5	→

Figure 9a-3

Comparisons from 2000 to 2002 are accurate in the sense that the EEC organization remained stable. Discontinuity exists between 2002 and 2003 so that comparisons 2002 to 2003 are

only approximate. To increase effectiveness across all research areas, key methodologies were reconfigured as transverse activities anchored in the SAS Centre of Expertise. Before 2003, safety was an independent research area. Also in 2003, research areas were realigned to the European ATM Master Plan. Some activities changed research area, GNSS activities were stopped and taken over by HQ, and the Airport research area was created. The 2003 column of figure 9a-2 shows these transitions as faithfully as possible with the new research area names. The first three rows of figure 9a-2 and the blue total row four try to show the total resources allocated to concept research and validation before and after the discontinuity.

### Skilling the strategy

The staff plan expresses skill needs and shortfalls based on the needs of the strategy. See chapter 3 for a detailed description of the process.

Skill orientation				
1999	2000	2001	2002	2003
6	9	9	6	3

Figure 9a-4

The figures in the table are the net number of staff posts re-orientated from one skill to another based on the needs of the strategy. The lower figures in 2002 and 2003 are due to the difficulties induced by the freezing of posts to reduce staff costs, and by the changing research area skill requirements following the strategy review and the alignment with the European ATM Master Plan.

A thorough review of the skill orientation process and detailed research area skill requirements is being conducted in 2004.

Training is also a major enabler of strategy. Results are provided in chapter 7.

### Safety

Safety is a key methodology in support of research. There are two main objectives, firstly to conduct targeted research to improve safety in European ATM, and secondly to include safety explicitly in all mainstream activities of the EEC, and to raise the EEC safety culture.

The deployment of this safety culture strategy at the EEC is measured by a set of leading indicators, and a series of lagging indicators

based on a Safety Culture Maturity Model (SCMM) survey.

Safety culture deployment (leading)			
	2002	2003	2004
Projects with a safety focus	-	6	12
Safety related training - people	38	56	69
Safety related training - days	49	97	144

Figure 9a-5 [2004 figures are planned]

The SCMM has been used in high reliability industry sectors including ATM. The model contains 5 iterative levels of maturity whereby organisations can progress sequentially by building on their strengths and removing the weaknesses. The five levels are:

1. Emerging
2. Managing
3. Involving
4. Cooperating
5. Continually improving.

Safety culture deployment (lagging)		
	2003	2004
Overall maturity level	2.38	
Overall standard deviation	+/-0.88	

Figure 9a-6

In 2003 the EEC was at level 2.38, indicating that we were between level 2 (managing) and level 3 (involving). The overall standard deviation between respondents was +/-0.88, indicating that respondents generally had similar points of view. A second survey will be conducted in Q4 2004.

### Items in validation

Moving promising research results out of research and through validation to industrialization and operations is a critical link in the overall supply chain. The EEC has deployed approaches to contribute to strengthening the process and to increasing the flow of results at the European level. The operational concept validation methodology (OCVM) has been developed with European partners. The European ATM research network is being strengthened. Alliances with industry are being forged. Key implementers and beneficiaries of research results are being engaged (see ATM impact). The following table lists the main aspects of EEC research which are in support to validation or which are concepts and components which are in the validation phase of the overall lifecycle. The items cover the full scope of EEC research activities.

EEC unit	Item	Purpose	Beneficiaries
NCD	Capacity planning	Medium term capacity profiles and baselines	All European ANSPs
	COSAAC	Pre-tactical ATFM simulator used by the CFMU network management cell as an operational tool	CFMU (since 2002)
	COCA method	Method to evaluate factors related to ATC complexity and their links to controller workload	PRU
	CAIA	Collaborative Airline Interface with ATFM. Delivery of design aspects of advanced CFMU interfaces for airlines after a series of prototyping exercises at airline sites (BA, KLM, SAS, Easyjet, Brussels Airlines)	CFMU
	PACT 2	Portable Area Control Centre capacity tool. Assessment of ACC capacity, sector traffic loading, simple what-if simulations	All European ANSPs
SSP	CORE	To consolidate and disseminate good practice on the requirements capture, design and evaluation of ATM working positions for European ATM.	ANSPs (Prague, Budapest)
	PROVE/MTCD	Medium term conflict detection prototype. Field trials in Malmo ACC 2002, and Roma ACC in 2003 and 2004.	ANSPs (S, IT)
	AVT	ADS-B/TIS-B Validation Testbed is a reference ATC surveillance platform used for the validation of ADS-B Package 1+ infrastructure and applications in ECAC [CRISTAL project]	EATMP ADS/CASCADE Programme; ECAC ANSPs (>10); ATM Surveillance and Avionics Industry (Thales, Airbus, ...); ICAO and EUROCAE [surveillance related standardisation groups].
	ACTS	Aeronautical Communication Technologies Simulator. VDL-2 version of the simulator completed in 2003. Support to VDL-2 validation for ICAO. EEC was the principal actor in preparation of the certification of the SAS Boeing 737 equipped with the Rockwell Collins ATN/VDL-2 avionics for CPDLC with MUAC. ATN and VDL2 work supervision has been transferred to LINK 2000+ Programme and CSM domain in 2002, EEC still hosts technical equipment.	ICAO, airframe industry
	AMP	Aircraft and transponder monitoring for the Mode-S implementation programme (year 2002 until 2005)	Mode S Programme, Airlines, Avionics Industry, Member States deploying Mode S.
	ASTP	Contribution to ARTAS version 6 Validation in the context of Mode S integration (year 2002-2003)	Mode S Programme, CAMOS (Central Artas Maintenance Office), ARTAS Users
	ASTP	Validation of ARTAS2 S1 in the context of ADS-B integration (year 2002-2003)	ADS Programme
	HMU Monitoring Cell	RVSM height monitoring (1997-2002) Transferred to DAS in 2003.	DAS AFN, IATA, Airlines and ANSPs
ERS	EAT	1) Real time facility for the evaluation of new airspace organizations and ATC procedures. 2) ATM training facility	1) EATM/EC projects 2) MUAC, IANS, CRDS, ANSP (CZ)
	ACE	AVENUE compliant ESCAPE. European validation and integration platform for the future European ATM system. AVENUE compliance is an EC requirement.	EATM/EC projects (G2G, EVP, DOVE, COSPACE, AVT, MFF)
	ACE+	Future planned development (2007+) Future European integration and validation platform which will meet the needs of the Master Plan and the Single European Sky implementation.	Projects of the Master Plan and the Single European Sky implementation
	eDEP	EUROCONTROL Early Demonstration and Evaluation Platform. eDEP is a low-cost, lightweight, web-enabled ATM simulator platform, for the rapid prototyping of ATM concepts. Installation and maintenance service	EATM, MUAC
ACE	BADA	Base of Aircraft Data. Aircraft performance database	ANSPs, research units, universities, industry
	Airports database	Central Data Base on European Airport Data Transferred in 2002 to APT Programme	Member States, 130 Airports, ACI, APT Programme and AEM domain
SAS	InCAS	Interactive Collision Avoidance Simulator	D, UK, DK, CH,NL,US, MUAC
	SHIELD	ATM safety data exchange tools and support	ANSPs (>10 deployments)
	OCVM	Operational concept validation methodology	In collaboration with the EC and partners, the aim is that OCVM

			is applicable to all European ATM research projects
	ACAS monitoring service	Operational monitoring of ACAS in Europe to ensure the continued safe operation of ACAS. Radar collected events as well as pilot and controller reports of ACAS events are analysed for significant/ unusual features.	ACAS implementation programme, ANSPs, ICAO SICASP
	ASMT	Automatic Safety Monitoring Tool. Field trials in GB and Roma. Pre-operations in Bratislava. Operational in MUAC. Being delivered to DFS and ENAV. Used by CRDS in the ESCAPE simulator. R&D phase completed, ASMT implementation in Europe in 2004 will be led by HQ.	ANSPs (GB, IT, SK,NL, D, H)
SEE	Noise studies	Evaluate noise impact around airports of operational scenarios	Airports (Paris, Nice), ANSPs
	Noise and performance database web site	Enables registered users to access the noise and performance data	Airports, ANSPs
INO	AIT	Aircraft Identification tag. Adaptation of digital watermarking techniques for pilot-controller VHF voice communication in view of increasing security. Developed in partnership with the university of Graz and Frequentis.	Avionics industry
APT	CDM	Collaborative Decision making. Implement procedures and data sharing to allow for better resource usage in airports, airlines, ground handlers, local ATC and the CFMU.	EU airports, airlines and the CFMU. Barcelona, Brussels, Stockholm and London are initial trial airports. Additional airports are conducting implementation projects.
	Time Based Separation	In short to medium term recovery of capacity lost due to strong wind on final approach. In the longer term an enabler for improved Wake Vortex Separation on Final Approach	European Airports in areas where the wind velocity often is high (London, Amsterdam, Paris) and the airlines operating there.
	ATC Wake	Develop a platform to that initially will serve as research tool to model Wake Vortex propagation, in the longer term the platform will serve as Safety Net for the controller and/or pilot	European Airports and ANSPs, Airlines
	A-SMGCS Level 1-2 Validation	Validation of proposed procedures by simulation and field trials of procedures for Surface Movement using Automated Surface Movement Guidance and Control Systems with the aim to obtain ICAO approval.	ANSPs in airports where A-SMGCS is being installed. Initially Paris and London
OPS	GENSpace	ATC familiarization for non ATC personnel	[EEC], CFMU
SFM	ESCAPE	Real time simulation and ATM concepts validation tool. Installation and support service	Prague (CZ) IANS (L) Maastricht (NL) ENAV (IT) SICTA (IT) ENAC (F) CRDS (H)
	AudioLAN	Voice over IP technology providing a telecoms infrastructure in a simulated environment. Maintenance and support service via the management of a fixed price contract with industry.	MUAC, CRDS, IANS, ENAC,ENAV

Figure 9a-7

### ATM impact

Starting in 2004 the EEC has initiated an approach to estimate the relative potential ATM impact of projects based on a consensus of expert opinion (see 2b). The following charts segmented by research area, depict the current state of the work.

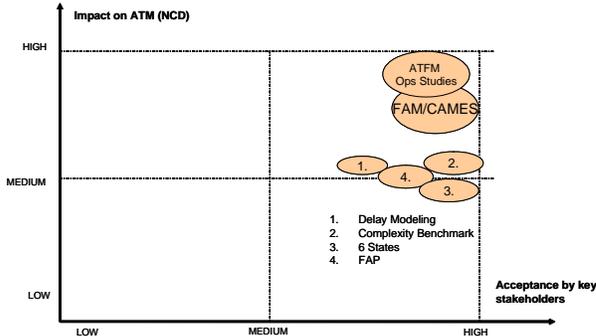


Figure 9a-8

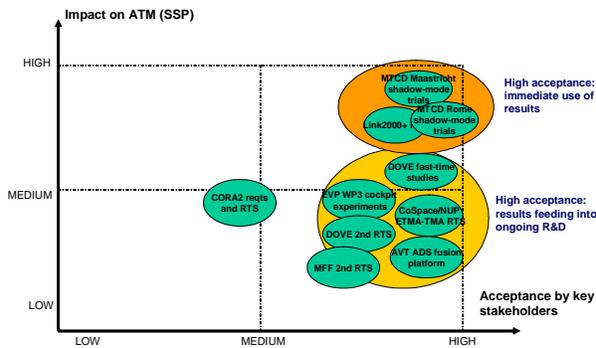


Figure 9a-9

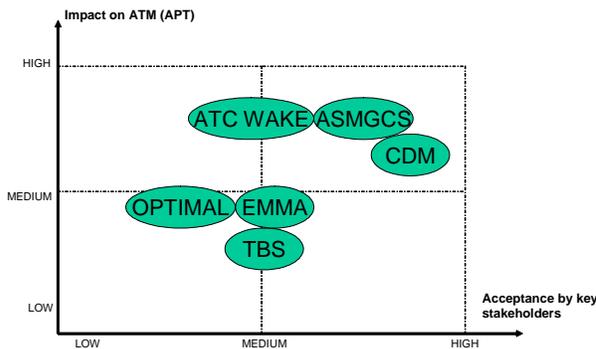


Figure 9a-10

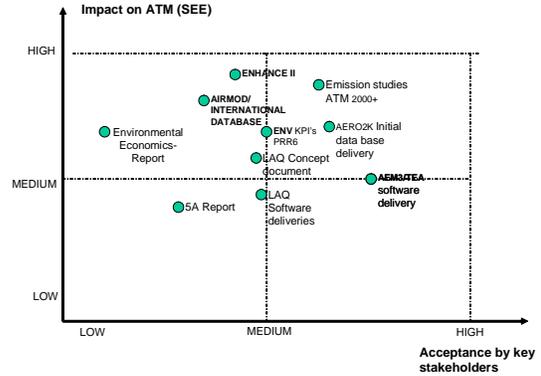


Figure 9a-11

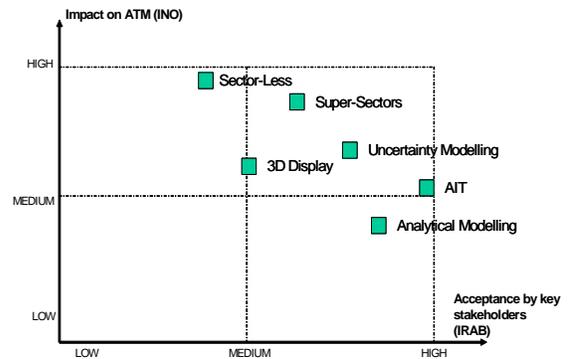


Figure 9a-12

### Publications

Research publications in the form of conference papers, reports, and articles in refereed journals, are the main vehicle to transmit and communicate research and validation results (see Overview).

Total number of research and validation publications						
1998	1999	2000	2001	2002	2003	target
39	32	60	92	93	123	100

Figure 9a-13

The target was set as a stretch target in 2002. It will be reviewed in 2004.

### Innovative Research

Research Area INO focuses on innovative research. The EEC aims to sustain a high level of funding of innovative research.

Funding innovative research (MEuro)				
2000	2001	2002	2003	2004
2.5	3.5	3.2	3.4	3.0*

Figure 9a-14 [\* value to date for 2004]

A key approach to stimulate innovative research is to build partnerships with universities which have air transportation departments. A programme of visits is established and systematically carried out. Universities are situated in Europe, including Eastern Europe, the US, and the Far East. The table contains the number of different universities visited.

Partnership with universities		
2001	2002	2003
8	14	10

Figure 9a-15

Partnerships with universities identify areas of mutual interest where the EEC can sponsor PhD studies. PhD students either continue their EEC sponsored studies at their home university or come to study at laboratories at the EEC. Thirteen PhD studies is considered to be the current optimum capacity of the EEC.

PhD studies at the EEC		
2002	2003	2004
11	13	12

Figure 9a-16

The total PhD theses and university studies sponsored by the EEC is shown in the following table.

Total onsite and offsite PhD theses and university studies		
2002	2003	2004
17	20	17

Figure 9a-17

To strengthen the European ATM research network, while maintaining a high level of partnership with universities, the distribution of innovative research funding is gradually being shifted from internal research towards partnership with research establishments. The optimum balance is shown as the 2005 target. 2004 figures are current estimates.

Innovative research funding distribution				
	2002	2003	2004	2005
EEC internal research	45%	37%	30%	30%
Partnership with research establishments	10%	18%	25%	30%
PhD and academic studies	45%	45%	45%	40%

Figure 9a-18

INO aims to increase its output of scientific papers in order to increase its contribution to the body of ATM research knowledge. These publications are a part of the total publications shown in figure 9a-13.

INO scientific publications in major conferences and journals			
2000	2001	2002	2003
1	7	13	36

Figure 9a-19

### Strengthen the research network and build alliances with industry

Procurement Drivers			
	2001	2002	2003
Signed contracts		265	162
Absence of Competition		25%	35%
Diversity	12.9%	10.1%	9.0%

Figure 9a-20

The procurement drivers steer the implementation of strategy, in particular outsourcing research and research enablers. We aim to reduce the number of signed contracts which will require larger individual contracts which will in turn drive outsourcing and the building of the research network. The competition indicator measures the percentage of contracts where there is insufficient competition. We look to reduce this percentage in order to increase responses from our research partners. The diversity indicator measures the percentage of core business contracts which are placed with research establishments. The aim is to increase this percentage in order to drive the construction of the European research network. Factors causing the current negative trend include uncompetitive bids from research establishments, and our current difficulty to identify a research establishment contribution when it is a member of a consortium. For the first cause we are negotiating with research establishments and for the second cause we are improving analysis techniques.

Meetings and other contacts are a major driver of partnership. The table below quantifies the meetings with major stakeholders.

Main stakeholder missions				
Stakeholder segment		2001	2002	2003
Research community	Universities	8	14	10
	Research units	-	16	18
	European commission	-	-	51
Industry		-	-	17

Figure 9a-21

Meetings with universities concern innovation, see the separate results above. Meetings with the European Commission concern ACARE, the Research framework programmes, the TEN programmes, and the master plan construction.

Meetings with industry concern mainly the master plan construction.

Total mission expenditure [MEuro]						
1998	1999	2000	2001	2002	2003	2004
1.0	1.2	1.6	2.0	1.6	1.4	1.6

Figure 9a-22. [2004 figure is current estimate]

Visits to partner and stakeholder sites are key enablers of partnership and alliance building and strengthening of the European research network. EEC policy seeks to sustain and even increase the mission budget in support of visits, despite Agency level cost saving measures. The peak in 2001 was largely due to the exceptional number of missions to Budapest to support the construction and transfer to operations of the CEATS research centre

Overall Missions			
	2001	2002	2003
Missions to EUROCONTROL sites	1353	1075	998
Missions to stakeholders	1674	1134	1114
Total missions	3027	2209	2112

Figure 9a-23

The decrease in the number of missions to EUROCONTROL sites results from the increased use of Visio-conference facilities.

We stimulate further co-operation with industry through the ERIS research enabler which is the principal platform for the integration and validation of the future European ATM system (see [4a](#)).

The following table lists the industrial components which have been integrated onto the ERIS platform at the EEC with a view to facilitating interoperability of ATM components supplied by different ATM system suppliers, through use of the standard ERIS platform application programming interfaces.

Integrated industrial components	
ATM system component	Industry partner
OSYRIS arrival manager	Barco/Orthogon
Flight manager-trajectory predictor	Indra
Datalink	Thales/ATM (on-going)

Figure 9a-24

## 9b Key Performance Indicators

### Finances are managed

The purpose of the financial indicators is to

- ensure responsible stewardship of funds
- ensure that funds are globally placed where they are needed

- support strategy, in particular outsourcing and diversity
- increase external funding
- improve the quality of the financial processes

Cash flow efficiency measures total expenditure as a percentage of total allocated budget. This is an aggregated figure for the whole of the EEC. The indicator is tracked at lower levels of decomposition: research area, project, and research enabler. The purpose of this indicator is to ensure optimum use of allocated budget. These figures are best in Agency.

Cash flow efficiency						
1998	1999	2000	2001	2002	2003	target
89%	92%	99%	98%	98%	97%	100%

Figure 9b-1

Overhead measures the percentage of expenditure which is spent on non core business activities.

Overhead						
1998	1999	2000	2001	2002	2003	target
39%	43%	33%	27%	29%	29%	30%

Figure 9b-2

The EEC has been using a combination of measures to reduce the overhead with the objective of transferring resources to core business:

- Improving support productivity
- Retraining and mobility to core business
- Selective outsourcing of internal services

The EEC judges 30% to be an optimum figure. Below this value the quality of the support services suffers and adversely impacts core business.

Procurement quality	
	2003
Requests rejected	2.9%

Figure 9b-3

We aim to reduce the percentage of procurement requests which are rejected by the Local Procurement Committee. Further training is planned. This should reduce rework and increase productivity.

Missions			
	2001	2002	2003
Average mission cost (euros)	653	677	659

Figure 9b-4

Average mission cost is being contained despite inflation. This is due to some use of low cost airlines and to special rates negotiated with major suppliers.

## Process quality

	2001	2002	2003
Project management quality	76%	80%	92%
Matrix efficiency	68%	80%	84%
Business excellence	306	350	402

Figure 9b-5

Project management quality is measured as the percentage of projects which have a compliant project management plan which is regularly reviewed.

Matrix efficiency measures the percentage of staff in all Centres of Expertise who are allocated to projects. Excluded are management, secretaries and people working on non project horizontal activities.

Business excellence tracks the EFQM self assessment overall score.

## Organisational Culture

Corporate values and associated guidelines have been developed between Q4 2002 and Q2 2004 (see [1a](#)). A plan is being drafted to measure the alignment of behaviour with values. A survey is being drafted which will be sent to all staff. The survey will first be conducted when the values are launched in Q3 2004 and this will set the baseline. The survey will be repeated annually. The table shows current thinking on results structure. Targets will be established when we learn from the baseline results. We will aim for a trend which moves the distribution to the left. The first set of baseline results is expected in Q4 2004.

Values alignment survey				
	always	mostly	some times	never
Professionalism				
Rigour				
Honesty				
Respect				
Cooperation				
openness				
Aggregate				

Figure 9b-6

## Knowledge and Information management

Knowledge and information management are key enablers of research. Section 4e describes the EEC approaches.

Knowledge management	
	2004
Number communities of practice created	4
Number of Babylon licences used	90

Figure 9b-7 [2004 data to date]

Babylon is the tool which manages thematic glossaries. The following communities of practice have been created in 2003: Real time simulation, safety, ATM operations, project management. The first two are into the adoption phase. The last two are in start-up phase.

Communities of Practice		
	RTS	safety
Number of members	79	19
Number of documents	204	<10

Figure 9b-8

We are currently studying how to further measure the adoption of knowledge management at the EEC.

Library			
	2001	2002	2003
Budget (k euros)		118	87
Books purchased	524	538	382
Periodicals purchased	121	157	155
Total docs borrowed		344	365

Figure 9b-9

The budget reduction is partially a result of the general budget restrictions, but also a move for greater cost effectiveness. Book purchases are reduced but this is compensated by a better use of the existing stock. The relevance and effectiveness of the library are demonstrated by the continued high level of use.

The scope of documents purchased covers the complete range of EEC interests: aeronautics, psychology, social sciences, mathematics, technology, languages, information technology, management, human factors.

Archives					
	1999	2000	2001	2002	2003
Input no. transactions	16	19	10	15	14
Input linear metres	34.7	27.7	13.6	19.3	22.4
Linear metres deleted	-	1.4	2.5	2.3	4.0
Total linear metres	34.7	61.0	72.1	89.1	108
No. consultations	4	8	18	35	26
No. boxes consulted	3	20	73	154	54

Figure 9b-10

The relevance and effectiveness of the archives are demonstrated by the increasing rate of consultation. The exceptional peak in 2002 was due to an extensive audit.

## Technology is managed

Information technology assets			
	2001	2002	2003
IT Investment and operating budget (k euros)	6478	4886	4936
PCs	652	618	620
Laptops	203	200	195
PC Servers	-	26	32
Development Servers	130	139	119
Development workstations	20	31	45
Real Time Simulator servers	28	25	20
Real Time Simulator Workstations	214	228	266

Figure 9b-11

Information Technology renewal schedule	
	Replacement period (years)
PCs and laptops	3
Printers	5
PC servers	5
Screens	5
Development servers	4-5
Storage system	5
Network equipment	5
Network cabling	10
Backup system	5
Fixed line telephones	5-8
PABX	8
Migration of PC systems	3-4
Email	3-4
Migration of Unix OS	3-4

Figure 9b-12

Figure 9b-11 shows that the outsourcing strategy implemented in 2000 has reduced costs significantly while maintaining the scope of the IT asset base which is critical to EEC processes. Figure 9b-12 is an extract from the EEC IT Strategy dated 24 December 2003. The figure depicts the systematic IT asset renewal plan which will ensure continued IT readiness.

## Continuous improvement

We seek to maintain or increase the amount of resources devoted to continuous improvement by means of the operating budget which funds improvement projects, suggestions box activities, special events, and surveys. The figures in the following table are taken from the Business Plan and combine the cost of internal effort and the operating budget. The figures are in keuro. The EEC continuous improvement policy states that quality is everyone's business. Hence only a small amount of effort is dedicated to continuous improvement (2 persons \* 50%).

Continuous improvement funding		
2001	2002	2003
119	264	308

Figure 9b-13

## GLOSSARY

ACARE	Advisory Council for Aeronautics Research in Europe	DGAC	Direction Générale de l'Aviation Civile (F)
ACB	Access to Business Information	DSI	Denmark Sweden Interface
ACE	ATM and CNS Systems Engineering (CoE)	EATM	European Air traffic Management
ACE	Avenue Compliant Escape	EATMS	European Air traffic Management System
ADS – B	Automatic Dependent Surveillance – Broadcast	EC	European Commission
AECMA	European Association of Aerospace Industry	ECAC	European Civil Aviation Conference
AENA	<i>Aeropuertos Españoles y Navegación Aérea</i>	ECCG	Experimental Centre Consultation Group
ANSP	Air Navigation Service Provider	EEC	EUROCONTROL Experimental Centre
APT	Airport Throughput (RA)	EFQM	European Foundation for Quality Management
ARDEP	Analysis of Research and Development in EUROCONTROL Programmes	EHQ	EUROCONTROL Headquarters
ASAS	Airborne Separation Assurance System	EMB	EEC Management Board
ASD	Aerospace, Systems and Defence	EMC	EATMP Management Committee
ASMT	ATM Safety Monitoring Tool	EMM	Extended Management Meeting
ATC	Air Traffic Control	ENAC	Ecole Nationale de l'Aviation Civile
ATCEUC	Air Traffic Controllers European Unions Coordination	ENAV	<i>Ente Nazionale d'Assistenza al Volo</i> Italian ATM Provider
ATFM	Air Traffic Flow Management	EPAC	Eurocontrol Programme Appraisal Committee
ATM	Air Traffic Management	EPDA	EATMP Project Delegation Agreement
AVENUE	ATM Validation Environment for Use towards EATMS	ERIS	EATMP Reference Industry-based ATM Simulation and Trials Platform (RA)
BADA	Base of Aircraft Data	ESC	European ATM Systems and Convergence
BP	Business Plan	ESCAPE	EUROCONTROL Simulation Capability and Platform for Experimentation
C-ATM	Co-operative ATM	EUROCAE	European Organisation for Civil Aviation Electronics
CDMS	Content and Document Management System	FAA	Federal Aviation Administration (US)
CEATS	Central European Air Traffic Services	FIN	Finance Services
CEO	Chief Executive Officer	FP	Framework Programme
CFMU	Central Flow Management Unit	FPA	Financial Planning and Analysis
CM	Core Management	FREER	Free Route Experimental Encounter Resolution
CoE	Centre of Expertise	GASEL	Generic ATFM Simulation Engine & Library
COSAAC	Common Simulator to Access ATFM Concepts	GCI	<i>Groupe de Coordination Infrastructure</i>
CRDS	CEATS Research Development and Simulation Centre	GMAO	Computer Assisted Maintenance Management
CWP	Controller Working Position	GNSS	Global Satellite Navigation System
DAI	Development and Integration (CoE)	HiRIS	Human Resources Information System
DAP	Directorate ATM Programmes	HMI	Human Machine Interface
DAS	Directorate ATM Strategies	HoCoE	Head of Centre of Expertise
DASC	Digital Avionics Conference	HQ/MIS	Head Quarters/Management Information Service
DATMAS	Danish ATC System	HRM	Human Resources Management
DEEC	Director EEC	IANS	Institute of Air Navigation Services
DFS	<i>Deutsche Flugsicherung</i> (German ANSP)		
DG	Director General		
DG RTD	Directorate General Research and Technological Development (EC)		

	(EUROCONTROL)
IATA	International Air Transport Association
IEEE	Institute of Electrical and Electronics Engineers
IFATCA	International Federation of Air Traffic Controllers Associations
IIMG	Internal Information Monitoring Group
INDRA	Spanish ATM system provider
INO	Innovative Research (RA)
INSEAD	European Institute for Administration
IP	Internet Protocol
IPAS	Integrated Preparation & Analysis System
IRAB	Innovative Research Advisory Board
ITM	Information Technology Management
JPB	Joint Programme Board
KM	Knowledge Management
KANT	KM for ATM Innovation
KPI	Key Performance Indicator
LPRC	Local Procurement Review Committee
MAEVA	Master ATM European Validation Plan
MEUR	Millions of Euros
MFF	Mediterranean Free Flight
MIM	Managing Information
MIS	Management Information Systems
MP	Master Plan (European ATM)
MUAC	Maastricht Upper Area Control Centre
NATS	National Air Traffic Services (UK)
NCD	Network Capacity and Demand (RA)
OCVM	Operational Concept Validation Methodology
ODID	Operational display and input development
OPS	Operational Services (CoE)
OSHAS	Occupational Health & Safety Assessment
PA	Performance Appraisal
PMP	Project Management Plan
PMS	Project Management System
PPL	Private Pilot Licence
PRU	Performance Review Unit
PSO	Project Support Office
R&D	Research and Development
RA	Research Area
RADAR	Results, Approach, Deployment, Assessment and Review (EFQM)
RAM	Research Area Manager
RAMM	Resource Allocation Management Meeting
RAMS	Re-organised ATC Mathematical Simulator
RTCA	Requirements and Technical Concepts for Aviation

RTD	Research and Technological Development
SBM	Support Business Manager (EEC Core Manager)
SC	Staff Committee
SCF	Standing Committee on Finance
SCMM	Safety Culture Maturity Model
SDE	Senior Director – EATM
SDR	Special Advisor (EEC Core Manager)
SEE	Society, Environment, Economics (RA)
SESAME	Single European Sky Programme (ATM)
SET	Services Enabling Team
SEU	Software Engineering Unit (EEC)
SFM	Simulation Facility Management (CoE)
SICTA	<i>Sistemi Innovativi per il Controllo del Traffico Aereo.</i>
SLA	Service Level Agreement
SMS	Safety Management System
SMU	Social Medical Unit
SSP	Safety, Sector and Productivity (RA)
SSS	Staff Satisfaction Survey
TCC	Training Coordination Committee
TIG	Transports & Mail Infrastructure General Support
TQ	Total Quality
TQA	Total quality Agent
TRS	Task Requirement Specification
TS	Technical Services
VDL	VHF data link
WIC	Weekly Information Corner
WMM	Work-programme Management Meeting