ATM Economic Regulation Study

Study on the Economic Regulation of Air Traffic Management Services – Final Report

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1. Executive Summary

1.1 Introduction

1.1.1 This is the final report on a study on the economic regulation of air traffic management (ATM) services carried out by Logica UK Limited for the Directorate General for Energy and Transport of the European Commission under contract No B2000/B2-7040/SI2.260421. As well as Logica staff, the Logica team included Michael Butler and Pablo Mendes de Leon of the International Institute of Air and Space Law, University of Leiden, The Netherlands and Hervé Dumez and Alain Jeunemaître of the Centre de Recherche en Gestion, École Polytechnique, Paris.

1.1.2 While air traffic management in Europe has achieved a high level of safety, delays have reached unacceptable levels. In Europe today, one flight in three is delayed. Air transport within Europe is expected to continue growing at an annual rate of 5 to 7%. Even allowing for planned improvements in the ATM system, expert opinion is that delays will worsen over the next 5 years.

1.1.3 The initiatives of the 1980's and 1990's have had some effect in curbing the level of delay but they have not been successful in addressing long term under capacity. Above all, they have failed to address the economic components of air traffic service (ATS) provision.

1.1.4 In general, ATS provision within Europe is carried out by state owned enterprises and based broadly on the principle of cost recovery. This results in fragmentation of the service, significant differences in quality of service and significant inertia to service improvement.

1.1.5 The Commission recently adopted a Communication[1] analysing the situation in the ATM sector. The Communication identified the need to modernise the public sector role in ATM and to limit its function to the regulatory sphere. This view has been endorsed by the High Level Group set up to support the Commission in the reform of the ATM sector[2].

1.1.6 The work of the High Level Group now needs to be taken forward into action. One strand of action concerns economic regulation. This includes a framework to cover economic issues, in particular the quantity and quality of the services provided and the price to be paid for such services.

[1] The Creation of the Single European Sky, COM(1999) 614 final of 1 December 1999.
[2] Single European Sky, Final Report of the High Level Group, 24 November 2000.

1.1.7 The aim of the present study was to analyse the scope for economic regulation in the ATM sector and propose a robust framework for economic regulation which will bring clarity to the sector and to set out all necessary actions to be taken at Community or national level to implement such a framework, including the raw materiel required for legislation.

1.1.8 Two other strands of action are concerned with the organisation of the ATM market and airspace management. These are the subject of other studies being carried out for DG Energy and Transport.

1.2 Scope

1.2.1 The study has concentrated on the timescale from the present to 2004/5 but with consideration of the longer term. The High Level Group report defines three timescales for action, Short Term (2001-02), Medium Term (2003-05) and Long Term (2005 and beyond).

1.2.2 The Geopolitical scope of the study is the 15 EU states with a wider view based on bilateral agreements, candidate member states and the wider EUROCONTROL and ECAC membership.

1.2.3 It is important to realise that under the objectives of the Single Sky initiative, economic regulation is not primarily about regulating static monopolies. It has to facilitate airspace and service provision restructuring at the European level to enable a increase in network capacity and a commitment to service quality. As a consequence, this study has had to include within its scope rather greater consideration of market organisation issues than would be the case in a more conventional study of the economic regulation of a static monopoly.

1.3 Legal Framework

1.3.1 The main instruments governing ATM charges are those due to ICAO (the Chicago Convention, Document 9082/6: ICAO's Policies on Charges for Airports and Air Navigation Services and Document 9161/3: Manual on Air Navigation Services Economics); bilateral air treaties between EU Member States and between EU Member States and other states; and those due to EUROCONTROL (the Multilateral Agreement relating to Route Charges, the Principles for Establishing the Cost-Base for Route Facility Charges, and Guidance on the Rules and Procedures of the Route Charges System).

1.3.2 From the legal analysis it is concluded that:

- The Chicago convention contains binding provisions for the imposition of charges, with the application of the non-discrimination principle as the most important condition.

- ICAO law and policy confirm that principle and adds further conditions concerning cost-relatedness and transparency.

- Bilateral air treaties contain in some, but not all cases, provisions pertaining to the imposition of en route and terminal charges. If so, they specify to a lesser degree (the older bilateral air treaties) or greater degree (the more recent bilateral air treaties) the conditions under which en route and terminal charges may be imposed.

- EUROCONTROL has established detailed principles on en route charges, which are based on ICAO rules and recommendations, and have treaty status.

1.3.3 Decision No 52 of the Commission of EUROCONTROL dated 20 July 1999 adopted amendments to the Principles of the EUROCONTROL cost recovery mechanism which essentially allow for the cost recovery mechanism to be disapplied provided that the service provider is subject to independent economic regulation. Under this new alternative, the regulator is obliged to conduct periodic reviews of future charges and shall set in advance, for a period not exceeding five years, conditions from which the maximum level of the national unit rate shall be determined in each year of the review period. Before setting up a new system based on economic regulation, states are required to undertake a prescribed process of consultation and notification.

1.3.4 This alternative mechanism based on economic regulation is specified in fairly general terms which allows considerable scope concerning the details of the economic regulation mechanisms adopted. The economic regulation measures proposed in this report could be implemented, at least in the short to medium term, under this mechanism. In the longer term, further amendments could be made to the EUROCONTROL Principles if this were agreed by the states.

1.4 Experience of Service Provision

1.4.1 The study gathered information on the economic regulation of ATM service provision and the associated legal and institutional arrangements in the following countries:

- France, Germany, UK (large countries);

- Netherlands, Ireland (smaller countries);
- Czech Republic and Romania (candidate EU member states where ATS has been separated from regulation and other functions).
- Australia, Canada and New Zealand (countries in which ATM service provision has been corporatised according to different models).

1.4.2 As well as states, information was also gathered from representatives of airspace users' and workers' organisations. The views expressed have been taken into account in the study. Participants and their organisations are listed in Appendix A.

1.4.3 A review of service provision in the European Railways and European Telecommunications sectors has also been conducted. These sectors have analogies with the European ATM sector and are further developed in terms of corporatisation and economic regulation.

1.4.4 The growth in air traffic has enabled an expanded number of air navigation service providers to become financially viable. This has led many governments to transfer the operation of their air navigation services to financially autonomous bodies. In almost all cases, such bodies effectively remain under direct control of the state. Only in the case of the public private partnership proposed for National Air Traffic Services in the UK is ATM service provision to be transferred to a private sector company.

1.4.5 The extent to which service provision and regulation have been separated also varies from state to state, although in almost all cases both functions are effectively under operational control of the state. The legal basis for regulation and service provision also varies from state to state since it relies strongly on state law. However, in almost all cases the principles applied are derived from the principles of ICAO.

1.4.6 Economic regulation of the European railways and telecommunications markets is significantly more developed than the air traffic services market. Experience from these markets indicates that formal institutional separation between regulation and service provision is not in itself a sufficient condition to create an integrated single European market. In markets where competition is driven by national, incumbent, dominant companies enjoying monopoly power over access to network infrastructure, introduction of separation between regulation and provision of service on a national basis without the oversight of a European regulator results in divergence in national regulatory regimes. Dominant national companies seek tight alliances which will protect

their home markets from competition. This reinforces the competitive status quo and fails to develop a single European competitive market.

1.4.7 An economic appraisal of European ATM service provision leads to the conclusion that there are three major issues which economic regulation should seek to address:

- poor allocative (investment) and productive (management) efficiency;
- fragmentation along national boundaries resulting in national vertically integrated monopolies;
- the interplay of key factors constraining efficiency, namely the management of the civil military interface, the intricate structure of powers and responsibilities and the lack of information disclosure.

1.4.8 With the exception of recent developments in the UK, the monopoly ATS providers have not been subject to economic regulation. On a national basis, ATS providers have to comply with administrative controls and public management procedures which govern investment and management policies. At the European level, the Enlarged Committee for Route Charges of EUROCONTROL monitors ATS providers' accounts. In addition, the Performance Review Commission sets targets on performance and capacity. All these institutions perform rudimentary regulatory functions. This regulatory framework lacks an independent auditing process, and lacks the enforcement powers for regulation to be effective.

1.4.9 At the European level, service providers report on costs according to the EUROCONTROL Principles. The level of reporting varies widely. The lack of harmonisation of accountancy procedures raises concerns that excessive or undue costs might be included in the cost base. Hence, it is unclear whether current charging for ATM services is cost-reflective.

1.4.10 Economic regulation based on incentives to cost efficiency and to increases in level and quality of service has not been implemented. The en-route charge covers all ATM services and is based on cost recovery. Whatever the quality and level of service provided, ATS providers are remunerated based on their nominal costs.

1.5 Proposals for Economic Regulation

1.5.1 Two approaches to economic regulation have been analysed: national regulation combined with a competition regime and European regulation combined with a regime of co-operation between service providers.

1.5.2 It is concluded that competitive franchising of the whole set of ATM services from a national perspective involving the creation of independent national regulators has scope for reinforcing European ATM fragmentation to the benefit of the incumbent provider, does not necessarily ensure proper investment levels, and may give rise to detrimental network effects.

1.5.3 It is further concluded that competitive franchising of cross-border airspace blocks would be difficult to implement in the short term, staring from the current situation of fragmentation of service provision along national boundaries. It would require a willingness of states to give away the revenues and employment attached to service provision and to agree swift restructuring.

1.5.4 An approach based on co-operation rather than competition is therefore proposed as the way forward. It relies on setting up a European regulatory framework.

1.5.5 The approach assumes the following principles:

- No trade-offs between safety and economics: the overriding principle is that under no circumstances should the search for economic efficiency result in trade-offs with safety.
- Cost relatedness.
- Non-discrimination.
- Unbundling of costs and services (transparency).

1.5.6 From an economic perspective, ATM can be viewed as the provision of a range of services organised around a network system. Four components can be identified:

- the network infrastructure (airspace design, route structures, etc);
- air traffic flow management (ATFM), which is concerned with optimising the use of the network infrastructure;

- air traffic control, which concerns (local) day to day operations;
- ancillary services which are not linked to the network infrastructure such as meteorological services.

1.5.7 The optimisation of the network infrastructure needs to be carried out at the European level as a joint civil/military activity. It is proposed that the charging formula for the network infrastructure component of ATM should include the cost of providing the service.

1.5.8 In order to improve the performance of the European ATM system, some initiatives to restructure infrastructure at a European level are likely to be appropriate. One the one hand "collective infrastructure improvements" should benefit from financial support on the basis of user charges. On the other hand, individual infrastructure improvements are likely to require pre-funding.

1.5.9 The planning of infrastructure investment should be subject to forward-looking contractual agreements.

1.5.10 ATFM also requires action at the European level. It supposes a centrally run body on ATFM and two major institutional changes are proposed:

- Pooling in a European body of the centralised part of current ATFM service provision (CFMU) and de-centralised ATFM positions in ACCs (FMPs).
- Corporatisation of ATFM by creation of a service providers/users club which would internalise prediction of demand and planning of supply from both users and providers. It is up to those involved in ATFM service provision to decide upon the most effective organisation, capacity management procedures and rules of prioritisation to be applied in acute congestion situations. The whole arrangement would be under the approval and supervision of the European Regulator.

1.5.11 It is proposed that the charging formula for ATFM would be based on the costs of providing the service and include penalties and discounts according to incentives. A charge formula based on cost is appropriate because the joint service providers/users club governance proposed for the corporatised ATFM function should ensure the necessary transparency and internalise service providers/users conflicts.

1.5.12 A key element of the proposals are what are termed airspace zones of operational co-ordination (ZOCs). ZOCs would be cross-border airspace blocks where an increase in efficiency would stem from co-ordination between national service providers. For example, ATFM co-ordination among providers involved in the airspace zone, alternative routing for reducing traffic overloads, co-ordinated management of controllers according to traffic flows, co-ordinated redefinition of airspace sectorisation. Currently, co-ordination operates from a national perspective. What has been achieved at the national level should produce further improvements if implemented at the cross-border level.

1.5.13 Optimising the performance of ATC rests on the design of a general system of incentives which would apply to both national and transnational airspace blocks (ZOCs). The aim would be to define ZOCs on operational grounds, regardless of national boundaries. To be effective, ZOCs require co-operation between national service providers. The general system of incentives would be designed so as to make participation in ZOCs financially attractive for national service providers: for example through cost-efficiency gains, reduced penalties due to increased performance, support to investment.

1.5.14 The incentives for co-operation rest on the principle that ZOCs get zone unit rates more attractive than airspace zones which do not require cross-border co-operation. The ZOC unit rate might be higher, the same or lower than the corresponding national unit rates. A higher rate would have to be justified and agreed with users based on improved service. A ZOC unit rate the same or lower than the corresponding national unit rates would still be financially attractive if the cost savings as a result of participation on the ZOC more than outweighed the reduction in the unit rate. Detailed investigations would be required to establish the economic viability of the ZOC and ZOC unit rate concept.

1.5.15 It is envisaged that co-operation would occur by means of states delegating service provision to ZOCs and by the involvement of national service providers in setting up what are termed here as Resource Pooling Alliance (RPA) schemes. In setting up a RPA, the service providers involved in a particular ZOC would be free to choose the appropriate form of co-ordination and restructuring (eg contractual relationships, joint ventures, creation of separate service provision entities).

1.5.16 The distribution of revenues from service provision in ZOCs would be agreed between the states involved in ZOCs and according to arrangements between services providers which might be based on factors such as coverage of airspace and pooling of resources.

1.5.17 It is proposed that Zone Unit Rates (ZURs) would be set up for a three year period and subject to review at the end of the period. Three years duration is selected according to the average time to develop and implement effective re-sectorisation and to allow for financial viability and consolidation. ZURs will be based on service unit (quantity) and quality target levels. Delays would not be allocated to sectors but to airspace zones.

1.5.18 The general design of the charging formula for en-route ATC service provision will apply to both national and transnational airspace blocks. Zone Unit Rates will be forward-looking and defined for a three year period (price cap regulation). They will be based on contractual agreements between the users and the service providers. The agreements will internalise contractuel targets on level and quality of service. Financial penalties would occur when contractual targets are not met.

1.5.19 Most ATM ancillary services could be opened to competition and will not require economic regulation as such. They could be subject to competition law investigation. However, optimisation of ancillary services might benefit from restructuring of the industry as has been the case in the Defence industry, particularly in the US and as is occurring in Europe.

1.5.20 The report presents a possible action plan together with a draft EU Regulation on User Charges.

2. Introduction

2.1 General

2.1.1 This document has been prepared by Logica UK Limited for the Directorate General for Energy and Transport of the European Commission under contract No B2000/B2-7040/SI2.260421. As well as Logica staff, the Logica team included Michael Butler and Pablo Mendes de Leon of the International Institute of Air and Space Law, University of Leiden, The Netherlands and Hervé Dumez and Alain Jeunemaître of the Centre de Recherche en Gestion, École Polytechnique, Paris.

2.1.2 It constitutes the Draft Final Report on a study on the economic regulation of air traffic management (ATM) services.

2.2 Context

2.2.1 While air traffic management in Europe has achieved a high level of safety, delays have reached unacceptable levels. In Europe today, one flight in three is delayed. Air transport within Europe is expected to continue growing at an annual rate of 5 to 7%. Even allowing for planned improvements in the ATM system, expert opinion is that delays will worsen over the next 5 years.

2.2.2 The initiatives of the 1980's and 1990's have had some effect in curbing the level of delay but they have not been successful in addressing long term under capacity. Above all, they have failed to address the economic components of air traffic service (ATS) provision.

2.2.3 In general, ATS provision within Europe is carried out by state owned enterprises and based broadly on the principle of cost recovery. This results in fragmentation of the service, significant differences in quality of service and significant inertia to service improvement.

2.2.4 The Commission recently adopted a Communication[3] analysing the situation in the ATM sector. The Communication identified the need to modernise the public sector role in ATM and to limit its function to the regulatory sphere. This view has been endorsed by the High Level Group set up to support the Commission in the reform of the ATM sector[4].

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2.3 Terms of Reference / Scope

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2.4 Structure of the Report

2.4.1 Sections 3 ,4 and 5 respectively present a analyses of the main international instruments dealing with user charges. These are:

- the Chicago Convention on International Civil Aviation (1944) and the standards and principles adopted from time to time by the International Civil Aviation Organisation;

- bilateral air services agreements concluded between states (bilateral air treaties);

- principles adopted by the EUROCONTROL.

2.4.2 These instruments are analysed according to the following areas:

- The scope of the provision on user charges, that is, whether the provisions apply to en route and/or terminal and/or airport charges, and/or charges for ancillary services.

- The territorial scope, that is, national airspace, national territory and/or areas in which ICAO states impose charges on the basis of special arrangements made under the auspices of ICAO.

- The substance of the provisions in the legal instruments, with special attention to the non-discrimination principle and cost-relatedness.

- The international responsibility for the imposition of charges.

- Enforcement of the provisions on user charges.

- Remedies or dispute settlement when disagreement arises on the establishment of the user charge.

- The binding nature of provisions on user charges.

2.4.3 Section 6 presents an analysis of the experience of ATM service provision in European states and third countries and a brief analysis if the European railways and telecommunications sectors. An economic appraisal of current European ATM service provision is given in Section 7.

2.4.4 Economic regulation measures are discussed in Section 8 to provides the context for the possible economic regulation scenarios discussed in Sections 9 and 10.

2.4.5 Section 9 presents a scenario (Scenario A) based on national regulation and market forces. Section 10 presents a scenario (Scenario B) based on European regulation and co-operation.

2.4.6 On the basis that Scenario B is the recommended option, Section 11 sets out an action plan for European ATM.

2.4.7 Section 12 presents an analysis of the elements which would govern an EU Regulation on user charges and a draft EU Regulation is set out in Section 13.

2.5 Acknowledgement

It is a pleasure to thank all of those who have contributed to this study through the provision of information and through discussions.

3. Legal Analysis: The Chicago Convention and ICAO

3.1 Introduction

3.1.1 The Chicago Convention forms the framework for the operation of international air services. The fifteen EU member states are parties to the convention and are therefore subject to its provisions.

3.1.2 The basic provisions of the Convention are elaborated in the Annexes to the Convention and the Statements of Policies and Manuals published by ICAO.

3.1.3 The principal documents relevant to user charges are:

- Article 15 of the Chicago Convention concerning charges for Airports and Air Navigation Services.
- ICAO Document 9082/6: ICAO's Policies on Charges for Airports and Air Navigation Services.
- ICAO Document 9161/3: Manual on Air Navigation Services Economics.

3.1.4 Document 9082 Version 6 was adopted by the ICAO Council in December 2000 and published in April 2001 to give effect to the recommendations relevant to user charges that were made at the ICAO ANS Conference 2000.

3.2 Scope of Charges

3.2.1 Article 15 of the Chicago Convention refers to "all air navigation facilities, including radio and meteorological services which may be provided for public use for the safety and expedition of air navigation".

3.3 Territorial Scope

3.3.1 The territorial scope of the Chicago Convention is national territory including national airspace. National territory and national airspace are defined in Article 2 of the Chicago Convention. In the airspace over the high seas and airspace of undetermined sovereignty under the ICAO based Regional Air Navigation Plan, the principles established by ICAO in Annexes and policy recommendations apply to the operation of international air services.

3.3.2 Chapter 2 of Annex 11 of the Chicago Convention provides that Contracting States shall determine, for the territories over which they have jurisdiction, those portions of airspace in which air traffic services will be provided. By mutual agreement a State may transfer to another State the task to establish and provide air traffic services in flight information regions, control zones or control areas extending over the territories of the former.

3.4 Substance of the Provisions

3.4.1 The main conditions applying to the establishment of charges in Article 15 of the Chicago Convention are:

- Charges must be related to the provision of air navigation facilities and services. No charges shall be imposed by any contracting State solely in respect of transit over its territory.

- Application of the non-discrimination principle (which is a mandatory requirement under Article 15 of the Chicago Convention). This principle refers to the nationality of aircraft. It means that charges must be set for the provision of air navigation facilities and services under similar conditions for aircraft registered in the country where the charges are set, and for foreign aircraft.

3.4.2 The ICAO Council provides policies to be taken into account by states when formulating the basis for charges for air navigation services. These policies include[5]:

- An equitable cost recovery system which should ensure that the cost to be shared is the full cost of providing the air navigation services, including appropriate amounts for interest on capital investment and depreciation of assets, as well as the costs of maintenance, operation, management and administration.

- The costs to be shared should include those assessed in relation to facilities and services, including satellite services, provided for and implemented under the ICAO Regional Air Navigation Plan(s).

- The costs of any other facilities and services should be excluded, unless requested by users, as should the cost of facilities or services provided on contract or by the users themselves, as well as any excessive construction, operation or maintenance expenditures.

[5] ICAO Document 9082/6

- Costs of air navigation services provided during the approach and aerodrome phase of aircraft operations should be identified separately.

- Charges should cover direct and indirect operating costs and provide for a reasonable return on assets (before tax and interest charges) to contribute towards necessary capital improvements. Experience indicates external costs would be dealt with by ICAO on a case by case basis. For example, the "environmental charge" in respect of which ICAO is developing a specific policy through the Committee on Aviation Environmental Protection that is to be debated at its Conference in autumn 2001.

- Any charging system should, so far as possible, be simple, equitable and, with regard to route air navigation services charges, suitable for general application, at least on a regional basis and the administrative cost of collecting charges should not exceed a reasonable proportion of the charges collected.

- Charges should not be imposed in such a way as to discourage the use of facilities and services necessary for safety or the introduction of new aids and techniques.

- Charges should be determined on the basis of sound accounting principles and may reflect, as required, other economic principles, provided that these are in conformity with Article 15 (of the Convention) and other principles in Document 9082/6.

- Where any preferential charges, special rebates or other kinds of reduction are extended to particular categories of users any resultant under-recovery of costs properly allocable should not be borne by other users.

- The charging system should take account of the economic and financial situation of the users directly affected, on the one hand, and that of the provider on the other.

- Charges should be levied in such a way that no facility or service is charged for twice with regard to the same utilisation. In cases where certain facilities or services have a dual utilisation (eg approach and aerodrome control as well as en-route control), their cost should be equitably distributed in the charges applied.

- The charge for en-route air navigation services should, so far as possible, be a single charge per flight, ie it should constitute a single charge for all route air navigation services provided by a state, or group of states, for the airspace to which the charge applies and the charge itself should be based upon the distance flown and the weight of the aircraft.

- There should be arrangements for consultation with users and for notice to be given to users of any proposed changes to charges, or the basis of calculation.

3.4.3 ICAO recognises the growing tendency of states to delegate responsibility for the provision of services to autonomous entities as well as the proliferation of charges on air traffic. The Council has indicated its strong support for the establishment of autonomous entities to operate airports and air navigation services where it is considered to be in the best interests of the providers and users.

3.4.4 The Council has recognised a need for an independent mechanism for the economic regulation of air navigation services[6]. The objectives of economic regulation would include:

- ensure non-discrimination in the application of charges;

- ensure that there is no overcharging or other anti-competitive practices or abuse of a dominant position;

- ensure transparency as well as availability and presentation of all financial data required to determine the basis for charges;

- assess and encourage efficiency and efficacy in the operation of providers;

- establish and review standards, quality and level of services;

- monitor and encourage investments to meet future demand;

- ensure user views are adequately taken into account.

[6] ICAO Document 9082/6, Section 1

3.5 Responsibility for the Imposition of Charges

3.5.1 The responsibility for the imposition of charges rests with States. States may delegate the competence to impose charges to a state body, or a private organisation, but that same state keeps the responsibility for the imposition, the level and the legality of the charges levied within the boundaries of its national airspace and on its national territory.

3.5.2 States are not free to impose charges as they wish, as the level and legality of charges is determined by (Article 15 of) the Chicago Convention and other policies and recommendations established by ICAO.

3.6 Enforcement

3.6.1 ICAO has regulatory powers but no enforcement powers. Enforcement of the Chicago Convention is left to contracting states of the Chicago Convention. Enforcement may lead to dispute settlement (see below) following the settlement of disputes mechanism foreseen in Article 84 of the Chicago Convention[7].

3.7 Dispute Settlement

3.7.1 The general provision on settlement of disputes under the Chicago Convention is interpreted here to mean that this provision is:

- mandatory for states party to the Chicago Convention;
- can be used for the settlement of disputes pertaining to the imposition of en route charges in so far as the Chicago Convention contains substantive provisions on the establishment of en route charges.

3.7.2 In other words, if disagreement arises between states on the application of the non-discrimination principle or on the question whether or not charges are imposed for the provision of air navigation facilities and services as foreseen in Article 15 of the Chicago Convention, the concerned states are required to engage into *negotiations*. If the disagreement cannot be settled by consultations, they "shall" ask for intervention of the ICAO Council, with a right of appeal to an *ad hoc* arbitration tribunal or the International Court of Justice.

[7] Cf. the "huskitt dispute" started in 1999 by the US with the EC Member States as defendants

3.8 Binding Nature of the Provisions

3.8.1 Although the provisions of the Chicago Convention are formulated is a general way, it is concluded that the terms of Article 15 are sufficiently precise to be applied in practice. This is especially true for the non-discrimination principle. Therefore, the substantive provisions of Article 15 are considered binding the contracting States of the Chicago Convention.

3.8.2 ICAO itself recognises the lack of legal force in relation to its Statements. In paragraph 1.10 of the ICAO Manual on Air Navigation Services Economics (9161/3), it is noted that the Council Statements differ in status from the Convention in that Contracting States are not bound to adhere to the Statement's provisions and recommendations. The paragraph also notes however that, since the recommendations have been developed by major international conferences, there is at the very least a strong moral obligation for States to ensure that their air navigation services cost recovery practices conform to the policies and philosophy set out in the Statements. This appears to be the general practice amongst Contracting States

Summary and Conclusions:

The Regulation of User Charges Under the Chicago Convention

1. Scope of charges

Airport charges.

Charges for the use of air navigation facilities (en route and terminal), including specified ancillary services.

2. Territorial scope

Provision of civil airport facilities and services as well as ANS and facilities in national territory incl. national airspace, plus the ICAO based Regional Air Navigation Plan.

3. Substance of the provisions

- uniformity of conditions (ie, non-discrimination).
- charges for the *use* of (airports and) air navigation facilities.

4. Responsibility for the imposition of charges

Upon states with an option to delegate the establishment of the charges but not the responsibility.

5. Enforcement

By states, in the absence of enforcement powers of ICAO.

6. Dispute settlement

Through:

- Negotiations,
- Intervention of the ICAO Council,
- Right of appeal to an *ad hoc* arbitration tribunal or to the International Court of Justice, and/or through the mechanism provided for in bilateral air treaties.

7. Binding nature of the provisions

Yes; treaty law.

4. Legal Analysis: Bilateral Air Treaties

4.1 Scope of Charges

4.1.1 It is estimated that there are some 1250 bilateral air treaties concluded between EC Member States and between EC Member States and third states.

4.1.2 The bilateral air treaties concluded between a number of EC Member States and the USA namely, those concluded between Austria, Belgium, Denmark, France, Italy, Germany, Sweden, the UK and the USA as well as the text of the standard "Open Skies" agreement have been carefully examined. It is concluded that those treaties contain an important limitation on the scope of applicability of the provision on user charges, so as to apply to airport, and airport system charges only. In light of the importance of this limitation for the purpose of the present study, the relevant section of the provision of the "Standard Open Skies" agreement is quoted:

"User charges imposed on the airlines of the other Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies providing the appropriate airport, airport environmental, air navigation, and aviation security facilities *at the airport or within the airport system*." (emphasis added)

4.1.3 This contrasts with other bilateral agreements which would seem to include en route charges. For example, the following section of the provision on "User charges" is taken from the Netherlands-US Open Skies agreement of 1992:

"User charges imposed on the airlines of the other Contracting Party may reflect, but shall not exceed, an equitable portion of the full cost to the competent charging authorities or bodies of providing the appropriate airport, air navigation, airport environmental, and aviation security facilities and services, *and*, *in the case of airports*, may provide a reasonable return on assets, after depreciation." (emphasis added)

In our opinion the term "user charges" in this bilateral air treaty, referring to the full costs of air navigation services and facilities, with an extra provision on the recovery of costs related to airport services and facilities, is deemed to include en route, terminal and airport charges, as well as charges for ancillary services.

4.1.4 It is concluded that depending on the factual situation, and on the interpretation of the wording "… of air navigation facilities … *at airports*" (emphasis added), en route charges, and in some instances, terminal charges are excluded from the scope of the article on "User Charges" in bilateral air treaties. This means that they are only subject to Article 15 of the Chicago Convention, the Annexes thereto, and ICAO policy statements and recommendations.

4.1.5 A trend towards stricter *a priori* control of user charges is noted when examining the clause on user charges in bilateral air treaties. This is emphasised by more detailed conditions on the imposition of user charges by governments rather than leaving the establishment of those charges to *a posteriori* control by competition authorities in a market oriented environment.

4.2 Territorial Scope

4.2.1 The territorial scope of bilateral air treaties covers national territory including national airspace, plus the airspace assigned to a State under the ICAO based Regional Air Navigation Plan. National territory and national airspace are defined in Article 2 of the Chicago Convention. Obviously, these definitions only concern the states party to the bilateral air treaty.

4.3 Substance of the Provisions

Non-discrimination

The non-discrimination principle is firmly enshrined in all bilateral treaties. For the purpose of the present analysis, it is concluded that non-discrimination can be equated with national treatment.

Cost-relatedness

4.3.1 Charges must be cost-related. Listed below are some elements, which are mandatory under bilateral air treaties, and are designed to implement provisions on cost-relatedness:

- All bilateral treaties require that charges are required to be "just and reasonable" and made for facilities and services which must be provided on an efficient and economic basis.

- Most bilateral air treaties which have been examined provide for the inclusion of "a reasonable return on assets, after depreciation", as an element of cost-relatedness.

- Two bilateral air treaties, namely, Greece-USA and the Netherlands-USA, restrict the permission of recovery of "a reasonable return on assets, after depreciation" to airports, thus apparently preventing providers of ANS – at any rate en route, and possibly also terminal ANS – from recovering such a reasonable return on assets, after depreciation.

- Some but not all bilateral air treaties make a reference to the costs of "airport environmental services" which may be part of the costs making up the imposed charge.

- Some but not all bilateral air treaties require that user charges shall be "equitably apportioned among categories of users", which may, inter alia, be seen as a reflection of Article 15 of the Chicago Convention.

The environmental component of user charges

4.3.2 There is one exception to the generic application of the same principles to all charges, which is the legality of the environmental component. Some, but not all, bilateral air treaties state that the costs of airport environmental services may be recovered under user charges. The costs incurred by the provision of "airport environmental services" may be allowed to be included in airport charges, and under a broad interpretation of the term "airport environmental services", in terminal charges. External costs in general, including environmental costs, can be included in en route charges.

4.3.3 It is noted that the environmental component in user charges, including en route and terminal charges, is the subject of a separate study being carried out for the European Commission.

4.4 Responsibility for the Imposition of Charges

4.4.1 Bilateral air treaties confirm that the states party to a bilateral air treaty are ultimately responsible for the establishment and imposition of charges.

4.5 Enforcement

4.5.1 Enforcement is left to the states party to the bilateral treaty, following the settlement of dispute mechanism laid down in bilateral air treaties. The ultimate remedy is, of course, cancellation of the bilateral air treaty.

4.6 Dispute Settlement

4.6.1 Bilateral air treaties include a provision on dispute settlement. Disputes arising under bilateral air treaties - which may concern dispute on the establishment of user charges - must be resolved by taking the following steps:

- consultations and negotiations;
- arbitration.

The decisions rendered by the arbitration tribunal are final. Obviously, a state can also amend or cancel the bilateral air treaty following the appropriate procedure.

4.7 Binding Nature of the Provisions

4.7.1 All provisions of a bilateral air treaty are binding treaty provisions, provided, of course, that national constitutional requirements are complied with. EC Member States are bound by Article 307 of the EC Treaty.

Summary and Conclusions:

The Regulation of User Charges under Bilateral Air Treaties

1. Scope of charges

Airport charges;
In most cases: terminal charges;
Sometimes: *en route* charges;
No reference to charges for ancillary services.

2. Territorial scope

To the provision of civil airport facilities and services, and ANS and facilities on the territory incl. airspace of the two states party to the bilateral air treaty, plus the ICAO based Regional Air Navigation Plan.

3. Substance of the provisions

Charges must be:

Imposed in a non-discriminatory fashion;
(In most cases) just and reasonable, with due regard for provision of facilities and services on an efficient and economic basis;
Cost-related, including, in most cases, allowance for a reasonable return on assets, after depreciation;
In some but not all cases: equitably apportioned among categories of users.

4. Responsibility for the imposition of charges

States, with an option for delegation of the task but not the responsibility (see Chicago Convention).

5. Enforcement

By states party to the bilateral air treaty

6. Dispute settlement

Through:

Consultations and negotiations;
Arbitration;
Amendment or cancellation of treaty.

7. Binding nature of the provisions

Yes; treaty law.

5. Legal Analysis: EUROCONTROL

5.1 Scope of Charges

5.1.1 The EUROCONTROL Contracting States have adopted the basic principles for a harmonised regional en-route charges system, involving a single charge per flight. The EUROCONTROL Central Route Charges Office (CRCO) was set up to operate the system on behalf of the States and does so under the provisions of the Multilateral Agreement relating to Route Charges in force since 1986.

5.1.2 The Principles for Establishing the Cost-base for Route Facility Charges and the Calculation of the Unit Rates (hereafter referred to as the EUROCONTROL Principles) sets out the common principles by which the costs of providing air navigation facilities and services are established by States/service providers. The current EUROCONTROL Principles are applicable as of August 1999 (Doc. N° 99.60.01/1).

5.1.3 The EUROCONTROL Principles allow for the inclusion of chargeable (GAT) military flights in the cost base for the en route charges. However, States may choose to exempt (GAT) military flights from charges. In such cases, the EUROCONTROL Principles require that the costs in respect of exempted flights should not be borne by chargeable flights.

5.1.4 As well as providing criteria for charging users, EUROCONTROL provides an established and harmonised framework for the billing and collection of en route charges in Europe. There is no equivalent for terminal charges, although some states subcontract billing and collection of those charges to EUROCONTROL. The charging system of EUROCONTROL is used by most European states and many states in the world.

5.2 Territorial Scope

5.2.1 The territorial scope is the area covered by the Multilateral Agreement of 1981. This area does not coincide with the combined national airspaces of the participating states, but also includes adjacent international airspace, that is, the airspace of the flight information regions falling within the competence of the Contracting States.

5.3 Substance of the Provisions

5.3.1 EUROCONTROL draws up relatively detailed accounting principles, which go into much greater detail than those which are laid down in the Chicago Convention and bilateral air treaties.

5.3.2 The EUROCONTROL Principles set out the items to be included in the cost base. They include but are not limited to:

- investment costs, including amortisation of fixed assets, amortisation of intangible assets and cost of capital (with detailed explanations);
- operating costs (with explanations);
- staff costs;
- air traffic Management (ATM) costs (for facilities and services, with detailed explanations);
- CNS costs;
- costs of training and research;
- administrative costs;
- costs of ancillary services: AIS and MET costs;
- search and rescue costs, with explanation;
- operating and investment costs of the organisation (EUROCONTROL).

The EUROCONTROL Principles also set out a method for calculating the national unit rate, with detailed explanations.

5.3.3 Decision No 52 of the Commission of EUROCONTROL dated 20 July 1999 adopted amendments to the Principles of the EUROCONTROL cost recovery mechanism which are particularly significant for the present study. The amendments provide that where the "Route Air Navigation Facilities" for which a contracting state is responsible are provided by a body (the service provider) which is subject to independent economic regulation, and that regulation is designed to provide incentives through the charge mechanism to encourage an efficient and effective service at the lowest possible cost, that

Contracting State may disapply both the paragraph of the EUROCONTROL Principles which provides that the Contracting States shall establish their cost base in order to account for the costs and the adjustment mechanism designed to ensure no over or under recovery of costs.

5.3.4 Under this new alternative, the regulator is obliged to conduct periodic reviews of future charges and shall set in advance, for a period not exceeding five years, conditions from which the maximum level of the national unit rate shall be determined in each year of the review period.

5.3.5 Before setting up a new system based on economic regulation, states are required to undertake a prescribed process of consultation and notification.

5.3.6 This alternative mechanism based on economic regulation is specified in fairly general terms which allows considerable scope concerning the details of the economic regulation mechanisms adopted. The economic regulation measures proposed later in this report could be implemented, at least in the sort to medium term, under this mechanism. In the longer term, further amendments could be made to the EUROCONTROL Principles if this were agreed by the states.

5.3.7 The mechanism has been adopted by the UK for NATS following the Public Private Partnership (PPP). NATS is subject to independent economic regulation by the Economic Regulation Group of the CAA. Price cap regulation has been adopted based on an RPI – X formula and including a service quality term based on total delay. It is too early to make any assessment of the effects of economic regulation on the quantity, quality and price of the services provided by NATS.

5.4 Responsibility for the Imposition of Charges

5.4.1 In accordance with provisions of the Chicago Convention and applicable bilateral air treaties, the responsibility for the establishment of en route charges remains with states. However, they have delegated powers regarding the establishment, billing, collection and enforced recovery of en route charges to EUROCONTROL. Also, they have delegated certain enforcement powers, including those pertaining to collection and billing, to EUROCONTROL. Such arrangements comply with the Chicago Convention (see Chapter XVI).

5.5 Enforcement

5.5.1 Enforcement can be viewed from two perspectives.

- Enforcement against contracting States where there are concerns that those Contracting States are not complying with the EUROCONTROL Principles.
- Enforcement against users for non-payment of charges.

Enforcement Against Contracting States

5.5.2 The regulatory functions of EUROCONTROL in respect of the route charges system are the responsibility of the Enlarged Committee for Route Charges. Part of the CRCO's role is to support the regulatory functions of the Enlarged Committee in the definition and application of the Principles by existing contracting states (and their service providers)[8]. It is explicitly stated that the role of the CRCO excludes:

- auditing the accounts of States/service providers;
- judging the cost-efficiency of States/service providers;
- target setting;
- enforcement of compliance with the principles.

However, if in the course of its routine analysis of cost-base data presented by the Member States the CRCO finds misinterpretation/misapplication of the Principles, it should attempt to clarify the situation on a bilateral basis.

5.5.3 The practical arrangements for dealing with possible non-compliance with the principles by contracting states are these:

- Concerns relating to possible non-compliance with the Principles may be raised by the users via a user organisation or by another member state.
- Concerns should first be raised on a bilateral basis, in which the CRCO may participate.

[8] Guidance on the Rules and Procedures of the Route Charges System, July 1999, EUROCONTROL Document GEN-0791.

- If this informal approach is unsuccessful, the concerns may be addressed to the CRCO in writing. The CRCO shall then take up the concerns with the state on a bilateral basis.

- If the user organisation or state is not satisfied with the outcome, it may bring its concerns to the attention of the Enlarged Committee for Route Charges in writing.

- The Enlarged Committee for Route Charges may then formally ask the CRCO to carry out an analysis of the situation.

- If, after these stages, it has not been possible to reach a solution, the Enlarged Committee for Route Charges may inform the Provisional Council of the matter.

5.5.4 Two other mechanisms may come into play in case there are questions on compliance by a Contracting State with the EUROCONTROL Principles. Those mechanisms are:

- A Contracting State may invoke the safeguard clause foreseen in (Article 6(1)(a) of) the Multilateral Agreement of 1981 (see Section 5.6 below).

- The Multilateral Agreement provides (in Art. 25) for dispute settlement by arbitration, failing settlement by direct negotiation or by any other method.

5.5.5 Since July 1999 when the procedures described above were implemented, the compliance by States with the Principles has been questioned by IATA and ATA in three cases and the CRCO has carried out the appropriate analyses, in conformity with para. 2.1.1.2 of Part I, Section 1 of the guidance document[9]. The CRCO's reports were submitted to IATA, ATA and the States concerned, and copied to the President of the Enlarged Committee for Route Charges for information. In two of the cases, the user organisations were not satisfied and requested further analysis by the CRCO. The CRCO is currently investigating one of these cases. The analysis of the remaining one being postponed until the interpretation of the Principles is clarified (by the Financial Information For Users (FIFU) Task Force which will be "re-activated" in September 2001).

[9] Guidance on the Rules and Procedures of the Route Charges System, July 1999, EUROCONTROL Document GEN-0791.

5.5.6 The procedures rely on concerns being raised by users or states, the process appears quite time consuming and, in practical terms, there would appear to be limited powers to ultimately enforce compliance with the EUROCONTROL Principles. No routine regulation or assessment process is in place. These are limitations of the current system which economic regulation should seek to address.

Enforcement Against Users

5.5.7 EUROCONTROL bills and collects the en route charge as a single charge per flight, which constitutes a single claim by that organisation. Under Article 12 of the Multilateral Agreement of 1981, EUROCONTROL has enforcement powers in case the operator of an aircraft does not pay the imposed charges. Proceedings for recovery are instituted by EUROCONTROL, or at its request, by a Contracting State. Each state must inform EUROCONTROL of the procedures as well as the competency of judicial institutions in cases pertaining to recovery of charges. This is what happens in practice as, confirmed by case law.

5.6 Binding nature of the Provisions

5.6.1 The EUROCONTROL Principles are not presented as a treaty. However, they are based on the execution of a treaty, namely the Multilateral Agreement Relating to Route Charges of 1981. More importantly, the EUROCONTROL Principles are adopted and implemented by states. Therefore, it is concluded that those principles are binding treaty law provisions which apply until they are revoked by those states in accordance with the indicated procedures. A Contracting State of EUROCONTROL is entitled to invoke "overriding national interests" in case it is unable to apply a decision of the Enlarged Commission, including a decision designed to establish the above EUROCONTROL Principles. Such a contracting state must explain the reasons for its inability to apply that decision.

Summary and conclusions:

The Regulation of User Charges Under the Auspices of EUROCONTROL

1. Scope

- en route charges;
- in some instances: terminal charges.

2. Territorial scope

In national territory incl. national airspace, plus the Flight Information Regions as defined by ICAO.

3. Substance of the provisions

Cost-relatedness, specified as:

Investment costs, including amortisation of assets and costs of capital;
Operating costs;
Staff costs;
Air traffic Management (ATM) costs (for facilities and services);
CNS costs;
Costs of training and research;
Administrative costs;
Costs of ancillary services: AIS and MET costs;
Search and rescue costs;
Operating and investment costs of the organisation (EUROCONTROL).

4. Responsibility for the imposition of charges

Upon states with an option to delegate the establishment of the charges but not the responsibility.

5. Enforcement

- Against Contracting States: EUROCONTROL;
- Against users: Eurocontrol or Contracting States.

6. Dispute settlement

Negotiation;
Arbitration.

7. Binding nature of the provisions

Yes; treaty law.

6. Experience of ATM Service Provision

6.1 Introduction

6.1.1 This study has gathered information on the economic regulation of ATM service provision and the associated legal and institutional arrangements in the following countries:

- France, Germany and UK (large countries);
- Netherlands, and Ireland (smaller countries);
- Czech Republic and Romania (candidate EU member states where ATS has been separated from regulation and other functions).
- Australia, Canada and New Zealand (countries in which ATM service provision has been corporatised according to different models).

The information was gathered from sources in the public domain and by the use of a questionnaire, followed up by telephone and face to face interviews.

6.1.2 As well as states, information was also gathered from representatives of airspace users' and workers' organisations. The views expressed have been taken into account in the study.

6.1.3 A review of service provision in the European Railways and European Telecommunications sectors has also been conducted. These sectors have analogies with the European ATM sector and are further developed in terms of corporatisation and economic regulation. Full details are given in the appendices to this report.

6.1.4 This section summarises the experiences of these states and markets relevant to economic regulation. Full details of the information gathered are given in the appendices to this report.

6.2 European States

6.2.1 An analysis of the provision of air traffic services within the European States discloses that there is little consistency of approach. The provision of air traffic services is governed by national legislation in all of the EU Member and Candidate States. Without exception, services are provided by an agency that is either a part of the State administration or a body established under the auspices of the Ministry (of Transport) or Directorate of Civil Aviation or Civil Aviation Authority.

6.2.2 Growth in air traffic has enabled an increasing number of air navigation service providers to become financially viable. That in turn has led many governments to transfer the operation of air navigation services to financially autonomous bodies. The majority of the EU Member States have transferred the responsibility for provision of ATS to an agency that is largely autonomous and, in principle, self-financing. Such bodies remain under the overall jurisdiction of the Minister in terms of their level of performance and charges and under the National Regulatory Authority in respect of safety standards. Only in the case of the public private partnership for NATS in the UK is ATM service provision to be transferred to a private sector company (expected in mid 2001).

6.2.3 An examination of the Working Papers presented to the International Civil Aviation Organisation (ICAO) Air Navigation Services (ANS) Conference in June 2000, particularly WP/9 and WP/18, reveals that of 29 European States responding to the questions only in three cases are air navigation services provided by a Ministry or other central Government Department. Conversely, in no case are services provided by a privately owned entity although two States are planning to establish such an entity. The 29 countries responding to the questions included 11 of the EU Member States and 7 of the Candidate States.

6.2.4 In a number of States, the legislation establishing the ATS agency does not exclude the possibility of there being more than one supplier of air traffic services. However, in respect of en-route air traffic services all of the Member States have retained a regime whereby services are provided by a single monopoly supplier, at least as far as civil air traffic is concerned. The provision of air traffic services at aerodromes and in aerodrome terminal areas is subject to greater freedom of access, as are the arrangements for the provision of meteorological services, communications and other ancillary services.

6.2.5 Within the EU Member States there is a need to comply with a number of, potentially conflicting, legislative requirements. The same requirement applies to the Candidate States, who are included by virtue of their obligation to comply with EU legislation as a consequence of their participation in the Multilateral Agreement for the creation of a European Common Aviation Area.

6.2.6 While the EC has competence in the field of air traffic management which derives from existing legislation in force directly (standardisation, TEN-T and R&D) and indirectly (access for carriers to Community routes and airport slots) related to ATM, EC legislation has, as yet, had little impact upon the economic regulation of air traffic services..

6.2.7 To a significant extent, legislation providing for economic regulation of ATS does not yet exist within Europe. The UK is the only state with a well developed and experienced economic regulation function. In the majority of countries a process exists for consultation between ATS providers and their users.

6.3 Third Countries

6.3.1 An analysis has been undertaken of the arrangements relating to the provision and regulation of air navigation services in three major countries outside Europe. Those countries are Australia, Canada and New Zealand. The three countries concerned have responsibility for providing air navigation services not only within their own national airspace but also in relation to large areas international airspace in accordance with powers delegated to them by ICAO.

6.3.2 The picture that has emerged displays a number of common characteristics, as follows:

- In each case air navigation services are provided by an organisation that has been separated both from Government and from the Regulatory Authority.

- In each case the organisation is managerially self-governing and financially independent. However, only in the case of Canada has the organisation been fully privatised.

- In each case the organisation is responsible for establishing and imposing its own charges for the provision of services.

- In terms of economic regulation the situation is largely one of self-regulation but with the right for users to seek recourse to either the National Transportation Agency (in the case of Canada) or the national Competition Authorities (in the case of Australia and New Zealand).

- In setting charges, the organisations are obliged to take account of international obligations and agreements (such as ICAO) as well as any national requirements embodied in the legislation under which they operate.

- In all cases there is a process of consultation with users in relation to the conditions for access to airspace and in relation to the setting of charges.

6.3.3 Whilst it is useful to examine the experience of those countries in the process of identifying legal issues, one must not overlook the fact that in each case the structure is a national one applicable only within the territory of a single state. The same characteristics are unlikely to be applicable in the development of an economic regulatory system for application on a European basis.

6.4 Other Sectors

Railways

6.4.1 Railways is a useful benchmark in so far as it illustrates an attempt by the European Commission to create an emergent single European market based on liberalisation and separation between network infrastructure and provision of service without resorting to the creation of a European regulator and a European regulatory regime.

6.4.2 This initiative has occurred in a European market composed of competitively isolated Member States' markets dominated by historically state-owned monopolies alongside a lack of infrastructure interoperability.

6.4.3 Competition in the rail market is not enabled by technological progress which would provide competitive substitutes for existing services and put pressure on national dominant incumbents. Growth in traffic is declining and there is little scope for highly profitable new entrants in the market.

6.4.4 It is concluded that:

- Formal institutional separation between infrastructure and provision of service is not in itself a sufficient condition to create an integrated single European market.

- National separation of infrastructure and service provision without regulatory harmonisation (together with significant national monopoly components) results in a diversity of restructured national market arrangements.

- Separation between infrastructure and provision of service from a national perspective, without guidance for setting up regulation or creating a European regulator results in different access pricing regimes with potential for discrimination.

Telecommunications

6.4.5 The analysis of telecommunications market regulation provides significant lessons for devising European regulatory frameworks.

6.4.6 Formal institutional separation between regulation and service provision is not in itself a sufficient condition to create an integrated single European market. In markets where competition is driven by national, incumbent, dominant companies enjoying monopoly power over access to network infrastructure, introduction of separation between regulation and provision of service on a national basis without the oversight of a European regulator results in divergence in national regulatory regimes. Dominant national companies seek tight alliances which will protect their home markets from competition. This reinforces the competitive status quo and fails to develop a single European competitive market.

6.4.7 In such an environment, national separation between regulation and provision of service leads to a slow uptake of new technologies which would enable economies of scale in the framework of a European single market.

6.4.8 To implement a single European market from isolated national markets governed by historical, incumbent monopolies, the Commission after having used liberalisation directives has been compelled to increase its use of competition regulatory tools (new directives, inquiries based on article 11 of regulation n°17, investigating complaints from competitors of national dominant telecommunications companies). The Commission competitive rationale sometimes contrasts with national regulatory policies.

7. Economic Appraisal of Current European ATM Service Provision

7.1 ATM Components

7.1.1 From an economic perspective, ATM can be viewed as the provision of a range of services organised around a network system that can be characterised as a Large Technical System[10]. Four components can be identified:

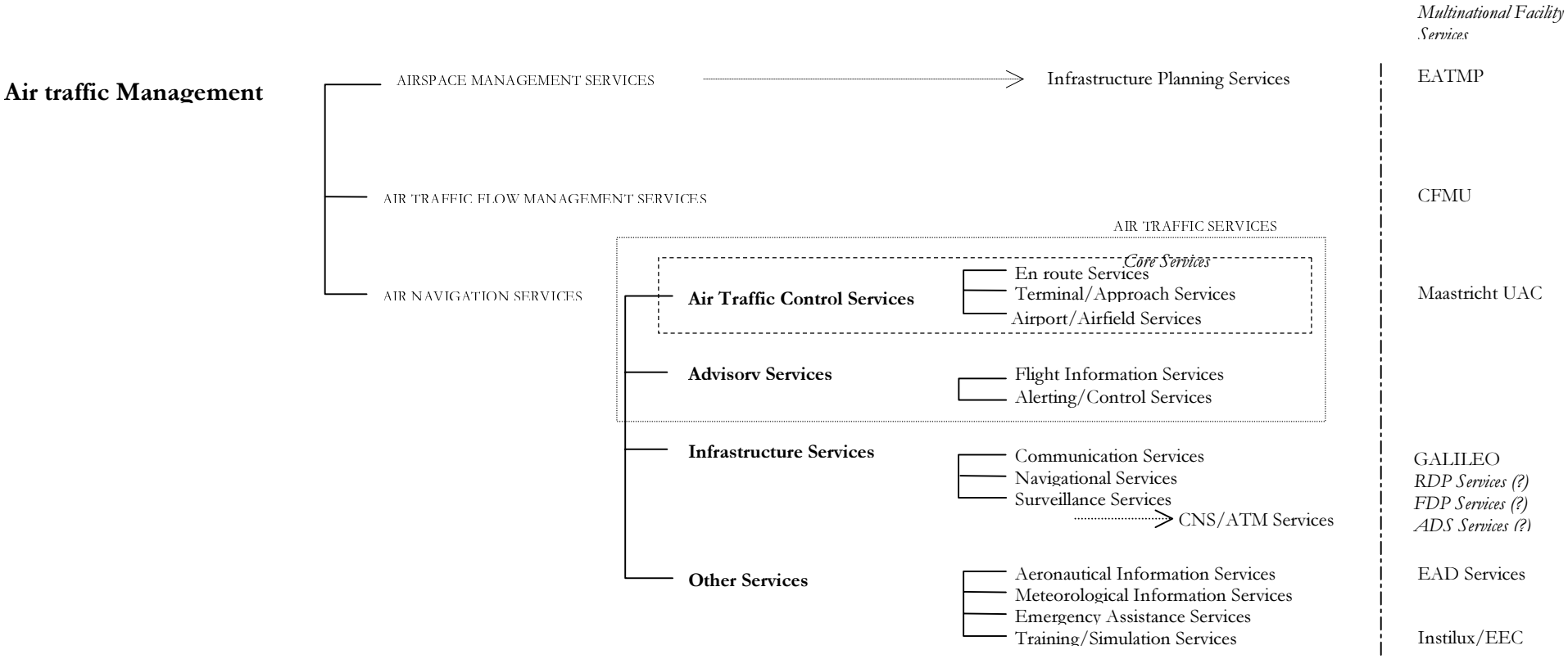
- the network infrastructure (airspace design, route structures, etc);
- air traffic flow management (ATFM), which is concerned with optimising the use of the network infrastructure;
- air traffic control, which concerns (local) day to day operations;
- ancillary services which are not linked to the network infrastructure such as meteorological services.

7.1.2 The economic perspective on ATM services is summarised in the following figure:

[10] Mayntz R. & Hughes T. [ed.] (1988) The Development of Large Technical Systems. Frankfurt, Campus/Boulder, Westview press.
Bayart Denis (2001) " Le tournant gestionnaire d'un grand système technique : Le contrôle de la navigation aérienne fait ses adieux à l'État. " in Lévy Emmanuelle [ed.] (2001) *Vous avez dit Public ? Situations de gestion dans le secteur public : de la coproduction à la régulation.* Paris, l'Harmattan, pp. 131-180.

Source : SINGLE EUROPEAN SKY STUDIES

Figure 1: Analysis of the components of service provision in Air Traffic Management



7.2 Deficiencies of the Current Situation

7.2.1 An economic appraisal of European ATM service provision leads to the conclusion that there are three major issues which economic regulation should seek to address:

- poor allocative (investment) and productive (management) efficiency;
- fragmentation along national boundaries resulting in national vertically integrated monopolies;
- the interplay of key factors constraining efficiency, namely the management of the civil military interface, the intricate structure of powers and responsibilities and the lack of information disclosure.

7.3 Poor Allocative and Productive Efficiency

7.3.1 European ATM capacity has failed to keep up with demand. As noted by the Performance Review Commission[11], lack of investment in capacity is noticeable in all European countries. Independently from level, investment can be questioned with regard to proper allocation and effectiveness. Historically, ATM investment has suffered from the launching of successive costly and delayed projects whose benefits in terms of increased performance are unclear[12].

7.3.2 Not only is traffic growth in itself a major issue in ATM service provision but also changes in traffic patterns. This implies that increased management flexibility is required to better respond to users' demands. For safety reasons, as well as human resource constraints, ATM service provision exhibits managerial rigidity. However, the cost recovery charging regime applied to ATM service provision does not provide for incentives to increase flexibility while maintaining safety levels.

[11] PRR1, June 1999, p. 32.
[12] *ATM Strategy for 2000+ (vol. 1)*

7.4 Fragmentation in European ATM Service Provision

7.4.1 European ATM service provision has developed according to a national vertical integration model with bundling of services under administrative management procedures. From a European perspective, national fragmentation in dealing with ATM issues has resulted in loss of economies of scale in service provision. Consequences include: inefficient European routings; lack of integration in the use of airspace infrastructure; a multiplicity of ATC Centres; support to national industry suppliers leading to poor interoperability; duplication of projects; no European harmonised controller status leading to limited controller mobility which is of major importance in a labour intensive service provision business such as ATM.

7.5 Factors Constraining Efficiency

7.5.1 The development of an efficient European perspective on ATM service provision has been impeded by key factors:

- The military have a direct impact on the performance of the ATM network, most obviously through military airspace zones which constrain the European route network.

- Powers and responsibilities have not been clearly identified. This stems from an intricate institutional geography with powers and responsibilities split between states, ECAC, EUROCONTROL and the EU amongst others.

- There is a lack of information disclosure to enable a reliable assessment of service provider performance and to enable benchmarking. The Performance Review Commission has proposed harmonisation of information on service provision according to a disclosure of information regime which has so far failed to receive approval[13]. It has also proposed a performance approach based on Key Performance Areas and Indicators along the lines of those in the ATM 2000+ strategy[14].

[13] PRC Consultation paper of 22 October 1999, Specification for information disclosure, 9 October 2000.
[14] Performance Review Unit (1999) "The European ATM measurement system", EUROCONTROL, 22nd March 1999.

7.6 Lack of Economic Regulation in ATM Service Provision

7.6.1 With the exception of recent development in the UK, the monopoly ATS providers have not been subject to economic regulation. On a national basis, ATS providers have to comply with administrative controls and public management procedures which govern investment and management policies. At the European level, the Enlarged EUROCONTROL Committee monitors ATS providers' accounts. In addition, the Performance Review Commission sets targets on performance and capacity. All these institutions perform rudimentary regulatory functions. This regulatory framework lacks an independent auditing process, and lacks the enforcement powers for regulation to be effective.

7.6.2 At the European level, service providers report on costs according to the EUROCONTROL Principles. The level of reporting varies widely. The lack of harmonisation of accountancy procedures[15] raises concerns that excessive or undue costs might be included in the cost base. On this ground, it is unclear whether current charging of ATM services are cost-reflective.

7.6.3 Economic regulation based on incentives to cost efficiency and to increases in level and quality of service has not been implemented. The en-route charge covers all ATM services and is based on cost recovery. Whatever the quality and level of service provided, ATS providers are remunerated based on their nominal costs.

[15] See PRC reports and to remedy the situation, the 'Specification for information disclosure' proposed by the PRC, version 1, 9 October 2000

8. Economic regulation

8.1 Introduction

8.1.1 This section describes some of the basic principles of economic regulation that might be applied to ATM. It provides the context for the possible economic regulation scenarios discussed in Sections 9 and 10.

8.2 The Economic Regulation Perspective

8.2.1 From an economic perspective, competition through market forces is the best means for achieving the optimal allocation of resources and ensuring highest quality level at lowest price. However, in some circumstances, market forces are unable to, or fail to, operate properly. Monopoly situations are the primary type of failure of concern in this study.

8.2.2 Economic regulation addresses failure of market forces in two ways. Firstly, it consists of re-introducing competition where possible. Secondly, when competition is limited or not possible, it consists of designing pricing mechanisms and incentives that will lead to results comparable to those that would be achieved in a competition regime[16].

8.2.3 The first line of inquiry of a monopoly situation is to isolate the different services and to study the extent to which each of them can be opened to competition. For monopoly services which do not allow for introducing competition 'in' the market - simultaneous competition among different independent suppliers - economic regulation shall consider the option of competition 'for' the market through franchising or concession. At the same time competition for corporate control may be introduced with regard to state-owned monopolies.

[16] For a general presentation on economic regulation see : Armstrong M., Cowan S., Vickers J (1994) : *Regulatory Reform: Economic Analysis and British Experience,* Cambridge MA, MIT Press.

8.2.4 Competition 'for' the market consists of auctioning exclusive monopoly rights among different interested suppliers. It raises important regulatory issues on conditions of entry and exit, on valuation of assets and duration of the franchise or the concession. The lower the cost of entry and exit the shorter the duration of the franchise can be made and the more efficiently competition 'for' the market will work. This is because the monopoly franchisee is kept under pressure of imminent competition. The terms of the franchise or concession would include a set of objectives to be achieved by the franchisee with regard to charging for service provision, quality and level of service.

8.2.5 Competition for corporate control includes privatisation and the possibility of take-overs. It is supposed that privatisation and commercial sector governance leads to more efficient outcomes by introducing direct assessment on profitability and quality of management. Balancing this is the fact that the financial interest in acquisition is motivated by generating profit from monopoly conduct and structure.

8.3 Introducing an Economic Regulation Regime

8.3.1 Whether or not competition 'for' the market is implemented and whatever the corporate governance, economic regulation is introduced to tackle the monopoly issue. Two main alternatives can be developed, the first one focuses on costs and profits through rate of return regulation, the second one focuses on prices through price cap regulation.

8.3.2 Rate of return regulation ensures financial viability but under the control of excess profitability. It is a form of regulation which has been favoured in the United States. However, it introduces the conditions of a cosy monopoly with little incentive for cost-efficiency and innovation. It raises concern about regulatory capture as the monopoly is more knowledgeable than the regulator concerning the costs of the business.

8.3.3 Price cap regulation focuses on prices rather than profits, inputs and costs. It is a form of economic regulation which has been favoured in the UK. It consists of setting a price profile for a particular duration. Price cap refers to an allowed increase in price according to a general price index level minus expected productivity gains embodied in a factor usually designated as X. Other specific factors may be introduced for particular purposes, for example on investment, quality of service, compensation payments to consumers for failure to provide quality of service. The key factor of price cap regulation is that it gives the monopoly an incentive to be cost-efficient. The productivity gains generate profits which are held by the monopoly. To work efficiently, price cap regulation necessitates a long period between formal price reviews and a

commitment by the regulator not to intervene in case of sustained and significant profitability. The shortcomings are that excess profitability is rarely politically acceptable and that price cap regulation does not guarantee a proper level of investment.

8.3.4 In both cases, rate of return regulation and price cap regulation, if there are a sufficient number of comparable monopolies, benchmarking techniques and yardstick competition can be used to reduce asymmetry of information between the regulator and the firms. The regulatory regime is based on cost and performance targets defined with the support of comparative information on companies' performance. The principle is to align economic regulation on a virtual "most efficient" company. However to be workable and effective, yardstick competition not only requires a sufficient number of comparable companies but also some stability of the industry structure for comparisons to make sense. An example where yardstick regulation would be applicable is regional water and electricity distribution monopolies.

8.4 Infrastructure and Access Pricing

8.4.1 An issue related to the regulation of monopoly industries is pricing access to network infrastructure, in particular when the regulated monopoly is vertically integrated. In theory, an access price based on marginal cost defines an economic optimum. However, in network industries where there are increasing returns with scale, short term marginal cost tends to be lower than average cost and therefore does not allow for financial viability. Under such circumstances, remuneration of investments to upgrade and increase the network capacity requires basing access pricing on long term marginal cost.

8.4.2 Frequently, both short term and long term marginal costs are not known with precision. Average cost may be used as an imperfect substitute. Other pricing techniques such as Ramsey Pricing can be used to approach marginal cost pricing. They link the access price to elasticity of demand by users. On these grounds peak-load pricing is an option. It consists of setting the price higher when demand and marginal cost are higher (peak periods) and lower when demand and marginal cost are lower (off-peak periods). Two-part tariffs made of a fixed and a variable part can be worked out in line with the Ramsey Pricing principle and other techniques such as capacity pricing, priority pricing are also available.

8.4.3 These pricing mechanisms (peak-load, two-part tariff, etc.) seek to introduce efficient pricing. However, they assume knowledge of consumption at different times of the day and of price elasticity from users. Besides they may introduce shifts in competition among users: higher prices at peak periods may give competitive advantage to dominant users and increase barriers to entry. Moreover they do not guarantee creating an incentive to investment and increase in capacity insofar as monopolies may find it remunerative to maintain under capacity.

8.5 Defining an Economic Regulation Perspective on ATM

8.5.1 Proposals on economic regulation tools for ATM service provision have to be consistent with the perspective of a European Single Sky. The principal objective is to deal with the current fragmentation of service provision and introduce restructuring.

8.5.2 At present, except for the UK, there is no expertise and experience of economic regulation and independent institutional regulation of ATM service provision in Europe. The level of information disclosure varies widely between states and is often incomplete. Therefore there is little information to design economic regulation on particular efficient access pricing mechanisms. Neither the cost functions of the different ATM services, nor the price elasticity of users are known reliably. It is doubtful that they can be known with sufficient accuracy without entering in a cumbersome process of information gathering. Also, most access pricing options are not easy to implement and there are misgivings about their effects on competition among users and doubts about their ability to increase capacity. Hence access pricing is not an appropriate economic regulation tool for European ATM at present.

8.5.3 Under the European Single Sky objective economic regulation in ATM services provision is not primarily about regulating static monopolies. It has to facilitate airspace and service provision restructuring at the European level to enable an increase in network capacity and a commitment to service quality. Since the aim is to create change in the industry, it is assumed that the industry structure will not be sufficiently stable to enable regulation through yardstick competition. However, introducing comparison through benchmarking[17] among existing ATS providers would be a useful tool to encourage change.

[17] On benchmarking in ATM services provision see : Experimental Experimental Centre (1999, 2000) : 'Cost of the en-route air navigation services in Europe', EEC note N° 8/99 and 'Investigating the Air Traffic Complexity', EEC Note N° 11/00.

8.6 Metrics

8.6.1 Quantity and quality of service can be assessed by means of a few key metrics. The metrics are deliberately simple, and therefore imperfect, in that they do not give account of the whole complexity of each element of the service. However, complex indicators may lead to over sophistication and impracticality. Metrics need to be:

- Forward looking: the key issue is that metrics should allow for projection and not concentrate on disclosure and analysis of past information.

- Contractual: the metrics, even if imperfect, should be devised so that they serve as a basis for contractual agreements between regulators and regulatees and between providers and users in a forward looking perspective.

- Global: metrics should not go into too many details. They should provide a sound basis for discussion and should not involve the regulator in a dynamic process leading to a hands-on regulatory approach. Each of the stakeholders has to perform its duties according to its responsibilities: the regulator defines the general orientations and principles, and the regulatory objectives; the regulatees organise themselves to meet the principles and achieve the objectives.

8.7 Incentives

8.7.1 The economic regulation scenario relies on the introduction of incentives under the principle of cost relatedness. The incentives consist of financial rewards and penalties. In the settlement of forward looking contracts, the regulator and regulatees agree on defined service levels. It is the remit of the regulator to ensure that the regulatees will have the necessary revenues to achieve the regulatory objectives. If regulatees prove unable to commit themselves to the contractual agreement and move away from their objectives, penalties will apply.

8.7.2 The regulatory objectives and the financial rewards and penalties, will be subject to review. In setting up targets and defining the economic regulation regime, the regulator will have to ensure that under the expected circumstances, service providers will be able to meet or outperform regulatory objectives, thus ensuring their financial viability. Failure to achieve regulatory objectives would lead to financial penalisation and poor profitability. Regulatory periods need to be set sufficiently long to allow services providers to get the benefits from their efforts but also sufficiently short to allow for adjustments, in particular with regard to changes of expected traffic patterns.

9. Scenario A: National Regulation and Market Forces

9.1 Introduction

9.1.1 As discussed in the previous section, economic regulation of ATM has to facilitate airspace and service provision restructuring at the European level to enable an increase in network capacity and a commitment to service quality.

9.1.2 There are two possible means to promote efficient restructuring. The first alternative is national regulation and the introduction of competition and market forces. It is denoted as Scenario A and discussed in this section. The second alternative, denoted as scenario B, is an arrangement based on European regulation and on co-operation, where economic regulation incentives will be aimed at achieving economically efficient restructuring. Scenario B is discussed in Section 10.

9.2 A National Approach to Franchising

9.2.1 Separation between regulation and service provision implemented at the national level with change of governance of the national service provider (either through corporatisation or privatisation) is an appealing option for some states. It assumes the granting of licences and franchising at the national level.

9.2.2 This approach has been pioneered in the UK. It introduced separation between NATS, the services provider, and CAA, the regulator. It then changed NATS' governance towards the private sector (PPP initiative), selected a group of users (The Airline Group comprised of UK airline companies) as the private sector partner, and awarded a licence to NATS. Economic regulation has been introduced under price-capping and penalisation for lack of quality of service (delays). Economic regulation is forward-looking and implemented at the national level.

9.2.3 It is too soon to make an assessment of the UK experience. However, it invites three comments :

- There has been neither franchising of airspace according to airspace design under a European rationale nor competition 'for' the market by means of competitive offers from other state service providers or a consortium of providers. NATS as the incumbent service provider has been conferred a franchise monopoly over the entire UK airspace,

effectively for a minimum of thirty years duration. Competition 'for' the market will therefore take place at best in two or three decades (unless the licence is revoked due to some failure on the part of the Licensee to comply with the conditions of the Licence).

- Privatisation under the price-cap regime does not guarantee an efficient level and allocation of investment. Asymmetry of information between the regulator and the regulatee is significant. Only in ten years time a better picture about the effectiveness of NATS PPP will emerge.

- Privatisation of an ATC service provider also raises difficult issues on competition grounds. If a users consortium dominated by national airline companies takes over, there is concern about the possibility of extracting rent from monopoly service provision at the expense of other users and possible scope for discrimination. If an ATC equipment manufacturer takes over, it may use acquisition of a service provider to get a competitive edge in the downstream supply market. If airports or venture capital take over, the former raises the issue of managing with a two tier monopoly, the latter raises the issue of technical capability, commitment to investment and service provision.

9.2.4 ATM services are services attached to a network infrastructure. Economic regulation of ATM services devised from a national perspective cannot handle European network effects. Incentive based economic regulation regimes established on a national basis without reference to the impact on other nodes of the network could well introduce a competitive race to pass on difficulties in improving performance to neighbouring states. Moreover, penalisation of delays from a national perspective could act as an incentive to "transfer" a decrease in quality of service to other service providers in the network rather than an incentive to create efficiency by means of co-operation. Already in the UK regulatory framework NATS argues with the CAA, the national economic regulator, that penalisation on delays is unfair as quality of service objectives depend on neighbouring European services providers and on network effects on which NATS has no control.

9.2.5 On balance, franchising of the whole set of ATM services from a national perspective involving the creation of independent national regulators has scope for reinforcing European ATM fragmentation to the benefit of the incumbent provider, does not necessarily ensure proper investment levels, and may give rise to detrimental network effects.

9.3 A European Approach to Franchising

9.3.1 On a legal basis, states are sovereign over their national airspace. A European approach to competitive franchising would mean that groups of states would pool together part of their national airspace and delegate service provision to a winning bidder. There is a question of whether those states would agree to give up revenues and employment from the management of their respective airspace portions or whether they would continue to receive the revenues attached to their respective delegated airspace portion.

9.3.2 It is likely that over a cross-border airspace block, national incumbent service providers would join forces and bid. The risk is that the competition will not lead to restructuring but rather maintaining status quo.

9.3.3 In summary, competitive franchising of cross-border airspace blocks would seem difficult to implement in the short term. In the light of experience, some elements could be further developed and proposed at a later stage.

9.3.4 An alternative means achieve European restructuring based on cooperation is discussed in the next section (Scenario B).

9.3.5 In the light of experience with European restructuring based on cooperation, it is possible that some elements of competitive franchising of cross-boarder airspace blocks might be introduced at a later stage.

10. Scenario B: European Economic Regulation and Co-operation

10.1 Introduction

10.1.1 An alternative to the competitive airspace franchising option is based on co-operation rather than competition. It relies on setting up a European regulatory framework rather than national regulatory frameworks. It is proposed as the way forward.

10.2 ATM Economic Regulation Principles

10.2.1 The scenario assumes a number of principles which are described below.

No Trade-Offs Between Safety and Economics

10.2.2 The overriding principle is that under no circumstances should the search for economic efficiency result in trade-offs with safety.

Cost Relatedness

10.2.3 ATM service provision exhibits monopoly components. Economic regulation should deal with the potential for rent-seeking monopoly behaviour[18]. Therefore, charging for services needs being related to costs and economic regulation should ensure that profits, if any, are reasonable.

Non-Discrimination

10.2.4 Non discrimination is entrenched in economic regulation[19]. The principle applies to both users and providers. Economic regulation shall not introduce distortion of competition in different areas, in particular discriminating according to the governance of providers or different (nationality of) users. Economic regulation should avoid being a tool for reinforcing the dominant position of particular providers and users. However, non discrimination does

[18] In this regard, auction pricing mechanism or congestion pricing may lead to non relatedness to costs and high profitability contrary to legal and economic principles. Costs of ATM services provision are a small proportion of users' total cost (from 5 to 7%). They can be passed on to passengers and demand price elasticity is negligible at peak hours, users being captive. Therefore the economic outcome could be high prices with non relation to costs and scope for limiting capacity on the side of services provision.

[19] Slot market and peak pricing may introduce discrimination.

not rule out differentiation[20] when dealing with the various economic regulatory issues raised by ATM service provision.

Unbundling of Costs and Services (Transparency)

10.2.5 To date, ATM service provision in Europe has been charged under national and EUROCONTROL aggregate costs which do not clearly differentiate the costs of the different ATM services.

10.2.6 Widely accepted, unambiguous data on the performance of the different ATM services is not available. Together with the aggregation of costs, this impedes the assessment of investment and management plans. It means that it is difficult to reliably target investment in the areas which would yield the most benefit.

10.3 Aims of European ATM Economic Regulation

10.3.1 There are three clearly identified aims to the economic regulation of ATM: the creation of incentives, the introduction of a forward-looking perspective, help for restructuring.

Creation of Incentives

10.3.2 Economic regulation aims at defining and introducing incentives through financial rewards and penalties so that ATM service provision is driven towards efficiency and performance. The scope for incentives has been made possible under changes to the EUROCONTROL Principles which permit economic regulation as an alternative to the EUROCONTROL "formula"[21]. This has been discussed in Section 5 of this report. Section 1.10 of the principles states "regulation is designed, inter alia, to provide incentives through the charging mechanism to encourage an efficient service at the lowest possible cost".

Introduction of a Forward Looking Perspective

10.3.3 It has already been noted that the management of the European ATM service provision is backward looking, with capacity lagging behind traffic growth. A key aim of economic regulation should be to make the system more re-active to future growth in demand. It can be achieved by means of a arrangement where providers commit themselves to service level and investment targets, the targets being set up according to assumptions on traffic growth and based on a

[20] Differentiation can be based on cost-reflectiveness, for example according to flights (overflights)
[21] Decision No 52 of the Commission of EUROCONTROL dated 20 July 1999.

consultation process with users. In practice, the arrangement might be either through some formal service level agreement of a more ad hoc arrangement.

Help for Restructuring

10.3.4 Economic regulation has to promote the restructuring of ATM service provision in two ways. Firstly, it has to develop a European approach, where necessary respecting the principle of subsidiarity. Secondly, it has to reduce fragmentation. Economic regulation should help restructuring by means of co-operation, and incentives should be devised accordingly.

10.3.5 In order to improve the performance of the European ATM system, some initiatives to restructure infrastructure at a European level are likely to be appropriate. For example, collective infrastructure improvements designed to assist specific categories of users or states in order to improve collective air navigation infrastructure, the provision of air navigation services or the usage of airspace. Such improvements should benefit from financial support on the basis of user charges. There is no principle which forbids the inclusion of such improvements in the cost base, provided that the improvements exist.

10.3.6 In other cases infrastructure improvements are likely to require pre-funding. In the past, the recovery of the cost of pre-funding through user charges has been discouraged on the grounds that it conflicts with the principle of cost relatedness and that users should not be charged for facilities that do not exist or are not provided .

10.3.7 As a result of revision following the ANS-2000 conference, ICAO document 9082 (now /6) states that notwithstanding these principles, pre-funding of projects may be accepted in specific circumstances where this is the most appropriate means of financing long-term, large-scale investment, provided that strict safeguards are in place, including:

- Effective and transparent economic regulation of user charges and the related provision of services, including performance auditing and "benchmarking".

- Comprehensive and transparent accounting, in accordance with the principle that user charges are provided for, directly related to, or ultimately beneficial for civil aviation services or projects.

- Advance, transparent and substantive consultation by providers and, to the greatest extent possible, agreement with users regarding significant projects.

- Application for a limited period of time, with users benefiting from lower charges and from smoother transition in changes to charges than would otherwise have been the case once new facilities or infrastructure are in place.

10.3.8 Taking due account of ICAO's policies, bilateral air treaties and the Eurocontrol principles, it is concluded that there is no rule of international air law which explicitly forbids the inclusion of pre-funding of ATS related activities. It could be argued that such inclusion is permissible under a broad, flexible and modern interpretation of the principle of cost-relatedness.

10.3.9 Such interpretation will depend on *designing* the pre-funding device in accordance with principles of international air law. In practice, this implies that the device must be *negotiated* with all parties concerned, especially states, and users. In our view, the negotiators must make the point that pre-funding should be seen as an item of the recoverable costs under user charges because longer term benefits related to the efficiency of the operation of ATS will serve all parties involved.

10.3.10 The EU might have a role in coordinating such infrastructure projects for its member states. If it were to devise a working arrangement that included EUROCONTROL then a larger number of states could be included.

10.4 Design of Economic Regulation of European ATM

10.4.1 The proposed economic regulation scenario is summarised in the following figure.

Figure 2: Economic regulation

ATM Component	Network Infrastructure	ATFM	ATC	Ancillary Services
Service metrics	- traffic flows, complexity and density indices - direct routing	- delay - routing - flexibility	- capacity - delay - cost - efficiency	- interoperability - system service or performance
Incentives	- possible financial support collective infrastructure improvements	- supply: declared/theoretical capacity - demand: alternative routing, booking mechanism - airports compliance	- delays	market mechanism under public procurement requirements
Basis of charging formula	cost + possible financial support to collective infrastructure improvements	cost + price of alternative routing mechanism + rewards on pre-visibility of demand + penalties on airports	(Zone Unit Rate) x (Number of Service Units) – (cost Delays) ZUR (for a three years period) = f (invest., productivity, target delays)	price (market equilibrium)

10.4.2 The table in Figure 2 has a column for each ATM component (Network Infrastructure, ATFM, ATC, Ancillary Services). There are rows describing the proposed service metrics , the proposed incentives, and the proposed basis for the charging formulae.

10.4.3 Each of the ATM components is now discussed the light of the general requirements for the economic regulation of ATM services as described in Section 8.

10.5 Network Infrastructure

10.5.1 The optimisation of the European network infrastructure needs to be carried out at the European level and would include:

- Joint civil and military management of use of airspace.
- The definition of routes.
- The definition of airspace zones of operational co-ordination (ZOCs).

10.5.2 ZOCs would be cross-border airspace blocks where an increase in efficiency would stem from co-ordination between national service providers. For example, ATFM co-ordination among providers involved in the airspace zone, alternative routing for reducing traffic overloads, co-ordinated management of controllers according to traffic flows, co-ordinated redefinition of airspace sectorisation. Currently, co-ordination operates from a national perspective. For instance, transfers of sectors have occurred from overloaded ATC Centres (Reims, Aix) towards less overloaded ATC Centres (Brest and Bordeaux). What has been achieved at the national level should produce further improvements if implemented at the cross-border level. In this respect, although little has occurred at a European level, the results of investigations such as the CHIEF project, imply that this type of operational co-ordination has the potential to produce important efficiency gains[22].

[22] "For example, simulation work done by the EUROCONTROL Experimental Centre (EEC) under the CH (Switzerland) I (Italy), E (Spain) F (France) (CHIEF) initiative has shown that very simple co-ordination in the control sector configuration choices, at an equal level of staff resources, could see substantial improvement in the delay statistics - Up to 20% decrease in delays for the simulation done on Barcelona-Aix ACCs. " Performance Review Commission (2000) : Independent Study for the improvement of ATFM, Brussels, PRC, p. 16.

10.5.3 Possible metrics attached to network infrastructure are shown in Figure 2. These might be based on:

- Some measure of the complexity of traffic flows, with reduced complexity being desired.

- The directness of routes: a metric could be based on route distance, although this would require care since airlines are more concerned with minimising total cost (and generally for short haul, arrival punctuality) than just route distance.

10.5.4 The charging formula for the network infrastructure component of ATM should include the cost for providing the service. As shown in Figure 2, it might include an element for collective airspace improvements (as discussed in Section 10.3). The planning of infrastructure investment should be subject to forward-looking contractual agreements.

10.6 ATFM

10.6.1 ATFM service provision is governed by en route ATC service capacity and fluctuations in air traffic demand both of which are governed by different time constants. En route ATC service capacity depends on medium to long term investment planning. Demand is governed by short term economic cycles. Additionally, ATC service capacity is affected by external factors such as weather.

10.6.2 Developing metrics to characterise the performance of ATFM is complicated by the fact that the constraints with which ATFM has to work are set by the capacity of the individual airspace sectors (or in the future, zones) declared on the day. Metrics of ATFM performance could be based on delay, routing and flexibility (as listed in Figure 2):

- A metric might be based on delay making due allowance for the number and duration of regulations in place.

- An example of a routing metric would be one based on the fraction of flights granted their first choice route. It is noted that there is a trade-off here with delay and that different users might have different criteria in making the trade-off. For example, scheduled short haul flights with a large fraction of premium fare passengers would probably choose arriving on time as a priority over route distance. A long haul flight on the other hand would probably see a fuel efficient route as a higher priority.

- ATFM ought also to offer users some flexibility, although this would be a difficult area in which to derive robust metrics.

10.6.3 Two incentive mechanisms are proposed to optimise ATFM, as listed in Figure 2. The first incentive applies to service providers. It introduces penalties where ATC centres default on providing operational capacity in proportion to their theoretical capacity. Penalties could be applied when the declared capacity of an ATC centre falls below a certain threshold in comparison with its theoretical capacity.

10.6.4 The second set of proposed incentives applies to users. These might include some form of booking mechanism and an alternative routing auction mechanism. These sorts of incentives would require further investigation and testing.

10.6.5 It would also be possible to consider imposing penalties on airports for non compliance with en-route slots. However, such a mechanism would only be applied *a posteriori* as airports have to assess the on-going operational situation and are subject to other constraints, such as those imposed by wake vortices, in order to optimise throughput.

10.6.6 The charging for ATFM will be based on the costs of providing the service and include penalties and rewards according to incentives, as shown in Figure 2. A charge formula based on cost is appropriate because the joint service providers/users club governance proposed for the corporatised ATFM function (see Section 10.9) should ensure the necessary transparency and internalise service providers/users conflicts.

10.7 ATC

10.7.1 Optimising the performance of ATC rests on the design of a general system of incentives which would apply to both national and transnational airspace blocks (ZOCs). The aim would be to define ZOCs on operational grounds, regardless of national boundaries. To be effective, ZOCs require co-operation between national service providers. The general system of incentives would be designed so as to make participation in ZOCs financially attractive for national service providers: for example through cost-efficiency gains, reduced penalties due to increased performance, support to investment.

10.7.2 To characterise the performance of ATC, metrics based on capacity, delay, cost and efficiency would be appropriate (as listed in Figure 2):

- Capacity is difficult to measure directly. Possible measures might be based the operational capacity declared to the CFMU or on the number of flights handled over some defined period.

- Delay is often used as a measure of ATC performance but requires careful definition if it is to be useful. It is important to be very clear what reference the delay is measured against. For example delays measured against published airline schedules are a poor measure because block times have increased over the years making delay statistics measured against them optimistic. Both departure delay and arrival delay are useful in characterising the system. The distribution of delays is also useful since it shows the extent to which delays are predictable. In general, for a given duration of delay, the more predictable the delay the less problematic it is to airlines.

- Cost would be a key performance measure. It could be based on unit rate. It would need to be adjusted in some way to account for airspace complexity and, where appropriate, exchange rate. A move from national unit rates to zone unit rates would make such a measure a more useful management tool.

- As well as absolute cost, some measure of efficiency would also desirable, in particular for benchmarking purposes. This implies "flights per controller" type metrics.

10.7.3 The general system of incentives would be based on output measurements, the most obvious being based on delay, as shown in Figure 2.

10.7.4 The financial rewards to co-operation rest on the principle that ZOCs get zone unit rates more attractive than airspace zones which do not require cross-border co-operation. The ZOC unit rate might be higher, the same or lower than the corresponding national unit rates. A higher rate would have to be justified and agreed with users based on improved service. A ZOC unit rate the same or lower than the corresponding national unit rates would still be financially attractive if the cost savings as a result of participation on the ZOC more than outweighed the reduction on the unit rate. Detailed investigations would be required to establish the economic viability of the ZOC and ZOC unit rate concept.

10.7.5 Co-operation would occur by means of states delegating service provision to ZOCs and by involvement of national services providers in setting up what are termed here as Resource Pooling Alliance (RPA) schemes. In setting up a RPA, the service providers involved in a particular ZOC would be free to choose the appropriate form of co-ordination and restructuring (eg contractual relationships, joint ventures, creation of separate service provision entities).

10.7.6 The distribution of revenues from service provision in ZOCs would be agreed between the states involved in ZOCs and according to arrangements between services providers which might be based on factors such as coverage of airspace and pooling of resources.

10.7.7 It is proposed that Zone Unit Rates (ZURs) would be set up for a three year period and subject to review at the end of the period. Three years duration is selected according to the average time to develop and implement effective re-sectorisation and to allow for financial viability and consolidation. ZURs will be based on service unit (quantity) and quality target levels. Delays would not be allocated to sectors but to airspace zones. The proposed basis of the charging formula for ATC is summarised in Figure 2.

10.7.8 The general design of the charging formula for en-route ATC service provision will apply to both national and transnational airspace blocks. Zone Unit Rates will be forward-looking and defined for a three years period (price cap regulation). They will be based on contractual agreements between the users and the service providers. The agreements will internalise contractuel targets on level and quality of service. Financial penalties would occur when contractual targets are not met.

10.8 Ancillary Services

10.8.1 Most ATM ancillary services could be opened to competition and will not require economic regulation as such. They could be subject to competition law investigation. However, optimisation of ancillary services would benefit from restructuring of the industry as has been the case in the Defence industry, particularly in the US and as is occurring in Europe[23].

[23] See Dumez H. & Jeunemaître A. (1999) "Le cadre institutionnel de la restructuration des industries d'armement. Une comparaison Etats-Unis/Europe." *Gérer & Comprendre,* n°57, septembre, pp. 13-22. See also : Dumez H. (1999) "Les industries de l'armement en Europe." *Sociétal,* n°26, septembre, pp. 115-118.

10.8.2 Three demand related initiatives can help effective restructuring of supply. These are: imposing interoperability conditions; promoting the development of a service providers' purchasing market to benefit from economies of scale; and as far as possible, implementing commercial purchasing procedures to reduce the cost of supply. Changes in demand conditions would result in supply restructuring and presumably increased industry consolidation. It would be up to European competition policy to assess to what extent supply restructuring results in excessive market dominance.

10.8.3 Metrics on ancillary services would be based primarily on interoperability and system or service performance, as listed in Figure 2.

10.9 Institutional Implications of Economic Regulation of European ATM

10.9.1 The proposed institutional framework to support proposals set out above is summarised in the following figure and discussed in the following text. They are not intended as definitive proposals but rather as an illustration of the sorts of functions that would be required.

Figure 3: Possible Institutional design

ATM Services		**Network Infrastructure**	**ATFM**	**ATC**	**Ancillary Services**
Service Providers		European Airspace Design Partnership Board: civil/military representatives of states Consultation: providers, users	European Air Traffic Flow Management Services (corporatised CFMU+FMPs) Board: users/providers	National providers Resources Pooling Alliances on airspace zone under human resources mobility	Supplier Organisations
European Regulator	*General Regulation*	Defining and enforcing key regulatory principles			
	Regulation of service provision under performance criteria	- increase in capacity by European level design	- decrease in regulation periods and chronic congested situations ; - agreement on ATFM principles	- economic regulation of ATC provision - performance targets	- interoperability - monitoring of procurement

Service Providers – Network Infrastructure

10.9.2 Emphasising the European nature of this ATM component implies the creation of a European Airspace Design Partnership (EADP). The EADP is presumed to be jointly run by civil and military representatives of states. It would be responsible for new initiatives in redefining routes, creating airspace zones, deciding on future technology. These services would be designed within a collaborative framework at the European level.

10.9.3 Alongside the decision-making process in the hands of EU member states' representatives, consultative procedures would be implemented and involve non EU ATM services providers and users.

Service Providers – ATFM

10.9.4 ATFM also requires action at the European level. It supposes a centrally run body on ATFM and introduces two major institutional changes:

- Pooling in a European body of the centralised part of current ATFM service provision (CFMU) and de-centralised ATFM positions in ACCs (FMPs).

- Corporatisation of ATFM by creation of a service providers/users club which would internalise prediction of demand and planning of supply from both users and providers. It is up to those involved in ATFM service provision to decide upon the most effective organisation, capacity management procedures and rules of prioritisation to be applied in acute congestion situations. The whole arrangement would be under the approval and supervision of the European Regulator.

Service Providers – ATC

10.9.5 The proposed regulatory framework is neutral towards the status and governance of the service provider. It can be privatised, coporatised or state-owned.

10.9.6 The Resource Pooling Alliances are flexible tools of co-operation which can have varying institutional status: contractual arrangement, join ventures, perhaps eventually mergers of services providers. Probably the main institutional change would be the creation of a European controller status with associated European controller licence.

Service Providers – Ancillary Services

10.9.7 Institutional developments should promote the establishment of common rules and principles in the buying conditions for ancillary services such as requirements for interoperability, the development of centralised European purchasing power (for example, creation of a European Buying Office), standardisation which will allow for buying commercial off the shelf products or services. Supply restructuring for ancillary services would be governed by competition policy principles.

European Regulator

10.9.8 Economic regulation cannot be designed in isolation of the institutional regulatory framework. As has been stressed earlier, incentives cannot be introduced from a national perspective if they are to be effective, since ATM service provision is governed by network effects. Definition of incentives at the national level and from a national perspective can introduce divergence in European regulatory regimes and translate into a national provider passing on difficulties to other providers. Therefore, there is a need to define and implement incentives at the European level.

10.9.9 In compliance with the subsidiarity principle, the European Regulator would not interfere with national and sub-national level activities. The regulator would define rules of harmonisation to ensure convergence of national economic regulation (if any) and make it compatible with the European regulation.

10.9.10 The European Regulator is expected to be in a better position than national regulators to tackle the issue of asymmetry of information because, having visibility of multiple services providers, it is better equipped to benchmark and assess their performance;

Legal Remedies

10.9.11 Regulation defined by the European regulator needs to be subject to legal remedies in the case of disputes involving users, services providers and stakeholders at large. Some disputes would fall under competition policy procedures and competition legislation. Others disputes or conflicts may involve the civil and the military (eg the optimisation of the network infrastructure) and therefore require political arbitration. Some conflicts may also involve non EU members states which participate in European ATM service provision. Procedures should be devised so that they are included in the process of legal remedy.

11. European ATM Action Plan

11.1 Introduction

11.1.1 The proposed action plan consists of two phases. The first phase covers short term actions required to put ATM services provision on the right track. The second phase covers actions that are necessarily longer term.

11.2 Phase I: 2001-2003

Economic regulation

- Preliminary studies on creation of the European ATM Services Economic Regulator. Key issues for study would include the relationship between the European regulator and national regulators (subsidiarity) and the source of expertise either within the regulatory organisation or on which it could call.

Service provision

Network infrastructure

- Studies on the creation of the a European Airspace Design Partnership or similar.
- Planning of European airspace restructuring (including financial aspects).

ATFM

- As far as possible, merger of CFMU and FMPs.
- Unbundling of ATFM costs.
- Studies of metrics and incentives.

ATC

- Studies into ZOCs, which would include identification of possible ZOCs, and analysis of ZOC unit rates to establish economic feasibility.
- Studies of metrics and incentives.

- Studies into establishing a European controller licence.

Ancillary services

- Definition of the process for establishing procurement and interoperability requirements.

11.3 Phase II : Beyond 2003

Economic regulation

- Creation of the European ATM Regulator.

Service Provision

Network infrastructure

- Creation of the European Airspace Design Partnership or similar.
- Development and implementation of a European airspace restructuring plan.

ATFM

- Creation of the corporatised European Air Traffic Flow Management Services with a service providers / users club governance.

ATC

- Implementation of a European controller licence.
- Creation of ZOCs, including implementation of ZOC unit rates.
- Creation of Pooling Resources Alliances to provide services in ZOCs

Ancillary services

- Promotion of market mechanisms.

12. Analysis of Elements for a Draft EU Regulation on User Charges

12.1 Summary Overview of the Existing Framework

12.1.1 From the legal analysis it is concluded that:

- The Chicago convention contains binding provisions for the imposition of charges, with the application of the non-discrimination principle as the most important condition.
- ICAO law and policy confirm that principle and add further conditions concerning cost-relatedness and transparency.
- Bilateral air treaties contain in some, but not all cases, provisions pertaining to the imposition of en route and terminal charges. If so, they specify to a lesser degree (the older bilateral air treaties) or greater degree (the more recent bilateral air treaties) the conditions under which en route and terminal charges may be imposed.
- EUROCONTROL has established detailed principles on en route charges, which are based on ICAO policies and recommendations, and have treaty status. Certain exemptions from the application of these principles may apply to ANS providers who are subject to economic regulation.

12.1.2 This leads to the provisional conclusion that the room for manoeuvre to change the basis for establishing en route and/or terminal charges is somewhat constrained. Existing treaty obligations may prevent EC Member States from introducing more flexibility into the establishment of charges. *A priori control* of en route and terminal charges is rather strongly embedded in the present framework. To move from *a priori control* of those charges to *a posteriori control* by the application of a competition regime to the ATM services in question may be not an easy step.

12.1.3 However, the following are noted:

- ICAO, CAEP and other organisations with a world wide mandate realise that there is a need for change.

- There is a case pending before the European Court of Justice which could have future relevance for the bilateral aviation agreements of the Member States.

- A key feature of the EUROCONTROL Principles is that they allow for independent economic regulation as an alternative to the application of the rules set out for determining the service provider's cost base. Price cap regulation with a service quality term based on delay has been introduced in the UK.

- Once the EC has acceded to EUROCONTROL, it will be in a position to influence the proceedings within this organisation, including in the area of User Charges.

12.2 A Unified Regime

12.2.1 The establishment of a unified regime in the field of user charges can be seen as a follow up to, or element of, the constitution of the internal market for air transport services. Also, reference can be made to the objective of setting up Trans European Networks, thus doing away with national systems.

12.2.2 Obviously, the Community has strong assets at its disposal in order to implement and maintain a unified regime. This observation applies to all phases of regulation, that is, from the first draft of the regulation to and including the presence of legal remedies. However, the question is whether the EC based enforcement and dispute settlement mechanisms can be used in the light of international (Chicago, bilateral and EUROCONTROL) obligations of the EC Member States. Again, this is a question that requires application of Art. 307 of the EC Convention, once an EU Regulation on User Charges has been drafted.

12.2.3 Compared with EUROCONTROL, the Community has a more limited territorial mandate. This point can be redressed in the coming years when Central European countries accede to the EC, or ratify the proposed Multilateral European Common Aviation Area Agreement.

12.2.4 In the context of the achievement of a unified regime, another question concerns the establishment of regulatory powers at the most appropriate level taking account of the subsidiarity principle. The need for a single regulatory environment suggests that regulatory powers are primarily exercised at Community level and leaving to States the oversight functions.

12.3 Limitation of Exceptions Regarding Categories of Users and the Involvement of the Second Pillar

12.3.1 The principle that no distinction may be made between categories of users has been noted. For the sake of consistently applying this principle, and for creating greater transparency in cost allocation of service provision, it is argued that the categories of users which are, or should be, exempted from payment of user charges should be restricted to an absolute minimum.

12.3.2 The proposals of this study proceed from the point of view that operators of state aircraft, including state aircraft used in military, customs and police aircraft,[24] are covered by the application of the draft EU Regulation on User Charges. However it is recognised that there may be enormous difficulties in achieving this.

12.3.3 There is no experience with the application of air transport regulations to military aircraft, or other operators of state aircraft. However, it is envisaged that certain aspects of the military, including but not limited to the avionics carried by military aircraft, and civil military cooperation to achieve greater efficiency in the use of airspace, could make use of the First Pillar.

12.3.4 With the creation of the Second Pillar, ATM issues which are more strictly related to the military such as military co-operation in the establishment of joint exercises and joint training zones can be brought under the umbrella of the Common Foreign and Security Policy. The most appropriate instrument would be the adoption of principles and guidelines by the European Council pursuant to Art. 13(1) of the EU Treaty, designed to apply an EU Regulation on User Charges to operators of military aircraft. Under the Second Pillar, unanimity is the rule (see Art. 23 EU Treaty).

12.3.5 On its way to reaching an agreement on the application of an EU Regulation on User Charges to operators of state aircraft, the European Council will have to take into account international obligations including those arising from the NATO and EUROCONTROL Treaties as well as national policies, laws and, not least, sensitivities. More specifically, it is understood that there are different practices in EC and in other states regarding the payment of user charges by state aircraft. The general rule seems to be that under certain regional, for instance NATO, arrangements, foreign operators do not pay user charges on the basis of reciprocity.

[24] See, the definition given by Art. 3 of the Chicago Convention

12.4 Cross-Subsidisation

12.4.1 Various types of cross-subsidisation can be envisaged. These include:

- Cross-subsidisation between different services, for example an ATC service and a meteorological service.
- Cross-subsidisation between different categories of users, for example civil and military users.

12.4.2 Most international rules and policies on charges, including those of ICAO and EUROCONTROL, require that charges should be cost related and that the charging system should be equitable. This implies that cross-subsidisation must be duly identified and justified.

12.4.3 Cross-subsidisation might be justified for regions where the volume of air traffic is insufficient to economically cover the cost of the infrastructure and services required.

12.4.4 Cross-subsidisation between different services, for example an ATC service and a meteorological services is inconsistent with the concept that ancillary services might be opened to competition. Greater transparency would help discourage this type of cross-subsidisation.

12.4.5 Strict prevention of cross-subsidisation between different categories of users may be more difficult to achieve since it often involves apportioning costs between users which is, to an extent, a matter of judgement. In addition, it may be uneconomic or impractical to recover charges from certain classes of users. Nevertheless, this type of cross-subsidisation should be avoided where feasible, at least in the short term. In the longer term, if there is significant progress towards a more market driven approach to ATM service provision, it may be appropriate to relax this requirement.

13. A Draft EU Regulation on User Charges

13.1 Preamble

13.1.1 The Preamble of a draft EU regulation on User Charges could contain the following paragraphs:

The usual references to intra-EU procedures, such as:

- proposal made by the Commission;
- advice of the Economic and Social Committee;
- involvement of the European Parliament.

Identification of the legal basis of the Regulation:

- Article 3(1)(f);
- Article 14;
- Articles 49 and 51 on the freedom to provide services;
- Article 70;
- the subsidiarity principle.
- (Competition rules: Articles 81, 82),

and to special subjects related to the drawing up of this Regulation, which include but are not limited to:

- the application of competition rules to arrangements between ANS providers in contestable markets, with the possibility of the grant of exemptions for reasons of safety and efficiency of the service provision, and to monopoly situations, including abuse thereof;
- the establishment of Trans European Networks (Articles 154-156);
- applicable provisions of the Second Pillar (Articles 12, 17).

as well as references to:

- the territorial scope of the Regulation;
- the users to which the Regulation is applicable;
- the division of user charges into three categories, that is:
    - en route charges;
    - terminal charges;
    - charges for ancillary services;
    - [charges related to the collection and billing of the User Charges]
- the substantive regimes applying to each category of user charges;
- the objectives of the Regulation;
- the ways and means to achieve these objectives;
- the substantive provisions, that is, on:
    - application of non-discrimination principle;
    - where feasible, the avoidance of cross-subsidisation among categories of users;
    - cost-relatedness of the user charge, because the Regulation is designed to proceed from the principle that costs must be reflected in charges to users generating those costs, subject to:
        - a variation with respect to limited profit-making for en route and terminal charges;
        - the establishment of a more competitive regime applying to charges for ancillary services;
        - inclusion of external costs, such as environmental costs;
        - while making room for price differentiation.
- the need for provisions on:

- provision of information and consultation in order to create transparency;
- enforcement; and
- dispute settlement.

13.2 Draft Articles

Objectives

13.2.1 The Regulation is to:

- unify the regime on User Charges in the territorial area defined by the Regulation;
- draw up mandatory rules, based on internationally agreed principles, for all categories of users subject to the provisions of the Regulation;
- Contribute to the achievement of greater transparency with respect to the establishment of user charges.

13.2.2 In order to achieve the above objectives, the Regulation is to:

- define the territorial scope of the Regulation;
- define the activities pertaining to charges;
- appoint the authorities competent to perform charging activities;
- define categories of charges falling under the scope of the Regulation;
- define the categories of users to which these charges are applicable [including military users];
- give provisions on the substance of those charges;
- where feasible avoid cross-subsidisation among categories of users;
- limit the exemptions from the Regulation to a minimum;
- set out provisions on exchange of information, consultations, enforcement and remedies.

Definition of the territorial scope of the Regulation

13.2.3 The definitions of national airspace and other airspace are based on:

- Article 299 of the EC treaty;
- Article 2 of the Chicago Convention, as supplemented by:
- rules and regulations established by ICAO.

In order to give effect to the imposition of charges outside national airspace, as envisaged in section 13.2.3, the concerned Member State or States may ask the Commission to conduct the necessary negotiations on their behalf with other states and with ICAO.

Definition of activities pertaining to charges

13.2.4 Subject to arrangements made with EUROCONTROL and its Central Route Charges Office, and in cooperation with competent national authorities (and with NATO), this Regulation applies to:

- the establishment;
- imposition;
- (billing and collection);
- enforcement of payment of user charges.

Definition of Categories of Charges Falling Under the Scope of the Regulation

13.2.5 User charges falling under this Regulation are:

- en route charges;
- terminal charges;
- charges for ancillary services;
- (charges related to the collection and billing of the User Charges);

- as defined by ICAO (in Annexes 2 and 11 as well as in Statements on Policies and Manuals).

Definition of Categories of Charges Falling under the Scope of the Regulation

13.2.6 Subject to the Article … (on Exemption of certain categories of users), this Regulation applies to all categories of users, including both military and civil users.

13.2.7 Users are operators of aircraft. The operator of an aircraft is the registered owner (or operator licensed according to the laws of the state of registration) of that aircraft.

Substantive Provisions Applying to User Charges

Non-discrimination

13.2.8 This Regulation shall be applied in accordance with the principle of non-discrimination.

13.2.9 In particular, the same or similar criteria pertaining to the establishment of charges shall be used for:

- charges imposed on domestic services and charges on international services;
- charges imposed on intra-EC air services and charges on services between a point in the Community area and a point outside the Community area;
- charges imposed on scheduled services and charges applied to non-scheduled services;
- charges imposed on civil users and charges imposed on military users;
- charges imposed on operators of national aircraft and charges imposed on operators of foreign aircraft.

The Cost-Relatedness of User Charges

13.2.10 Subject to Article … (on the exemption of certain charges from the conditions contained in this Article) the establishment of en route and terminal charges shall be subject to the principle of cost-relatedness.

13.2.11 Cost-relatedness shall be understood to mean the cost of the en route and terminal services and facilities used by operators of aircraft who generate them.

13.2.12 The following costs must be included in en route and terminal charges:

- investment costs, including amortisation of assets and costs of capital;
- operating costs;
- staff costs;
- ATM costs (for facilities and services);
- costs of training and research;
- administrative costs;
- search and rescue costs;
- operating and investment costs of the charging authorities.

13.2.13 Costs that are external to the operation of user facilities and the provision of services to users including, but not limited to, environmental costs, shall be a component of the user charge.

13.2.14 The above costs can be made so as to allow a reasonable return on capital.

Exemption of Certain Charges from the Condition on Cost-Relatedness

13.2.15 At the end of a period of …, (and subject to applicable international regulations), the Council of Ministers may decide that the establishment of certain charges [to begin with, ancillary services, and perhaps charges related to the collection and billing of user charges] shall be exempted from the provisions of paragraph .. of Article … (on the cost-relatedness of user charges).

13.2.16 Without prejudice to other provisions of this Article (and to applicable international regulations), service providers qualifying for an exemption in accordance with paragraph 1 of this article shall be free to set prices.

13.2.17 The Member State in whose territory (airspace) the regime set forth in paragraph 2 of this Article is to be applied shall (may) require such prices to be filed with it in the form and within the period of time prescribed by it.

13.2.18 Subject to the procedures of this article, a Member State may disapprove the price setting as foreseen in paragraph 2 (of this Article) if it deems that such price setting is contrary to:

- requirements imposed by considerations of safety and security of the service to be provided;
- and/or the efficiency of the service provision in the shorter or longer term;
- (other policy objectives).

13.2.19 The Member State shall confirm its disapproval in a reasoned decision within two weeks after the price has been submitted to it, and address it, within 24 hours after the decision has been taken, to the service provider(s).

13.2.20 The Member State concerned shall notify the Commission on decisions taken pursuant to paragraph <para no> within 24 hours after the decision has been taken.

13.2.21 The Commission shall review the decision taken by the Member States …

(Further procedural arrangements and remedies).

Exempted Categories of Users

13.2.22 The following categories of users shall be exempted from (Article(s) .. of) this Regulation:

- operators of aircraft engaged in emergency rescue operations;
- operators of aircraft engaged in emergency military operations;
- <others as required>

13.2.23 Member States in whose airspace the categories of users identified in paragraph 1 of this Article are exempted from the scope of this Regulation shall make appropriate provisions in their national laws for the payment [by those operators or the competent national authorities] of charges which are equivalent to those which are covered by this Regulation to the concerned service providers.

13.2.24 This article must be construed so as not to undermine the objectives of this Regulation.

Provision of Information, Consultations and Remedies

13.2.25 Two months (or another period of time which is reasonable but should be defined) before a charge is established by the service provider, in accordance with the applicable procedures (as defined by the competent national authority, in accordance with the principle of subsidiarity), users shall be informed on the proposed level and structure of the charge.

13.2.26 In case of disagreement on the level or structure of the user charge, user and service provider shall engage in consultations.

13.2.27 Subject to applicable international regulations, and in accordance with national procedures (following the principle of subsidiarity), users who are in disagreement with the outcome of the consultations referred to in paragraph 2 of this article are entitled to bring a claim before a national court/ an independent authority/ arbitration body (with a right of appeal).

Enforcement

13.2.28 Subject to applicable international regulations, if a user does not pay the charges established, imposed and billed in accordance with the provisions of this Regulation, or otherwise does not comply with the provisions of this Regulation, the aircraft of such a user may:

- be detained by the competent national authority of an EC Member State when that aircraft is found on the territory of that Member State;
- refused access to the airspace covered by this Regulation;
- be the object of any other enforcement procedure which is applicable in the Member State in whose territory the aircraft is found.

Validity and Revision

13.2.29 The Regulation shall apply for a period of (three to five) years, after which it shall be revised.

Publication

13.2.30 In the Official Journal (and in international treaties series).

Entry into force

13.2.31 This Regulation shall enter into force upon the day of its publication in the Official Journal of the European Communities (or in the official documents referred to in Article … on Publication).

Study on the Economic Regulation of Air Traffic Management Services – Final Report, Appendices

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14. Appendix A: Information Gathering

14.1 Approach to Information Gathering

The principal means of information gathering from States, was a questionnaire which was used in conjunction with e-mail correspondence and telephone interviews.

Users' organisations and workers' organisations have been contacted by e-mail, telephone and meetings.

Other sources of information have included material provided by CANSO, Eurocontrol (CFMU, CRCO, Experimental Centre), and ICAO.

14.2 Contacts

A list of contacts is set out below.

Organisation	Contact
Air Navigation Services of the Czech Republic	Mr Pavel Mrna
Airservices Australia	Bernie Smith Chief Executive (point of contact Ms Kerry Messner)
ATCEU, TUEM	Bjorn Neher
Ireland	Michael Gloster
Eurocontrol	Mr P Jeannet, CFMU
	Mr E Soehnle, CRCO
	Mr X. Fron, PRU
EFT	Brenda O'Brien
France	Jean-Claude Coulardot, chef du service de la régulation de la sécurité (DNA)
	Gilles Mantoux, Conseiller du DNA pour les affaires européennes
	Jean-Claude Gouhot, head of user charges and costs assesment DGAC-DNA-France
Germany	Mr. Wolf Liedhegener Bundesministerium fur Verkehr, Bau- und Wohnungswesen

Organisation	Contact
	Mr Dirk Nitschke Bundesministerium fur Verkehr, Bau- und Wohnungswesen
Hungarian CAA	Peter Moys
IATA	Mr L O'Toole
	Mr N Zveguintzoff
National Air Traffic Services Limited	Hugh Westaway Director Corporate Development and Compliance
Nav Canada	John Deacon Vice President, General Counsel and Corporate Secretary
Netherlands	Mr Pieter Mulder Advisor, International and European Affairs, Dutch CAA
New Zealand	Ms Heather Hayden, Airways Corporation of New Zealand
Romania	Gabriel Dumitrescu Dir. General, CAA
Swedish CAA	Mr Mikael Larsson
UK Civil Aviation Authority	Douglas Andrew Group Head of Economic Regulation

15. Appendix B: Australia

15.1 Overview

Air navigation services in Australia are provided by Airservices Australia, a Government owned commercial authority established in July 1995 under the Air Services Act 1995.

15.2 National Framework

Airservices works with other Government organisations concerned with aviation policy, safety and regulation in Australia. These are the Department of Transport & Regional Services, the Civil Aviation Safety Authority, and the Australian Transport Safety Bureau. The Department of Transport & Regional Services has responsibility for economic regulatory functions relating to civil aviation operations and oversight of Government Business Enterprises including Airservices Australia.

Airservices Australia is responsible for the following principal functions:

- air traffic control and airspace management;
- aeronautical information;
- communications;
- radio navigation aids;
- search and rescue alerting;
- airport rescue and fire-fighting services;
- environmental regulation and monitoring.

Airservices Australia is committed to performing its functions and delivering its services consistent with Australia's international aviation obligations and in accordance with civil aviation standards and recommended practices

15.3 Charging Regime

Airservices Australia is subject to the general provisions of the Trade Practices Act 1974 which prohibits misleading or deceptive conduct and anti-competitive behaviour in trade and commerce.

Additionally, Airservices Australia is subject to economic regulation by the Australian Competition and Consumer Commission. Charges for terminal, en-route and aviation rescue and fire-fighting services that are provided by Airservices Australia are classified as "declared services" for the purposes of the Prices Surveillance Act 1983. Consequently, the Commission is required by law to be notified of, and agree to, any increases in service prices or changes to the structure of such prices. In carrying out a determination, the Commission is required to have regard to the cost of providing the services as well as to the efficiency of the provider and the reasonableness of the rates of return generated.

The Australian Government is considering measures to limit any abuse of a monopoly position and is considering options for the introduction of competition in the provision of terminal navigation, aviation rescue and fire-fighting services.

16. Appendix C: Canada

16.1 Overview

Air navigation services in Canadian airspace are provided by NAV CANADA, a corporation incorporated under the Canada Corporations Act as a private non-share capital company (the Company). The Company operates on a not-for-profit basis.

16.2 National Framework

By virtue of the provisions of Sections 7 and 9 of the Civil Air Navigation Services Commercialisation Act, S.C. 1996, Chapter 20 (the ANS Act) the right to provide air navigation services in Canada was transferred by the Minister of Transport to the Company. The Department of Transport retains responsibility for aviation safety in respect of all sectors including air navigation services.

Under Section 2 of the ANS Act, air navigation services are defined as:

- aeronautical communication services;
- aeronautical information services;
- aeronautical radio navigation services;
- air traffic control services;
- aviation weather services;
- emergency assistance services; and
- flight information services.

The ANS Act further provides in Section 10 that, subject to certain exceptions, no person other than the Company shall provide aeronautical information services, air traffic control services or specified flight information services in respect of Canadian airspace. The exceptions include a person acting under the authority of the Ministry of Defence or with the consent of the Company.

Subject to the right of the Governor in Council, under the Aeronautics Act, to make regulations respecting the classification and use of airspace and the

control and use of air routes, the Company has the right to plan and manage Canadian airspace and any other airspace in respect of which Canada has responsibility for provision of air traffic control services.

16.3 Charging Regime

Under Section 32 of the ANS Act the Company has the right to impose charges on users for the provision of air navigation services by the Company. Under Section 33 the initial charges imposed by the Company were to be the charges imposed by the Minister immediately before the transfer date. Thereafter, the Company is responsible for determining the charges to be imposed in accordance with the principles set out in Section 35 of the ANS Act. Those principles are as follows:

a) charges must be in accordance with a methodology established and published by the Company that is explicit and that also includes the terms and conditions affecting charges;

b) charges must not be structured in such a way that a user would be encouraged to engage in practices that diminish safety for the purpose of avoiding a charge;

c) charges for the same service must not differentiate between domestic and international flights;

d) charges for the same services must not differentiate between Canadian and foreign air carriers;

e) charges must differentiate between provision of services in relation to the landing and take-off of aircraft and the provision of services in relation to aircraft in flight and must reflect a reasonable allocation of costs of providing the services;

f) charges in respect of recreational and private aircraft must not be unreasonable or undue;

g) charges for designated or remote northern services and for services directed to be provided under Section 24(1) must not be higher than charges for similar services utilised to a similar extent elsewhere in Canada;

h) charges must be consistent with the international obligations of the Government of Canada; and

i) charges must not be set at a level that, based on reasonable and prudent projections, would generate revenues exceeding the Company's current and future financial requirements in relation to the provision of civil air navigation services.

For the purposes of subsection 35(i) above, the financial requirements of the Company in relation to the provision of air navigation services include, without duplication, the Company's:

- costs incurred before the transfer date;
- operations and maintenance costs;
- management and administration costs;
- debt servicing requirements and financial requirements arising out of contractual agreements relating to the borrowing of money;
- depreciation costs on capital assets;
- financial requirements necessary for the Company to maintain an appropriate credit rating;
- tax liabilities;
- reasonable reserves for future expenditure and contingencies; and
- other costs determined in accordance with accounting principles recommended by the Canadian Institute of Chartered Accountants or its successor.

Provision is made under subsection 35(6) for various deductions to be made from the costs detailed, as follows:

- all grants, contributions and subsidies of a monetary amount received by the Company;
- all transition period payments pursuant to Section 98;
- all interest income and investment income earned by the Company; and

- all profits earned by the Company other than in respect of the provision of civil air navigation services.

The Company is required to give notice of its intention to establish a new charge for air navigation services or to revise an existing charge. The notice must set out the particulars of the proposal and specify that a document containing more details of the proposals and the justification thereof under the charging principles in Section 35 can be obtained from the Company. The notice must also invite representations and must be sent to representative organisations of users and those users who have given notice of their wish to receive notices or announcements under the ANS Act. The Company is also required to post an electronic version of the notice in a location generally accessible to persons having access to the Internet. A new or revised charge can only come into effect after 10 days have expired since the date of the announcement.

For charging purposes, all services are grouped into four service categories: 1) En route, 2) Terminal, 3) North Atlantic and 4) International Communication Service. All costs are allocated to these four categories, as appropriate. The cost allocation is reviewed by an independent firm, attesting to its reasonableness.

Charges by the Company for air navigation services may be appealed to the National Transportation Agency established under the National Transportation Act 1987 under Section 42 (1) of the ANS Act. An appeal can be made on the grounds set out in Section 43 which includes the ground that one or more of the charging principles set out in Section 35 have not been observed. Such an appeal can be made by any user, groups of users or representative organisations. This procedure is consistent with the stated objectives of the legislation which include the establishment of an economic regulatory framework based on the principle of self-regulation. Sections 45 – 53 set out the procedures to be followed in dealing with an appeal and in relation to the determination thereof.

The Company consults widely with users, user organisations and other stakeholders in accordance with Section 36 of the ANS Act. It submits proposals to individual customers, international, national and regional air transport organisations and other interested parties, to invite comments. The Company meets with user organisations to discuss proposals and makes modifications when warranted.

17. Appendix D: The Czech Republic

17.1 Overview

Air navigation services are provided within the Czech Republic by the Air Navigation Services (ANS) which is a wholly independent enterprise with its own management and having control over its own financial affairs.

17.2 National Framework

ANS was established under the Civil Aviation Act (No.49/1997 of 6 March 1997) under the jurisdiction of the Ministry of Transport & Communications. It has a share capital which is the property of the State.

Under Section 45 (2) of the Act, the ANS shall be responsible for providing the following services:

- air traffic services, including airport services;
- aeronautical telecommunication services;
- aeronautical meteorological services;
- aviation search and rescue;
- aeronautical information services;
- pre-flight check and flight monitoring services;
- clearance related services at airports.

Under Section 46 of the Act air traffic services may be provided by a legal person established in the Czech Republic and authorised by the Ministry of Transport & Communications and for that purpose the Ministry shall, in agreement with the Ministry of Defence, allocate Czech Republic airspace. The provider of air traffic services must demonstrate that he has the required technical equipment, suitably qualified personnel and third party liability insurance in order to obtain authorisation. Theoretically, at least, the possibility of more than one, monopoly, supplier is envisaged and provided for by the legislation. Similar provisions apply under Section 49 to the supply of telecommunications, meteorological, aviation information, pre-flight checks and monitoring services.

17.3 Charging Regime

The charges for the provision of en-route and terminal services are based upon the Eurocontrol Principles (as embodied in Document No. 99.60.01/1). Such charges are imposed in accordance with the provisions of Section 98 of the Act which states that, in setting the price for the provision of air traffic services, international agreements which commit the Czech Republic and limit the price, shall be adhered to. The Ministry of Transport & Communications is responsible for securing compliance with international agreements.

Multilateral consultations relating to en-route charges take place under the Eurocontrol framework. Bilateral consultations take place with IATA in relation to terminal charges. There is no national procedure for independent regulation or oversight of ATS charges. The Authority for the Protection of Economic Competition does not have jurisdiction over the ANS.

18. Appendix E: France

18.1 Overview

ATS provision in France exhibits two key characteristics :

- France is at the crossroads of many of the European air traffic flows. This makes it a key element in determining European ATC network performance. If en-route service provision were liberalised with a shift from a cost recovery to a market pricing mechanism it is possible that France could exploit its particular geographical location[25].

- Secondly, the French ATS management system is probably the last in Europe to be managed as an integrated system with French officials advocating the superiority of integration over separation. Hence the French experience raises a key issue: has an integrated system such as France which has not undertaken separation between regulatory structure and service provision been regulated and if so how ?

18.2 National Framework

In France, ATS provision is part of the air civil navigation administration and is composed of:

- A strategic department, the Direction de la Navigation Aérienne (DNA), which formulates the main political orientations of ATS provision, including investment policy, quality of service, airspace design, recruitment of controllers and staffing.

- A service provider, the Service du Contrôle Aérien (SCTA), which manages day to day operations of the five French ATC Centres.

- R&D and technical units which support the service provision operations, the Centre d'Études de la Navigation Aérienne (CENA), in charge of Research and Development.

[25] The number of UDS (service units) recovered by France in 1999 was 13 770 298 million against 8 750 730 for Germany, 8 495 855 for the UK, 7 340 615 for Italy and 6 239 272 for Spain. France controls around 30% of European Traffic.

- A state school which trains controllers and which is also a school for pilots and civil air technicians, l'École Nationale de l'Aviation Civile (ENAC).

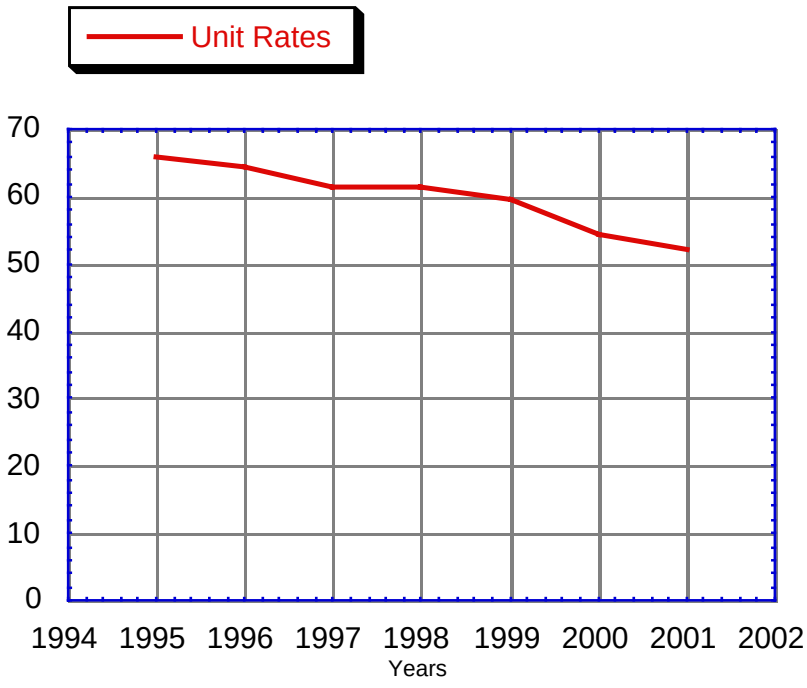
Revenues from en-route charges, expenditure and borrowing requirements are detailed and grouped together in a separate public account, the Budget Annexe de l'Aviation Civile (BAAC).

BAAC has been devised to avoid public service borrowing requirement constraints. This option allows for an administratively run department (where there is no formal separation between regulation and provision of service) to receive allocated revenues (en-route charges and taxes) and enjoy financial freedom in borrowing for investment.

18.3 Charging Regime

Regulation

Fluctuations in the French national unit rate suggest that the ATS system is under financial control and exhibits some of the characteristics of economic regulation.



The graph illustrates that at a time of traffic growth, costs, if they have increased, have been kept under control and that on the whole, over the past years, the French national unit rate has regularly decreased. It indicates that even if fully integrated, the financing and the provision of service have been subject to some form of economic regulation.

The French administrative form of regulation relies on three pillars, the first two of which could described as "a priori regulation", namely regulation that applies to planning the future. The third pillar could be described as "a posteriori" regulation which focuses on assessment of the past and which indirectly impacts on planning the future.

Three year management planning

A key regulatory tool, a management procedure for ATS termed Protocole, was introduced in 1988. The Protocole is a general agreement signed for a three year period between the administration and representatives of controllers. It singles out managerial conflicts and specifies how human resources should be managed for the three year period. It covers remuneration, working hours and overtime, recruitment, careers, performance targets on level and quality of service, etc.

For example, the 3 November 1997 Protocole has scheduled recruitment of controllers on the basis of 80 in 1998, 80 in 1999, 110 in year 2000. The Protocole timetabled a 32 working hour week for controllers of which 24 hours are on a control position. Flexibility allowed for up to a 36 working hour week to accommodate peak traffic levels.

Recently, a new Protocole has been agreed at the end of year 2000 which will be implemented over the next three years.

Parliamentary oversight

Each year Parliament votes the "Loi de Finances", the French budget, to which the BAAC is attached. Since 1995, a yearly BAAC assessment report has been introduced and issued. The report details the circumstances of civil aviation and ATS provision. It reviews the balance of accounts, revenues (taxes and en-route charges) and expenditure (borrowings, staffing and investments). It provides an appraisal of the current situation, pointing out key relevant issues and making proposals for improvement.

For instance, the 2000 Parliamentary report put forward that the French air civil navigation system should be managed according to a binding charter defining performance objectives, together with adequate funding to reach them. On the one hand, the charter would put forward objectives to be translated into performance targets on level and quality of service and on the other hand, financial objectives would focus on efficiency gains and allocation of resources in the short to medium term[26].

Periodic a poteriori oversight

As any French branch of the civil service administration, the Air Civil Navigation Services are subject to random and frequent oversight from the "Cour des Comptes".

Under French administrative law, the Cour des Comptes looks into public spending, points out inefficiencies and submits reports to which ministers and the administration have to respond. Detailed reports about investigations on poor administrative management and misuse of public finance are not made public. However, the Cour issues general documents. From time to time the Cour scrutinises the Direction de l'Aviation Civile accounts and policy. Such was the case in 1994[27].

In addition, parallel to national administrative planning and investigation, as a Eurocontrol Member State, France is subject to the accountancy principles and procedures issued by the CRCO and reports to the CRCO Enlarged Committee.

Consultative process with users

By a ministerial decision of 25 November 1987, an economic consultative committee gathers each year which allows users to put forward their claims, criticisms and requests on BAAC. Hence, French public management procedures make consultation with users compulsory. However, users have no representatives in collective bargaining about Protocoles. The French system being integrated, negotiations take place between the administration and unions. Insofar as users pay for ATS services through en-route charges their involvement would be legitimate: "It is quite abnormal that users who are

[26] Commission des Finances du Sénat, Rapport Général sur le projet de loi de Finances de l'an 2000, tome III, Annexe 25, Equipements, Transports et Logement : III.-Transports : Transport aérien et Météorologie et Aviation Civile. Annexe au Procès verbal de la séance du 25 novembre 1999, p. 50.
[27] Cour des Comptes, Rapport public, Journal Officiel, 1994, État, 1ère partie 6. L'organisation et le financement des services de l'aviation civile.

financing the system have no representation in the making decision process on their future financial contribution."[28]

Assessing economic regulation in the French integrated system

Making an assessment of regulation in the French case is not straightforward.

Data suggest that costs are kept under control. However, the national unit rate is not the sole cost performance indicator. CRCO cost allocation principles do not allow for investments which have not become operational to be part of recovered costs. Therefore, over the past years, investments have been financed through borrowing and increases in the air civil aviation tax.

A main characteristic of the French public management regulatory system appears to be smoothing provision of service according to lower estimates of required capacity alongside some managerial rigidity and agreeable stance to controllers claims. Search for optimisation relies primarily on co-operation and understanding rather than competition which is disregarded.

Smoothing

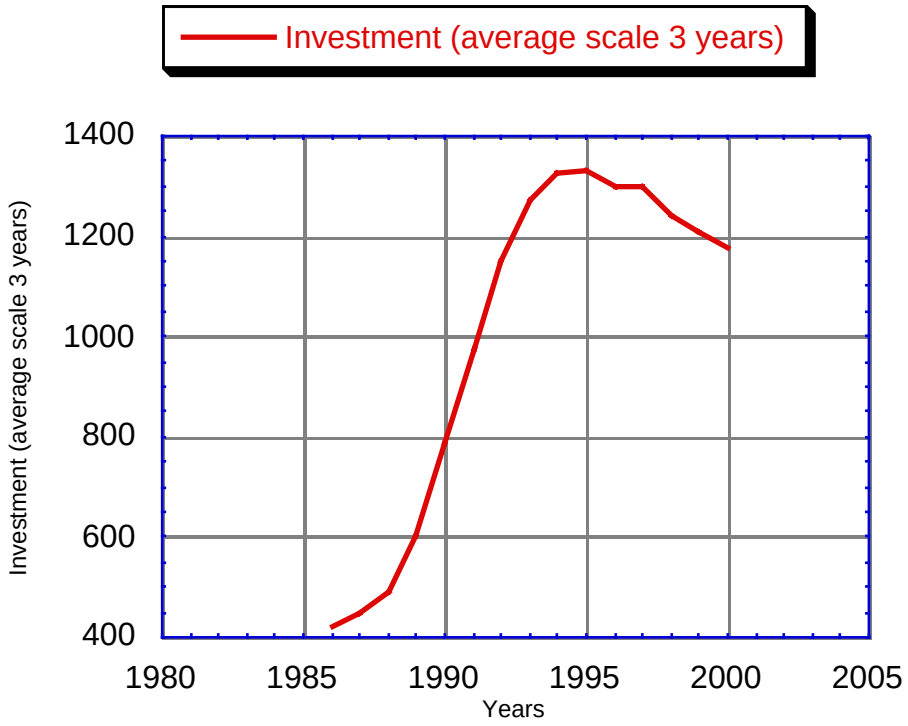
The concept of Protocole, a forward looking perspective on the required workforce, is set out for a three years period. It includes assessing the need for training and recruitment and it acts itself as a smoothing mechanism with regard to coping with future traffic growth and fluctuations.

As previously stated the agreed 1997 Protocole scheduled the recruitment of 80 controllers in 1998, 80 in 1999, and 110 in year 2000. But pressure on the ATS system led the government to make amendments to the implementation of the Protocole and the final figure has been the recruitment of 90 controllers in 1999 instead of 80, and 180 in 2000 instead of 110. The renewed 2000 Protocole anticipates the need for recruiting 210 controllers in 2001, 210 in 2002, 210 in 2003. Protocoles and their implementation illustrate the tendency to smooth controller recruitment according to forecasts of growth in demand but also the potential for adjustment in response to traffic increases.

Investment planning follows a similar rationale with more erratic fluctuations. 1999 has witnessed a decrease in investment expenditures but the figure for year 2001 should be equal to 2000 (1.29 billion Francs). Investment on a yearly

[28] Commission des Finances du Sénat, Rapport Général sur le projet de Loi de Finances pour 2001, tome III, annexe 24 Équipement, Transport et Logement : III – Transports et sécurité routière, transport aérien et météorologie et Aviation Civile. Annexe au procès verbal de la séance du 23 novembre 2000, p. 28

average of a three year period illustrates the cyclical nature of efforts to increase service provision.



Smoothing does not preclude flexibility and review as recruitment policy illustrates. What can be expected is some delay before adjustments to cope with traffic growth deliver benefits.

Capacity targets

Broadly speaking the French integrated regulatory model works out capacity targets by adjustment to levels slightly lower than those required to deal with traffic at peak hours (day and seasonal peaks).

The level of controller recruitment in the coming years (210 a year) would suggest a major increase in future capacity. However, recruitment aims above all at dealing with the high level of controller retirement scheduled in years 2006-2010. Therefore, it is far from obvious that capacity will dramatically increase.

The decision-making process allows for time lags in the system. It considers delays between investment decision and effects. As a general rule it is assumed that major investment requires ten years to bear fruit, and that the lag between deciding upon controller recruitment and having qualified and operational controllers is about five years.

Human resources management rigidity

The French regulatory model focuses on safety in the management of air traffic. The training period for controllers is longer than observed in any other European member state. Five years are required for controllers to be qualified. Controller operations are organised through teams. Worktime is strictly regulated.

As already mentioned, since the first 1988 Protocoles, the working week consists of 32 hours of which up to 24 hours may be on a control position. At peak traffic period, the working week may increase to 36 hours but overtime is managed within strict boundaries. The recently agreed Protocole has not amended these organisational principles which are supposed to best govern the management of human resources. It sets out the framework for the next fifteen years even if significant shifts in traffic pattern are expected, for example due to hub and spoke strategies, deregulation of air traffic, development of tourism. The rigid regulation of human resources is likely to be detrimental to accommodating fluctuations in traffic.

Unions

The power of French unions is reinforced by the central geographical location of France in Europe, the fundamental role of air traffic in economic growth in France, and also in Europe. These circumstances result in settlements that may primarily satisfy remuneration claims of controllers over recruitment: "Increase in remuneration contributions is largely due to periodic negotiation of social work conditions setting a three years agreement in which successive governments have attempted to avoid conflict"[29]

Negotiating work conditions through Protocole seems not to have been successful in achieving increases in funding for organisational and managerial changes and over the past years the organisation has remained largely unchanged: "Most of the growth in DGAC labour expenditures (35.8%)

[29] ibid note 39 p. 27

comes from increases in employees remuneration the remaining expenditures relating to increase in personnel" [30]

Emphasising co-operation and criticising competition

French advocates of an integrated administrative management system for ATS disregard potential improvements through the introduction of competition. Managers and controllers consider that competition would introduce detrimental trade-offs with regard to safety, co-operation between ATC centres, co-operation between national ATS providers. They believe that solutions for increasing performance have to be looked for in the areas of technical and organisational co-operation.

This underlying managerial principle has resulted in mixed outcomes. If co-operation has been successful in part of the system it has not proved easy to handle and to foster even in an integrated system: transferring a particular airspace sector from one ATC Centre to another has sometimes required several years. By the same token co-operation with other national ATS systems has been rather disappointing: in the 1990s, the planned joint ATC Centre with Switzerland (ZOE) failed.

The analysis of the French case illustrates that under a vertically integrated and administratively managed ATS system, economic regulation exists and exhibits key characteristics: smoothing of service supply, response by planners to erratic shifts in traffic pattern, organisational rigidity in the management of human resources, strength of bargaining power of the unions.

It is worth noting that probably many of these characteristics also lie at the heart of other European models. Perhaps are they simply more acute in the public management of regulation in an integrated system.

[30] ibid note 37 p. 43

19. Appendix F: Germany

19.1 Overview

Air navigation services are provided by a corporatised provider, the Deutsche Flugsicherung (DFS).

19.2 National Framework

In Germany aviation is subject to federal administration according to the Constitution. During peacetime the Federal Ministry of Transport, Building and Housing is responsible for air traffic services, except at military airfields and except for air defence matters. In times of crisis and war the Federal Ministry of Defence takes over responsibility for ATS.

By Ordinance of 11 November 1992 based on Article 31 b (1) of the German Aviation Act (Luftverkehrsgesetz – LuftVG), the Federal Minister of Transport, Building and Housing has entrusted the DFS with the performance of the sovereign task to provide air navigation services as defined in Article 27 c (2) of the German Aviation Act. The task includes the provision of operational and technical air navigation services, research and development in the area of procedures and equipment, as well as the collection and publication of the Notices to Airmen (NOTAMs). The DFS started operations on 1 January 1993, taking over most of the duties of the former Bundesanstalt für Flugsicherung.

Amendments to the German Constitution and the Aviation Act were necessary to provide the legal basis for the organisational privatisation of the air navigation services provider.

DFS is a private, limited liability company under public law, 100% owned by the state: The Federal Minister of Transport, Building and Housing is the only shareholder.

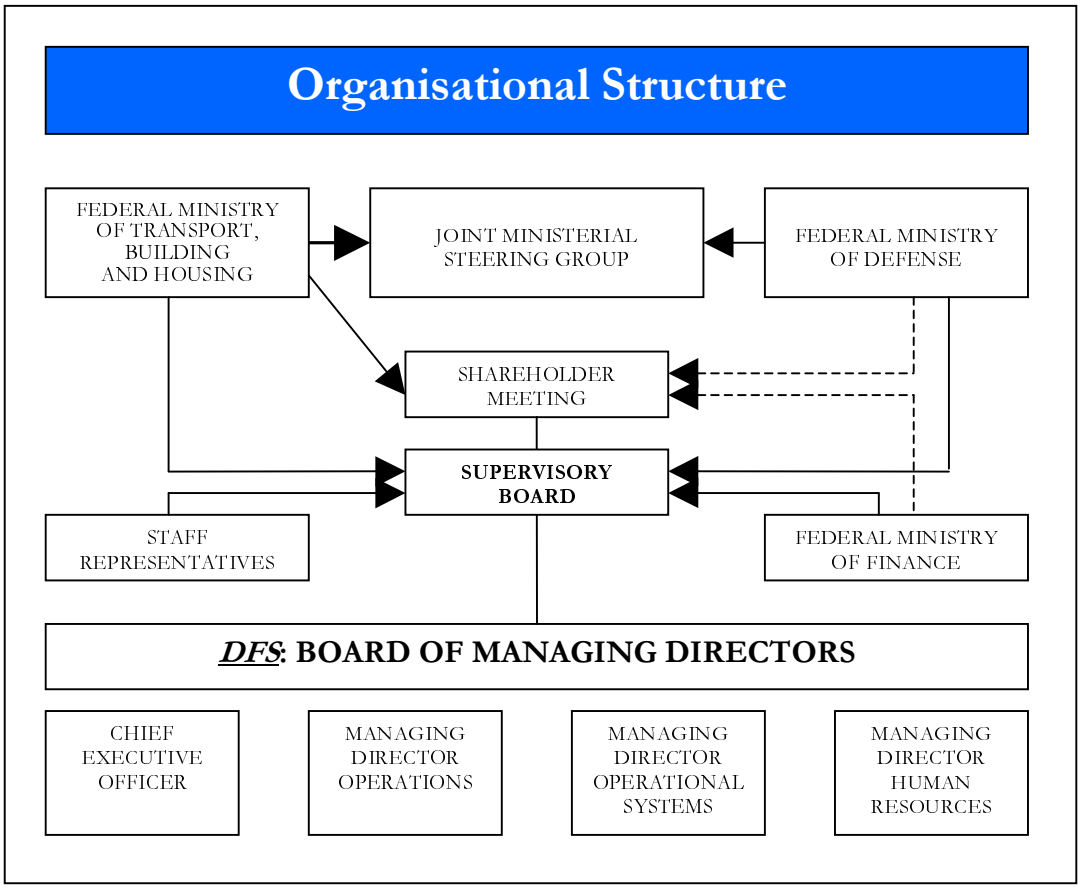
Law requires the formation of a Supervisory Board which consists of the same number of elected employee representatives and representatives of the owner, represented through the Ministry of Transport, Building and Housing, the Ministry of Defence and the Ministry of Finance. In case of a parity of votes the chairman of this board, who is the DGCA, has a second vote. The main tasks of the Supervisory Board are the execution of regulatory and functional control and the safeguarding of civil and military interests on a common level. The Supervisory Board receives the reports of the Board of Managing

Directors of the DFS and must consent to major investments and approve the annual business plan.

The Federal Minister of Transport, Building and Housing has direct access to, and exercises supervision over, the DFS in legal and functional matters. This duty lies within the remit of the DGCA.

With respect to the military functions of the DFS, the Federal Ministry of Defence is participating in the supervision via a Joint Ministerial Steering Committee at management level.

The organisational structure is shown below.



19.3 Charging Regime

The charges for the provision of en-route and terminal services are based on the Eurocontrol Principles for establishing the cost base for charges and the calculation of unit rates. The principles are based on those described in ICAO's Policies on Charges for Airports and Air Navigation Services (ICAO Doc 9082/6) and the Manual on Air Navigation Services Economics (ICAO Doc 9161/3).

The legal basis of charges is Section 32 (4) Nr. 6 Luftverkehrsgesetz (LuftVG – Aviation Act). The basis of charges is published in the so called "Bundesgesetzblatt Teil I or Teil II.

Independent regulation or oversight of the charges is carried out by the Ministry of Transport, Building and Housing under provisions of Section 32 (4) Nr. 6 LuftVG. Regulation is left to the discretion of the Regulator after user consultations have taken place. The principle applied is recovery of the full costs. No profit is allowed. There is no economic regulation of ATM.

20. Appendix G: Ireland

20.1 Overview

The Irish Aviation Authority (IAA) was established by the Irish Aviation Authority Act of 1993 as a limited liability company under the Irish Companies Acts. The Company has a share capital all of which is owned by the Irish State.

20.2 National Framework

The IAA was established as both a regulatory authority and the provider of air navigation services. Article 14 of the Act states that the principal objects of the Company shall be stated in its Memorandum of Association and shall include:

- to give effect to the Annexes to the Chicago Convention specified in the Schedule;
- to ensure that Irish airspace and other airspace in relation to which air navigation services are provided by the Company are used in a safe and efficient manner and to facilitate their use;
- subject to Section 68 to provide, operate and manage or arrange for the provision, operation and management of air navigation services in Irish and other airspace.

20.3 Charging Regime

Section 14 of the Act also provides for the IAA to impose charges for the use of services provided by the Company. The section goes on to provide that the Company shall regulate, inter alia, the operation and maintenance of air navigation services in Irish and other airspace and the maintenance of air navigation systems. It is therefore clear from the provisions of the Act that the IAA has a responsibility for providing air navigation services and also, separately, a responsibility to regulate the provision of such services within the scope of its safety oversight functions.

Furthermore under Section 14 (j) the IAA is required is to take such measures as it considers necessary or expedient to give effect to the purposes of the Eurocontrol Convention as well as to international agreements or conventions

to which the state is a party insofar as those purposes relate to matters to which the functions of the Company relate.

The company has a general duty to ensure that its revenues are not less than sufficient to meet all charges and costs which are properly chargeable to its revenue account and to generate the capital it requires, repay capital and interest and conduct its business at all times in a cost effective and efficient manner. The Company is required to keep all proper accounts and balance sheets in such form as shall be approved by the Minister, with the consent of the Minister for Finance, and to submit such accounts for annual audit. Copies of the audited accounts are required to be laid before the Houses of the Parliament.

So far as its charges are concerned these are governed by the provisions of Section 43 of the Act which requires that the Company shall require payment to it of such charges that are payable to Eurocontrol, the Minister or otherwise as may be prescribed by the Company from time to time in respect of air navigation services and aeronautical communication services in accordance with international agreements or as determined from time to time by the Minister.

The Section goes on to provide that the rate of charges prescribed as aforesaid shall be, in the case of charges payable to Eurocontrol, such rates as may be specified pursuant to any international agreement and in the case of charges payable to the Minister such rates as the Company may determine with the consent of the Minister.

The legislation makes no specific provision concerning the basis for calculating charges levied for the services provided but the Act does give Eurocontrol legal status in relation to the provision of services and in respect of the right to collect charges therefore. The Act does not contain any specific requirements with regard to economic regulation, a function that is retained by the Department of Transport (now the Department of Public Works). However, proposals have recently been presented by the Government under which there will be established a specific function of economic regulation within the Ministry under whose jurisdiction procedures will be established for the provision of economic regulation and supervision of the charges for the supply of air navigation services.

21. Appendix H: The Netherlands

21.1 Overview

Air navigation services are provided in The Netherlands by an independent body that is established as an autonomous, self-financing agency supervised by the Ministry of Transport.

21.2 National Framework

The Agency was established under the Air Navigation Act 1992 (as amended by State Official Journal Notice 322 of December 1999).

The Agency is responsible for providing the following services:

- air traffic control;
- approach/tower control;
- area control;
- flight information, aviation information services.

21.3 Charging Regime

Charges for the provision of the services are based upon ICAO and Eurocontrol Principles in accordance with the legislation and are published in the State Journal as well as in circulars to users and in the AIP.

There is no independent procedure for the regulation of ATS charges although the Minister of Transport has overall supervisory responsibilities. Competition and anti-monopoly legislation does not apply to public undertakings or to those enterprises having an exclusive right to provide public services. Consultation with users does take place under the auspices of the Minister of Transport and through Eurocontrol.

22. Appendix I: New Zealand

22.1 Overview

Air navigation services are provided in New Zealand airspace by Airways Corporation.

22.2 National Framework

The Corporation was founded in 1987 and is owned jointly by the Ministry of Finance and the Ministry of State Owned Industries.

The Civil Aviation Authority is responsible for the regulation of safety and the investigation of accidents.

22.3 Charging Regime

Economic regulation is undertaken by the New Zealand Commerce Commission as a general regulatory authority although the Government expected regulation to be merely a fall back provision in the event that the airports authorities and air navigation services providers were unable to agree charges with users for the services provided.

The free market approach has not worked as efficiently or as smoothly as envisaged by the Government which has had to intervene in relation to disputes between airport authorities and users. As a consequence the Government launched a Consultation on Air Traffic Services and Airspace Policy to review the working of the current arrangements. The main concern is that whilst the CAA is responsible for ensuring that the system is sufficient and meets ICAO requirements it does not have the power to secure compliance and to ensure adequate consultation and disclosure of information.

23. Appendix J: European Railways

23.1 Introduction

Regulation of railways in Europe provides useful insights on the issue of separation between network infrastructure and service provision.

23.2 Separation and Market Arrangements

Railway services are characterised by a large number of inputs and outputs. Inputs include infrastructure components (track, electrical systems, stations, estates), rolling stock and labour. Outputs are diverse and include travel services for passengers (commuters and long distance passengers), freight, high speed and international links, etc. The combination of inputs and outputs has led to different market arrangements. At least seven different arrangements can be identified:

1. The first market arrangement is the historical state-owned integrated monopoly model. It emerged in the first part of the 20th century and was driven by administrative control and supervision. The state-owned monopoly integrates operations of development and maintenance of rail infrastructure, management and investment in rolling stock and provision of travel services for freight and passengers. It is commonly considered that the historical model has reached its limits[31]. This model has not proved successful in reversing decrease in rail traffic, particularly freight. It has not been effective in increasing demand particularly when measured against road and air. Ministerial departments have been unable to develop sufficient expertise either in assessing the potential for productivity gains of the state-owned monopoly operations or in controlling its strategic investment plans. The end result has been an increased involvement of the political sphere in the railways system, fragmentation of the European railways market and isolation of national markets, support of national industry policies in equipment and rolling stock which has resulted in interoperability barriers and a lack of flexibility in human resource management. Most frequently the outcome has been management which has fallen short of best practice, a high level of subsidy, and a hierarchical and abnormally enlarged monopoly

[31] European Commission (1996) *White paper : a strategy for revitalising the Community's railways.* COM(96)421 final, 30.07.

structure. Building upon the state-owned historical model, other alternative market arrangements have been developed.

2. The second market arrangement is to split the monopoly structure into operational divisions under the management of a financial holding company. Each division has financial autonomy with financial, productivity and performance targets set by the holding company. The holding model characterises the German railways market arrangement. Deutsche Bahn AG Holding has control over independent subsidiaries (regional transport, long distance, freight, railway stations, infrastructure)[32].

3. The third market arrangement consists of splitting the monopoly according to a regional rationale and allowing for reciprocal competition on the whole network. Each regional monopoly owns and manages the regional track infrastructure and offers access to infrastructure to the other regional competitors. Regional monopoly structure is characteristic of the Japanese and US market arrangements[33]. The railways regional companies are private, each controlling part of the infrastructure. Amtrak handles intercity passenger trains and owns track infrastructure in the North East of the US. It is charged an access price by the other regional companies (mainly freight rail companies) when offering travel services in other parts of the US.

4. The fourth market arrangement consists of creating an independent rail services transport market. One company has monopoly over track and rolling stock and offers travel services to wholesalers of transport who own terminals. The rail company limits itself to control the technical operations of service provision. The independent rail services transport market is characteristic of Australia where freight rail service providers own terminals and contract out transport to the rail company according their requirements.

5. The fifth market arrangement is a toll rail company. The track infrastructure is managed by an independent company (either corporatised or privatised). The infrastructure company has property rights on network infrastructure and decides on investment. Rail

[32] SNCF (1999) *Annales 99 de la direction de la stratégie*, pp. 66-73. OECD (1998) *Railways : Structure, Regulation and Competition Policy.* Paris, OCDE, DAFFE/CLP(98)1.
[33] Krohn Ted (1998) " The Railroad Industry in the United States of America. " *in* OECD (1998) *Railways : Structure, Regulation and Competition Policy.* Paris, OCDE, DAFFE/CLP(98)1, pp. 183-189.

companies which provide transport services are charged an access price to the infrastructure. There is the possibility of developing franchise contracts and auctions for particular lines and schedules. In this framework it is possible that the rolling stock is managed separately by independent companies and leased to the rail transport companies. The UK is characteristic of this market arrangement.

6. The sixth market arrangement is an independent joint-venture between rail companies to manage the track. As shareholders of the infrastructure the rail companies presides over investment policy.

7. The seventh market arrangement separates the ownership of the infrastructure, but leaves the rail monopoly company vertically integrated and compels the owner of the infrastructure to co-operate with, and contract out to, the rail monopoly. The French market arrangement is characteristic of that market arrangement. Réseau Ferré de France (RFF) owns the track and makes investment decisions but contracts out maintenance to the Société Nationale des Chemins de Fer Français (SNCF) which has been left vertically integrated and manages train operations.

Thus railways, which had been historically managed according to a vertically integrated rationale have experienced restructuring which covers a wide range of competing market arrangements.

23.3 Assessment of Market Arrangements

Railways illustrates the pros and cons of integration and separation between infrastructure and provision of service.

Integration enables economies of scale and minimising the costs of transactions and of co-ordination. But it increases opacity and rigidities in management:

- An integrated railways company which provide services for commuting, intercity passenger travel and freight transport can achieve economic gains in the management of line scheduling, timetables, connected trains. Also, rolling stock and infrastructure can be managed from a single perspective to adjust to the needs of different services.

- An integrated railways company generally finds it hard to assess costs and allocate them in the provision of multiple services. This makes

managerial procedures complex and can entail significant rigidities and additional costs.

Separation reveals efficiency gains and opportunities for performance improvement but increases the costs of transactions and co-ordination.

- Provision of rail services is usually considered as requiring subsidy. However railway lines which were supposed to be structurally in deficit by historically integrated rail companies proved profitable when managed properly and with flexibility. Swedish authorities tendered unprofitable lines and decided to select the offer which required the lowest amount of subsidy. Surprisingly, they received offers which did not ask for subsidy[34].

- Separation introduces opportunities for economies of scope from a new governance rationale. Bus companies managing rail lines on short hauls can increase optimisation of existing costs in travel services through better integration of the two modes of transport.

- Separation also increases the difficulty in co-ordinating the management of the components of service provision and the management of risk, particularly on safety issues. The danger is that each separate entity assumes that responsibility for ensuring safety shall be handled by other entities.

Privatisation of an integrated network monopoly without introducing separation is likely to be financially more profitable (because a monopoly is being sold) and less complex to manage than first separating and then privatising multiple entities and service providers. However, in the long run separation is likely to prove beneficial with regard to economic optimisation and regulation. This is because there is less risk of information asymmetry than with an single, large monopoly and there is also less risk of regulatory capture (ie less risk that the regulated company's demands will be difficult to resist).

23.4 The Current Situation

In contrast to telecommunications market, the European Commission not only issued liberalisation directives but also made the splitting of rail network infrastructure and rail service provision compulsory. In Members States'

[34] Baumstark Luc (2001) " Railway Transport in Sweden. " *in* Henry C., Jeunemaître A., & Matheu M. (2001, to be published) *Regulating Network Utilities : The European case.* Oxford, Oxford University Press.

markets, this led to restructuring and the emergence of different market arrangements, independent regulation being considered as a second step forward. A key question is to what extent has this created a positive environment in the perspective of a single European market for rail services ?

A primary consideration is that railways markets are characterised by little technological progress that would put competitive pressure on national incumbent monopolies. Track investments have to be congruent with investment in rolling stock – for example high speed lines require high speed trains to exploit them, and vice versa. Congruence has been historically managed on a national basis which has produced idiosyncrasies and created interoperability difficulties. Rail is not expected to witness a major technological disruption that would create new growth and opportunities for profits. Moreover it is under pressure of competition from other modes of transport (road, air) and declining. Therefore the market attractiveness for potential new entrants is reduced and limited to competition by better management of service level and quality. Competition for the market (franchising of monopoly rights) and in the market (auctioning of particular niche market segments) are the only options and probably the only practical ones on a national basis.

The major competitive issue is to control abuse of dominant or monopoly positions and to find ways of defining reciprocal, non-discriminatory and fair access to national infrastructures in the perspective of a single European market for rail services.

In this regard rail restructuring spurred by the Commission led to various market arrangements that have been designed on a national basis. So far it has not produced the expected harmonisation and competition. Cross border strategic alliances have been struck between national rail companies (German Deutsche Bahn Cargo and Netherlands NS Cargo). On a national basis new entrants have occurred in the UK market by means of a franchising process. In Germany, BASF a chemical firm has decided to operate its own trains for internal business purposes – linkage between two of its industrial sites. Therefore, except in the UK through a national government initiative, no new significant competitive entry has yet occurred in the European railways market.

European infrastructure harmonisation has also proved disappointing. Although the Thalys line between Paris and Brussels and other international high speed lines have been highly successful, rolling stock had to include over-abundant electrical (4 for the Thalys) and safety systems (6 for the Thalys) to cope with interoperability. Also, the development of European rail freight which was aimed at relieving traffic congestion on the roads failed; rail freight

undergoing an on-going decline against road and air traffic. It led the Commission to take action with the creation of Réseau Transeuropéen de Fret Ferroviaire (RTFF). From now on any railways company having a licence to operate in one Member State can freely operate on the whole European railways infrastructure network. However 'cabotage' is not allowed[35] and rail companies have to agree a timetable with national authorities.

In the rail sector, the Commission is poised to use incentives to both strengthen co-operation and competition[36]:

- Freight rail will only develop if managers of national infrastructure co-ordinate their efforts to offer lines, schedules and harmonised access conditions from a European network perspective.

- Co-operation between national dominant rail companies may also serve this purpose and the development of a pan European freight rail market. However it could lead to reinforcing the isolation of Member States markets from competition and may not create impetus for innovation from new entrants.

- Competition among managers of infrastructure or else national management of infrastructure without reinforced co-ordination could result in maintaining fragmented national markets working contrary to the European perspective.

- As for competition among railways companies and opportunities for new entry, there is little doubt that it could produce efficiency gains. Given the various national market arrangements this would require principles on access conditions to be defined at a European level.

23.5 Access Pricing

Member States' railways markets have undertaken separation of infrastructure and service provision under the impetus of European Commission liberalisation and separation directives. The restructuring move has been carried out at the national level. The outcome has been diverse national market

[35] Freight competitive entry is only allowed for crossing national rail infrastructures to provide service between two European delivery points. Trains cannot stop at several delivery points during travel.
[36] Lado Augustine A., Boyd Nancy G., Hanlon Susan C. (1997) " Competition, cooperation and the search for economic rents : a syncretic model. " *The Academy of Management Review,* vol. 22, n° 1, January, pp. 110-141.

arrangements and infrastructure access conditions. The dominance of historically vertically integrated railways companies has been maintained.

In most cases national infrastructure access conditions discriminate between passengers and freight traffic, the former enjoying better access conditions than the latter. It is not obvious that giving preference to passenger traffic over freight leads to optimising the use of the infrastructure. Moreover, optimisation is not straightforward as it involves public interest issues[37].

A two part access tariff with a fixed access charge set at a high level and a variable part on use of infrastructure increases barriers to new entry in most of the market arrangements and provides the dominant historical rail companies with a competitive advantage.

Diversity of national market arrangements to infrastructure has translated into divergence in access pricing in the European rail infrastructure network. For example, Sweden has opted for gratuity of infrastructure access for freight. Eurostar is charged equally for using the French and the UK track while travel in the UK is over a shorter distance over slower speed track. Member states have also implemented divergent policies when allocating subsidy between rail companies and infrastructure and the unbundling of costs has neither been standardised nor subject to standard auditing processes.

[37] Kessides Ioannis N. et Willig Robert D. (1998) " Restructuring regulation of the rail industry for the public interest " *in* OECD (1998) *Railways : Structure, Regulation and Competition Policy.* Paris, OCDE, DAFFE/CLP(98)1

24. Appendix K: Romania

24.1 Overview

Romanian Air Traffic Services Administration (ROMATSA) was established by Government Decree Number 74 of 1991 and is an independent body, being autonomous and self-financing, under the authority of the Ministry of Transport.

24.2 National Framework

ROMATSA is responsible for providing:

a) en-route air navigation services;

b) terminal air navigation services (including aerodrome control);

c) communications;

d) flight information;

e) meteorological information.

The basis of charges for en-route air navigation services is determined by the principles described in Eurocontrol Document 99.60.01 (Principles for establishing the cost base for route facility charges and calculation of the unit rates) and for terminal air navigation services the same provisions are applicable. For services provided that are not included in the above document the basis is the direct calculation of costs for the provision of such services. The Eurocontrol Convention was ratified by Romanian Law 46/1996 and this covers items (a) and (b). For all other services there are no specific legislative provisions determining the basis of the charges.

24.3 Charging Regime

The en-route navigation services cost base is published by Eurocontrol and distributed to users associations that participate as observers in the Enlarged Committee for Route Charges. The terminal services cost base is provided to users associations during bilateral consultations and for all other services the cost base is provided to interested users on request.

There is no procedure established under Romanian Law for independent regulation or oversight of air traffic services charges. Such supervision as exists is undertaken by the Ministry of Transport although there are competition and anti-monopoly laws in force in Romania that do apply to public undertakings or to those enterprises having an exclusive right to provide public services. Such legislation would therefore apply, at least in theory, to the provision of air traffic services but to date the competition authorities have not involved themselves in the function of economic regulation of air traffic services.

A process of consultation with users is employed. For en-route charges such consultations are conducted within the context of the multilateral agreement relating to route charges and on a bilateral basis whenever requested by user organisations. For other charges consultations are undertaken on the basis of requests made by users or users associations.

25. Appendix L: European Telecommunications

25.1 Introduction

The regulation of European telecom markets raises an important issue relevant to the design of a regulatory framework for ATS: What is the competitive and regulatory outcome where separation between regulation and provision of service is introduced nationally without the creation of a European regulator ?

Under such circumstances does separation help create a unified and integrated European market with efficiency gains from economies of scale, does it promote competition, and does it help the development of technological progress?

25.2 The UK Experience

Brief overview

The UK has provided the impetus for deregulating European telecom markets. It has long been considered a benchmark for other European countries.

At the beginning of the 1980s, the UK government decided to both privatise its incumbent monopoly, BT, and to introduce and promote competition in its telecommunications market. As part of the process, it set up an independent regulator, the Director General of Telecom, backed by an administrative non-governmental body OFTEL.

At the outset of deregulation a second corporation operating in fixed telephony, Mercury, was poised for business growth. The regulator's duty was twofold: regulating BT and promoting competition, in other words increasing competition from Mercury. These two objectives were partly conflicting - the more BT's prices were regulated downwards the more difficult it would be for Mercury to compete.

Assessment

The regulatory process has proved more complex than was originally expected. At first, regulation focused on average basket tariffs for service provision. The regulator anticipated that the incumbent monopoly would modulate prices, raising some and cutting others, the end result being moderation in average price increase. One aspect of regulation was to provide for leeway in pricing policy but at the same time avoiding the exploitation of monopoly rents.

However, minimal regulation through monitoring average price proved unsatisfactory for at least two reasons:

- Increases in prices worsened the situation of particular groups of consumers. Those consumers complained, driving the regulator to take action and exercise a stricter control on the whole spectrum of telephony services and not solely on average basket prices.

- Regulation which did not initially focus on quality of service had to shift in that direction as the regulator was held responsible for service degradation. In other words, regulation which was thought to be minimal and transitory became more invasive – regulation based on average price supervision moved towards detailed price and quality control.

Promoting competition has been partly successful. In spite of regulatory efforts, Mercury did not truly challenge BT's dominant position. This was to a large extent due to the infrastructure remaining a BT asset. Liberalisation was supposed to attract new market entrants and was based on opportunities for potential competition but over the past fifteen years the expected competitive outcome has not materialised.

25.3 The European Experience

The way forward to separation and deregulation

Deregulation of European telecommunications markets initially focussed on the national monopolies' control over sales of telephone handsets and the issuing of an EU Directive seeking to break barriers to entry in that market which was working contrary to the creation of a single market for domestic telephony equipment. Subsequent EU activities focussed on services.

Back in the early 1980s, Europe was characterised by quasi national monopolies (Deutsche Telekom in Germany, France Telecom in France, British Telecom in the UK, and so forth) in the provision of domestic equipment and services.

Looking for integration, the European Commission advocated separation between regulation and provision of telephony services in Member States' markets. The Commission did not advocate the creation of a European Telecom regulator since this would probably have been difficult to achieve and probably exceeded the Commission's competencies. Hence, deregulation was to be based on the emergence of national member states' regulators making

use of national competition laws. European competition legislation and policy would be applicable to cross-border issues with regard to abuse of dominant position and mergers. Subsequently, national regulators were set up: OFTEL UK, the Autorité de Régulation des Téléccommunications (ART) in France in 1997[38], the Regulierungsbehörde fur Telekommunikation und Post (ReTP) in Germany in 1998[39], etc.

Assessment

There are several observations on European telecom deregulation policy, as set out below.

Firstly, since deregulation was introduced fifteen years ago, the market power of historical European dominant incumbents has proven remarkably stable. Germany decided to unbundle its local loop and offer it to potential competition in 1998 but by year 2000 Deutsche Telekom still had control of 99% of local phone calls and internet access through its telephony infrastructure [40].

Secondly, strategic alliances have been worked out between national monopolies, for example between Deutsche Telekom and France Telecom. However, these strategic alliances have usually focussed on third markets and even in this context they have partly failed as for instance the intended alliance between FT and DT.

Thirdly, it is questionable if the efficiency gains from competition have resulted from deregulation. Rather, it could be argued that competition resulted from the introduction of new technologies (eg, mobile telephony) challenging the fixed telephony network. Europe has lagged behind the USA in the development and implementation of Internet technologies (particularly Asymmetric Digital Subscriber Lines) illustrating that nationally regulated, dominant telecommunications companies who enjoy an infrastructure monopoly – and therefore lack the spur of competition - do not adequately invest. Deregulation has above all meant liberalisation alongside privatisation

[38] Bureau Dominique et Curien Nicolas (2001) " The Establishment of Independent Regulators *in* France. " in Henry C., Jeunemaître A., & Matheu M. (2001, to be published) *Regulating Network Utilities : The European case.* Oxford, Oxford University Press.
[39] Gassner K. (2001) Contrasts in Germany : Decentralised versus Sector-Specific Regulation. " *in* France. " in Henry C., Jeunemaître A., & Matheu M. (2001, to be published) *Regulating Network Utilities : The European case.* Oxford, Oxford University Press.
[40] De La Rochefordière Christophe (2000) " Le dégroupage de la boucle locale : un pas de plus dans la libéralisation des télécommunications. Exemple de complémentarité entre la régulation sectorielle et les règles de concurrence du Traité. " *Competition Policy Newsletter,* n°2, June, pp. 34-40.

of monopoly rents without the breaking up of national telecommunications companies into contestable parts. The core infrastructure monopoly has remained. As a result, separation between regulation and provision of service has not produced significant competition in the market.

Finally, regulation has remained nationally focused without the setting up of a European telecommunications regulator. The European Commission has been cautious of being involved in European wide regulation, as it would mean taking responsibility for market developments and arrangements. Hence, governance of competition in the European telecommunications market has been left to national regulators facing national dominant telecommunications companies. Currently, the Commission is promoting a single European competitive telecommunications market tackling the issue of fixed telephony. It has issued two binding directives to liberalise fixed telephony (Directives 96/19/CE, 98/61/C). It also issued a recommendation on 26 April 2000 addressed to Member States urging them to open the local loop infrastructure to competition. The Commission is currently investigating three telecommunications market segments (leased lines, local loop, mobile roaming services) on the basis of article 11 of regulation 17. In this regard the Commission's room for manoeuvre is constrained by the existence of competition complaints. For example, in Germany RegTP agreed to a Deutsche Telekom pricing policy which resulted in household end-users being charged a price for use of the local loop that was lower than the local loop access price for competitors, hence squeezing competition. Subsequently the Commission has been flooded with complaints on anti-competitive practices and abuse of dominant position. Without the strength of a European regulator the Commission is witnessing a divergence on regulatory rulings among national regulators. A striking example has been the national management of UMTS technology franchising.

26. Appendix M: United Kingdom

26.1 Current Situation - Overview

After World War 2, responsibility for civil aviation passed to the newly formed Ministry of Civil Aviation and thereafter, until the CAA was formed at the end of 1971, to a succession of Government departments.

Until the 1960s, the provision of air traffic services in the UK was divided between civil and military providers. Given the growth in air traffic by that time, a unified national operation was adopted as a Government objective. Accordingly, National Air Traffic Control Services came into existence at the end of 1962 as an integrated civil-military organisation within Government.

The CAA was established and separated from Government by Statute at the end of 1971.

Under the Civil Aviation Act 1982 (the 1982 Act), the CAA was obliged to provide air navigation services in the UK and for any other area for which the UK had responsibility. Pursuant to Directions issued in September 1992 by the Secretary of State for Transport and the Secretary of State for Defence under Section 72(2) of the 1982 Act, the CAA was required to collaborate with the Secretary of State for Defence in exercising its functions in providing air navigation services through a joint organisation known as National Air Traffic Services.

In 1996, in order to achieve a degree of separation between service provision and regulation within the then current legislative framework, NATS was incorporated as a wholly owned subsidiary company of the CAA to discharge its air traffic service functions and further Directions were issued to the CAA by the Secretary of State for Transport and the Secretary of State for Defence (the 1996 Directions). These required the CAA to ensure that the air navigation services it was obliged under the 1982 Act to provide were undertaken on its behalf by NATS (other than those air navigation services concerned with UK airspace policy).

In accordance with the 1996 Directions, the provision of civil and defence air navigation services concerned with UK airspace policy is undertaken through a Director of Airspace Policy (DAP), who is currently appointed by the Secretary of State for Defence.

26.2 Current Situation - International Framework

The current framework relating to the provision of air navigation services in UK airspace was established when the UK signed the Convention on International Civil Aviation (the Chicago Convention) on 7 December 1944.

Whilst large areas of UK legislation relating to civil aviation are derived from provisions of international conventions such as the Chicago Convention, the international treaties and conventions are part of the English legislative system only in so far as they have been incorporated in domestic legislation.

In 1946, the Provisional International Civil Aviation Organisation determined that the UK and Ireland should jointly provide air traffic control services to the Shanwick Oceanic Control Area. The current agreement between the UK and Ireland governing the provision of these services was signed in 1966. The UK undertook to provide air traffic control services and Ireland took responsibility for providing high frequency radio communications services.

The UK is a signatory to both the Eurocontrol International Convention relating to Co-operation for the Safety of Air Navigation, concluded at Brussels on 13 December 1960, and the Multilateral Agreement relating to Route Charges signed in 1970 and amended on 12 February 1981. The UK has stated its intention to ratify the Revised Eurocontrol Convention which was opened for signature on 27 June 1997.

The UK is a member of the European Community.

26.3 Current Situation - National Framework

Civil Aviation Act 1982 sets out the functions and duties of the CAA, as well as those of the Secretary of State for the Environment, Transport and the Regions (the responsible government minister).

The CAA's functions include:

- the licensing of air transport;
- the licensing of the provision of accommodation in aircraft;
- the provision of air navigation services;
- the provision of assistance, information and safety regulation functions conferred by Air Navigation Orders with regard to the registration of

aircraft, the safety of air navigation and aircraft (including airworthiness), the control of air traffic, the certification of operators of aircraft and the licensing of air crews and aerodromes.

The Secretary of State's duties under Section 1 of the 1982 Act concern:

- the development of civil aviation;
- the designing, development and production of civil aircraft;
- the promotion of safety and efficiency in the use thereof;
- research into questions relating to air navigation.

Under Section 6 of the 1982 Act the Secretary of State may give to the CAA directions of a general character as to the performance of its functions, and of a specific character in order to achieve certain national security, international or environmental objectives.

The CAA is required to ensure that its duty with regard to air navigation services is undertaken on its behalf by NATS under the Civil Aviation (Air Navigation Services) Directions 1996 (the 1996 Directions). The 1996 Directions also provide the framework for the provision of joint and integrated civil and military air traffic services.

Under the Airports Act 1986, the CAA has functions relating to the economic regulation of airports.

Safety requirements relating to air traffic services provision are primarily derived from the provisions of Section 60 of the 1982 Act and the Air Navigation Order 2000 (ANO) Parts IX and X. The latter requires a provider of an air traffic control service in the UK to hold an approval granted by the CAA. In order to be granted such an approval the provider must satisfy the CAA that its organisation, staffing, equipment, maintenance and other arrangements will result in a service which is safe for use by aircraft (ANO Article 88).

26.4 Current Situation - Charging Regime

Under current legislation, the obligation of owners and/or operators of aircraft to pay charges for certain air navigation services arises under regulations made by the Secretary of State under Section 73 of the 1982 Act. This relates to charges for services for which there is no ready contractual mechanism for

payment, including charges in respect of en route services in the UK, en route services in the Shanwick Oceanic Control Area, and certain other services.

Also included are the arrangements by which charges for air traffic services at Heathrow, Gatwick, Stansted, Edinburgh, Glasgow and Aberdeen are collected directly from users by virtue of the Civil Aviation (Navigation Services) Regulations 2000.

With the exception of the charges payable for en route services in the UK, which are payable to Eurocontrol, the charges are payable to the CAA which pays them to the service provider (NATS).

Charges for en route services provided in respect of UK airspace are, in common with those of other Eurocontrol Contracting States, calculated and collected in accordance with, and through, the Eurocontrol Route Charges System. Currently, NATS is designated as the recipient of the income received by Eurocontrol by means of a letter from the Secretary of State to Eurocontrol and accordingly the income is paid by Eurocontrol directly to NATS.

The CAA is currently empowered under the 1982 Act to detain, and ultimately sell, aircraft in the case of non payment of overdue charges.

26.5 Future Situation - Overview

On 11 June 1998, the Government announced its intention to create a Public Private Partnership (PPP) for National Air Traffic Services Limited (NATS). Following a consultation process, the Government published its PPP proposals on 27 July 1999, announcing its intention to introduce a strategic partner into NATS.

The Government's detailed proposals for the legal and regulatory framework for the future provision of air traffic services in the UK are contained in the Transport Act 2000, which gained Royal Assent on 30 November 2000.

Under the PPP the Government is to sell 46% of its interest in NATS to a strategic partner with a further 5% being made available to employees. Voting arrangements will ensure that the strategic partner has effective control and that NATS is classified to the private sector.

As part of the PPP, NATS will be reorganised into a holding company and two wholly owned operating subsidiaries. One operating subsidiary, the regulated subsidiary, will provide en route air traffic services. The other non-regulated subsidiary will provide air traffic services at airports and undertake other

competitive activities. As airport air traffic services are open to competition, their charges do not generally need specific economic regulation.

Following PPP, the CAA will become the UK's overall aviation regulator:

- safety regulation will remain, as now, with the CAA Safety Regulation Group (SRG);
- economic regulation will reside with the CAA Economic Regulation Group (ERG);
- airspace policy will be fully assimilated into the CAA as a result of transfer of Director of Airspace Policy's (DAP's) functions to the CAA.

The Secretary of State for the Environment, Transport and the Regions will continue to appoint the members of the CAA, in the case of the DAP jointly with the Secretary of State for Defence.

26.6 Future Situation - International Framework

Decision No 52 of the Commission of Eurocontrol dated 20 July 1999 adopted amendments to the Principles of the Eurocontrol cost recovery mechanism which essentially allow for the RPI-X principle to be applied in relation to the recovery of charges, as an alternative to the cost recovery mechanism currently applied.

The amendments provide that where the "Route Air Navigation Facilities" for which a contracting state is responsible are provided by a body (the service provider) which is subject to independent economic regulation, and that regulation is designed to provide incentives through the charge mechanism to encourage an efficient and effective service at the lowest possible cost, that Contracting State may disapply both the paragraph which provides that the Contracting States shall establish their cost base in order to account for the costs and the adjustment mechanism.

Under this new alternative, the regulator is obliged to conduct periodic reviews of future charges and shall set in advance, for a period not exceeding five years, conditions from which the maximum level of the national unit rate shall be determined in each year of the review period.

26.7 Future Situation - National Framework

The primary instruments by which the Government and the CAA will continue to deal with NATS following PPP are:

- the Transport Act 2000;
- the Licence;
- the Strategic Partnership Agreement;
- the Memorandum and Articles of Association of NATS.

The Transport Act

Overview

The Transport Act is the principal piece of legislation governing the provision and economic regulation of air traffic services. It repeals the CAA's duty to provide air navigation services under Section 72 of the 1982 Act and the 1996 Directions.

The Secretary of State and the CAA are the principal economic regulators of providers of air traffic services, and each is given specific responsibilities under the Transport Act. Those of the Secretary of State include the granting of licences and exemptions. Those of the CAA include economic regulation, licensing (with the consent of the Secretary of State or pursuant to a general authority given by the Secretary of State) and the general supervision and enforcement of the licence regime and of licence holders statutory duties.

The existing safety framework remains essentially unchanged.

The Transport Act makes the provision of air traffic services in certain areas a licensable activity. The areas are defined so as to encompass UK national airspace and any other airspace for which the UK has undertaken to provide air traffic services. It is an offence for anyone to provide air traffic services without a licence, unless subject to an exemption.

A licence will be provided to a NATS subsidiary (the regulated subsidiary), authorising it to provide air traffic services. The licence, while authorising the provision of air traffic services throughout the specified licensed areas, will contain a detailed description of the services actually required to be provided. The licence will effectively prohibit the regulated subsidiary from providing air

traffic services at airports. Where such services are provided by NATS they will be provided through a non-regulated subsidiary.

Modification of the licence

Licence conditions may be modified, either in accordance with the terms of the Licence or in accordance with the procedures provided in the Transport Act. Under the Transport Act, the CAA may modify a licence condition with the agreement of the licence holder or after a reference to the Competition Commission[41] for a public interest judgement on the modification. Modifications to licence conditions may also be made by order in consequence of a monopoly or merger reference under the Fair Trading Act 1973.

Enforcement

The CAA will be responsible for enforcing compliance by each licence holder with the conditions included in its licence and with its statutory duty under the Transport Act. Where the CAA is satisfied that a licence holder is contravening, or is likely to contravene, any of these obligations, it is obliged to make, by order, such provision as is necessary to achieve compliance. In reaching its decision the CAA must have regard in particular to the extent to which any person is likely to suffer loss or damage as a result of the contravention unless a provisional order is made, and to the lack of other remedies.

An enforcement order by the CAA creates a duty owed by the licence holder to any person who may be affected by a contravention of it. Any breach of this duty which causes such a person to sustain loss or damage is actionable at the instance of that person. Compliance with enforcement orders is also enforceable by civil proceedings by the CAA.

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[41] The Competition Commission is an independent public body established by the Competition Act 1998 ("the Act"). The Commission replaced the Monopolies and Mergers Commission ("MMC") on 1 April 1999.

The Commission has two distinct functions. On its reporting side, the Commission has taken on the former MMC role of carrying out inquiries into matters referred to it by the other UK competition authorities concerning monopolies, mergers and the economic regulation of utility companies. Secondly, the newly established Appeal Tribunals hear appeals against decisions of the Director General of Fair Trading and the Regulators of utilities in respect of infringements of the prohibitions contained in the Act concerning anti-competitive agreements and abuse of a dominant position.

Air traffic administration regime

In certain circumstances, the court may make an air traffic administration order (ATAO) in relation to a licence holder. These circumstances may include where an application is made by the Secretary of State, or with his consent the CAA, in an event of insolvency or a grave breach of the licence or statutory duty. The court may make an ATAO only if it is satisfied that one of the qualifying circumstances exists.

Under the ATAO, an air traffic administrator would be appointed for the purposes of transferring to one or more different companies so much of the business of the licence holder as was necessary for the proper carrying out of its licensed activities and, pending the transfer, of carrying out those activities.

Airspace policy

Airspace policy can be described as the policy for the allocation and use of UK airspace and its supporting infrastructure. The function of defining, developing, approving, promulgating, monitoring and enforcing such a policy was previously carried out by the Director of Airspace Policy (DAP), in accordance with the 1996 Directions. The Act repeals the 1996 Directions and allows for the DAP's functions to be exercised in the future by the CAA instead.

Charges

The Transport Act implements a new regime for the setting and recovery of charges for air traffic services. These are described later in this paper.

Competition

The CAA will have concurrent powers with the Director General of Fair Trading (DGFT) under competition legislation, in line with those exercised by other UK regulators. The CAA will have powers to apply and enforce the Competition Act 1998 (the 1998 Act) to deal with anti-competitive agreements or abuse of market dominance relating to the supply of air traffic services. When exercising its current functions under the 1998 Act, the CAA may, but is not obliged to, have regard to matters covered by its general duty under the Transport Act. The CAA's duty to take enforcement action in relation to a breach of a licence condition or a licence holders statutory duty does not apply where it is satisfied that, in a particular case, it is more appropriate to proceed under the 1998 Act.

In addition, the CAA will have concurrent function with the DGFT under the Fair Trading Act 1973 (the 1973 Act) in respect of scale and complex monopoly situations existing in relation to the supply of air traffic services. In exercising its 1973 Act functions, the CAA must have regard to its general duty under the Transport Act.

National security and control in time of hostilities

The Secretary of State will be able to give a licence holder, or licence holders generally, general directions as to their conduct in the interests of national security or of encouraging or maintaining the UK's relations with another country or territory. In addition, he will be able to give a licence holder a specific direction in the interests of national security.

Separate provision is made for the Secretary of State to direct relevant persons (including the CAA, providers of air traffic services and airport operators) in times of actual or imminent hostilities or of great national emergency. Directions may provide for expropriation of relevant assets for use by, or for the purposes of, the armed forces.

Environmental directions

The Secretary of State has the power to give directions which he thinks necessary to prevent or deal with noise, vibration, pollution or other disturbance attributable to aircraft used for civil aviation. Such directions may be general or specific in character. Before giving a direction of a specific (rather than a general) character to a particular provider of air traffic services, the Secretary of State is required to consult that person and the CAA.

The Licence

Overview

The Licence authorises the Licensee to provide the following services (referred to as the Core Services):

- the UK en route Air Traffic Control Service;
- the Oceanic Air Traffic Control Service;
- the Advisory Control Service;
- the Terminal Approach Service in respect of Heathrow, Gatwick, Stansted, and Luton Airports (meaning approach services except such

services as are provided to an aircraft on its final approach path or initial departure path or on the manoeuvring area or apron of the aerodrome).

The authorisations relating to the UK and Oceanic areas may be determined independently of each other.

The Licence also requires the Licensee to provide the following specified services:

- aeronautical messaging network;
- air traffic operational telephone network;
- emergency fixing facility;
- emergency frequency facility;
- lower airspace radar service;
- navigational infrastructure services;
- North Sea helicopter advisory services;
- nuclear and chemical accident service;
- surveillance infrastructure services;
- UK aeronautical information service;
- UK flight information service;
- UK meteorological service.

It is intended that the Licence will continue in force until determined on not less than ten years' notice from the Secretary of State, such notice not to be served earlier than the twentieth anniversary of the grant of the licence. The licence would therefore fun for a minimum period of thirty years unless revoked in accordance with its terms (generally related to some failure on the part of the Licensee to comply with the conditions of the Licence).

It is the Government's intention that NATS should continue to be the sole commercial provider of en route air traffic services in UK and Oceanic

airspace for a period of ten years following the grant of the licence. Hence, the Government intends that the licence will be the only authorisation for Core Services for ten years.

Licence will be subject to an annual licence fee, payable to the CAA. The basic fee payable by the Licensee must be a fair proportion of the CAA's costs incurred in the regulation and enforcement of licences and the carrying out of its other functions under the Transport Act, capped by reference to the retail price index (RPI), and the Competition Commission's costs in connection with relevant references to it. The overall cap on fees is 0.25% of the Licensee's turnover in the relevant year.

Service obligations

The Licensee's main service obligation relates to the Core services. The Licensee is obliged to make available the Core Services so as to be capable of meeting on a continuing basis any reasonable level of demand for those services. In addition to the obligation to provide an overall level of Core Services, the Licensee is under an obligation to meet each individual request for provision of Core Services where reasonable having regard, in particular, to safety considerations. In providing services, the Licensee is to be under a duty not to discriminate unduly against, or give preferential treatment to, any person or class of persons.

Financial conditions and ring fencing

The Licence contains a number of conditions imposing financial obligations and restriction on the Licensee. Their purpose is to regulate the dealings between the Licensee and other businesses (including between businesses of the Licensee) and ensure that the Licensee's financial adequacy is maintained.

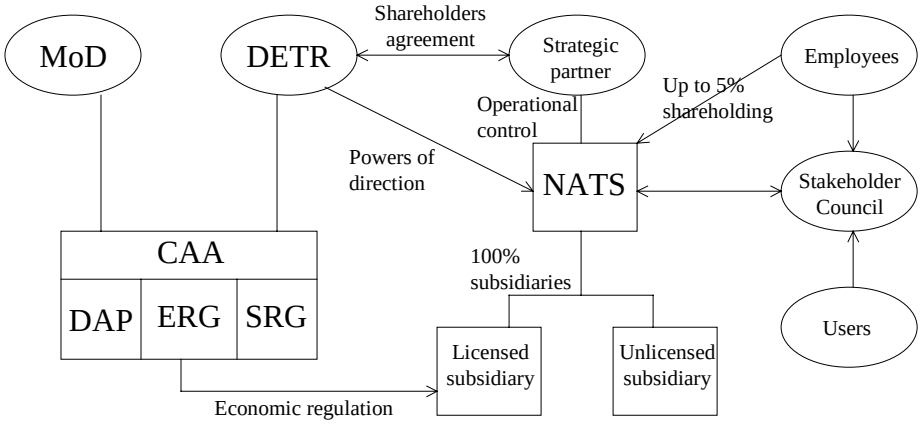
Business operation

The Licensee is required to submit Business Plans and Service and Investment Plans for approval by the CAA. Business Plans cover a 10 year period. The principal purpose of the Business Plan is to demonstrate how the Licensee plans to meet future demand and what service levels it plans to achieve. Reconciliation of actual performance with previous plans must be provided annually. The Licensee must also produce an annual statement proposing the measures and indicators by which its performance is to be measured, including standards to be enforced under the Licence. In drawing up this statement the Licensee must consult users. The CAA's approval is required to this statement, and the CAA may thus determine the appropriateness of the measures, indicators and standards.

Relations with stakeholders

The Licensee is required to furnish such advice and information the Secretary of State and the CAA as they may reasonably require to discharge the UK's obligations relating to the provision of air traffic services and to participate in consultations with users, other providers and international organisations. The Licensee may charge for advice or reports provided on a consultancy basis, and for the carrying out of representational functions. The Licensee is required to give the CAA information it reasonably requires to perform its functions under the Transport Act.

The anticipated situation post PPP is summarised below.



26.8 Future Situation - Charging Regime

Under the Transport Act, the obligation to pay charges previously determined by regulations arises instead by virtue of specifications of charges made by the CAA. These specifications may include the amount of and method of calculating the charges, the persons by and to whom they are to be paid, and the currencies in which they are to be paid.

There are two charge control formulae, relating to two separate sets of revenue:

- subject to certain exclusions, the part of the charges paid to Eurocontrol by users which is reimbursed to the UK and relates to services provided by the Licensee (ie charges levied in respect of the UK en route area);

- charges levied by the Licensee in respect of the Oceanic area.

The licence also contains provisions relating to the charges for the North Sea Advisory Service and the Terminal Approach Service.

As regards the Eurocontrol charges, the purpose of the charge control conditions is to limit the increase in the average Eurocontrol charges for the UK area. This is achieved by reference to a maximum permitted average charge per service unit, which is a combination of:

- a base charge per service unit, which will be set by the Secretary of State (on the CAA's advice) for the first year and is thereafter limited to an annual increase of RPI less a factor (X);

- a correction factor (K) per service unit, to apply after the charge control's first two years in force, whose purpose is to adjust the charge control to reflect the extent to which charges actually levied two years previously exceeded or fell short of the maximum permitted average charge per service unit which applied for that year;

- a service factor (S) per service unit, reflecting the licensee's performance against a set of specified service levels which will be based on a measure of delay.

The proposed formula is:

$M_t = SC_t + K_t - S_t$

M_t is the maximum permitted average charge per service unit in year t.

SC_t is the base charge per service unit in year t, calculated as follows:

$SC_t = SC_{t-1}[1 + (RPI_t - X_t)/100]$

Where RPI_t is the annual percentage change in the retail price index and the value of X_t (in percent) is set by the CAA.

The correction factor, K_t is given by:

$$K_t = [((Q_{t-2}\ M_{t-2}) - TR_{t-2})/Q_{t-2}] * [1 + (I_{t-1})/100] * [1 + I_t/100]$$

Where the value of K_t is zero for the first two years; Q_{t-2} is the quantity of service units attracting a Eurocontrol charge in year t-2; TR_{t-2} is the controlled Eurocontrol revenue in year t-2; and I_t is the average Treasury Bill Discount Rate (expressed as an annual percentage interest rate) for the twelve month period if positive, or 3% per annum above the average rate if negative.

The service factor S_t is bounded within limits set by the CAA. Within these limits it is given by:

$$S_t = F*E_{t-2}$$

Where F is a monetary value set by the CAA; and E_{t-2} is the difference in the aggregate minutes of delay per service unit in the relevant year when compared with the specified permitted levels calculated as:

$$E_t = (RD_t/Q_t) - PD_t$$

Where RD_t is the recorded aggregate minutes of air traffic flow management delay attributable to the Eurocontrol business in relation to year t based on CFMU data; and PD_t is the permitted minutes of delay per service unit attributable to the Eurocontrol business in relation to the relevant year t, as specified by the CAA.

Similarly, the purpose of the Oceanic area charge control condition is to limit increases in the average charges by the Licensee in respect of that area. The Licensee's permitted revenue from charges relating to the oceanic area for any year is capped by reference to a maximum permitted average charge per Oceanic flight. This is reached by means of a formula which sets a base charge per flight, whose annual increase is limited by reference to RPI less a factor (Z), and then applies a correction factor (L) reflecting the extent to which charges actually levied two years previously exceeded or fell short of the maximum permitted average charge for that year.

The initial charge control conditions will cover the first five years of the licence period. They will be reviewed with effect from the end of that period and every subsequent five years.

The charge control conditions provide for their suspension and/or modification at the request of the licensee on the occurrence of certain exceptional circumstances outside the control of the Licensee.

In respect of the North Sea Helicopter Advisory Service and the Terminal Approach Service, the Licence requires the Licensee to demonstrate to the satisfaction of the CAA that the charges have been set following appropriate consultation with users.

Charges for en route air traffic services in the UK area are paid by the relevant aircraft owners and/or operators to Eurocontrol. The Transport Act places the Secretary of State under an obligation to ensure (as far as practicable) that the money be paid by Eurocontrol to the person who provided the service, in practice the licence holder.

Charges for other chargeable air services (eg for North Sea Helicopter Advisory Service) will be paid by aircraft owners and/or operators directly to the Licence holder in accordance with the charges promulgated by the CAA under the Act.

The Transport Act allows the Secretary of State to make regulations providing for the detention and (ultimately) sale of aircraft where charges are unpaid. It is intended that the power to authorise the detention of aircraft will remain with the CAA.