SINGLE EUROPEAN SKY

Report of the high-level group
Single European sky
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November 2000
This report has been compiled from the contributions made by senior representatives of national authorities. The views expressed and recommendations given may not be regarded as stating an official position of the European Commission.

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server (http://europa.eu.int).

More information on the Commission’s ‘Single European sky’ initiative is available from the following website: http://europa.eu.int/comm/transport/themes/air/english/single_eur_sky_en.html

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FOREWORD

When I took up the mandate as Commissioner responsible for transport policy last summer, I was confronted with complaints that sustained air traffic growth in Europe led to unprecedented delays, prompting airlines and passengers to call for effective action. There was general dissatisfaction with the fragmentation and lack of efficiency in the organisation of air traffic control services. At the same time, I found that the scope for action by the Community had increased: the development of a common foreign and security policy within the European Union has provided opportunities for organising the involvement of the military. In addition, Member States and industry increasingly acknowledged the potential of the Community decision-making process to drive change and to secure commitment.

The Commission has made the reform of air traffic management in Europe one of its priority actions. One of my first projects, therefore, was to launch a debate about this reform. Some aspects of the system work well: there is general appreciation for the hard work by controllers (even though it is not always well understood how difficult their task is) and for the high safety level in Europe. However, in many other areas, I feel that we can only deliver improvements by a more integrated approach that reflects the requirements of modern air transport: we must move towards a single sky, in line with the approach followed for the completion of the single market and for the euro.

I set up a high-level group comprising senior civil and military air traffic control authorities. The group met frequently throughout 2000, and I am very pleased to be able to present the results of this hard work. The group benefited from the interest and support of many in the industry and in government, including the Heads of State or Government and the European Parliament.

Many people cooperated in this effort, and I cannot thank them all individually. I should nevertheless acknowledge some particular contributions. I thank the civil air traffic management authorities for accepting to relook at problems that must be only too familiar to them, and to be open-minded about the benefits of a Community approach. The openness and commitment of the military members, even though they were navigating uncharted waters, also need to be highlighted. I am also grateful to the various industry organisations — air navigation service providers, airports, airlines, equipment manufacturers — and to users for making constant suggestions and helping this initiative to make progress. Eurocontrol graciously provided technical expertise and made helpful suggestions. Finally, I was able to rely on continuous feedback from the employees' representatives, whose constructive participation is absolutely essential if we want to move ahead.

The report of this high-level group is only the beginning. The Commission must now follow up. We will shortly be submitting an action plan, and we intend to come forward with proposals for legislation early in 2001. I should like to single out, however, two topics of fundamental importance. First of all, we face the challenge of organising the involvement of the military air traffic control services in the single sky. We will need the continued interest
and support of the highest political authorities to build adequate structures that enable military air traffic authorities to gain confidence and to work closer together with their civilian counterparts. Second, we must develop synergies with Eurocontrol as well as the Community’s own capabilities to establish an agenda for reform and to implement these changes.

The high-level group report was instrumental in bringing all the views together. It has succeeded in forging a common vision of where we want to go and how to reach these ambitious targets. We now need to continue on this track to turn these ambitions into realities and to provide for safe air traffic growth within Europe.

Loyola de Palacio

Brussels, December 2000
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INTRODUCTION

1. As a result of the general economic situation, of the development of tourism and of business travel, as well as of the liberalisation of air transport within the Community, air transport is growing considerably. In addition to environmental concerns, this growth reveals a mismatch of infrastructures: airport infrastructures are increasingly congested but, more specifically, the current functioning of air traffic management in Europe is, despite all the measures taken, a key cause of the increased delays.

2. With the support of the European Council this analysis led to the creation of a high-level group bringing together civilian and military representatives of the Community Member States, together with representatives of Norway and Switzerland. This group has held 10 meetings since January 2000 and adopted this report with the objective of undertaking a genuine reform of air traffic management; this involves, first of all, strengthening the safety of air transport by a more coherent organisation at the level of the Community, while at the same time complementing traffic growth by releasing capacities as a result of a more efficient use and organisation of airspace. In accordance with the conclusions of the European Council of Feira and with the European Parliament resolution on the single European sky, the Commission is expected to come forward with appropriate proposals in the first half of 2001. The aim is to achieve a fully operational internal market in these areas and the European Council will assess progress achieved when it meets next spring on the basis of a Commission report and appropriate proposals.

3. Airspace is an area suffering, contrary to appearances, from limited capacity first of all because aircraft have to follow a pre-planned route based on a fixed route network, but also because, in Europe, traffic converges on the same routes which become increasingly congested. Aircraft therefore need en-route and approach assistance by air navigation service providers. This assistance requires increasingly sophisticated and expensive technical means which, to be effective, have to be compatible and available in the whole of Europe; it requires increasingly close coordination and cooperation between these air navigation service providers, at regional level and at European level. This assistance has to respond in a coherent way to the different requirements of civilian operators (commercial, business and general aviation) and of military traffic.

4. In view of traffic growth, these navigation services have to act within a framework increasingly regulated by public authorities and governing in particular safety and airspace organisation. Cooperation between these services, which have a natural monopoly in the area under their management, can only be effective if these regulations are consistent. But there is in Europe no specific framework for coordination and harmonisation of these rules. Eurocontrol (1), which is an international organisation involving 29 European States, was not originally designed specifically for this regulatory function; this is why it endeavoured during its 49 years of existence to improve coordination between the national navigation services. A revision of its constitutive

(1) European Organisation for the Safety of Air Navigation: the international organisation dealing with air traffic management and safety in Europe.
convention aims to grant it certain regulatory responsibilities but on the basis of the revised convention, Eurocontrol will not be able to meet the need for regulation such as it is identified in this report because it does not have the necessary instruments to act as a full-fledged regulator. The same analysis results currently, in the field of air safety, in giving priority to an integrated Community solution as opposed to an intergovernmental solution.

5. This report aims, therefore, to examine the way in which the European Union, with its legal system, its decision-making process, its political control mechanisms and its responsibilities can meet the need for harmonisation of the rules governing airspace usage.

6. Without challenging the current framework of cooperation within Eurocontrol and its development on the basis of the revised convention, the European Union can be successful in reorganising airspace usage at least for the EU Member States. Since the single European sky should also encompass non-EU Member States, these will be closely involved, with Eurocontrol providing the forum for pan-European cooperation. Working together with Eurocontrol and the Member States, the Commission will need to develop its own expertise, to provide its decision-making process and to ensure the application of the rules. In addition, defence cooperation mechanisms will have to be put at the service of the military to facilitate their use of the airspace.

7. It results from the discussions within the group that the implementation of the orientations stemming from this report requires support and political impetus at the highest level, in order to let the European Union institutions enhance their action in the field of safety, and extend action into other areas within the competences defined by the Treaty of Amsterdam. High-level political attention is also required for the consequences of this approach in terms of organisation and of priority for action. In particular political support is needed to initiate cooperation in relation to defence in order to optimise airspace use and to ensure that Community regulation is also recognised by the military users.

8. As a consequence, the implementation of the orientations drawn up by the present report depends upon political decisions at European Council level, in particular for the use/exploitation of the instruments provided by the Treaty of Amsterdam for the military cooperation. It was indeed recognised in the group that without this element, it will not be possible to achieve the full objectives of a single European sky.

9. The report assesses the situation today, the pressures on the air transport system, the deficiencies of the air traffic management system and the consequent need for reform. Subsequently, the main orientations for this reform are identified, how these orientations translate into specific actions in the different areas and finally recommendations for the way forward.
1. THE SITUATION TODAY

1.1. The development of air transport and increasing delays

10. Air transport demand has been growing steadily at between 5 and 7% over recent years and this rate of growth is expected to continue for the foreseeable future, leading to at least a doubling in traffic every 12 years. Whilst improvements have been made to the national air traffic management (ATM) systems that constitute the European system, these improvements have either not kept pace with or have been insufficient to meet demand, with the result that delays are remaining at unacceptably high levels. Last year virtually 21% of all flights were delayed with an average of 25 minutes and even for June 2000, 13% of all flights were delayed by more than 15 minutes with the average delay per delayed flight exceeding 20 minutes.

11. The perception of delays by the travelling public is even worse than the statistics show, as aircraft frequently do not respect their published departure times due to the margins of manoeuvre that some airlines have had to build into their schedules as a result of delays. This perception and the continuing growth in traffic confirm that action is needed (1).

12. Since the last major delay problem in 1988/89, much has been done to improve the situation (2), but as the persistence of the delay statistics over the last few years show, there is a structural problem that these efforts have not been able to solve.

13. Notwithstanding general efforts, it has not always been possible to respect the objective, endorsed by ministers meeting within the European Civil Aviation Conference (ECAC) in January 2000, of maintaining an average of 3.5 minutes delay per flight during the summer period of 2000 (see Annex 4) and the continuing traffic growth, which exceeds the present ATM system capability, call for effective action.

14. On the basis of a communication adopted in December 1999 (3) analysing the situation in the sector, and with the endorsement of the Council, the Commission launched a dialogue with senior representatives of Member States’ civil and military air traffic authorities in the framework of a high-level group. The purpose of the group was to assist the Commission in preparing proposals to improve the situation. Norway and Switzerland were associated with the group on account of their involvement with the Community’s air transport policy through their agreements with the EU. Euro-

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(1) The evaluation of the cause of these delays is disputed and the proportion attributable to air traffic management varies depending on the point of view of the various actors. It is clear that airport capacity, weather, aircraft serviceability and airline operational policies all contribute to overall delays. However, according to Eurocontrol data, the biggest single cause of delays is attributable in one way or another to the organisation of air traffic management (ATM is the primary cause of 29% of all delays rising to 49% if you include reactionary delays).

(2) As identified under the achievements of the Eatchip, European air traffic control harmonisation and integration programme (Eurocontrol brochure) — in 1989, the average departure delay per scheduled flight in Europe was four minutes. By 1995, this had been reduced to 2.2 minutes. During the same six-year period, traffic in European airspace had increased by more than 30% and in 1995, States which reported statistics handled a total of 4,986,000 flights.

control was invited to provide its technical expertise. The other European States have been kept informed through specific meetings with them and through the Eurocontrol Provisional Council.

15. The Commission has furthermore involved stakeholders (airlines and other airspace users, air traffic service providers (the organisations performing services such as air traffic control, flow management, weather information — e.g. NATS in the UK, the Direction de la Navigation aérienne in France, DFS in Germany, etc.), manufacturers, trade unions and professional organisations, consumers) in the context of an industrial and social group. Both groups met frequently since January 2000 in order to deepen the analysis and develop a consensus about the measures required to remedy the situation.

16. The objective of this initiative is to create a ‘single European sky’ based on an airspace and ATM system, designed, managed and regulated in a harmonised way to ensure efficient utilisation of the sky at a European level for all users.

17. The urgency of this problem is reflected by the political support at the highest level for change. The European Councils of Lisbon (*) and Feira called on the Commission ‘to continue the work of the high-level group on a single European sky in order to present a final report in the first half of 2001 with a view to bringing forward appropriate proposals’. The European Parliament also called for a political decision to develop a single sky over a single market to provide the optimum use of European airspace, and asked for urgent proposals on this subject (†).

— Air traffic is growing and will continue to grow; delays are likely to increase as well.
— The problem can only be resolved by effective measures at the European level.

1.2. ATM deficiencies

18. Air traffic management exists to ensure the safe, orderly and expeditious operation of aircraft, in this context safety is paramount. Aircraft essentially have to follow routes that enable controllers to monitor flights and to maintain separation so as to ensure safe operation. These routes reflect several constraints, such as the need to fit in with the historical national responsibility for organisation of ATM, and to bypass airspace being temporarily used for military purposes.

(*) The Lisbon Council asked the Commission, regarding the use and management of airspace, to put forward its proposals as soon as possible. The aim is to achieve a fully operational internal market in these areas and the European Council will assess progress achieved when it meets next spring on the basis of a Commission report and appropriate proposals.

19. Safety is paramount and ATM in Europe has a proud record in this respect. However, there is wide agreement that the ATM organisation suffers from significant handicaps standing in the way of a more efficient performance:

— A comparison of airspace organisation between the Member States shows vast differences, leading to inconsistencies and confusion and making airspace design difficult and ultimately reducing the effectiveness of air transport.

— The European ATM system is characterised by a multiplicity of national centres, not optimal routes and sectors that have been designed to meet national requirements. Even though there are praiseworthy regional initiatives at Eurocontrol level that provide a seamless service to all airspace users and which should be a first step to a single sky concept, such as the Maastricht Upper Area Control Centre and the planned central European air traffic services, many of the bottlenecks that cause delays stem from insufficient planning at a European level of national airspace design and air traffic control organisation.

— Another difficulty is the use of a large amount of airspace for military purposes in some high civil traffic density areas. Whilst an effective civil/military cooperation exists in many States, which enables, to varying degrees, a flexible use of the airspace for the benefit of all users, this is not the case in other States, where, by lack of system flexibility, large areas of airspace are not used by civil users, even when these sectors are declared available by the military.

— Investment decisions in the past often have been taken on the basis of national industrial interests with the result that the centres have limited technical or operational compatibility with their neighbours, or low interoperability. This insufficient interoperability results in a multitude of severe inefficiencies and additional costs, ranging from fragmented controller training, through to increased procurement and maintenance costs, and to major difficulties in operational coordination. The small size and the predominance of national standards developed between the service providers and the national industry has led to fragmentation of the equipment market which does not facilitate the necessary industrial cooperation to develop common standards, in particular for new technology (e.g. electronic flight strips, medium-term conflict detection tools, flight data processing). This sector has escaped the common disciplines for public procurement as a result of a lack of common standards and of exemptions to the normal legal requirements. The development and implementation of new technology in control centres is unnecessarily difficult even if this technology is available elsewhere. Training for the introduction of new technology into control centres could also be improved. Without a dramatic change in this situation, it will be a real challenge to introduce the technologies that are required to increase capacity.

20. Europe also suffers from a chronic shortage of air traffic controllers, leading to intense work pressure and emphasis on procedures at the expense of flexibility and capacity, with a shortfall of between 800 and 1 600 controllers out of a total of 15 000 for the EC. In general, the trend in the number of controllers has not followed the increase in traffic thus amplifying the problem. The present demographic trend is such that one third of controllers will retire between now and 2010. This requires an intense and ur-
gent effort of recruitment and training of additional human resources to face the traffic growth.

21. Whilst the basic function of controlling air traffic is fundamentally the same in each Member State, the very diverse environment (design and equipment of control centres) requires significant ‘on the job’ training of new controllers to become operational. The result is that even if controllers were available in other areas, mobility is virtually impossible unless a tremendous effort is undertaken in appropriate training, at European level.

22. Eurocontrol, as an international organisation of 29 European States, has focused on the convergence of national systems, but notwithstanding these efforts and reorientation of its actions towards harmonisation and integration (ATM 2000+ strategy), airspace structures and the organisation of air traffic management in Member States do not reflect European system-wide needs.

23. Eurocontrol is a typical intergovernmental organisation which, despite its technical expertise, must face up to a slow consensual process of making decisions and lack of enforcement powers which make it less effective than required. The revised convention foresees an improvement in the formal decision-making process by replacing the consensual or unanimity rules by voting procedures based on a double weighted majority (75%), but the current consensus-based culture should be adjusted accordingly and nothing is foreseen to improve the enforcement powers.

| — Air traffic management in Europe is fragmented. |
| — The fragmentation results in an inefficient use of available capacity. |
| — The current system is not able to keep pace with demand. |
| — There is a shortfall of qualified controllers. |
| — Eurocontrol does not at present have the necessary decision-making process and enforcement powers to ensure rapid improvement of the situation. |

1.3. The need for reform

24. Delays not only have direct effects on the airlines, which are unable to maintain their schedules and have a direct cost penalty, and their passengers who suffer significant periods of waiting at airports and disrupted travel plans; delays also weigh on the overall economic climate and undermine the credibility of air transport liberalisation. Inefficient routings and delays once airborne also have an adverse environmental impact.

25. The foregoing analysis of the present situation has shown that there is an urgent need for change if we want Europe to have a dynamic and efficient air transport system. The overall performance of the European ATM system has to be enhanced if we wish to avoid the air transport system from becoming ‘gridlocked’, hampering economic growth in general and the air transport industry in particular.
26. The intrinsically ‘national’ approach to developing systems is inefficient and costly, the development of common solutions to common problems has to be actively pursued to ensure that scarce resources are used effectively and the competitiveness of European industry in the world markets is improved:

— The current airspace design is a patchwork of national systems that are each different from their neighbouring systems. Airspace has to be designed as a continuum for the overall efficiency of the European air transport system and to ensure sufficient access for all airspace users.

— The efficiency of the European air traffic management system as a whole should take precedence over national concerns. However, the performance of the European system depends on action by the local or national service providers to meet changing patterns of demand and implement new procedures and technologies. Measures, either regulatory, financial, or a combination of both should be established to stimulate appropriate action.

27. The major criticisms of the current ATM approach in Eurocontrol are the slowness of the ‘consensual’ decision-making process. The national members in the governing bodies represent not only the interests of the transport and defence ministries but also of the ANS providers. Furthermore, once decisions are taken, in the absence of efficient control mechanisms it is difficult to ensure that these decisions are implemented by the various administrations and service providers in a correct and timely manner. An efficient decision-making process needs to be established, backed up by the necessary legal instruments (enforcement) to ensure implementation.

28. Whilst delays are the main concern at the moment, it is imperative to ensure that measures to increase capacity are not developed or implemented which could compromise safety or otherwise clash with public interest imperatives. A regulatory framework is therefore always needed, but it is particularly important that it is transparent and robust where Member States service providers (such as navigation services, meteorological information, maintenance and training) are becoming increasingly independent from governmental structures. The reasons for this evolution vary from easier access to investment capital, responsiveness to user requirements and increased autonomy.

<table>
<thead>
<tr>
<th>The organisation providing air traffic control is:</th>
<th>Country</th>
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<tbody>
<tr>
<td>Corporatised</td>
<td>A, B, D, E, IRL, NL, P, UK</td>
</tr>
<tr>
<td>To be corporatised</td>
<td>DK, I</td>
</tr>
<tr>
<td>Government department</td>
<td>EL, F</td>
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<tr>
<td>State or ‘semi-State’ enterprise</td>
<td>S, FIN</td>
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29. These developments in the organisation of service providers require Community measures to ensure that they comply with basic requirements based on the Treaty: in particular the freedom to provide services, to preserve public interest objectives —
foremost of which is the guarantee of the safety of air transport, to secure the cooperation between authorities and organisations exercising similar responsibilities, to ensure that regulation is efficient and fair and to avoid distortions. These basic requirements are needed to ensure the efficiency of the cooperation between the national administrations and the objectivity of the regulatory measures in the interest of safety and public service obligations imposed over the service providers. Even where such developments in the organisation of service provision are not taking place, the efficiency and fairness of the regulator must be guaranteed to ensure safety which — in this area as in others — requires that the regulator be independent from the economic and commercial interests pursued by the service provider.

30. The main problem is within the high-traffic density airspace of Europe and is primarily concentrated in EU States today. Consequently, the need for action is, at short time, essentially within the European Union due to the fact that the bottlenecks are mainly over the territory of its Member States. But due to the impact of such an action for its neighbours and due to the contributions of some of these neighbours to the air traffic congestion, an efficient cooperation is needed and it is therefore necessary for the EU to work with other States in the framework of bilateral agreements with the EU, or through Eurocontrol. It is also necessary to maintain consistency with the policies and decisions of the International Civil Aviation Organisation (ICAO).

The main thrusts of the reform process follow from the needs identified above:

— reinforce mechanisms to optimise the performance of European ATM as a whole;

— establish a ‘European’ airspace as a single continuum, managed for overall system efficiency;

— ensure sufficient access to airspace for both civil and military purposes;

— ensure the development of a coherent approach to ATC across Europe;

— develop a coherent ATM system design across Europe;

— establish high-level rules at the European level for safety and system performance;

— establish strong and independent regulators;

— develop a process that ensures implementation backed up by effective enforcement;

— respect national security and defence requirements for the use of airspace;

— be consistent with the international framework;

— comply with the basic requirements of the EU Treaty.
2. THE MAIN ORIENTATIONS

31. At a time when Europe has achieved a single market and a single currency (7), it is inconceivable that a single European sky is outside our reach. The only effective solution to the problems associated with the current organisation of European air traffic management is to establish a ‘seamless system’ across Europe. The European Union should adopt and apply necessary legislation by 2005; a more detailed time frame is set out in Annex 2. The main components of such a system include:

2.1. Effective regulation

32. To ensure a safe, efficient and cost-effective air traffic management system, effective regulation is required. This regulation entails the definition of essential requirements, oversight of the application of such requirements, and where necessary, their enforcement; it may also specify, when and if necessary, the conditions for access to the market. The regulatory framework has to cover the domains of safety, overall system performance and required levels of service, airspace design, system design and economic aspects. To ensure that safety remains paramount, the potential conflict of interests between the various regulatory needs require a transparent decision-making process with safety regulation taking precedence.

33. The regulation will depend upon an effective regulator, who will be responsible for the definition of the rules with which the service providers, airspace users, airports and supply industries will have to comply, and who will be responsible for ensuring compliance. The regulator must be able to balance the conflicting demands of the various interest groups. It should be independent of service providers, air transport users or equipment suppliers and have at its disposition adequate expertise and resources in order to avoid conflicting interests and to ensure clear responsibilities and accountabilities of all actors, in consistency with their competencies and tasks. This autonomy can take different forms with distinction being ensured at least at a functional level. The nature of the ownership of ATM organisations does not have an incidence on the regulatory framework.

34. The regulator should be responsible for setting objectives (high-level rules) relating to the main components of air traffic management: safety of course, but also coordination of airspace use, performance, equipment interoperability and pricing, with oversight being exercised locally within a European regulatory framework.

35. To ensure that the different authorities are carrying out their functions correctly, and that the rules they are applying are appropriate, there will need to be mechanisms to support review and to provide feedback both within the regulator and from the regulator to the political level.

(7) With the exception of Denmark, Sweden and the United Kingdom.
— Need for further and stronger European regulation in the safety, performance, 
  system and airspace design, and economic domains.
— The regulator will define the high-level rules and ensure compliance.
— Reforms should be completed by 2005.

2.2. Constructive involvement by all stakeholders

36. Effective air traffic management is inconceivable without close association of civil and 
  military components. It is time to bring together civil and military expertise and require­
  ments at European level in cooperation with NATO.

37. The development of regulation requires an open and transparent consultation process 
  that provides for participation of all the stakeholders, to ensure that they are well 
  founded and provide for balance between the different groups. Therefore all interest­
  ed groups — notably service providers, airlines, equipment manufacturers, staff — 
  need to be closely involved in all aspects of regulation. An effort should be made to 
  develop a comprehensive vision or ‘roadmap’, to be shared by all, of the develop­
  ment of systems and airspace architecture. Stakeholders should be involved from an 
  early stage, through an industrial consultation body so that this development will re­
  flect their requirements and expectations, and it can help in assessing feasibility and 
  defining priorities.

38. Staff should be involved not only at local level but also by stimulating a social dialo­
  gue at European level in order to provide a forum for discussion of industry-wide de­
  velopments and to increase the mutual understanding of requirements and constraints 
  of reform.

39. Stakeholders should not only be involved upstream, in the process of drafting regula­
  tion. There would also be merit in the establishment downstream of an organisation, 
  along the lines of the current Performance Review Commission, drawing on all stake­
  holders, assessing the performance of the overall ATM system and of the regulator, 
  and making suggestions for improvement.

— Stakeholder participation in the rule-making and review process should be es­
  tablished.
— The formal ‘social dialogue’ process should be extended to include all parties 
  involved in ATM.
— An organisation, along the lines of the Performance Review Commission, should 
  assess the performance of the European ATM system and make suggestions for 
  improvement.
2.3. Coherent airspace design

40. Airspace is a common resource and should be designed and managed as such without internal frontiers (single European sky). The upper airspace should be organised to ensure maximum efficiency of overflight and in consistency with the lower airspace; lower airspace is devoted more to approach and departure from airports and to flights over short distances or by general aviation. This implies that beneath this pan-European airspace there would be local requirements (local constraints, complex airport requirements), but compatible with pan-European planning and design. The effort to identify and alleviate bottlenecks within airspace as a result of both civil and military arrangements must be intensified.

41. The implementation of the single European sky could be managed in phases. This phased approach would allow the implementation of a more integrated management of the airspace, without consideration of national borders, in order to maximise capacity through initiatives such as flexible use of airspace, uniforming airspace categories and free routing starting with upper airspace above a certain altitude and continuing in stages to optimise capacity. The speed of implementation could vary as a function of the required scale of the reform, traffic density and the priority for overall system efficiency.

42. All users — commercial aviation, general aviation, and the military — need access to airspace and zones should only be reserved permanently to any category of users when absolutely necessary. Military and civil users are willing to improve arrangements for coordinating usage and to establish arbitration procedures. The rules have to take into account the specificities of the military use of airspace. The credibility of the reorganisation of ATM in Europe depends on the involvement of the military in the definition and implementation of the regulatory framework, which needs predictability, clarity, and transparency for the benefit of all users. The way the European Union is progressing with its decision-making process and the development of its common defence policy should be a key element of the appropriate framework to address their needs.

- Airspace is a common resource and should be treated as a single European sky above the European Union territory and, through Eurocontrol, at the pan-European level.
- The single European sky should be designed and regulated at a European level, starting with upper airspace and consistent with lower airspace.
- The design and management process must include both civil and military interests.
2.4. Institutional framework

43. The reform of air traffic management hinges on the development of effective regulatory action. In carrying out its role, the regulator will need to lay down regulatory policies and essential requirements (design/implementation tasks), to draw up common technical regulations and specifications (development tasks), to establish control and infringement procedures (monitoring tasks) and to ensure the application of the regulatory framework where this application requires adoption of measures at the tactical level (management tasks).

44. A complete regulatory framework should cover safety, the economic conditions of service provision, the design and use of airspace, civil–military coordination and cooperation and technical and operational aspects. All these activities fall within the competence of the European Union. It should be efficient and guarantee the respect of the rules by all: Member States, service providers and users.

45. Ensuring safety and enhancing the efficiency of air traffic management must be done consistently with overall transport policy orientations, building on a social dialogue on air traffic management that permits full participation of the different actors taking account of the diversity of expertise involved.

46. The European Union institutions could offer the most appropriate institutional framework to establish the required regulatory environment:

— the decision-making process ensures political control by Member States and by the European Parliament over individual actions and over general policy;

— as a result of the jurisdiction of the Court of Justice the Community legal framework guarantees the direct applicability of decisions, and thus ensures the effective implementation of measures on the basis of a common interpretation;

— Member States’ involvement at all stages of the consultation and decision-making process makes it possible to take into account civil and military interests, provided that there is an adequate coordination at national level;

— the integration of air traffic management policy into overall Community policies makes it possible to use Community instruments (in particular in relation to funding, social action and external policy) for air traffic management;

— representative bodies of the controllers should be associated with the development of the Community policy through their participation in the existing social dialogue in this area;

— finally, the implementation of the common foreign and security policy (CFSP)(*) could reinforce cooperation between air forces so as to make the best possible use of airspace.

47. It was initially considered that the accession of the European Community to Eurocontrol would facilitate the application of Eurocontrol measures by the EC Member

(*) Under the protocol to the Treaty of Amsterdam, Denmark does not participate in the elaboration and the implementation of decisions and actions of the Union which have defence implications. At any time, Denmark may, in accordance with its constitutional requirements, inform the other Member States that it no longer wishes to avail itself of all or part of this protocol.
States, through the use of the EC legal and institutional mechanisms. However, that accession has not yet been possible. As a result Eurocontrol decisions are difficult to implement, in particular because they are not drafted in a manner that facilitates their conversion into EC regulation (7).

48. The accession remains necessary because Eurocontrol has developed unparalleled expertise within its organisation and because ATM measures have to be developed in the largest number of countries possible. Furthermore, the Community’s accession will allow Eurocontrol to surmount many of the difficulties stemming from the intergovernmental structure of that organisation, from the absence within Eurocontrol of a broad sectoral social dialogue and of a fully-developed legal and political control over its potential regulatory activity, assuring the direct applicability of rules. Assumption by the Community of regulatory responsibilities also helps Eurocontrol to organise the distinction between regulatory and service provision activities, which is foreseen in the revised convention. That is why it is desirable that the Community becomes a full member of Eurocontrol as soon as possible; this will also help to align the regulatory approaches and the priorities of the Community and Eurocontrol. It will also permit the Member States to ratify the revised convention (8), and thereby allow Eurocontrol to attain greater efficiency and effectiveness. The relationship between the European Union and Eurocontrol will therefore be developed on the basis of the strengths of both organisations, so as to make use of synergies that will improve the quality and the capacity of air traffic control in Europe. Eurocontrol will contribute by means of its technical know-how and its relations with non-EU Member States, whereas the European Union will mobilise its decision-making and implementation mechanisms in order to attain the ambitious objectives stated in this report.

49. The cooperation with Eurocontrol will take two forms:

— The Community will participate fully in the regulatory activities of Eurocontrol, as a member of the organisation. This participation will involve the possibility to promote the methods of functioning of the single sky and will entail the obligation to transpose into internal Community law the rules that have been adopted.

(7) Article 3 of Council Directive 93/65/EEC of 19 July 1993 on the definition and use of compatible technical specifications for the procurement of air traffic management equipment and systems requires the Commission to identify and adopt the Eurocontrol standards whose respect has to be imposed by Community law. The Commission has adopted in full all Eurocontrol standards that are legally transposable in the Community framework, that is to say, Edition 2.2 of ‘On-line data interchange (OLDI)’, Edition 2.0 of ‘Air traffic services data exchange presentation (ADEXP)’ and Edition 1.0 of ‘Flight data exchange interface control document (FDE-ICD)’. The adoption of the four remaining Eurocontrol standards under this directive presents legal problems that have been notified to Eurocontrol. See the Commission’s report on the application of the directive, COM(1999) 454 final.

(8) The revised Eurocontrol convention intends to give Eurocontrol powers of a regulatory nature in a number of areas, including those for which Member States have transferred their competences to the Community. As a result, many obligations on EU Member States stemming from the revised convention can only be exercised, and — as already stated by a declaration when the convention was signed — EU Member States cannot ratify the convention without the EC also joining. As a result the Community has negotiated the terms for its accession as a full member to Eurocontrol, so that it can actively participate in the preparation of relevant legislation and commit itself to adopting such legislation. Notwithstanding efforts made by all Community institutions it has so far not been possible to secure agreement of all Member States for the Community’s accession to the Eurocontrol convention. At the same time as the Community joins the organisation, Member States should ratify the revised convention. The dispute between the United Kingdom and Spain over Gibraltar airport prevents the other Member States from approving Community accession to the Eurocontrol convention.
In parallel, the Union will implement the orientations resulting from this report, in accordance with normal working methods and decision-making processes. The Commission will make proposals to Council and European Parliament after having heard the advice of the civil and military experts and the industrial and social partners. These proposals will cover the definition of essential requirements ("roadmap") and a timetable for implementation. The application of these measures will need the elaboration of these essential requirements and definition of technical specifications, which could, as appropriate, be conferred on the Eurocontrol Agency on the base of mandates (1). The result will be evaluated and, where satisfactory and if necessary, made legally binding by its adoption in the Community or by the legal instruments of the second pillar. Such regulation will be directly applicable and enforced vis-à-vis EU Member States and private operators (airlines, airports, service providers, etc.). Eurocontrol on its side will ensure as far as possible that these measures are made binding vis-à-vis the non-EU Member States by its own decision-making processes, and in the perspective of the future enlargement of the Union.

50. In this way the European Union will be able to go further and faster. In parallel, and as a member of Eurocontrol, the Community will act consistently in that framework. It will also be necessary to work with ICAO towards convergence of global and European regulatory developments.

51. Non-member States of the Community having close links to the legal system of the European Union through multilateral agreements (such as EEA, the European Economic Area) or through bilateral agreements providing for air transport integration (such as Switzerland) should participate to the extent possible in the European decision-making process.

52. In the perspective of an enlarged Union, Europe will thus benefit eventually from a single and strong regulator, fully capable of guaranteeing the efficient organisation of its airspace.

53. Without prejudice to the cooperation with Eurocontrol and the availability of its expertise, due to the need for a global approach, it will be necessary for the European Union to rely on comprehensive Member State expertise on a permanent basis. Therefore, the appropriate mechanisms should be considered to ensure a full implication of the military and civil actors in the development and implementation of the EU regulatory framework (2).

(1) The Commission already confers, on a contractual basis, working mandates to the standardisation bodies (CEN, Cenelec, ETSI).

(2) This issue is also raised in the European Parliament's call for a single European air traffic control agency, in its resolution of 13 April 2000 containing the European Parliament's proposals for the Intergovernmental Conference, document AS-0086/2000.
- Maintain the pan-European character of the ATM system by making best use of the revised convention of Eurocontrol.

- The recognition of the EU institutions as the appropriate regulatory body for the EU and States that have integrated their aviation areas into the EU's.

- Improve the cooperative process with both civil and military actors for the development and enforcement of the Community regulation, in cooperation with Eurocontrol.

- The accession of the European Community to Eurocontrol will help to secure convergence and coherence at European level.
3. FIELD OF ACTION

3.1. Safety

54. Safety is a fundamental feature of all air transport activities. Ensuring safe separation between aircraft is the principal objective of the air traffic controller. Rising traffic volumes, advanced automation and increasing technological integration between ground/airborne systems will create new challenges for safety managers. Together with new structures for service provision, such as corporatisation or privatisation, this reinforces the need for new safety regulation processes and structures.

55. Whilst ATM has the primary function to ensure safety, the lack of specific safety targets and standards essentially put the burden of ensuring safety on air traffic controllers without giving them the benefit of adequate guidance and procedures. This deficiency also makes it difficult to have an objective view on achieved safety performance of the system.

56. Consequently the strengthening of current safety regulation structures and processes is an immediate priority and urgent steps are required to ensure a consistent and robust approach to the preservation and improvement of current safety levels. This would result in the Community making Eurocontrol safety regulatory requirements mandatory.

57. The Commission has made a proposal (13) in 2000 for the creation of a European Aviation Safety Agency (EASA). As agreed in the Council the first priority of this agency will focus on the certification of the aircraft with the objective to extend this activity in particular to the safety aspects of air traffic management. Depending from the timetable of the creation of such agency, it might be possible to transfer to this organisation responsibilities for safety regulation of air traffic management by 2005 with the same objective as for its other activities: to make possible the adoption of binding and direct applicable rules with a full enforcement power.

58. However, these developments cannot affect in the meantime the present regulatory activities of the Eurocontrol Safety Regulation Commission within the limits of the power and competence attributed by the convention.

59. During this interim period, it is necessary to ensure that there is a clear distinction between the public role of safety regulators and the service provider who is responsible for safety management. In addition, the following measures that are of importance should be implemented between now and 2005:

- a non-punitive safety reporting environment in order to assess compliance with an objective safety target approach;
- progressive implementation of controller assistance tools that provide a 'safety back-up' in the event of system failure or error (so called 'safety net' tools);

— support to national safety authorities for the implementation of safety regulation measures.

— An effective and independent safety regulator at the European level, ensuring enforceability of safety regulatory requirements.
— The development of a safety action programme specifically dedicated to systems capacity developments.

3.2. Airspace management

60. The growing demands on the use of airspace necessitate a consistent and effective regulation at the European level from airspace architecture, through design to management to ensure safety and efficiency. The upper airspace needs to be treated as a continuum and managed accordingly. The current European approach is not well organised to respond to the projected traffic growth and there is consequently a need for an innovative approach to achieve harmonisation and facilitate new arrangements.

— A fundamental requirement is to gain acceptance of a common planning process for European airspace. It is essential to set policies on a European basis so that a common, harmonised airspace structure is achieved, that the present and future allocation and use of airspace is based on common principles, and that airspace is designed and managed to agreed rules.

— The common planning process must be capable of ensuring that an integrated pan-European airspace is developed and maintained, with due regard for national planning processes taking into account such matters as local constraints, complex airport requirements and security and defence requirements. This would result in the creation of a pan-European airspace architecture based on a common planning and network design process. Beneath this there would be a national structure responsive to local requirements, but compatible with pan-European planning and design.

— The implementation of the single European sky could be managed in cooperation with Eurocontrol by the Community in phases. This phased approach would allow the implementation of more integrated management of the airspace, without consideration of national borders, in order to maximise capacity. It should start with uniforming airspace categories, optimising route and sector design with special attention to removing existing and future bottlenecks, and effective and uniform implementation of the flexible use of airspace concept. In the longer term it should facilitate the introduction of new concepts e.g. free route airspace starting with upper airspace above a certain altitude and reducing in stages to optimise capacity.

— Access to airspace should be as free as possible and non-discriminatory. In peacetime airspace should be available to all users, both civil (commercial and ge-
neral) and military, as a function of their operational needs. To support direct routings of civil aircraft to decrease flying time and reduce unnecessary fuel burn, but also to provide the necessary airspace for military training, it is necessary for airspace to be administered in an integrated and flexible way.

61. The implementation of a new airspace structure and the airborne and ground system tools and technologies to support new concepts will require the commitment and cooperation of regulatory bodies, service providers and the airspace users to achieve effective implementation. This commitment needs to be ensured by a combination of timely involvement of all parties, binding measures and incentives.

62. Air traffic flow management leads to restriction to operations that ensures that the ATC system is not overloaded. When the predicted demand exceeds the stated capacity, restrictions are introduced and overloads are prevented. However, the stated capacities of nominally similar sectors vary significantly and the system is far from optimum.

63. Efforts by airspace users to circumvent this system has led many control centres to introduce additional operational limitations, which reduces still further the optimum capacity available. The result is unused slots and lost slot improvement opportunities.

64. To resolve these issues the following improvements could be envisaged:

- Integration between airport, airline and air traffic flow management planning needs to be enhanced to enable collaborative decision-making through better use of real-time information exchange to improve the effectiveness of flow management.

- In times of congestion or crisis, the role of the Central Flow Management Unit (CFMO) — the Eurocontrol unit responsible for adjusting traffic flows to the available capacity in order to avoid overloads and to optimise the tactical and real-time efficiency of the ATC system — needs to be reinforced to integrate the strategic and tactical planning of traffic flows (consistent route and traffic policy) and to define priorities for the allocation of slots.

- Airspace should be designed, regulated and strategically managed on a European basis.

- Airspace regulation should enable fair and non-discriminatory allocation of airspace resources to all users.

- Phased introduction of the single European sky facilitating new concepts, such as free routing.

- More responsive air traffic flow management through CFMU with a broader mission, better rules and enforcement.
3.3. The integration of military needs in the single European sky

65. The success of this initiative is dependent on an effective civil/military cooperation, which requires the full participation of the military on an equal footing in the regulatory process. Such participation will require the use of the instruments of the second pillar and consequently needs the approval of, and a decision by the Heads of State or Government in the European Council.

66. Military activities account for a small proportion of total air traffic, and whilst civil air traffic will double every 12 years, military activities are expected to grow at a significantly lower rate. In the future, the new way to use military aircraft will require fewer but larger airspace training areas with more intensive activity at all flight levels.

67. In order to alleviate bottlenecks, areas where civil and military traffic interact significantly should be identified, effective tactical coordination has to be achieved, and actions for a more efficient use of airspace have to be conducted, backed up by the necessary process between civil and military authorities and the legal framework and should be introduced by 2001.

68. Some military activities temporarily require a large zone of airspace, and the location of some of the airbases can substantially increase the difficulties in the already existing bottlenecks in the civil air traffic. However, military needs reflect changing requirements and an increasingly global role. Military flights today carry out a more varied operational repertoire; their airspace requirements as a result also change, and this has an impact on the way in which overall airspace is organised and used.

69. Where segregation is essential to preserve flight safety, it is necessary to optimise the time periods in which any particular sector of airspace is allocated to military needs, especially during peak periods for civilian traffic and in high-density airspace. An initial element to achieve this will be full implementation across Europe of the ‘flexible use of airspace’ concept.

70. To be effective, the principles of organisation and management of the airspace for civil and military use should be regulated at the European level respecting national security and defence requirements. Ultimately this airspace regulation should be an integrated civil/military function. As a first step, and to facilitate the establishment of the integrated European regulator, the military component of this regulator should be established.

71. Whilst today much of the training is within national borders and near airbases, there is scope for substantial gains for optimising civil and military use of airspace. The result could be a possible shifting of military air activities. In this case, there could be cost and operational implications for military airspace users, which would need to be compensated for by the introduction of mitigating measures and incentives.

72. By 2002, there should be the effective implementation of the flexible use of airspace concept and collaborative management to smoothly adapt military training with civil traffic flow with no fixed areas of segregation and time-periods for segregated military use should be optimised. In this framework, the implementation of cross-border training areas and the possible relocation of military activities should be encouraged.
within the limits of technical and financial feasibility. This collaborative approach needs to be backed up by common procedures and regulations for handling military traffic and financial incentives to stakeholders where investments or relocation could have benefits for civil ATM.

73. By 2005, as part of the single European sky, both civil and military ATM bodies should participate as equal partners in the regulation and management of European airspace. Where the Community exercises regulatory responsibilities, it will ensure full input by military expertise.

74. In order to make a Europe-wide approach possible for airspace management, coherence between the various national military and security requirements on airspace is necessary, and newly developed military cooperation within the second pillar of the EU Treaty can offer the framework for undertaking this exercise.

— Civil/military cooperation should be encouraged.
— Airspace usage and management should be an integrated effort, at all levels.
— The military requirement in Europe needs to be coherently defined for airspace planning.
— The flexible use of airspace concept, consisting of no permanent areas of segregation, optimised time-periods for segregated military use, should be implemented effectively in all States and harmonised within Europe.
— Relocation of military activities outside high-density traffic areas should be encouraged, with suitable incentives.
— Suitable regulatory structures for military air traffic need to be assured, involving instruments derived from the second pillar of the EU Treaty (CFSP), well-integrated into the overall regulatory framework for the single sky.

3.4. Systems and operations

75. Even if progress has been realised during the last few years towards a seamless operation of the ATM system in Europe, the situation still remains unsatisfactory with a low level of integration between the national ATM systems. In addition there is need to contain costs and avoid multiple ‘national’ developments of systems with basically the same functionality.

76. In order to increase capacity, it is necessary to implement new concepts, tools and procedures in the next few years. This is a relatively small market, development processes are complex and there are limited resources in Europe. Therefore, a new partnership approach is required which allows a balanced involvement of all stakeholders, stimulating creativity and the sharing of knowledge, experience and risks. This process could be achieved by:
— enhanced cooperation between research and development organisations and ATM industry in order to pool resource and minimise duplication;
— consolidated technical and operational requirements across Europe in accordance with Community legislation;
— a European approach to the validation of new systems against defined requirements.

77. The industry consultation body at European level, referred to in paragraph 36 above, has a crucial role to play in order to promote consensus on the technical and operational requirements and on the instruments to achieve these goals, and to provide input into the research and development, the standardisation and the legislative processes. This body will establish a strategic programme (roadmap) for the development of new functionalities and technologies to ensure that safe, efficient and performant ATM systems and sub-systems are available when required. This will aid service providers and industry to better plan their investments to introduce new technologies and procedures to increase safety and/or capacity. In order to achieve tangible and quick results and avoid building up time-consuming new structures, Eurocontrol should be associated with this body.

78. ATM systems development requires close integration between user requirements, operational validation processes and the need for detailed technical specifications or standards. Therefore the Community should initiate an open standardisation process adapted to the specificity of this sector. The current tendency of Eurocontrol and service providers to act as legislator, customer, designer, certification and operator undermines transparency and creates conflicts of interest and risks for the development of new systems. Their role should be reoriented accordingly.

79. Consequently new forms of technical regulation are required to define essential requirements for interoperability, common functional and performance levels and use of common procedures. To the extent possible, these should take the form of voluntary European standards through ‘standardisation mandates’ developed by Eurocontrol where appropriate. These mandates would be passed by the European Commission to the relevant standardisation bodies under the umbrella of the binding essential requirements. These essential requirements should be technology-independent, leaving industry the freedom to develop specific technological solutions. In order to avoid the proliferation of standards and resource consuming validations of them, but still enabling desirable competition, standardisation should be made within the frame of a high-level architecture and an ‘overall, total system approach’ the so-called ‘new approach’ (\(^*\)). Within the frame of its revised tasks, Eurocontrol should support these activities.

\(^*\) This standardisation process is the application of the general conditions of the ‘new approach’ on standardisation from the resolution ‘on a new approach to technical harmonisation and standards’ (85/C 136/01, published in OJ C 136, 4.6.1985).
— Concentrate resources to develop and validate common technical and operational solutions to common needs.

— Establish an industry consultation body where the major stakeholders — airspace users, service providers and manufacturing industry — can develop and agree a strategic management programme for the development of new functionalities and technologies.

— Establish technical regulation on the basis of the new approach where rules, operational requirements and standards are complementary and consistent.

— Task Eurocontrol to provide technical support in these activities.

3.5. Framework for providers of air traffic control

80. Providers of air traffic service (notably air traffic control), are developing rapidly. From a tradition of civil and/or military administrations, many of them have gained a certain degree of autonomy, giving them increased flexibility and access to human and financial resources. All of them, public and private are under severe pressure to catch up with the growth of air traffic; they have become more dynamic organisations with increased emphasis on customer responsiveness.

81. Whilst the dynamism of the sector is a favourable evolution, it removes some of the old certainties. There are some concerns that must be addressed.

— How can we preserve and even reinforce the safety culture that is one of the main features of European air traffic control? How can we ensure continuity, efficiency and quality?

— How far can the trend towards commercialisation go? What is the scope for competition and expansion into new markets?

— How can we guarantee that the system as a whole is optimised and that service providers do not merely pursue their individual interest?

82. As stated above, it is necessary to distinguish between regulation and service provision, both being seen as two distinct activities and organised accordingly. This distinction must as an absolute minimum be achieved at the functional level.

83. Whilst preserving the continuity of service provision, the service provider must be subject to a system of authorisation which will constitute a means to detail the respective rights and obligations.

84. Authorisations or 'cahiers de charge' provide for a means to control access to the activity of air traffic management and to establish 'quality of service' objectives. It is clear that the core service (separation of aircraft) still remains a monopoly under the present technical and operational environment and cannot be opened to competition. Only one air traffic service provider can separate all the aircraft in a given volume of airspace and in this respect he exercises a State power (pouvoir régalien). Certain an-
ciliary services, such as communications, aeronautical information systems, meteorology, lend themselves to competitive provision, and as technological development advances, the scope for competition is likely to widen. Also, ultimately, the competent authority may wish to give others an opportunity to tender for monopoly services. This makes it necessary to take a dynamic view of authorisation and adjust the 'cahier de charges' as appropriate.

85. In particular where air traffic services are provided under monopoly conditions, it is essential to provide for control of pricing so as to avoid excessive charges. Interests of users in terms of the safety, availability and continuity of services, cost and quality have to be taken on board. With regard to service quality, issues related to the target level of performance (level of service) in quantifiable terms have to be addressed. This could imply negotiation between the regulator, service providers and users on different regulatory aspects, possibly moving towards proposed and agreed 'service levels' and their price.

86. In addition, in order to stimulate strategies by service providers and airspace users that contribute to maximise system-wide capacity, there should be scope for modulating charges. Incentives are a useful way to accelerate the introduction of ground-based or airborne equipment that increases capacity, to reward high performance or to offset the inconvenience of choosing less desirable routings. Therefore more sophisticated charging principles should be part of the framework.

87. Cooperation between service providers, in particular at regional level, either on a contractual basis or through more structural arrangements such as joint ventures, is a useful way to enhance the integrated management of airspace and to operate airspace blocks regardless of national borders. Airspace use and air traffic flow management must be optimised at the European level to maximise capacity and will require intervention by a suitably enlarged central flow management unit structure. In any event, to ensure the efficiency of the system, there will be a need for provision of data by service providers to others.

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- Regulation and service provision should be seen as two distinct entities and organised independently from each other at least at a functional level.
- National service provision and regulation activities should comply with Community requirements.
- The regulator must benefit from adequate resources and expertise.
- Whilst core air traffic control today is a monopoly there is opportunity for competition for ancillary services.
- The charging mechanism should stimulate cost-effectiveness and include incentives for practices that increase capacity to enhance system-wide efficiency, whilst maintaining a high level of safety.
- System optimisation to be managed at a European level.
3.6. Social aspects

88. Social questions need to be suitably addressed in order to ensure the motivation and social acceptability of the reform process.

89. A major current limitation to system capacity is the number of aircraft a controller can safely handle within a given volume of airspace and a given period of time. Human factors should be more rigorously integrated in the development of new systems and procedures so as to ensure that staff have sufficient confidence in the operation of new systems and procedures intended to increase capacity, as well as to mitigate human error. Systems and tools actually supporting air traffic controllers may result in increased capacity, provided that safety levels are adequately addressed first and can be assured. The successful implementation of new systems and procedures can only be achieved when operational staff have sufficient confidence that the tools provided will properly support them to increase capacity without degrading safety levels.

90. Safety regulation and an effective regulator are essential requirements to improving the current situation. Safety regulation must take precedence over any other type of regulation. As the maintenance of adequate separation between aircraft within the current system is heavily dependent on human intervention, the sensitivity of the system to error should be minimised by the introduction of an efficient and reliable safety reporting system based on a ‘no-blame’ culture.

91. The structures for social dialogue at the European level need to be reinforced in order to guarantee that all air traffic management staff affected by the reform process are involved in an open and constructive way, throughout the lifecycle of the reform. Benefits of the reform must be clearly identified, taking all constraints (e.g. safety, staff shortage, training, etc.) into account. Existing Community structures could be used to provide the forum for social dialogue.

92. There is currently a shortage of air traffic controllers in Europe and consequently there is a need to recruit and train new controllers. Any major changes such as the current reform process put additional constraints on ATM staff, particularly in terms of capital and labour-intensive training, as this requires increased numbers of air traffic controllers. Whilst the recruitment and training of controllers is a matter for the service provider to address, this will be influenced by the performance and level of service requirements established by the regulator.

93. Manpower planning should therefore be improved, with better anticipation of future traffic evolutions, with a view to creating a surplus of air traffic controllers which can then be used for on-the-job training, and to start fostering mobility in the longer run. Care must be taken when financial incentives are offered, to avoid jeopardising safety. Current transition issues on European licensing should be resolved, addressing working conditions throughout Europe. All this requires increased investment in human resources, both at national and European level. The definition of the safety requirements for the issuance of a European licence and the approval of training programmes will be carried out by the safety regulator.
94. Where possible, the joint use of training facilities by both civil and military should be encouraged to facilitate the best use of resources.

- Improved manpower planning and recruitment to ensure timely availability of adequate staff.
- Harmonised training and procedures.
- A European licence to ensure agreed qualification levels for ATC staff.
- A reinforced structure for 'social dialogue'.
- Early integration of human factors expertise in the lifecycle of ATM systems to ensure operational acceptability and trust.
4. THE WAY FORWARD

4.1. Conclusions/further work

95. The high-level group has, during its 10 months of work, examined all the aspects that influence the better functioning of the air traffic management system. Without underestimating the impacts of technical improvements in the system, it is considered that without structural changes which imply high-level political decisions, the improvements that could be made to the current system, in place for the last 40 years, would only be palliative.

96. These structural changes imply passing from a logic of cooperation to a logic of regulation with all that is required in terms of political and legislative controls. They also imply that airspace needs should be determined in relation with the growth of traffic. Finally these changes suppose that the airspace is managed at European level in the common interest without denying the local specific characteristics justifying measures adapted at this level.

97. For all these reasons, the high-level group considers that the regulation of air traffic must be fully integrated into the European Union activities; it deems that it must be able to benefit from all forms of such activities, whether it be its regulatory powers, its training and assistance instruments, its dialogue and control mechanisms and the new EU competence in the defence domain.

98. The Commission will make appropriate legislative proposals in 2001 that should be in full effect by 2005 at the latest.

99. This approach must be able to complement the activity of Eurocontrol that offers a larger framework for cooperation, to which Community participation will ensure an active contribution.

100. The Commission is therefore invited to implement the action plan resulting from this report, assisted in the most suitable way by expertise of the national administrations including their military component, and by the interim structures of the second pillar. The Commission should also use the consultation mechanisms of the industrial and social sectors.

101. The Heads of State or Government in the European Council are invited to approve the use of the second pillar instruments to enable the full participation of the military on an equal footing in the regulatory process.
4.2. Recommendations

102. The main thrusts of the reform process following from the needs identified in the report are intended to optimise the performance of European ATM as a whole, whilst ensuring sufficient access to airspace for all, backed up by a strong and independent regulatory framework with powers of enforcement to ensure implementation. The regulators established under this framework would set high-level rules at the European level for safety and system performance, whilst respecting national security and defence requirements for the use of airspace and in consistency with the international framework.

The specific recommendations arising from the report have been grouped under the following headings to take account of the common threads and to facilitate understanding.

Regulation
— There is a need for further and stronger European regulation in the safety, performance, system and airspace design, and economic domains.
— The regulator must benefit from adequate resources and expertise.
— The regulator will define the high-level rules and ensure compliance.
— The recognition of the EU institutions as the appropriate regulatory body for the EU and States that have integrated their aviation areas into the EU’s.
— Maintain the pan-European character of the ATM system by making best use of the revised convention of Eurocontrol.
— EEA States and States having integration agreements with the European Union should be granted participation to the maximum extent possible in the decision-making process of the new EU regulatory body.
— National service provision and regulation activities should comply with Community requirements.
— Improve the cooperative process with both civil and military actors for the development and enforcement of the Community regulation, in cooperation with Eurocontrol.
— Suitable regulatory structures for military air traffic need to be assured and well integrated into the overall regulatory framework for the single sky involving instruments derived from the second pillar of the EU Treaty (CFSP).
— The accession of the European Community to Eurocontrol will help to secure convergence and coherence at European level.
— Technical regulation on the basis of the new approach should be established to ensure that rules, operational requirements and standards are complementary and consistent, with the assistance of Eurocontrol as appropriate.
— Stakeholder participation should be ensured in the rule-making and review process.
— An organisation, along the lines of the Performance Review Commission, should assess the performance of the European ATM system and make suggestions for improvement.

**Airspace**

— Airspace is a common resource and should be treated as a single European sky.

— The single European sky should be designed, regulated and strategically managed at a European level, starting with upper airspace and consistent with lower airspace.

— The design and management process must include both civil and military interests.

— Airspace regulation should enable fair and non-discriminatory allocation of airspace resources to all users.

— The military requirement in Europe needs to be coherently defined for airspace planning.

— Phased introduction of the single European sky facilitating new concepts, such as free routing.

— In the interim, the flexible use of airspace concept, consisting of no fixed areas of segregation, optimised time periods for segregated military use, should be implemented effectively in all States and harmonised within Europe.

**Safety**

— An effective and independent safety regulator must be established at the Community level.

— A safety action programme should be specifically dedicated to system's capacity developments.

**Systems and operations**

— European resources should be concentrated to develop and validate common operational and technical solutions to common needs.

— An industry consultation body of major stakeholders — airspace users, service providers and manufacturing industry — should be established to develop and agree a strategic management programme for the development of new functionalities and technologies.

**Environment for air traffic control**

— Regulation and service provision should be two functionally distinct entities and organised independently from each other, at least at a functional level.

— Whilst core air traffic control today is a monopoly, there is opportunity for competition for ancillary services.

— System optimisation to be managed at a European level.
— The charging mechanism should stimulate cost-effectiveness and include incentives for practices that increase capacity to enhance system-wide efficiency, whilst maintaining a high level of safety.

— Civil/military cooperation should be encouraged.

— More responsive air traffic flow management through CFMU with a broader mission, better rules and enforcement.

Social aspects

— ‘Social dialogue’ is an important factor in the change process requiring reinforced structures at a European level.

— To ensure adequate staff is available for the efficient functioning of the system, improved manpower planning and recruitment is required.

— Training and procedures should be harmonised to facilitate mobility.

— A European licence or qualification levels for ATC staff should be established to facilitate training, supply and mobility of personnel.

— Enhancement of acceptability of, and trust in, new systems used by the controllers through early integration of human expertise.

Incentives

— Relocation of military operations outside high-density traffic areas should be encouraged, with suitable incentives.

— The charging mechanism should stimulate cost-effectiveness and include incentives for practices that enhance system-wide efficiency.

— Involvement of operational staff and human factors expertise in the lifecycle of new systems to ensure acceptability and confidence that already high levels of safety will not be eroded.

Timing

— Reforms should be completed by 2005 according to the timetable in Annex 2.
Annex 1
The work of the high-level group

The specific tasks of the HLG were to:

— define the modalities of functioning of the single European sky within conditions of efficient delivery of services and in the respect of public service obligations, responsibilities and safety objectives to the benefit of civil and military users;

— examine the technical issues, implementation decisions and restructuring measures to be considered at national or European level in order to achieve such a reorganisation of routes and airspace structure, and their operational usage;

— propose harmonisation of national systems along a coherent Community approach implying central decision making processes and solidarity mechanisms;

— indicate how the Community framework can be supported by the use of the Eurocontrol organisation in the implementation of its conclusions.

These tasks have to be pursued, taking into account security and defence requirements in the spirit of the ‘Helsinki conclusions’ of the European Council.

To help the high-level group in its work, a number of sub-groups were established addressing:

— civil/military coordination;
— regulatory frameworks;
— structures for service provision;
— social questions.

Each sub-group prepared a report to the HLG with recommendations (in annex) and these contributions form the basis of this final report.

In total, the high-level group met 10 times and this report is the result of the work carried out between January and October 2000.
Annex 2
The timetable for change

Short term (2001–02)
Accession of the Community to Eurocontrol.
Functional distinction between service provision and regulation.
Improved civil/military cooperation.
Establishment of a ‘non-punitive’ safety reporting system.
Transposition of Eurocontrol safety regulatory requirements (ESARRs) into Community legislation whilst awaiting the enlargement of EASA to cover ATM safety regulation.
Support to national safety authorities for the implementation of interim safety regulation measures.
Develop a safety action programme to increase capacity.
Definition of a single European airspace design.
Coherent definition of military requirements for airspace planning.
Creation of mechanisms for a full involvement of both civil and military in the development and implementation of the regulatory framework.
Establishment of the ‘industry support body’ to ensure stakeholder participation in the regulatory and standardisation processes.
Harmonised implementation of the ‘flexible use of airspace’ concept.
Community proposal to establish technical regulation (standardisation) on the basis of the ‘new approach’.
Creation of a reinforced structure for social dialogue.

Medium-term (2003–05)
Establishment of a ‘system optimisation’ organisation to monitor and optimise system capacity at a European level regrouping ATFM and airspace management aspects.
Commission proposals for the enlargement of EASA to cover ATM safety.
Implementation of a single European airspace.

Long-term (2005 and beyond)
EASA responsible for the safety regulation of ATM.
Relocation of military operations outside of high-traffic density areas through suitable incentives.
Introduction of new operational concepts for the integrated management of the airspace.
Annex 3
List of acronyms

ADSB  automatic dependant surveillance — broadcast
ATC   air traffic control
ATFM  air traffic flow management
ATM   air traffic management
CEATS central European air traffic services (Eurocontrol)
EASA  Future European Aviation Safety Agency
ECAC  European Civil Aviation Conference
Eatchip European ATC harmonisation and integration programme (Eurocontrol)
ESARR Eurocontrol safety regulation requirement
Eurocontrol European Organisation for the Safety of Air Navigation
FUA   flexible use of airspace
Galileo future European global navigation satellite system
HLG   high-level group
ICAO  International Civil Aviation Organisation
ISG   Industrial and Social Group
UACC Upper Area Control Centre — Maastricht (Eurocontrol)
Annex 4
Tables

Total Departures in the ECAC Region

Percentage of Flights Delayed due to ATFM Regulations (PDF)

Average ATFM Delay per Movement (ADM)
Annex 5
Positions of interested organisations

The contributions in this annex reflect the views of organisations of the sector, developed in the context of the work on this report, without prejudice to the final positions of individual organisations on the initiative.

1. ACI Europe — The position of the airports

1.1. Introduction

ACI Europe is pleased that the discussions in both the high-level group and the industry and social group indicate that a convergence of views emerges around the main orientations of the work towards creating a single European sky. While we note the positions of the other stakeholders, including some divergences of views, let us start by saying that Europe’s airports are convinced that the key to the solution is not how individual actors perform, but how the system is organised.

Out of the many topics, we would like to stress the following four areas, which we believe are paramount to the success of the initiative:

— the need for a strong, pan-European regulator, alongside consistency of air traffic management (ATM) regulation across Europe;
— the use and organisation of European airspace as a common resource;
— the improved use and management of the civil/military ATM interface;
— addressing the human factor in European ATM, with specific reference to air traffic controllers.

Although it is clear that the Council mandate did not include airports specifically, since the main issue to address remains en route, ACI Europe welcomes the recognition of the role of airports in the European ATM system or network. It is unquestionable that the current delays and congestion problems will not be adequately and permanently solved without full consideration being given to ground operations. The European Civil Aviation Conference (ECAC) and the European Organisation for the Safety of Air Navigation (Eurocontrol) have already acknowledged this both in the ATM 2000+ strategy and the European air traffic management programme (EATMP), by including airports as an actor in an integrated management concept of air traffic from gate to gate.

1.2. Institutional framework

ACI Europe is confident that the organisational/institutional structures and mechanisms to make things happen can now be agreed upon.

ACI Europe understands and supports the need for institutional changes alongside technological and procedure enhancement across Europe. It is paramount in our view that all
efforts accomplished by other institutions, such as Eurocontrol, are supported and, to some extent, guaranteed by a strong, pan-European regulator. It is obvious to us that the issue is not about technicalities but structural change.

We believe that the Community framework provides effective instruments to perform the task. Full Community membership of Eurocontrol would constitute a first important step, but there is no doubt that we cannot at this stage continue without a regulator and a regulatory structure, independent of the service provider.

1.3. Conclusion — The role of airports

We acknowledge the fact that the role of airports is recognised in the orientations listed in Ms de Palacio’s information note of June 2000, and we support the establishment of a road map in order to prepare the effective introduction of the different (ATM) system components.

Even if the reality is most probably not as simple as that, it appears that solutions for the en route delay situation have been identified and broadly agreed upon. However, we believe that the role of airports in a single sky framework can only be effective with a gate-to-gate approach. This issue should/could be addressed at a later stage, depending on the outcome of the report to be delivered to the Council.

Aiming at this, ACI Europe believes that it is essential to establish a strategy to:

— stop imposing unnecessary artificial barriers on airport capacity;
— relate a fully defined single sky framework to the gate-to-gate environment;
— establish a transition path into the new operating environment.

By definition, the second and third elements can only be realised if stakeholders are brought together. In this regard, ACI Europe welcomes the Commission’s plan to create a mechanism for maintaining a European-wide dialogue with industrial and social partners.

As mentioned before, we strongly support the management of European ATM as a common resource, and, as a result, are convinced that this implies a pan-European strategy designed and shared by all partners, to the benefit of all. We must build upon those previous programmes and initiatives that have brought us so far, knowing that the single sky will not be a panacea, but is the only option we have at present.

2. AEA — The view of the airspace users

The regulatory part of European air traffic control (ATC) should be in the hands of the European institutions, namely the Commission, the Parliament and the Council of Transport Ministers. Eurocontrol should act as the regulator’s expert body. The national authorities should implement the decisions of the regulator. The provision of ATC services should be in the hands of bodies, public or private, which are not themselves part of the regulatory structure. The demands of the military on the airspace structure should reflect today’s realities.
We are aware that the above will not improve punctuality overnight. It is, however, an important avenue towards solving our problems. From history, we know that, in spite of the best intentions, the Eurocontrol mechanism did not (and could not) produce the necessary results in the field of ‘binding regulations’.

The above suggestion to go down a new road is at this point in time an expression of hope, based on the fact that only the Community has a mechanism in place where sovereign States give up sovereignty in full, step by step. Why should we invent the wheel in Europe if we already have one.

We can only judge the high-level group (HLG) report (and any further specific actions by the Commission) on the fulfilment and the results of the above credo. As an initial reaction, we are encouraged that the HLG goes very far in recognising the problem and pointing out the avenue to follow. For this, the HLG and the Commission deserve our appreciation; even more so, as it is the first time that the military side of air traffic control has been an integral part of such a strategy, and obviously very cooperative — something we do not find in all sectors on the civil side. We do hope that the service providers (CANSO) will request a clearer strategy for the separation of regulator and service provider at European level.

3. **AECMA — The view of the equipment manufacturers**

3.1. **Communication of the European Commission**

As stated in the communication of the European Commission, air traffic congestion in Europe is the result of growing air transport in a limited space and also because the overall system, with its global performance, is suffering from fragmentation caused by national frontiers. In addition, the European ATM is operating within the framework of a complicated institutional process which is not facilitating an efficient decision-making process.

Following the communication of the European Commission, AECMA fully supports the idea of promoting a systematic and comprehensive approach to improve ATM with a combination of short-term, medium-term and longer-term actions and plans for reforms.

In particular, AECMA agrees on the need for a new approach of cooperation in Europe by clarifying the roles of the various stakeholders.

AECMA fully supports the idea that the manufacturing industry must be involved in all phases of the process, including the early stages. In addition, sufficient R & D effort shall be provided to speed up the development of the next generation of ATM systems.

3.2. **Intermediate report of the European Commission**

Following the intermediate report of the EC, AECMA agrees with the overall analysis, which proposes ‘to improve the effectiveness of the system while ensuring that the safety objective is protected’. As regards the current situation, we agree with the fact that Eurocontrol has focused on the convergence of national systems, but, nevertheless, ATM does not adequately reflect the European system-wide needs, in particular with insufficient stan-
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dardisation, not enough interoperability, too much fragmentation and delays in implementa-
tion. In addition, there is not enough commitment to introduce new technologies.

Concerning the proposed orientations, AECMA agrees with the fact that air traffic man-
agement requires a strong regulator at European level, not only for safety, economic condi-
tions and airspace use, but also to implement a seamless, cost-efficient and interoperable system.

As regards the possibility of implementing more integrated management of the European
airspace, industry is prepared to provide the necessary systems and tools: development of
large ATM centres, multinational planning and collaborative decision-making tools, data-
linking applications, flexible use of airspace tools, etc.

In the same way, AECMA supports the idea that a Community framework will be necessary
to provide effective instruments to regulate the sector: monitoring of economic develop-
ment, infrastructure, safety, research, market and industrial policy.

3.3. Key objectives on the way to progress

Key objectives for the progress of ATM are increased European-wide performances, im-
proved cost-efficiency, timely implementation of systems and environmental sustainability.

Increased performances, which can be translated into improved safety, flexibility,
 interoperability and increased capacity, will imply, for the years to come, using current
industrial solutions and applying a step-by-step upgrade policy.

Improved cost-efficiency of the ATM system will be made possible by a harmonised market
using basic industrial solutions together with a policy of optional functions.

Timely implementation of systems, which is paramount to solving the immediate capacity
issues, means also using current industrial solutions and, at the same time, preparing in
cooperation a clear road map for the years to come with the clear commitment of all
stakeholders.

As a consequence of more flexibility, a seamless European system and reduced delays of
flights, there will be environmental benefits in proportion.

3.4. Programme of actions

In terms of a programme of actions for the short term, AECMA proposes three domains
which have to have a high level of priority.

— The modernisation of ATM infrastructures by using existing industrial solutions and
  a step-by-step upgrade policy as regards additional functionalities which could be
  necessary. Modernisation will apply mainly to enhanced surveillance and tracking,
  ATM centres and then to data-linking capabilities, flight data processing and
  controller support tools. In addition, the Galileo programme should bring benefits,
  in particular to the navigation domain.

— The launching of an interoperability programme on existing systems.

— The launching of a new telecommunications infrastructure (air and ground).
For the longer term, actions must be launched today, in parallel, to prepare a new breakthrough at the 2010 horizon by the integration of new available technologies.

To ensure a European-wide approach, this initiative must be funded and promoted at the European level in cooperation with all stakeholders.

3.5. AECMA views as regards organisational aspects

To clarify the role of all stakeholders and improve the overall efficiency, AECMA supports the following:

- a strong European regulator is needed for safety, overall performances, required level of service, airspace design, system design and economic aspects, and also to decide on interoperability standards, consistent road map of developments and commitment for implementation;

- high-level standards of operation and interoperation and high-level requirements, in general, could be developed by Eurocontrol, enforced by the EU and put into effect by the Member States;

- voluntary standards should be developed by the manufacturing industry in association with other stakeholders (Eurocae/AECMA) with the support of the EU;

- detailed technical specifications of systems and equipment should be developed by industry within the framework of dedicated contracts.

3.6. Conclusion — Industry is prepared for a proactive role

The ‘Single European sky’ initiative is a unique opportunity to reform ATM in Europe, which is necessary to solve the safety and capacity issues of aviation in Europe.

For AECMA, the key points are as follows:

- a strong regulator is needed at European level to bring the necessary European-wide dimension;

- the ATM manufacturing industry must be involved in all phases of system development and, in particular, in all technical and industrial matters, detailed specifications and preparation of the European road map;

- the ATM manufacturing industry is prepared to contribute proactively to new progress but it needs to follow the rule of profitability;

- an industry support body is necessary in Europe to support and implement such a ‘Single European sky’ initiative and the ATM manufacturing industry, in coordination with Eurocontrol, the EC and all stakeholders, is prepared to set up dedicated task forces for that purpose.
4. CANSO — The view of the ATC service providers

The Civil Air Navigation Services Organisation (CANSO) has contributed to the discussions of the industry and social group as the organisation representing the corporatised suppliers of air navigation services (ANS). Such suppliers, separate to some degree from direct government control, are responsible for handling the majority of the traffic in the European Community. States, of course, continue to have the responsibility for ensuring that ANS are provided but delegate the provision to the service providers. We believe that the providers are doing much to improve ANS provision, but that the full resolution of Europe’s problems can only be achieved by institutional change.

CANSO welcomes the initiative taken by the European Commission to improve air traffic management and strongly supports the concept of the single European sky. We note that this requires a common approach to many management and design problems. We believe that the concept of the single sky cannot mean a uniform sky. The problems vary greatly between different parts of Europe, from the heavy traffic areas in the core of Europe, to the lightly loaded areas on the edges of the area. We are convinced that the way ahead is for the service providers to work closely with their customers to provide the services they need as efficiently as possible. This must be achieved within a regulatory environment that protects the interests of the citizens of Europe. This regulation must be formal and backed by the appropriate legislation. It must be at a high level to avoid interference with the service delivery issues that are correctly the responsibility of the service providers. The successful application of regulation by the EC in telecommunications with the resulting transformation of service delivery levels to the customers is the model to follow.

We believe that the model for the future involves the establishment of service providers providing safe ANS provision as market responsive businesses with a central European regulator. These businesses should have a minimised monopoly component and their customer charges should be performance related rather than based, as at present, on cost recovery. This will take time to develop and will need the removal of State monopolies and the development of alliances between service providers.

It is, in our view, essential that service provision is entirely separated from its regulation, not only at service provider level but also at the level of European institutions, i.e. Eurocontrol. We are convinced that the European Union alone has the appropriate powers and instruments to act as Europe’s regulator. We are sure that the division between design and delivery and regulation must be complete. As regards safety, for example, all design and delivery activities must be subject to independent safety audits. We are not impressed by claims that some tasks are an unavoidable mix of design and regulation. Neither do we support the view that safety is put at risk by a commercial approach to ANS provision. The key is to create a proper regulatory regime and this we support strongly.

It would be appropriate for a board at the highest political level to define Europe’s needs from its ANS providers. It would need to have legal powers to ensure that its needs are met by imposing regulations on the providers. This implies a strong role for the European Commission. With this, Eurocontrol can provide an appropriate mechanism for ensuring that the interests of all the ECAC States are respected.
The service providers will need to cooperate in many areas and we support the establishment of an ANS industry body to assist this. We believe that all stakeholders in European aviation should be represented on this body, for example service providers, airspace users and equipment suppliers. Its task will be to interpret top-level requirements for service supply into system designs, functional specifications and technical standards. It should also be responsible for the common airspace design. It will be a clearing house for joint projects and will champion standard designs.

CANSO also supports the development of a formal social dialogue in the European Union to complement the arrangements for managing relations with staff members that already exist in our members’ organisations.

We are particularly pleased to note the importance given in the meetings of the high-level group and the industry and social group (ISG) to the issues of airspace design and civil/military cooperation. We are convinced that the airspace over Europe must be designed as an integrated whole rather than as an assemblage of national designs. This is certain to lead to the development of ANS provision, which extends across national borders much more than at present, and this must be achieved without involving problems of national sovereignty. We note that airspace design is, as its name suggests, a design task, which must involve the service providers. The regulation of the design will be, of course, the responsibility of the central European regulator.

On civil/military matters, we note that problems vary considerably from State to State. The preferred model involves very close cooperation between the civil and military authorities. This has been achieved in several States, for example Germany, the Netherlands and the United Kingdom. Switzerland is introducing an integrated military and civil system on 1 January 2001. In these cases, harmonised working and the flexible use of airspace enable both civil and military requirements to be satisfied. The new airspace design must take into account both civil and military needs.

We note that following major difficulties in Europe’s airspace in the late 1980s, management attention and Eurocontrol’s Eatchip programme led to major improvements for a few years. The problems have recurred recently and again increased management attention is bringing benefits. However, we believe that this time institutional reform is essential to underpin the efforts of the providers in order to ensure that the problems will not recur. CANSO will continue to support the efforts of the European Commission to bring about these changes.

5. The view of the ISG staff representative group (including pilots)

In their capacity as safety professionals, ATM staff and European aircrew are dedicated to the promotion of high safety standards and have contributed to the work of the high-level group and the industry and social group. We welcome the fact that the Commissioner has recently brought safety to the fore. It is worth remembering that delays are one of the tools used to maintain the safety of the ATC system.
We are submitting this document as a summary of our current position. We have been unable to consult all our affiliated organisations and we reserve the right to submit detailed comments on the report when it is finally published. We acknowledge that the Commission and the members of the high-level group have done a great deal of work, but we still have a number of concerns about the future of the ATM sector.

Europe has a remarkable safety record. Traffic has almost doubled over the last 10 years and yet we have not had a major crash that is attributable to ATC. A strong safety regulation system is vital to maintain that safety record. The high-level group has indicated that regulation is within the competency of the EU. We believe that there is a resource implication for the Community. Clear links must be established between national safety regulation arrangements that are already in existence and any regulatory system established by the EU. In particular, we need to see how safety regulation will be delivered and what resources will be given to it. We also need to examine the apparent conflict between open reporting of incidents and some national legal systems.

Despite the massive efforts made by national air traffic services and their personnel during the last 10 years, the ever-increasing needs of airspace users have pushed the system to its limits. Various factors such as the inconsistencies between national airspace navigation, the bottlenecks in parts of Europe, the large amount of airspace for military use, short-sighted national investments, especially as regards human resources, and the incapacity of Eurocontrol to harmonise and integrate the European ATM system, can no longer be considered as compatible with the needs of the industry. The national approach has clearly showed its inefficiency and thus the need for a better integration of ATM policies at European level. An integrated ATM regulatory framework should contribute to the needs and requirements of the overall objectives of a common aviation industry.

We would oppose the introduction of market forces into the ATM sector and the service provision in particular. ATM is an integral part of the infrastructure. Other examples of privatisation and the introduction of market forces, in other modes of transport, have clearly demonstrated the limits of market-oriented decisions in the management of infrastructures.

We have called for more detailed research into the causes of delays. The current statistics are deficient in two ways. Firstly, the analysis is based almost entirely on information provided by the airlines. Secondly, the information only reports delays on departure and does not track the flight through. There are good and sound reasons for an aircraft to be delayed on take-off in order to enhance the efficiency of the system. We also suspect that on some occasions ATC delays are recorded when the fault lies elsewhere. This suspicion is increased when we see the constant attacks from airline associations, particularly from the AEA. We also suggest that there are times when delays occur because of a lack of capacity at airports.

We do not pretend that the current system is perfect. However, we have argued that there has to be recognition that the system is working flat out at the present time. We want to see some research carried out which will look at how the system recovers from major problems such as extreme weather changes or airport closures. We know that research in the United States has shown that a large number of reactionary delays have been caused by the inability of some of the busiest airports to recover when things go wrong. Talking to
controllers in some of the busiest airspace in Europe, we get the same message. Problems at the start of the day will lead to increasing delays throughout the rest of the day.

Staff representatives consider that the EU institutions provide for the appropriate regulatory body for the European Union countries. States that have integrated their aviation areas into the EU's (European countries that are part of the European common aviation area and Switzerland) can be associated to Eurocontrol through the accession of the European Community. The combination of the expertise existing within Eurocontrol and the enforcement powers of the EU should ensure an effective implementation of common rules.

If we are to develop the European ATM system to deal with the amount of traffic expected over the next 5 to 10 years, we need to develop solutions which are acceptable to all. We need to ensure that when technological change is introduced all airlines equip their aircraft. With reduced vertical separation minima (RVSM), a great deal of the advantage was lost because a small number of aircraft did not carry the correct equipment. We also need to accept that some of the technological solutions being suggested will not work and therefore we need to have proper contingency plans to cope with such failures. We also need to be honest when it comes to planning capacity increases. We need to acknowledge that there are staff shortages all over Europe. There simply are not thousands of people queuing up to be employed in ATM. Even if there were, it would still take four or five years for these people to become operational.

Given the sensitivity of some of the legislative measures identified in the report, it is essential that all stakeholders are included in the process and, in particular, in the preparation of future legislative instruments at an early stage. This involvement in the rule-making should also allow all parties involved in the process to anticipate eventual changes and to ensure that there is, ultimately, the widest degree of consensus on the measures to be taken.

We therefore particularly welcome the establishment of a consultation process, through the establishment of an ‘industrial support body’, thereby including the participation of stakeholders in the rule-making procedures. We are also of the opinion that creating a formal social dialogue process will greatly improve the understanding between ATM staff and ATM service organisations. We must establish clear rules for how the relationship between the social dialogue group and the ISG will be dealt with. We note that it is the Commissioner’s intention that staff representatives should be involved in the ISG.

The Performance Review Commission of Eurocontrol has started to examine the real capacity problems of the ATM system. The results of this work should be fed into the EU’s process. We need an understanding of how the system is working to support future planning. The number of sector overloads reported by controllers has increased in recent years. This raises safety concerns and can cause delays.

The high-level group has made a good start. We hope this initiative will succeed and we look forward to being involved in developing the solutions to the problems of ATM. We need to be honest with the travelling public. Delays are inevitable unless we build more runways and more airports, and, ultimately, we persuade the airlines not to abuse the current rules.
6. The Eurocontrol activities developed in the context of the ATM 2000+ strategy

6.1. Introduction

Eurocontrol, an intergovernmental civil and military organisation, was initially established in the 1960s to provide and operate air traffic facilities and services in the upper airspace of Europe. To that effect, it developed several regional UACs (Upper ATC centres). In the 1980s, the organisation's objectives and tasks were reoriented towards harmonisation and integration of the national air traffic services. Finally, more recently, the action of the organisation was reinforced with the view to maintain and enhance safety as well as the overall performance of the ATM framework at pan-European level. Between 1960 and now, different steps were implemented to improve the use of the existing ATM system capacity, increase this capacity and reduce delays, while keeping stable or even reducing unit costs. In spite of the substantial increases in capacity due to the increased traffic demand and some inherent limitations of the system, the ATM situation did not improve as it should and the transport ministers of 29 European States initiated stronger action at MATSE 6 in January 2000.

In particular, they:

- launched a comprehensive gate-to-gate ATM strategy for the year 2000+ to cater for the forecast increase in demand up to the year 2015 and beyond;
- asked Eurocontrol to put in place, as a matter of urgency, a short-term action plan to implement the strategy;
- agreed to develop enhanced regulatory functions and ENPRM for Eurocontrol;
- invited Eurocontrol, in cooperation with the European Community, to establish a proper mechanism to reinforce the implementation by all the parties involved of the collective decisions taken through Eurocontrol.

6.2. Objectives of the Eurocontrol ATM 2000+ strategy

The strategic priorities put in place to fulfil the ATM 2000+ strategy are to improve capacity, accelerate integration and realise the gate-to-gate, uniform, performing European ATM system. These will be implemented in three steps:

- step 1 (up to 2005): Improvement of the capacity;
- step 2 (2005 to 2010): Acceleration of the integration;

6.3. Pan-European action programmes

The ATM 2000+ strategy is being implemented through short- and medium-term pan-European programmes such as Mode S and ADS for improved surveillance; RVSM and airspace organisation and ATS route network development for increased airspace capacity; ACAS for safety; requirements for tenders for new FDP systems; 8.33 kHz channel spacing, and Link 2000 for improved communications. These programmes are implemented in close cooperation with all stakeholders, including airspace providers, air traffic
service providers, airspace users, military authorities, airport authorities, avionics and ATM equipment suppliers and other international organisations (ICAO, NATO, EU, JAA, CANSO, etc.).

6.3.1. Airspace

An airspace strategy has been developed in full consultation with all stakeholders and, in particular, has taken care of military requirements. The International Civil Aviation Organisation (ICAO) has given its full support to the implementation of the strategy which aims at a uniform airspace organisation leading to one single continuum of airspace (one/single sky) for the whole ECAC region. This organisation is based on the principles of contiguous volumes of airspace, not constrained by national boundaries, providing maximum freedom for all airspace users consistent with the required level of safety in the provision of ATM services, while making due allowance for the security and defence needs of individual States. The strategy will be implemented in phases and has been translated into a number of concrete action plans.

Some of these are summarised below.

**Improving the ATS route network (ARN)**

The European ATS route network is being continuously improved to remove bottlenecks around Europe. Investigations have shown that just 30 locations in Europe account for 50% of the total delays. The development of the ARN was only possible because Eurocontrol has managed basic area navigation (BRNAV), at pan-European level, since 1998. The implementation of the latest version of the ATS route network (ARN session 4) has brought between 5 and 15% capacity increases for ACCs in 1999 and the beginning of 2000, depending on the local particularities of each ACC.

**Reduced vertical separation minima (RVSM)**

The reduction of vertical separation between FL 290 and FL 410, the objective of the RVSM programme, will improve airspace organisation. An initial impact has been assessed as a 10–20% capacity increase for ACCs in the RVSM area in 2002 (typically: 20% for UACs, 15% for ACCs with a large proportion of overflights and 10% for other ACCs). RVSM is planned to be fully introduced in the whole ECAC area on 24 January 2002.

**Free route airspace concept programme (FRAP)**

The FRAP has been developed to provide more airspace capacity to meet growing demand. It comprises specific airspace within which users shall freely plan their routes between an entry point and an exit point without reference to the ATS route network. In this airspace, flights will remain subject to air traffic control.

An initial feasibility study for the Maastricht area showed the following expected benefits from the implementation of free route airspace in Belgium, Germany, Luxembourg and the Netherlands:

- considerable benefits can be achieved in cost reduction to airspace users (EUR 60 million p. a saving flight distance/time — approximately 2%).
— increased flexibility and efficiency for airspace users will result from the operation at more optimal horizontal and vertical profiles, with corresponding additional fuel savings;
— a significant decrease in the number of conflicts (approximately 30%) has the potential to increase airspace capacity provided the right ATC systems support tools are implemented.

This initial concept has also been adopted by the Nordic harmonisation and implementation programme, representing four Nordic States — Denmark, Finland, Norway and Sweden — as well as the CEATS (central European air traffic system) States representing eight States in central Europe — Austria, the Czech Republic, Croatia, Italy, Hungary, Slovenia, and Bosnia-Herzegovina. ECAC recently agreed that this concept should be implemented in the whole ECAC area.

Flexible use of airspace (FUA) concept
The FUA is one of the major programmes of the airspace strategy to facilitate a progressive move towards an ECAC airspace which is no longer constrained by national boundaries or exclusive use by a particular user group.

A survey is currently under way to assess how the FUA concept has been implemented by various States.

Visits by the agency staff (Airspace Unit and CFMU) to the national airspace management cells (AMCs) have started. By the end of the year, 16 AMCs will have been visited with the purpose of identifying the way FUA is currently implemented in each State and corrective measures.

6.3.2. Systems and tools
Surveillance programmes are developed by Eurocontrol under the umbrella of the surveillance strategy for the ECAC area, essentially through two programmes: ‘Mode S secondary surveillance radar’ and ‘Automatic dependent surveillance’.

Mode S is a technology that provides enhanced surveillance information to controllers. Benefits come through the selective addressing of aircraft. The technology also offers the opportunity to use the data-link capability to down link certain aircraft parameters that would further enhance the quality of the surveillance information.

Automatic dependent surveillance (ADS) will be a major element of the surveillance infrastructure in Europe and the sole surveillance infrastructure in oceanic areas or remote areas where the introduction of radar is impractical or not economically viable.

8.33 kHz channel spacing
The 8.33 kHz channel spacing programme was set up to implement reduced channel spacing in the VHF frequencies to ease the problems of frequency congestion in order to accommodate the growing demand for new control sectors and RVSM implementation. The programme was delivered on 7 October 1999.
Implement air/ground data link

This programme optimises the involvement of controllers, aircrew and aircraft operators through integrated air and ground data communications. The introduction of digital communications in the cockpit and at ATC sectors is gradually increasing the productivity of ATM by reducing voice congestion and increasing controller efficiency. Safety is also enhanced by reducing communication errors and pilot and controller fatigue. In order to obtain early benefits from data-link implementation, a specific programme (Link 2000+) has been launched with the full support of stakeholders.

Interoperability of flight data-processing system

This programme aims at harmonisation and integration of flight data-processing system (FDPS) functionality in Europe in order to satisfy cost-effectively the needs of an increased number of air traffic management stakeholders. It ensures that the European FDPS will be built on compatible operational requirements and will evolve towards providing a seamless operation through system interoperability across the ECAC area.

Tools

Eurocontrol is developing a set of tools to increase controller productivity through automation of the more routine activities, leaving more time to the person for knowledge-based activities. These tools include MTCD (medium-term conflict detection), monitoring aids, SYSCO, civil/military coordination, AMAN and DMAN (arrival and departure management tools). All these tools need good human–machine interfaces (HMIs) to become operationally acceptable.

European aeronautical information services database (EAD)

The European AIS database (EAD) programme will be operational by 2003 with the view to provide the stakeholders with a unique ECAC pan-European reference database of quality-assured aeronautical information. Implementation of the EAD will increase cost-efficiency by eliminating service duplication and improving safety by guaranteeing quality, integrity and timely availability of information.

6.3.3. Human resources

There is currently a shortage of air traffic control officers (ATCOs) in Europe of about 10–12% of the required workforce, as shown by the latest Eurocontrol survey. Because of the need to recruit and train new ATCO staff as quickly as possible in order to eliminate the staff shortage, the demand for making all training capacities available is very high.

Eurocontrol therefore develops programmes relating to new training methods and tools to support and enable the Member States to cope with future demand, and to increase effectiveness in recruitment, selection and quality level of the ATCOs in Europe.
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