

EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL



**SINGLE EUROPEAN SKY
(SES) REGULATIONS**

**EUROCONTROL FINAL REPORT ON
EUROPEAN COMMISSION'S MANDATE**

***TO SUPPORT THE ESTABLISHMENT OF
FUNCTIONAL AIRSPACE BLOCKS (FABs)***

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Executive Summary

In the context of the Single European Sky (SES) Regulations of the European Union and in particular in accordance with Article 8 of the Framework Regulation, the European Commission issued a mandate to the EUROCONTROL Agency for support in the establishment of Functional Airspace Blocks (FABs). The mandate called for an identification of the key issues associated with the development of FABs and for support in the identification of best practises.

This FAB Mandate Final Report was developed by EUROCONTROL in consultation with States, ANSPs, military authorities and the labour and airspace user organisations. It responds to the terms of the mandate, detailing the key issues identified during consultation in public workshops, specific focused stakeholder meetings, existing EUROCONTROL working arrangements and through the EUROCONTROL website.

The broad consultation process enabled direct stakeholder input and extensive discussions on the issues. A significant additional benefit of this process has been a resultant increase in the level of understanding amongst stakeholders of the FAB concept and SES in general.

In the course of identifying the key issues, it became clear that States/ANSPs must be afforded sufficient time to make the assessments that are critical to the successful establishment of a FAB, in order to achieve the optimisation of the upper airspace and meet the seven criteria of Article 5.2 of the Airspace Regulation.

The report identifies the establishment of FABs as a “window of opportunity” for improvements to the European airspace. Improved efficiencies for all airspace users could be advanced by alleviating the constraints associated with aligning ATC sector boundaries along national borders and, where appropriate, by extending the lower limit of a FAB below FL 285 to a FL that is more operationally advantageous.

The mandate consultation process showed that there is a clear requirement to continue the holistic approach to the development of European airspace ensuring that changes made by individual States charged with developing FABs remain

compatible with the European airspace network. It also showed that if issues arise, they can be addressed through established collaborative and co-operative processes.

Airspace is a joint civil/military resource and its timely availability is essential to the Military airspace users for training, testing of weapons systems and the development of strategic or tactical capabilities. It therefore follows that the establishment of a FAB should take account of national and international military requirements and this is best achieved by involving the military authorities in negotiations, from the outset.

The development of common guidance material for the implementation of FABs must be initiated as soon as possible and should be developed through co-operative processes. Stakeholder consultations have concluded that unless work begins on the development of common guidelines as soon as is practicable there is a risk that additional fragmentation of the pan-European ATM network will be introduced. Encouragingly, the consultations also indicated that the development of such common general guidelines would be feasible if undertaken in the frame of existing co-operative processes among all European ATM stakeholders.

In order to assist States to properly address their responsibilities regarding the establishment of FABs, which will often imply international arrangements, the need to develop guidance material, including models for legal instruments, has been strongly advocated. These instruments will assist States in addressing issues of a Legal and Institutional nature and will support them in the establishment of FABs. All supporting material and model arrangements should be developed and agreed upon at the appropriate political level and be aligned, where appropriate, with the SES Regulations.

The establishment of a FAB will need to be supported and justified by its overall added value based on cost-benefit analyses. Solving the significant issues related to the allocation of costs and revenue in a multi-State FAB will also be of prime importance to a successful implementation. Agreement on general guidelines for methods of allocating these costs and revenues must be reached to ensure that economic constraints do not inhibit or constrain operational developments. The

implementing rules as contained in the Charging Scheme Final Report will have to be fully considered in this task.

Whereas the requirements to establish FABs could be met without any immediate consolidation of service provision by States/ANSPs, negotiations between States/ANSPs on FABs should include issues related to future consolidation of service provision as this may be the best way to address the requirements set out in the seven criteria of Article 5.2 of the Airspace Regulation.

In this regard the stakeholder consultations indicated a level of unease over the mechanism for assessing each FAB against the regulatory criteria represented by Article 5.2 of the Airspace Regulation. Clearer guidance was sought on the process, responsibilities and methodology of the operational assessments.

Article 5 of the SES Airspace Regulation requires that the establishment of individual FABs be supported by a safety case. In this regard, issues concerning, *inter alia*, appropriate arrangements for safety oversight, in a multi-State FAB, will need to be addressed.

FAB implementation processes must take full account of the social issues associated with FAB establishment. The scope of the social issues which will need to be addressed will depend on the individual FAB service provision arrangements and agreements. Comprehensive discussions with social partners are important in order to promote a mutually acceptable transition to a FAB environment.

The FAB Mandate consultations concluded that the existing technical infrastructure is sufficient to support FAB operational requirements. The FAB establishment process will nevertheless provide the opportunity for convergence among disparate ATS technical systems. The report recommends the agreement of a “roadmap”, designed to ensure compliance with regard to the procurement and implementation of new technical system components.

This report is submitted to the European Commission which is invited to refer back to EUROCONTROL should any further clarification be required.

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List of Contents

1	Introduction.....	1
1.1	Analysis of the Mandate	2
1.2	Purpose of this document.....	3
1.3	Organisation of this document.....	4
1.4	Enablers	4
1.5	Methodology for establishing key issues	5
1.6	Consultation	5
2	Context.....	7
2.1	Current situation	7
2.2	Impact of FABs on the Current Situation.....	8
2.3	The role of EUROCONTROL, States, ANSPs, European Commission	9
2.4	Elaboration of the FAB Concept.....	9
2.5	Environment	13
2.6	Common General Principles.....	14
2.7	Performance	14
3	Safety	16
3.1	Safety requirements.	16
4	General Key Issues.....	21
4.1	The development of guidance material would assist the harmonised design and implementation of Functional Airspace Blocks.	21
4.2	The implementation of Functional Airspace Blocks should be an evolutionary and incremental process.	23
4.3	Consolidation of service provision.	27
4.4	Cost Benefit Analysis	28
5	Area of Interest - Operational	32
5.1	A pan-European perspective is essential.	32
5.2	Benefits will increase with optimising FAB lateral and vertical dimensions	35
5.3	Harmonisation of operational rules and procedures applied across national borders must be the ultimate aim.	37
5.4	Military operational requirements should be taken into account in the FAB planning and delineation processes.	40
5.5	The capacity planning within a Functional Airspace Block should meet the European ATM network performance requirements.....	41
5.6	Air Traffic Flow and Capacity Management (ATFCM) processes within and between Functional Airspace Blocks should be seamless and harmonised, and ensure consistency with pan-European network requirements.	44
6	Area of Interest - Technical	48
6.1	Identification of the minimum technical requirements to create a FAB.....	48
6.2	Technical Evolution within a FAB	51
7	Area of Interest - Military	54
7.1	Safeguard of specific military operational requirements.....	54
7.2	Essential military requirements to Airspace Management in FAB.....	57
7.3	Safeguard of National Security and Defence Policy Interests	58
7.4	Representation of the Member States Armed Forces interests in the creation and management of Functional Airspace Blocks.....	60
7.5	Further assessments by the Military Authorities.....	61
8	Area of Interest Legal/Institutional/Organisational.....	64
8.1	The relation between States' sovereignty and the establishment of a FAB	64

8.2	Joint designation of certified ATS providers and definition of their rights and obligations	68
8.3	Supervision in a FAB	70
8.4	Regulatory environment governing a FAB	73
8.5	The need for a liability framework	76
8.6	Consultation within, and on-going organisation of, a FAB	79
8.7	Modalities for modification / withdrawal	80
8.8	Appropriate arrangements for incident reporting and incident / accident investigations	81
8.9	Obligations on States stemming from the Chicago Convention and ICAO Standards	83
9	Area of Interest - Issues of Social Nature	85
9.1	Information and consultation between social partners	86
9.2	Employment and working conditions	90
9.3	Staffing Arrangements	91
9.4	Training, licensing and competence requirements	93
9.5	Human factors and culture	96
10	Area of Interest - Economic/Financial	98
10.1	Cost of establishing the FAB	98
10.2	Distribution of costs incurred in a FAB	100
10.3	Financing the FAB - Determine the Charging volume	105
10.4	Financing the FAB - Determining Revenue Division within a FAB	106
10.5	Financing of lower airspace services	107
10.6	Cost efficiency	109
11	Impact Assessment	111
11.1	Impact of the identified FAB issues on States, ANSPs, airspace users and institutional bodies	111
11.2	Impact on and interactions with other areas of the Single European Sky (SES) package	119
	Annexes	121

1 Introduction

Responding to continuing demands for increasing the safety, capacity and efficiency of the European air traffic management (ATM) system, the European Parliament and Council of the European Union have adopted four (4) important regulations¹ pertaining to the implementation of the “Single European Sky (SES)”.

In seeking to define a single, unified European upper airspace, the SES Framework Regulation has defined the generic term “Functional Airspace Block (FAB)”, as: *“An airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace regardless of existing boundaries.”*

In explicitly disassociating the FAB design process from current constraints resulting from the alignment of airspace design with national borders, FABs can represent a major step in the pan-European upper airspace design evolution. Accordingly, FABs are considered as a fundamental means of enabling the future optimisation of the pan-European ATM system. Airspace users will benefit from enhanced efficiencies stemming from an upper airspace ATS route structure founded upon a pan-European design process which ensures consistency with both lower airspace and the interfaces with perimeter areas of the SES. Inherent in the design and implementation of FABs will be the integration of the important requirements of the military, as provided for by the SES.

The Airspace Regulation requires States to establish FABs, through mutual agreement between all States concerned in multi-State FABs or through a declaration by one Member State if the airspace concerned is entirely under its responsibility. Recognising the need for a pan-European approach, the SES

¹ The four SES Regulations entered into force on April 20, 2004:

- Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 march 2004 laying down the framework for the creation of the single European Sky (the framework Regulation);
- Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 march 2004 on the provision of air navigation services in the single European Sky (the service provision Regulation);
- Regulation (EC) No 551/2004 of the European Parliament and of the Council of 10 march 2004 on the organisation and use of the airspace in the single European Sky (the airspace Regulation);
- Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 march 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation).

Regulations call upon the expertise and experience in pan-European air traffic management of EUROCONTROL, with respect to the establishment of FABs. The civil-military nature of the EUROCONTROL Organisation will also facilitate the incorporation of both the civil/commercial and military airspace requirements.

This report recognises the responsibilities of individual States to negotiate and establish FABs as well as the role of key players such as air navigation service providers. It aims to provide States and all relevant stakeholders with an assessment and analysis of key issues relevant to the establishment of FABs.

1.1 Analysis of the Mandate

The European Commission intends to support EU Member States² and Air Navigation Service Providers (ANSPs) for the establishment of FABs. For this reason and pursuant to Article 8 of the Framework Regulation and the Memorandum of Co-operation between the European Commission and EUROCONTROL, the European Commission has requested, in the form of a mandate³, the assistance of EUROCONTROL in facilitating the establishment of FABs through the identification and analysis of “key issues”.

Specifically, the EUROCONTROL Agency was entrusted to carry out the following actions:

Main Issues:

1. To identify and analyse operational, technical, economic, financial, social, organisational, legal, institutional and military requirements, principles and changes,
2. Investigate key issues, opportunities and difficulties arising from the establishment and modification of FABs, taking due account of ongoing initiatives and lessons learned,

² Execution of the mandate will also include consideration for the airspace of non-EU Member States.

³ “Mandate on Support for Establishment of Functional Airspace Blocks”, Single Sky Committee, March 19, 2004.

3. Develop a comprehensive report containing reference material for the establishment and modification of FABs,
4. Organise extensive discussions on the key issues, opportunities and difficulties to raise awareness and promote “best practices” and acceptance of FABs.

1.2 Purpose of this document

This report represents the final deliverable of the FAB Mandate, namely the “FAB Mandate Final Report”.

The purpose of the FAB Mandate Final Report is to provide a comprehensive compilation of:

- Key issues associated with the establishment and modification of FABs,
- Various possible ways to address the different key issues, including a safety assessment,
- An identification, in advance of FAB implementations, of opportunities/benefits, as well as difficulties/challenges, relating to the different key issues,
- Existing experiences and lessons learned in relation to the various issues, and,
- Reference and guidance material.

The report is intended to serve as a reference document for all stakeholders involved in the establishment and organisation of FABs. Inasmuch as individual States are responsible for the planning and implementation of FABs, the document will provide a common reference focus for all parties during the process of establishing FABs.

The report does not describe or propose draft implementing rules as regards establishment of FABs.

Although this report does provide an extensive list of key issues associated with the establishment and implementation of FABs, it should be appreciated that the contents of the report are based on the understandings of the FAB concept as it existed during the mandate consultations with stakeholders. As such it does not claim to be exhaustive in those respects. Indeed, it may prove to be the case that important additional issues may surface during future FAB planning processes.

1.3 Organisation of this document

This document is organised around the six (6) major areas of interest, namely: operational, technical, military, legal/institutional/organisational, social and economic/financial. In addition, safety is discussed in Section 3 of this report.

From the perspective of each area of interest, a listing of the key issues associated with the establishment of FABs is provided. Individual key issues are subsequently the subject of an analysis. As a function of the analyses, assessments on the impact of the key issues on other areas of interest are constructed.

1.4 Enablers

The development of this report is based on the following material:

- SES regulations and implementing rules,
- FAB Mandate,
- FAB Mandate Initial Plan,
- Comments received during the consultation process (focused stakeholder meetings and Workshops).

1.5 Methodology for establishing key issues

In organising the work associated with the execution of the mandate, contributions from several EUROCONTROL areas of expertise was established. This forum provided the basis for an examination of issues across a wide range of domains and the preparation of the initial material that was subsequently used for extensive consultation with stakeholders (see below). The views and observations of stakeholders were considered in the further development of the material, progressive iterations of which, were submitted for stakeholder scrutiny and comment

1.6 Consultation

Requirement

The Mandate required that the EUROCONTROL Agency consultation process would, as a minimum:

- Invite comment,
- Evaluate and report comments,
- Be available for reasonable requests by individual stakeholders for meeting and discussions,
- Organise public workshop(s) to discuss the results.

Consultation Partners/Stakeholders

In order to ensure widespread consultation, the following stakeholders have been included in the consultation process:

- National Authorities (civil and military),
- Military Users,
- Air Navigation Service Providers (civil and military),
- Users Organisations,
- International Organisations,

- Social and Industrial Representatives.

Consultation Activities

Having regard to the European Commission consultation requirements for the development of the Mandate, and the specific responsibilities of the EUROCONTROL Agency towards the EUROCONTROL Members States, the processes have provided adequate opportunity for consultation of both the EUROCONTROL Members States and a more widespread stakeholder population.

Three main forms of stakeholder consultation were established, namely:

- Feedback/Input (sounding board),
- Information,
- Large-scale workshops.

Feedback/Input:

For this form of consultation, the EUROCONTROL Airspace and Navigation Team (ANT) were used as the forum which could provide the immediate level of expertise and authority necessary for receiving and addressing stakeholder views. Given that the ANT is at the forefront of European strategic initiatives associated with the EATM Airspace Domain, the stakeholders associated with the ANT were considered best placed to provide direction to the FAB mandate.

Information:

For this form of consultation other Teams/Sub-Groups/Task Forces within EATM were involved. The basis for the consultation was the provision of information and submission of stakeholders' input as regards the progress on the development of the FAB Mandate. These stakeholders were therefore best placed to conduct their internal (national or organisational) development processes.

Large-Scale Informal Workshops:

As a means of ensuring as wide a representation of views as possible, three (3) large workshops were held. The structured discussions on the individual areas of interest provided the opportunity to compile the views of a large cross-section of stakeholders. Opportunity was also afforded for certain stakeholders to directly present their views to the workshop participants. Reports of the workshops are provided at Annex 2, 3 and 4. In addition, four key stakeholders (CANSO, IATA, JATMWG and NATO) were invited to present their five main expectations of FABs to the final workshop. These are reproduced at Annex 6.

2 Context

2.1 Current situation

The European airspace of today is organised essentially on the basis of Flight Information Regions (FIRs)/Upper Flight Information Regions (UIRs), which delineate the airspace where States are responsible for the provision of Air Traffic Services (ATS). FIR/UIR boundaries are often aligned with national borders although that is not an ICAO requirement. It has long been acknowledged that national borders are not necessarily the optimal basis for air traffic service provision, but rather constitute a constraint to the design and implementation of an optimum pan-European airspace structure satisfying airspace user requirements.

States address any operational deficiencies that occur where FIRs boundaries are aligned along national borders through bilateral agreements pertaining to the delegation of ATS. Nevertheless, there are significant shortcomings with such arrangements, related to legal/institutional, economic/financial and military issues.

There is a need for a unified framework for optimising the provision of ATS that facilitates operational improvements whilst integrating requirements stemming from other areas of interest (e.g. legal/institutional, economic/financial, military issues).

Airspace user requirements drive the development of the European ATS Route network and changes are carried out in a collaborative and coordinated manner. Representatives from European States, civil and military, together with representatives from the airspace users, come together to discuss and agree changes. The Implementation of the changes are not necessarily optimal as the process is entirely based on consensus, and lacks any regulatory support.

2.2 Impact of FABs on the Current Situation

As of 20 April 2004, States have to reorganise their airspace in accordance with the Airspace Regulation. States must therefore take the necessary steps to establish FABs.

Whilst re-organising the European airspace into FABs aligned in accordance with operational parameters, some of the perceived shortfalls of the present European ATM system could be addressed. The outcome of the negotiation process between States establishing FABs has the potential to enhance the safety, capacity and efficiency of the pan-European airspace.

The establishment of FABs will have to address interoperability, not only within, but also between FABs, ensuring the flexible coordination processes that exists today between sectors within an ATC centre, will also apply between adjacent sectors from different ATC centres.

There will also be an opportunity to reduce fragmentation in the provision of air traffic services. Differences in rules, organisation and varying national approaches to ATM (e.g. civil/military coordination) have an adverse effect on the efficient running of the internal air transport market. Such differences could be resolved, at least in defined airspace blocks, through the establishment of FABs.

Confidence can be derived from the constructive nature of the inter-relationships that will develop during FAB negotiations between States. These negotiations will foster

mutual understanding and co-operation on operational issues and will be conducive to supporting downstream FAB incremental improvements.

This climate of mutual respect will lead to progressive co-operation and convergence in all areas of interest, although differences may exist between ACC/UACs for some time after FAB implementation.

The European Commission has stated that it will review, within a period of five years, the progress made on reconfiguring the upper airspace into FABs that meet the criteria laid down in the Airspace Regulation.

2.3 The role of EUROCONTROL, States, ANSPs, European Commission

It has been underlined that a number of actors in the field of aviation will have a role and a responsibility in the process leading up to the establishment of optimally designed FABs. The SES Regulations provide part of the regulatory environment within which those parties will have to operate. The States have the responsibility to implement FABs with their ANSPs where applicable. EUROCONTROL acts as the co-ordinating body for the ATM domain within Europe.

2.4 Elaboration of the FAB Concept

In the Final Report of a study conducted by Wilmer, Cutler and Pickering⁴, it was concluded that, in future European airspace design, safety, efficiency and fairness should no longer be subordinated to constraints of historic political geography. The report used the term 'functional airspace blocks' to describe airspace where this could apply. The Framework Regulation defines a Functional Airspace Block as:

⁴ *Study for the European Commission on the Regulation of Airspace Management and Design, May 2001*

“an airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace, regardless of existing boundaries”.

From this definition, it is therefore apparent that future implementations of FABs will need to fulfil three (3) overriding attributes which are central to FABs, namely:

- a) design on the basis of operational requirements,
- b) more integrated management of the airspace, and
- c) delineations free from the constraints of national borders.

Article 5 of the Airspace Regulation indicates that the FAB shall take account of traffic flows and ensure compatibility with the lower airspace. It will therefore be incumbent upon States to assess operational requirements for FAB design from a perspective which extends beyond their national borders.

However the establishment of an FAB encompasses many issues that are not necessarily related to the operational requirements. These are laid down in Article 5 of the Regulation (EC) no 551/2004 of the European Parliament and of the Council of 10 March 2004 on the organisation and use of the airspace in the single European Sky (“The Airspace Regulation”) and are reproduced below:

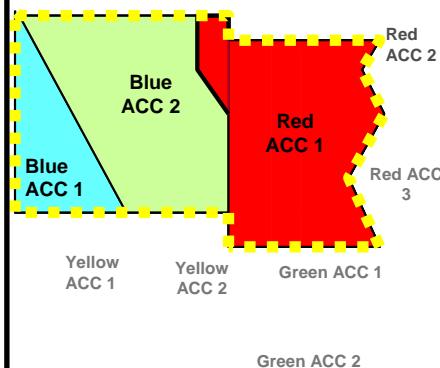
Functional airspace blocks shall, *inter alia*:

- a. be supported by a safety case;
- b. enable optimum use of airspace, taking into account air traffic flows;
- c. be justified by their overall added value, including optimal use of technical and human resources, on the basis of cost-benefit analyses;
- d. ensure a fluent and flexible transfer of responsibility for air traffic control between air traffic service units;
- e. ensure compatibility between the configurations of upper and lower airspace;
- f. comply with conditions stemming from regional agreements concluded within the ICAO, and

- g. respect regional agreements in existence on the date of entry into force of this Regulation, in particular those involving European third countries.

During the stakeholder consultation undertaken in support of the development of the mandate, three conceptual examples related to FABs were developed by EUROCONTROL. The purpose was to stimulate discussion on the identification of the key issues. The conceptual examples are illustrated in Figures 1-3 and represent a fictitious block of airspace that includes four States (Blue, Red, Green and Yellow) and their associated ACCs.

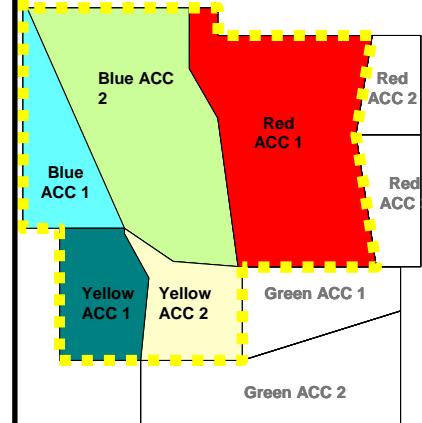
Example 1



- Arrangements to optimise the use of airspace within a FAB
- Cross-border service provision
- Minimal adaptations to existing rules/proc. for ATS provision
- Collaborative airspace planning and management between States within FAB
- Minimum technical upgrades

Figure 1: Illustrates a FAB made up of the two Blue ACCs and Red ACC 1. Cross border service provision is made between Red ACC 1 and Blue ACC 2 with minimal commonality in terms of rules and procedures

Example 2



- Improved airspace organisation
- Sectors groups across borders
- Collaboration in provision of services
- Collaborative airspace planning process and harmonised airspace management for both civil and military
- Enhanced co-ordinated arrangements with Air Defence Units
- Improved use of resources

Figure 2: Illustrates FAB made up of the two Blue ACCs, two Yellow ACCs and Red ACC 1. The boundaries between Red ACC1/Blue ACC2/Yellow ACC2 are modified to accord with the traffic flows. This allows for collaboration in service provision and creates opportunities for an improved ATM structure.

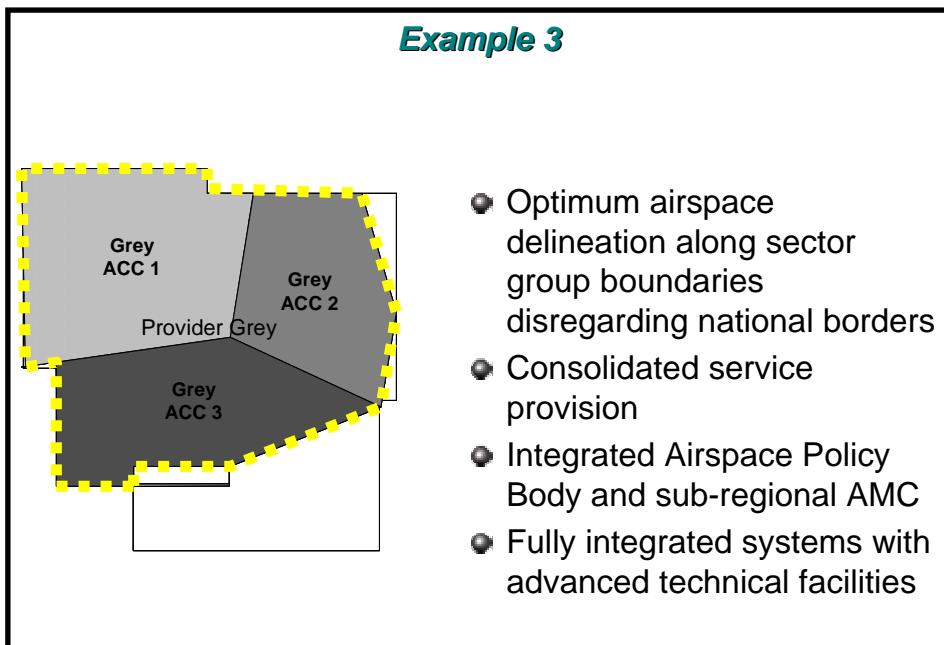


Figure 3: Illustrates a FAB with a single service provider with multiple ACCs. ATM is fully harmonised

2.5 Environment

An examination of the environmental issues was not required by the FAB Mandate. It is generally expected that the environment should benefit from the establishment of FABs through efficiencies in improved airspace design and improved management of the traffic.

Detailed analyses of the impact of the establishment of FABs on the environment could be undertaken. Such an analysis, in support of the implementation of RVSM, was undertaken by EUROCONTROL in 2002⁵. It provided a quantified assessment of related environmental benefits. A similar quantified assessment of the benefits related to FABs could be considered.

⁵ The EUR RVSM Implementation Project Environmental Benefit Analysis, EUROCONTROL/EEC/ENV/008/2002

2.6 Common General Principles

Article 5.3 of the Airspace Regulation makes reference to the development of common general principles for the establishment and modification of FABs. These will be developed by EUROCONTROL in accordance with the process described in Article 8 of the Framework Regulation. Whilst there is a need for a set of common general principles to ensure commonality and compatibility between FABs, they are not a pre-requisite for the establishment of FABs and their absence does not affect the responsibilities of the member States to start the development of FABs immediately.

This subject was the cause of debate at the workshops and focused Stakeholder meetings where presentations were made on the requirement for, and suggestions on, common general principles by several stakeholders. The co-ordinated views of both the Civil Aviation Administration of the United Kingdom (UK CAA) and the Ministry of Transport, The Netherlands (MOT-NL), and, four major ANS providers, namely: AENA (Spain), DFS (Germany), DNA (France), NATS Ltd. (UK) were presented. The content of each presentation can be reviewed at Annex 5.

During the consultation process it was suggested that pending the development of the common general principles a set of guidelines could be developed for the States/ANSPs. These guidelines would assist any State/ANSP in the establishment of FABs and would encompass elements from all the areas of interest. The issue of common general guidelines is detailed in Section 4.

2.7 Performance

In line with the Single European Sky Regulations, ANSPs will have to comply with common requirements in terms of performance planning, including *inter alia*, safety, capacity and cost-effectiveness. This requires a coherent approach in order to ensure a continued performance-driven development at network level.

Processes are in place aimed at ensuring consistency between individual (local) performance objectives and European targets. An adequate mix of arrangements needs to be defined to ensure that the actual performance of the European ANS system converges towards agreed European targets. The EUROCONTROL Agency ensures alignment between individual (local) objectives and European targets through aggregating individual plans, identifying and promoting best practices, assisting States in planning and implementation, etc.

The current performance-driven planning process of the pan-European ATM system includes capacity/delay targets. While safety remains a key priority, the approach to cost-effectiveness will be also considered and will be balanced with capacity planning to ensure that capacity provision is not jeopardised by the drive to reduce costs.

The development of FABs will be expected to contribute to the achievement of these performance targets.

3 Safety

3.1 Safety requirements.

See also para 8.3. “Supervision in a FAB”, and para 8.8. “Appropriate arrangements for incident reporting and incident / accident investigations”, as regards issues related to safety in the Legal / Institutional / Organisational Area of Interest; and para 7.1. “Safeguard of specific military requirements” concerning the safe, efficient and economic performance of military air traffic.

States, which have mutually agreed to establish a Functional Airspace Block (FAB), will have to take the appropriate arrangements for the organisation of this FAB. This will involve establishing, where appropriate, consultation and decision-making mechanisms in order to ensure the on-going safe and efficient operation of the air navigation services in the FAB.

The arrangements for organising a FAB should encompass common rules and standards for the establishment and / or modification, allocation and utilisation of airspace structures across national borders and/or FIR boundaries. Further to these arrangements, the associated civil-military co-ordination procedures as well as the ANS provided in the FAB should equally be subject to a set of common rules, standards and conditions. Additionally, in accordance with Articles 8.2 and 8.4 of the Service Provision Regulation, States shall undertake the joint designation of one or more service providers.

This will ensure consistency with the processes operated at national level, and will facilitate the handling of both civil and military aviation across national borders and/or FIR boundaries. It will provide a continuum and achieve transparency, clarity and stability for all Stakeholders regarding safety requirements across those national borders and/or FIR boundaries which are “internal” to a multi-State FAB.

With regard to the overall levels of ATM safety, the establishment of FABs should take into account Article 1 of the Framework Regulation; Article 5.2 of the Airspace Regulation, and Article 6 of the Service Provision Regulation. Consequently, the

establishment of FABs should result in reinforced or enhanced current levels of safety.

Note: The establishment of FABs is intimately associated to airspace design and management. Therefore FABs can, in addition to being a mechanism to maintain or increase the levels of safety in ATM, also be a means of conflict prevention. In essence, there should be sufficient emphasis on enhancing safety during the FAB planning and design phase as it represents a potential control mechanism or even solution to incidents or accidents.

Whenever a portion of airspace is established and / or used as a FAB, the States concerned should establish an agreement ensuring appropriate ATM safety regulation, and unambiguously arrange for:

- A formal commitment to implement and enforce into the appropriate legal order the common set of rules and standards applicable to the FAB;
- The identification of a focal point for addressing the issues associated with ATM safety regulation;
- The identification of minimum acceptable levels of safety, in terms of quantified targets, qualitative targets or applicable national or international standards;
- The identification of a common set of applicable rules and standards, so as to ensure consistency with the rule-making processes operated at national level for the development of rules, safety regulatory requirements and other mandatory provisions or associated practices that meet ICAO Standards, Recommended Practices and Procedures (SARPs) as well as the identification and notification of differences, if any; and
- The specification and integration into the planning and design process of the civil and military regulatory requirements regarding safe and efficient separation between civil and military flights;

The identification of safety oversight mechanisms that apply to ATM services operating in a FAB, in order to be consistent with the organisation, design and use of the FAB, as provided for in the Airspace Regulation. In accordance with ESARR 1,

Section 3.2, the agreement between States on the supervision of the ATM services relating to FABs which extend across the airspace falling under the responsibility of more than one State, shall specifically ensure that responsibilities for ATM safety oversight are identified and allocated in a manner which ensures that:

- Clear points of responsibility exist to implement each requirement that ESARR 1 imposes on NSAs;
- The States concerned have visibility of the safety oversight mechanisms operating as a result of the agreement;
- A means to regularly review the agreement and its practical implementation in the light of safety performance measurements is established. All States concerned have visibility of that means and its results.

It is crucial to ensure the clear identification of safety oversight responsibilities within the said agreements to prevent a dilution of responsibilities between the different entities involved in the supervision of ATM services within a FAB. It is also necessary to establish a single point of responsibility for all ATM safety oversight functions related to a particular FAB, wherever this approach is possible, through agreement with all Member States concerned, so as to address, *inter-alia*:

- Provisions for incident reporting and incident / accident investigations, in order to establish a clear framework for, *inter alia*, the tasks relating to occurrences' reporting and analysis (in line with the requirements of ESARR 2 and EC Directives 94/56 and 2003/42). It must be ensured that any safety deficiencies identified in one sector of a FAB be shared and remedied in, at least, the whole FAB;
- The support of the Interoperability Requirements, and the associated Implementing Rules emanating from the relevant SES Regulations, as a minimum technical baseline. Among the various opportunities for close technical collaboration the use of a harmonised set of Safety Nets has a prominent place;

- With reference to ESARR 5, the outline of harmonised principles on conditions of, among others, selection and recruitment; training and licensing, and staff development;
- Adequate resources and organisational, as well as functional capabilities to ensure that the agreement, in particular its safety oversight mechanisms, is implemented.

Note: States under the SES Regulations can fulfil (part of) their supervisory responsibility through NSAs and/or recognised organisations. Supervision tasks for NSAs should not be limited to those rules imposed by the applicable SES Regulations, but should also include the appropriate national rules and their harmonisation or unification (Ref. para 8.4.).

In compliance with Article 6 of the Service Provision Regulation and Article 5 of the Airspace Regulation, as well as in application of the ICAO SARPs and the appropriate ESARRs, Member States must, within the context of the Safety Management Process, perform prior safety assessments so as to demonstrate that all objectives of FAB implementation are achieved. The safety assessments include an analysis, evaluation and validation phase, and the established EUROCONTROL Safety Assessment guidelines support these processes.

Note: Contingency support needed for essential operations during periods of degraded facilities should also be covered by a safety and availability analysis, generating its own set of mitigations and / or contingency requirements.

FABs need to be supported by the publication, by the responsible States, of a Safety Case. Depending on the nature of a FAB, clear roles and responsibilities should be defined with respect to the development of the FAB Safety Case:

- For the EUROCONTROL member States, the application of ESARRs – in particular, ESARR 1, Section 7, requiring NSAs to implement a process to deal with the introduction of changes to the ATM system;

- Approbation of the Safety Case by the collective expression of the coordinated Regulatory / Supervisory Authorities of the responsible States;
- Responsible States may consult, as deemed appropriate, the EUROCONTROL Safety Regulation Commission (SRC) or any competent and independent European safety body on the validity of the Safety Case, the airspace design coordination, and the agreements regarding the transfer of responsibility between a given FAB and the adjacent lower airspace units.

As such, the Safety Case must prove that the results, associated rationales and evidence of the safety assessment have been collated and documented in a manner which ensures:

- That correct and complete arguments have been established to demonstrate that the constituent part under consideration, as well as the overall ATM System were, and will remain tolerably safe (i.e. meeting allocated safety objectives and requirements) including, as appropriate, specifications of any predictive, monitoring or survey techniques being used;
- That all safety requirements related to the implementation of a change are traceable to the intended operations / functions.

Notes: The provisions of ESARR 4 on Risk Assessment and Mitigation in ATM are consistent with the requirements of ICAO Annex 11 in this area. Guidance material in respect of the development of a FAB Safety Case can be consulted at Annex 1 to this report.

4 General Key Issues

Introduction

It is recognised that the organisation of the key issues, associated with the implementation of FABs, into categories corresponding strictly to the six (6) areas of interest, may not be possible in particular cases, given the characteristics, stemming from cross-domain dependencies of certain key issues. These key issues are addressed in the following paragraphs.

4.1 The development of guidance material would assist the harmonised design and implementation of Functional Airspace Blocks.

Analysis

Although not a pre-requisite for the establishment of FABs, the development of guidance material⁶ was strongly considered as necessary by a number of stakeholders, in order to facilitate the establishment of FABs across Europe. This material should be available to all parties involved in developing a FAB and should provide the key elements for designing FABs whilst allowing some flexibility. The guidance material should also assist in harmonising the design and implementation of a FAB, and take into account, *inter alia*, the draft implementing rules and related material regarding Airspace Design and Flexible Use of Airspace.

The guidance material could assist in the development of a FAB in a more coherent and coordinated manner. This would limit fragmentation across European airspace, avoiding situations where strategic constraints would be introduced between FABs.

⁶ The development of guidance material should not be confused with the future development of Common General Principles for the modification and establishment of FABs, to be developed by EUROCONTROL in accordance with Article 5.3 of the Airspace Regulation. The mandate to draft the Common General Principles should be issued in 2006. In the meantime, States have to proceed with the establishment of FABs and guidance material could assist them with this requirement.

In these latter circumstances, the efficiency of the pan European network could regress rather than improve.

The guidance material would be developed and agreed by the States, ensuring full involvement of competent civil/military authorities. It should be done through a coordinated approach, which would support States by providing timely and appropriate interpretation of the pan-European network requirements as they influence individual FAB delineation principles/processes. Furthermore, the material should provide important planning criteria for ensuring connectivity with lower airspace.

Guidance material, including model agreements, may also assist States in fulfilling their international responsibilities as well as those under the Airspace Regulation with respect to the establishment of FABs. Several of the issues identified under the Legal and Institutional part of this report could be adequately addressed at States level through appropriate agreements. Model arrangements will, *inter alia*, support States with respect to the establishment of FABs and avoid fragmentation. All supporting material and model arrangements will be developed and agreed upon at the appropriate political level and will be aligned with the SES Regulations.

Opportunities and Challenges

- a) Development of, and support for, guidance material.
- b) Common approach to FAB planning, implementation and modification, which will promote seamless operations between FABs.
- c) Increased harmonisation of European FAB characteristics.
- d) Equal basis for a State to negotiate with candidate FAB States.
- e) States or sub-regions, working in isolation, could generate an unintended new layer of fragmentation.

Experience (lessons learned)

The design of airspace in Europe for past 10-15 years has been based on guidance stemming from broad design principles and criteria. Although not binding, this

guidance reflects the results of a collaborative and co-ordinated approach to airspace design that respects general agreement on the process and methodology for planning and implementing new airspace structures. Basic general principles on capacity planning, ATFM, airspace design and FUA have been developed by EUROCONTROL and are applied extensively in Europe.

Note: The EUROCONTROL Manual for Airspace Planning, edition 2.0, developed and agreed by States in the frame of EATM, contains general principles on airspace design and FUA.

Experiences associated with the sharing of surveillance data, amongst the States involved in the Maastricht Upper area Control Centre (MUAC) also provides a clear basis for elaborating related common general principles.

The CEATS Airspace Plan contains common principles encompassing the necessary elements for the design and management of the CEATS Airspace structures. The document facilitates the implementation of the CEATS Airspace and ensures appropriate alignment with the pan-European network planning.

4.2 The implementation of Functional Airspace Blocks should be an evolutionary and incremental process.

Analysis

Regardless of the eventual make up of a FAB, the progression from the current situation to an operational FAB must be an incremental process. The establishment of a FAB should be viewed as a long term project and should encompass the many different facets of ATM, including the legal, institutional and social issues.

When planning a FAB a review of the existing operational, technical, social and financial issues will be required. This would include a review of the airspace aimed

at developing a new structure that better meets the criteria laid down in article 5 of the Airspace Regulation.

The development of major airspace changes is a complex and time consuming process designed to allow systems, processes and procedures to be sufficiently tested and validated prior to introduction, so as to ensure that the overall level of safety is maintained or enhanced. Therefore, it is unlikely that a FAB designed to optimise the airspace and traffic flows can be implemented quickly.

An assessment of the airspace within a FABs area of responsibility should include but not be limited to:

- The ATS route network architecture,
- ATC sectorisation.
- Technical Infrastructure.
- Airspace structures supporting military operations.
- Existing ATC restrictions, in the form of transfer levels (agreed in LoAs⁷), level and route restrictions published through AIPs or the Route Availability document (RAD).
- A review of the ATC rules and procedures applied to cross border operations.

As a result, potential improvements to the airspace structure may be identified that will lead to an optimised airspace. Planning should accord with principles agreed by States and contained in the EUROCONTROL Manual for Airspace Planning. The network should also take into account the requirements at the pan European level and seek an objective balance between national, regional and Europe-wide requirements.

In summary, the following could represent a viable approach to support States' airspace planning for FAB implementation:

- Commence cooperation on the establishment of FABs;

⁷ LoA: Letters of Agreement between ATS units

- Defining the optimum route network at European level, taking account of all users' requirements (civil and military);
- Achieving the best compromises between national, regional and Pan-European requirements;
- Defining control sectors to support the route network, unconstrained by national borders/FIR boundaries;
- Grouping closely interdependent sectors (sector groups⁸).
- Building upon sector groups to delineate FABs.

Operational requirements will not remain static over time, as traffic patterns will shift from year to year. As a consequence, FABs should not themselves be static entities. Airspace design is a continuing iterative process which develops as a function of evolving traffic characteristics and improvements in communications, navigation and surveillance infrastructure.

Opportunities and Challenges

- a. A progressive approach to FAB developments and changes could ensure that operational benefits accrue early whilst the change process remains manageable.
- b. Systematic process for identifying the airspace changes.
- c. Optimising operational efficiencies gained from the improved airspace design.
- d. Possible dynamic allocation of sector responsibilities, between contiguous sector groups, as a function of either staffing and/or daily fluctuations in the orientation and volume of major traffic flows within a FAB.
- e. Establishing mutual agreement on the adjustment of control sector boundaries.

⁸ A sector group is a combination of several elementary interdependent sectors that strongly interact with each other and cover specific air traffic flows and conflict areas.

- f. Challenge for States to closely monitor the ongoing progressive integration between ANSPs and the need to give strong direction and support to these processes.
- g. Resource requirements for system assessments. (e.g.: simulations).

Experience (lessons learned)

A large rationalisation of ACCs is taking place in Germany and the changes are being introduced progressively. Similarly the development of CEATS foresees a phased approach to the implementation of the airspace changes and transfer of responsibility from the ACCs including principles for management of operational needs during transition.

There are examples of ACCs of States working closely together to create a larger coherent block of airspace (not classified as FABs but nevertheless retaining many of the characteristics expected of a FAB) and this has lead to operational benefits. However, this has mainly occurred within the territory of individual states and not across national borders.

The benefits of operational cooperation and convergence between States in Europe are evident in the transformation of ATM over the last 15 years or so. To take but one example, the ATS route network in place in 2005 is unrecognisable from the one that existed in 1990. This has been achieved through incremental changes that result from planning, negotiation and collaboration with all stakeholders. The same is true of many other facets of ATM, and the further cooperation that will develop during the establishment of the FABs should lead to additional improvements in the pan European network.

The development of ARN Version 3, which was based on the implementation of B-RNAV routes, included a major re-organisation of the Nordic airspace, including extensive use of the delegation of ATS. This was only achieved through a co-ordinated planning process.

4.3 Consolidation of service provision.

Analysis

The SES regulations clearly indicate operational requirements as the main driver for FAB implementations, and as such do not entail any immediate requirement for the consolidation of service provision. However, in order to justify the overall added value of a FAB and its optimum use of human and technical resources, different forms of consolidated service provision may prove to be the most beneficial alternative.

Inasmuch as a consolidation of service provision is not considered a prerequisite for the establishment of FABs, their development and the associated process of realigning airspace according to operational requirements are closely linked to the organisation of service provision, and will provide an opportunity to address areas where cooperation and coordination between ANSPs may be advantageous. In this respect, the FAB concept may provide possibilities for consolidation of service provision.

The existing European service provision infrastructure can form the basis for service provision in the evolving FAB environment. Once experience with operations grows, opportunities for future consolidations with respect to service provision may be identified.

Major service provision changes should also be considered, from a legal and financial perspective, and planned in order to ensure the continued good performance of the entire European ATM network and avoid major disruptions.

The possibilities for cost efficiency would in theory be enhanced by consolidating service provision. This could include ATS and CNS consolidation.

Opportunities and Challenges

- a) States will be able to commence the process of establishing FABs without simultaneously dealing with the complex issues surrounding consolidation of service provision.
- b) Service providers could reassess their infrastructure for efficiency gains after implementation of a FAB.

4.4 Cost Benefit Analysis

Analysis

Article 5 of the Airspace Regulation requires the creation of FABs to be justified by their overall added value by means of a cost benefit analysis. A cost benefit analysis to determine the value of creating an FAB will, clearly, depend upon the way in which the FAB is created and, since there is no specific model for an FAB, the nature of the cost benefit analysis is likely to vary. However, some of the issues which may be relevant are noted below.

Since the purpose of a cost benefit analysis is to determine whether or not the creation of an FAB is economically beneficial, there can only be one cost benefit analysis for a FAB and this should take into account the costs and benefits of all parties involved. These should include:

- All ANSPs involved, where the FAB crosses national borders.
- Commercial aircraft operators.
- General aviation.
- Military and state aircraft operators.

In preparing the cost benefit analysis, an assumption must be made on the time period for the analysis. This would normally be determined by the working life of the proposed system or equipment and such assumptions could be made for an FAB.

However, given the commitment of the European Commission to assess the progress of FABs after 5 years, the analysis may need to take this into account.

The introduction of an FAB may lead to changes in the charging system such as the introduction of a single FAB charge. However, under the full cost recovery system currently applied by all States in Europe except the UK, the structure and level of route charges is not relevant to the cost benefit analysis as these simply represent the transfer of ANSP costs to aircraft operators. It should be noted that, under this cost recovery system, changes to route lengths do not affect the total revenues generated by a service provider. However, other States, notably Germany, may move to the target level charging system now adopted in the UK and, under this system, a surplus may be retained by the service provider and the cost benefit analysis should take account of this.

Implementation costs may include:

- Project planning and definition, including studies and simulations.
- Organisational changes.
- Systems changes.
- Technical upgrades.
- Staff training and, if required, staff relocation.

Given that the creation of an FAB may lead to a single system of control applying over a large area, it may be necessary to take steps to ensure adequate contingency for ATM and any ancillary services, possibly through maintaining additional capacity at the facilities providing control of flight levels below the FAB.

The introduction of an FAB may lead to lower ANSP operating costs. These may be derived from:

- Improved management of ATC sectors and staff, harmonised rules and procedures and the Flexible Use of Airspace.
- Some consolidation of ancillary services (e.g. training, Met, AIS).
- Consolidation of some support services (Operational support departments, management representation, capacity planning etc).

- Improved staff mobility.
- Facilitation of airspace adaptations.
- Improved contingency arrangements.

The practical consequences for aircraft operators may include the following:

- A reduction in route distance flown and a consequential fuel saving.
- An increase in the number of route options available to the operator which may help to reduce delays.
- Better flight profiles in the climb/descent phase leading to potential fuel savings.
- Some additional capacity and consequential reduction in delays.
- Simplification of flight planning procedures by rationalising the constraints.

The consequences of establishing an FAB will be largely dependent upon the nature of the FAB. The most significant difference is likely to occur if the creation of the FAB is a matter of route modification and revised sectorisation or if it involves rationalisation of control centres and other ground infrastructure.

Where rationalisation takes place in a FAB, there may be additional benefits such as:

- Reduced ATC training costs.
- Reduced administrative overheads.
- Reduced ancillary costs.
- Harmonised rules and procedures for ATC.
- Reduced co-ordination (through procedures and technical).
- Common procurement savings.

However, there are also likely to be substantial extra costs such as:

- Investment in technical upgrades and possibly new equipment and buildings.
- The relocation of staff and consequences for employment costs.
- Additional training costs (as a consequence of language and cultural differences).

In evaluating the possible benefits of rationalisation, the facilities required for the control of lower level sectors, below the FAB, must be taken into consideration as these requirements may severely limit the potential for rationalisation.

5 Area of Interest - Operational

Introduction

The identification of key issues which are specific to the operational area of interest is not always straightforward. Many issues overlap with items that have been identified in other areas of interest.

Nevertheless, in order to facilitate an identification of the issues in the context of the organisation of this document, this chapter aims to identify issues that are specifically related to the operational area of interest. This includes aspects of FAB implementations such as airspace design, airspace management, capacity management, ATC procedures and the involvement of the military in establishing a FAB.

The general impact of FABs on the environment has not been assessed in this chapter. The environmental consequences associated with the implementation and operation of a FAB will be site specific and depend on a number of factors including its lateral and vertical dimensions, route network, proximity to major airports and environmental laws of the States concerned.

The issues detailed in the following paragraphs were identified during a series of consultations, involving both EUROCONTROL staff and external representatives.

5.1 A pan-European perspective is essential.

Analysis

Airspace should be considered as one continuum, from ground upwards and across Europe and changes made in one area can have a significant impact on other areas. In particular, route network changes carry the potential for shifting large volumes of traffic from one ATC sector or ACC to another and unless this shift in traffic is

assessed and anticipated it can result in an overload in other sectors/ACCs. States/ANSPs must ensure that a pan-European perspective is maintained, to the extent possible, and that any significant changes to the airspace structure are coordinated in sufficient time for assessments of the effects to be made.

European Airspace development should continue through the established collaborative processes, in conformance with established ICAO processes. However it is inevitable that some compromises are required and States/ANSPs may need to accept changes that are not necessarily in their own interest but may be beneficial to the network as a whole. A balance must be found between the requirement to ensure that each airspace block is designed to maximise the efficiency of the European airspace as a whole, and the interests of individual member States/ANSPs.

States retain the right to decide on the FAB and its components and it is therefore necessary that the information and data on the pan-European network be accurate and that all stakeholders have confidence in its veracity. All stakeholders should be able to participate and acquire the relevant information on the Europe wide scale.

Although the Single Sky Committee (SSC) will provide the necessary guidance for the establishment of FABs, there is also a need for close coordination and cooperation, on a pan-European level, during the process of developing material.

Opportunities and Challenges

- a) Harmonisation of the airspace and the opportunity to optimise on a large scale.
- b) Reconciling local/ regional and pan-European interests.
- c) A broad European view could prevent the development of new fragmentation of European airspace.
- d) Definition of the overview activities/processes.
- e) ICAO requirements related to high seas as they impact the pan-European requirements (e.g. States obligations to comply with ICAO regulations in provision of ATS over the High Seas).

- f) States/ANSPs on the periphery of the European region play a significant role in maintaining this perspective with respect to adjacent regions.

Experience (lessons learned)

The development of major changes to the European route network and ATC sectorisation is generally made through a process that ensures that all stakeholders are involved in, or informed on, the development of major airspace changes. Through this collective and collaborative approach to ATS route network and ATC sector development a large scale perspective (across the airspace of the ECAC States) is maintained. It also allows for proposals for local changes to be assessed by ANSPs/States and aircraft operators that could be impacted by them.

When RVSM was introduced in the EUR RVSM area the airspace changes were developed collectively ensuring that the pan- European perspective was maintained when local or regional difficulties were solved.

European ATM network capacity planning has become a co-operative effort where National Authorities, ANSPs and aircraft operators work closely with EUROCONTROL to ensure timely delivery of ATM capacity. Future capacity requirements are based on the achievement of the network cost-optimum average en-route ATFM delay and the performance at individual ATC is planned on this basis, as resulting from the network requirements. The final outcome is the development of well-based local and network capacity plans. This co-ordinated European-wide capacity planning and management has already proved its value.

5.2 Benefits will increase with optimising FAB lateral and vertical dimensions

Analysis

It is considered that the three important FAB attributes, operational requirements, integrated ASM and disregard for national borders support an approach to defining FAB delineations which are, at the outset, “boundless” or “open-ended”.

There will be a limit to the minimum and maximum size of all FABs, mainly depending on geography and available infrastructure, if they are to maintain the operational efficiency expected of them by the SES Regulation. In general it is that the larger the coherent block of airspace the greater the potential for improving the route network, through permanent or conditional routes and also to better accommodate particular airspace requirements of other airspace users (e.g. military).

This will also increase the flexibility to adjust the network according to the traffic flows. In addition, the potential for maximising the aggregate capacity through the reconfiguration and collapsing of sectors within a coherent sector group would be greater in a larger volume of airspace.

The SES Airspace Regulation sets the division between Upper and Lower Airspace at FL285 and FABs must be introduced in the upper airspace by the member States. However, it is not credible to create an arbitrary level for sector division or areas of responsibility without impacting operational efficiency. Although FL 285 may be an ideal cut between sectors in some cases, in the majority of European airspace the creation of an artificial boundary at the same level between ATC sectors contained in a FAB and an ACC below would decrease operational efficiency. When determining the block of airspace that will constitute the FAB, States and ANSPs should be mindful of the vertical dimensions of the block of airspace and extend the base level of the FAB below FL 285 where operational issues dictate that a lower FL would be advantageous

The airspace around the major airports in Europe is increasingly designed to accommodate the climb and descent profiles of aircraft. The resultant sectorisation often has stepped base levels with no common division flight level separating the upper/lower or en-route/Terminal Area sectors. The vertical dimensions of a coherent block of airspace should take full account of traffic patterns down to the TMAs around major airports and should encompass the airspace necessary for operational efficiency to be maximised.

Opportunities and Challenges

- a) Provision to States of planning information pertaining to optimal (i.e.: from a pan-European perspective) candidate FAB arrangements.
- b) Optimisation of the pan-European ATM network. It is considered that network efficiencies will accrue as fragmentations, of any nature, decline.
- c) The creation of FABs should optimise the performance of the network and not introduce additional complexity to the airspace structure or add further layers of coordination.

Experience (lessons learned)

Experience with airspace re-organisation projects in Europe has shown that when changes are introduced at the boundaries between ACCs as part of the airspace improvement, there is scope for considerable benefit. This has been the case in projects in Germany, France and the UK where ACC boundaries have been redefined to differing degrees as a result of major airspace re-organisation. In each case increases in capacity and operational efficiency have been made.

In contrast there are parts of Europe where the potential for airspace re-organisation along operational lines is nigh impossible and political differences dictate that any progression on cross border sector development is unlikely

Studies have shown that it is unlikely that the overall number of ATC sectors will be significantly reduced by the introduction of a FAB. Nevertheless operational efficiencies and improvements in available capacity can be made through the

reconfiguration of the available sectors and the flexible management of the opening and closing of those sectors.

This was borne out by the recent experience of AVINOR in Norway in connection with the reduction of the number of ACCs and rationalisation of the airspace. AVINOR was aiming to reduce the number of en-route sectors in order to achieve more efficient use of staff. Analysis and fast-time simulations performed during 2004 showed that it was only possible to reduce the number of ATC sectors from 14 to 13. The aim was therefore altered so as to achieve a more efficient use of staff and more efficient operations. This was done through optimising the sector design and the flexible management of sector-manning through the tactical collapsing and splitting of the sectors.

Furthermore, a large number of studies, conducted in support of the CEATS implementation plan, indicate that operational benefits of certain capacity management processes are achievable at strategic and mid term horizons and accrue with larger scale airspace block.

5.3 Harmonisation of operational rules and procedures applied across national borders must be the ultimate aim.

Analysis

It should be the intent of each FAB implementation to demonstrate sufficient operational harmonisation to the point that airspace users perceive the service provided as that of a single service provider throughout the FAB. In order to achieve this, all involved, in cases where services within a FAB are provided from more than one unit, should operate in accordance with an agreed common operational concept. This common operational concept should, to the extent possible, be harmonised between FABs as well.

However, a lack of harmonisation on individual ACC/UAC operational rules and procedures should not represent an impediment to FAB implementation at the outset, although the ultimate aim must be to ensure full commonality.

Harmonised rules and procedures would support a seamless service provision, and effectively address difficulties that may arise in a cross border FAB where the States have filed differences with ICAO, ensuring that service provision within a FAB could be undertaken on the basis of a single set of ATC procedures.

During the FAB negotiation process, those elements of an operational nature that require immediate harmonisation, as well as those that can be the subject of detailed future harmonisation activities, should be identified. An issue of relevance here is the integration of technical systems, as it is considered that technical integration will foster parallel initiatives on operational harmonisation and simplify contingency. In addition, it should be a prerequisite that rules and procedures in cross border ATC sectors are harmonised upon establishment of such sectors.

Harmonised application of airspace classification for the airspace within a FAB will also contribute to optimising airspace efficiencies and seamless ATS provision.

Opportunities and Challenges

- a. By harmonising ATC procedures and rules across ACCs the potential for misunderstandings between controllers from different units or between the controllers and pilots could be reduced.
- b. As a result, service provision might be less complex, which may, in turn enhance controller productivity and enhance safety.
- c. Identification of the specific procedures which should be the subject of initial harmonisation development processes.
- d. Training will be facilitated due to more harmonised rules and procedures.
- e. Achieving agreement for a single ATC operations manual for the provision of ATS within a FAB.
- f. Improved flexibility in the use of ATCO resources.
- g. Increased opportunities for contingency arrangements.

Experience (lessons learned)

Whereas MUAC strongly recognises the importance of a cohesive set of common rules and procedures, practice at the MUAC demonstrated that the centre can cope with a set of differences. For example, in cross border sectors at MUAC, the responsibility for providing separation between GAT on ATS routes from OAT operating within TSAs is not consistent across national borders. Eliminating or reducing those differences would have a positive impact on average controller productivity, reducing complexity and alleviating the training needs. Flexible resource allocation and deployment of controllers throughout the different sector groups would be enhanced with common training, rules and procedures.

The provision of ATS to state aircraft operating under GAT status and across national borders at MUAC, required BENELUX countries and Germany to adopt a harmonised definition for "formation flight under ATC".

The need for a single set of ATC operational rules and procedures was identified for the CEATS UAC together with harmonisation in the whole region. The main driving factor is interoperability and flexibility of tactical ATC through control transfers supported by advanced technical support in the area of interest of each ATC unit involved. Combinations of these areas of interest resulted in definition of the Area of Common Interest in the CEATS operational concept where harmonisation of procedures is a precondition for its successful implementation. In addition the CEATS Contingency Plan calls for the harmonisation of ATC operational rules and procedures enabling implementation of different models of contingency measures.

5.4 Military operational requirements should be taken into account in the FAB planning and delineation processes.

Note: For a more detailed analysis of other key issues within the Military Area of Interest see chapter 7.

Analysis

In 2002 the Single European Sky Report of the High Level Group pointed out the fundamental requirement to gain acceptance of a common planning process for the European airspace. It was considered as essential that future allocation and use of airspace should be based on common principles and managed to agreed rules. An effective civil/military co-operation should contribute to the integrated airspace planning and design processes taking into account military operational requirements and the specifics of the military use of airspace.

The establishment of FAB should take into account the possibility to enhance civil/military co-operation and co-ordination. Some routine day-to-day military operations are similar to those of other airspace users and should be covered accordingly within the agreed concept of operation, whereas some military air operations are fundamentally different from other airspace users and therefore need temporary segregation. As far as possible, the ATM service provision in FAB should cope with harmonised procedures for the handling of civil and military air traffic. The airspace organisation and management of FAB should be based on collaborative civil/military processes to enable an efficient and optimum use of airspace for both civil and military aviation.

The FAB planning and delineation process could contribute to smoothing the progress of cross border operations (CBO) and provide cross border areas (CBA) for military operations and training. Joint civil/military airspace design processes should facilitate the provision and temporary activation of larger airspace volumes for military training or exercise purposes.

Where collaborative civil/military processes for the design of the airspace are well developed, experiences show that the efficient and optimum use of airspace for both civil and military aviation is subject to beneficial agreements.

Opportunities and Challenges

- a) Enhanced civil/military co-operation, un-constrained by national borders, will provide the opportunity to improve airspace design processes and develop the flexible provision of sufficient military training airspaces. Subject to further negotiation between competent military authorities, “centralised TRAs” might be an option to cope with the operational requirements of military airspace users from the participating Member States.
- b) Opportunity for the integration of the proposed Pan European OAT-IFR Route System into the established collaborative planning processes (the OAT-IFR route system is a concept under development to allow military flight planning along OAT-IFR route segments across national borders).

5.5 The capacity planning within a Functional Airspace Block should meet the European ATM network performance requirements

Analysis

A network capacity performance target has been set on the basis of achieving an average en-route ATFM delay per flight of 1 minute over the ECAC area. This represents the total performance of all the European ACCs, in both upper and lower airspace. The design of the FABs (and of the sector groups forming it) shall ensure that the total air traffic throughput will be processed by the ATM system in full observance of this delay target.

Medium-term capacity profiles, based on agreed planning assumptions, are derived for each ACC and/or component sector group, and the design of future FABs shall

take this into account in order to ensure a consistent and stable performance of the ATM network.

Capacity profiles (requirements) will be provided for all sector groups, in a cohesive European ATM network planning process. Future traffic demand and capacity requirements at sector group level will give the required level of information to ANSPs to enable them to translate this into the necessary capacity enhancement steps.

Capacity plans, drawn up in line with capacity profiles (requirements), will be produced by ANSPs at sector group level and/or ACC level. Local capacity plans are consolidated at European network level into a European ATM network capacity plan, which will highlight the potential for improving and/or creating FABs. It will ease the collaborative management of the provision of capacity within the network, monitoring its availability and use, and analysing how capacity can be enhanced as a result. It will be based upon a collaborative approach between European network design and management between specific central functions, ANSPs and airspace users.

The development of FABs (and the creation of supporting sector groups) will provide the opportunity to achieve an efficient, consistent and stable performance of the ATM network. This will be made through further improvements to the capacity planning process by ensuring an increasingly interactive interface between network and local planning, and more focussed and operationally driven local capacity plans that meet network requirements in a timely and cost-effective manner.

Opportunities and Challenges

- a) Proper definition of the sector groups in advance so as to increase performance over the network, particularly in existing interface areas.

- b) A phased development of FABs will provide the opportunity to achieve an efficient, consistent and stable performance of the ATM network.

Further improvements to the capacity planning process are ensured by an increasingly interactive interface between network and local planning, and more focused and operationally driven local capacity plans that meet network requirements in a timely and cost-effective manner.

c) The current development of the European ATM network, including a more flexible approach to airspace planning, capacity and flow management, will impose changes on the capacity planning process.

d) The need to evaluate various options/scenarios for the creation of FABs.

The options could come from local and/or network levels and they could imply the requirement to ensure maximum throughput, to match the demand with the resources available, to ensure that the local/network performance targets are met, etc.

Experience (lessons learned)

Significant experience was gained over the recent years in the capacity planning process due to the various plans made by ANSPs to reorganise the areas of responsibility of various ACCs. This was combined with the need for more granularity as the approach becomes more operational, and the requirement to provide capacity requirement profiles for an increasing number of airspace volumes and transition scenarios. Additionally, in any plans made for the re-organisation of service provision, ANSPs are requested to test various options before making the final decision. This experience has already given a good insight into the potential challenges and opportunities that will arise from FAB creation in the context of network and local performance planning.

Capacity assessment methodologies and tools to meet the above requirements are already available, but will require constant improvements to respond to the operational requirement of planning at sector group level.

5.6 Air Traffic Flow and Capacity Management (ATFCM) processes within and between Functional Airspace Blocks should be seamless and harmonised, and ensure consistency with pan-European network requirements.

Analysis

ATFCM is part of ATM and is fulfilling a role that is complementary to ATC. Efficient ATFCM processes contribute to a safe, orderly and expeditious flow of traffic, and thereby directly affect the operational throughput of the FAB. ATFCM fulfils its role by managing flows of traffic across Europe in an equitable way. This role and in particular the safety aspects of it need to be ensured at all levels of responsibilities within the ATFCM process. In the context of FABs, and to optimise this throughput, the ATFCM organisation should ensure that the different roles of ATFCM are fulfilled, both within and outside the FAB.

Pan-European network management is a key issue regarding the overall performance of ATM in Europe, and ATFCM procedures within a FAB should therefore be consistent with the Pan-European ATFCM processes.

One of the objectives of the evolution of ATFCM is to establish a seamless process encompassing both flow management and capacity management aspects. The added value of ATFCM lies in making the best use of the available network resources. The continuity in ATFCM operations is a fundamental requirement to manage the network efficiently. This seamless process must be established across the different ATFCM phases and be supported by a clear definition of the role and responsibilities of each of the actions necessary in the coordination and decision making process at each level (local level / ANSP or FAB level / Pan-European network level).

The impact of airspace management activity on flow measures is high and the best way to provide the required effectiveness is to ensure close cooperation and coordination between the two disciplines. By integrating relevant parts of ASM and

ATFCM within a FAB, it would be possible to achieve optimal value-added effects for the pan-European ATM network. Route activation/military airspace allocation would be considered jointly with the capacity management and the various flow management solutions.

Implementing rules for ATFM will be developed with a view to optimising available capacity in the use of airspace and enhancing ATFM process (Article 9 of the Airspace Regulation)

Opportunities and Challenges

- a) Built upon a coherent operational model, the opportunity exists to initiate the amalgamation of ASM and ATFCM functions so as to make the best use of the airspace. If this amalgamation takes place at the regional/FAB level, it will bring new opportunities and new ASM/ATFCM solutions, at the FAB, and at the pan-European level.
- b) ATFCM measures during the strategic phase could be improved by the introduction of FABs. At this stage, measures affecting major traffic flows across Europe are discussed and regional decision making plays a key role in that process. Coordination amongst regions would ease the process of establishing these ATFCM strategic measures independently from ACC boundaries.
- c) Since FABs are based upon traffic flows and operational efficiencies, some ATFCM measures such as re-routing of major traffic flows are expected to be easier to implement within a FAB. This would offer new possibilities for the selection of ATFCM measures, bringing additional benefit to the airspace users, regardless of national constraints and charging constraints.
- d) Since the ANSPs resources involved in ATFCM operations are not unlimited, the establishment of FABs offers an opportunity to rationalise

and harmonise some tasks and practices and would permit better use of the available resources dedicated to ATFCM function.

- e) There is a risk that the ATFCM process within a FAB may achieve a local optimal that may not be the best solution for the users at the pan-European level. The ATFCM procedures within a FAB should be consistent with the pan-European ATFCM processes.

The definition of the roles and responsibilities at the various ATFCM levels (Pan-European Network/FAB/Local levels) and in the various ATFCM phases should be aiming at achieving a seamless ATFCM process from local to European level ensuring optimal and coherent flow and capacity management across Europe. If it is not achieved there is a risk of inconsistencies between local flow management decisions and the Pan-European measures.

- f) The implementation of a FAB is mandatory in the upper airspace only; this may create some fragmentation and operational discrepancies if the lower airspace is not properly considered in the elaboration of the network solutions. This is particularly critical for flow management since this activity has to consider flows of traffic from airport to airport, regardless of the type of airspace affected by these flows. In addition, the interfaces between en-route, terminal areas and airports are becoming more and more critical (about 50% of the ATFCM delays in 2004 were generated at the airport level).

Experience (lessons learned)

Recent history has shown that ATFCM is making a solid contribution towards the ATM network capacity performance target, endorsed by the Provisional Council, to achieve an average enroute ATFM delay per flight of 1 minute over the ECAC area. This is partly the result of the measures taken by the ATM network as a whole - States, ANSPs, civil and military airspace users and the EUROCONTROL agency. As far as ATFCM is concerned, the benefits rely increasingly on measures

that are defined and implemented through a collaborative approach between the various partners. In addition, this approach facilitates dialogue between the central network function as catalyst and facilitator and the regional or local structures.

This CDM process is a key enabler of the ATFCM Strategy allowing the sharing of all relevant information between the parties involved in making decisions and supporting a permanent dialogue between the various partners throughout all phases of flight. But this dialogue must be inclusive, transparent and build trust between the players involved to reach the required objectives.

In the future context of FAB, this collaborative process and this dialogue should continue and be strengthened so as to face the future challenges of the traffic growth in Europe.

6 Area of Interest - Technical

Introduction

This section outlines the technical key issues which have been identified concerning the implementation of FABs.

General observations about the technical key issues are:

Technical opportunities within a FAB should be promoted. All anticipated FAB configurations offer the possibility for rationalisation of some technical aspects such as training, maintenance and procurement.

The detailed technical requirements for any given FAB are driven by the operational concept for the FAB agreed by the States/ANSPs involved. However, technical changes tend to be major cost drivers, so that where operational changes require technical changes, cost benefit considerations may influence the evolution of the operational concept.

Initial FABs can take advantage of and build on existing arrangements and facilities, so that major technical upgrades are unlikely to be required to create initial FABs unless new operational concepts have been agreed.

6.1 Identification of the minimum technical requirements to create a FAB

Analysis

From a technical viewpoint, the main questions concerning the starting point for a FAB are:

- Do technical considerations exist that constrain the initial operational objectives?
- What minimum level of interoperability and functional capability is needed?

The starting point may be different for each FAB because of differing local airspace circumstances, individual levels of technical capability of the ACCs concerned, and the degree of collaboration already achieved.

Technical changes tend to be costly in terms of both time and money for all phases of the project life cycle such as definition, development, implementation, training, etc. Pragmatically, the initial operational concept may be influenced by cost-benefit considerations concerning the required technical changes.

Nevertheless some operational improvements may be agreed by the States/ANSPs involved in a FAB, and these may require some technical upgrade.

Coordination facilities between sectors controlled by different ACCs in the FAB should as far as possible be the same as coordination facilities between sectors controlled within the individual ACCs, in order to provide a 'seamless' coordination process throughout the FAB. Data communications are used today between most ACCs in Europe for initial co-ordination purposes. The automation of further co-ordination functions and transfer facilities can build on these data communications functions to increase the level of seamlessness.

All information about flights provided by the ACCs within a FAB to other stakeholder systems (e.g. other ACCs outside the FAB, or military units) should be self-consistent.

For areas where the responsibility for the provision of Air Traffic Services was already delegated before the FAB was created, it may be that the technical interoperability problems have been addressed, and possibly solved.

For areas subject to new service provision arrangements, where the responsibility for the provision of Air Traffic Services had not previously been delegated, new technical problems could be encountered which may not be supported by the existing systems owing to differences, for instance in:

- Separation standards.
- Procedures.
- Surveillance and RTF facilities.
- Military interfaces.

Challenges and opportunities

- a) Aspects such as new cross border service provision could introduce some technical implications on aspects such as voice communication connections, surveillance coverage and/or data availability and multi-state military connections.
- b) Alignment of the existing technical facilities to support the initial operational concept will need to be achieved. In the best case this could be minimal, perhaps involving simple adaptation changes. However, in situations where ACCs participating in a FAB have significantly different capability, some upgrades may be necessary.
- c) Presentation of consistent information about flights by the ACCs within a FAB to other stakeholder systems (e.g. other ACCs outside the FAB, or military units) may require technical upgrades.
- d) A safety analysis of the technology differences between adjacent FABs may be necessary, not only within each FAB.
- e) Agreements may be needed for coordination of development and procurement activities (to achieve the required level of technical interoperability and technical upgrades).
- f) A start can be made on harmonisation of technical facilities for aspects such as maintenance, testing, training etc.
- g) The initial FAB implementation could build on any existing collaborations for aspects such as procurement.
- h) Coordinated technical development planning should be initiated to facilitate a longer term operational roadmap, e.g. outline agreement of technical solutions and responsibilities for each stage in the subsequent FAB evolution.

Experience (lessons learned)

There are already significant initiatives that implement FAB-like features and collaborations. Examples quoted during the consultation process were:

- a) Seamless border crossing facilities in the context of automated coordination have been implemented across most of Europe.
- b) Delegated cross border service provision is in widespread use throughout Europe and has solved some of the hot-spot and traffic complexity problems. Technical solutions for these arrangements are in place and the migration of these arrangements into FAB agreements should be possible without further technical implications.

6.2 Technical Evolution within a FAB

Analysis

The second technical issue concerns the manner in which the technical facilities for a FAB will need to evolve. Most points raised about previous chapter also apply to this chapter. The technical implications will closely follow the operational objectives agreed in a FAB roadmap. The technical implications need to be defined for each operational enhancement and are likely to differ for each FAB, because of differing local airspace circumstances and individual levels of capability of the ACCs concerned.

Challenges/opportunities

- a) There may be differences in procedures and practice between ACCs co-operating within a FAB. The extent to which these procedures and practice should be harmonised within a FAB needs European and then FAB level consideration. Technical implications will depend on the decisions taken.
- b) Operational problems requiring technical support will need to be resolved in line with a cost benefit case for each step on the operational roadmap.

- c) The re-organisation of airspace responsibilities across state borders may introduce technical complexities. For example, an individual ACC may need to connect to several different military organisations operating with different procedures. In addition, the segregation of data on military flights operating as OAT from multiple states in a single system may require additional security measures.
- d) Consideration may be given to implementing the same level of technical facilities throughout a FAB. For example, different levels of implementation on aspects such as Mode S, AGDL, ADS could cause operational and technical difficulties. Synergies/advantages of sharing technologies between partners should be part of the feasibility study.
- e) Support for improved interoperability may be provided at the boundaries between FABs and lower airspace, e.g. coordination procedures for situations such as vertical transitions through an upper/lower division level.
- f) ATFCM in Europe is currently based on a Pan-European central technical infrastructure as well as on local systems. The various ATFCM actors need to comply with technical interoperability standards in order to allow efficient information sharing and to achieve common assessment of the network situation. This common ATFCM picture is considered as a cornerstone of an efficient flow planning process, and needs to be shared at network, at FAB and at local level.
- g) The ECIP/LCIP process for managing change in Europe may require some modification to take account of the existence of FABs.
- h) Cross border risk assessment on technical issues could be considered.
- i) Implementation of evolving interoperability standards. For example interoperability requirements and data definitions are already available for most aspects of seamless border crossings and will soon be standardised across Europe. It should therefore be possible to plan improvements to include the following:
 - Automation of the transfer phase
 - Automated exchange of tactical conditions for the boundary crossing
 - Delivery of conflict free flights for the boundary crossing (Sysco level 2, Automated coordination concept)
 - Co-ordination of flights proceeding off ATS routes

- Negotiated crossings of military training areas
- Commonality of overall technical ATM architecture

j) Increased collaboration, cost sharing and common infrastructure for facilities such as training, testing and maintenance.

k) Common development and procurement.

l) Joint strategy related to outsourcing of CNS, AIS and meteorological services to third party service providers.

m) Unified approach to the provision of improved operational information and HMI.

n) Improved consistency of data utilised by the FAB units.

o) Closer integration and communication between civil and military ATS services and military operations centres.

p) Technical support for dynamic capacity and resource management.

q) Provision of suitable short and long duration contingency provisions.

Experience (lessons learned)

Various development initiatives are in progress in Europe which aim to create compliance of systems with SES objectives. Flight Data Interoperability between all of the main ATM components is in the progress of being standardised in the form of Community Specifications under the EU Interoperability Regulation (referring especially to the Flight Object Interoperability Proposed Standard (FOIPS) under development by EUROCAE and EUROCONTROL).

EATM programmes have led to a common technical understanding of requirements for basic and advanced functional capabilities needed in future generations of ATM systems, which will facilitate the introduction of new operational concepts within a FAB.

7 Area of Interest - Military

Introduction

Whereas the creation of FAB is mainly driven by the existing airspace fragmentation and the overall need for more capacity in the European airspace, the uninterrupted discharge of military responsibilities is of equivalent political interest to the nations. In line with the general statement by the Member States, civil/military and military/military co-operation should be fostered to contribute to the successful establishment of FAB.

Military use of airspace is determined by different national objectives which require the timely availability of airspace for the conduct of aircrew education and training, testing of weapon systems as well as for the development of strategic or tactical capabilities. The safe, efficient and economic performance of military air operations is of high value with regard to effective training, time-critical missions and fulfilment of national defence tasks.

The establishment of a FAB shall be supported by a safety case and justified by its overall added value based on cost-benefit analyses. Military involvement in the States' participation should be ensured from the beginning to cope with the different aspects of civil and military use of airspace. As result, a clear list of benefits for both civil and military airspace user will support the establishment of FAB.

7.1 Safeguard of specific military operational requirements

Analysis

Military aircraft operators must rely on the readiness and proficiency of the ANSP(s) with regard to support and assistance of all kinds of military operations. The service provision within a FAB will have to take into account the specific requirements of military missions. It should be based on a uniform concept of operation and

procedures, harmonised with those of other users thus ensuring uninterrupted and seamless services for all airspace users.

New tasks and scenarios will require different volumes of airspace with more intensive military activities at all flight levels. To cope with Member States global commitments, the training of a more varied operational repertoire will need to start from the lowest possible flight level and will even go beyond FL 660. Therefore it is of importance from a FAB concept point of view, that consistency between lower and upper airspace volumes is an essential operational requirement.

Whereas aircraft general handling manoeuvres often only need smaller portions of airspace, complex air combat training missions will require reservation and segregation of sufficient airspace dimensions. A temporary allocation of larger volumes of airspace is essential for Composite Air Operation exercises, often involving aircraft from many different nations.

At present, the majority of military training airspaces are subject to fixed dimensions as determined at national level. In many States there are ongoing efforts being undertaken by civil and military authorities, in co-ordination with EUROCONTROL, to develop new concepts regarding enhanced flexibility for the timely provision of sufficient airspace dimensions, their variable location, or their periods of activation. Since the distances from airbases must be short enough to ensure an economic ratio between transit and training time and cognisant of lower fuel carriage rates for military aircraft .

Challenges/opportunities

To ensure the integrity of national territory, the discharge of military responsibilities will still require access to all portions of national airspace. If necessary, supplementary agreements need to be developed with regard to priority handling of security flights within a FAB. Further harmonisation of national exemption policies for State Aircraft should enable military airspace users to better accommodate their mission tasks. Different handling procedures for State Aircraft should be investigated

with the objective of agreeing on best practise solutions for integration into a FAB concept of operation.

Military aircraft operators expect the ANSP(s) to support the safe, efficient and economic performance of military air traffic regardless of the flight regularity status as either Operational Air Traffic (OAT) or as GAT. Although the provision of cross border services will initially only require some modifications to existing rules and procedures, military airspace users should be facilitated by harmonised procedures as early as possible.

With regard to FAB operation and service provision, contingency aspects will need further consideration regarding redundancy and respective agreements with civil and/or military units. In some nations, appropriate arrangements between civil and military authorities are in place which might offer best practise solutions through the common and optimal use of technical and human resources.

Experience (lessons learned)

Based on the different operational demand of the national Armed Forces, a flexible provision of sufficient airspace dimensions for training and exercise should become possible within a FAB area of responsibility. According to specific mission profiles, temporary reserved airspace volumes will be either published, pre-planned or be subject to flexible provision by the ANSP. Fixed TSA/TRA might be replaced by a dynamic allocation of pre-defined portions of airspace as currently demonstrated in the German concept of Military Variable Profile Areas (MVPA). Future operation of FAB will need to ensure that civil/military and military/military relationships with adjacent ACCs are to a common standard, to maintain or improve safety and operational flexibility of military aviation in line with the EUROCONTROL Concept of Operations for enhancing the ASM/ATFM/ATC processes (FUA 2008 scenario) approved by the EUROCONTROL Airspace and Navigation Team (ANT).

7.2 Essential military requirements to Airspace Management in FAB

Analysis

Close co-operation and more intensive collaborative processes between civil and military partners will benefit an optimised airspace structure and the management of the airspace which accommodates all airspace user requirements. Cross border airspace management functions within a FAB will become an important enabler for an efficient provision of services and should enhance possibilities for large scale military exercises.

Regional AMC operations together with harmonised AMC procedures are probably the most efficient solution to ensure effective airspace management within a FAB. Since military training or exercise missions will largely depend on specific criteria, such as prevailing weather conditions, technical readiness status of fighter aircraft or the availability of appropriate instructor pilots, there is often an operational need for late decision making or changes at short notice. Airspace management in FAB should take into account the dynamic operational decision making processes of military operations.

Procedures must be in place to safeguard some degree of priority for military operations and training, if required. Therefore, effective civil/military co-operation and co-ordination at all levels will provide for a maximum flexibility to accommodate all airspace user requirements.

Challenges/opportunities

Since Member States do have different requirements, close co-operation and co-ordination with the national military authorities involved is considered as essential to exploit benefits of a FAB. The creation of CBA and extended CBO will significantly contribute to the optimal use of airspace. They may become an important feature related to the establishment of a FAB and the effective management of the whole airspace.

The establishment of FAB might also offer additional opportunities to the Military to develop harmonised military regulations and procedures for the joint use of cross border volumes of airspace whilst taking into account national interests. In future, TSAs might be allocated in a more flexible manner to reduce effects on civil air traffic flows, whereas military operational requirements, technical constraints or different safety standards will have to be taken into full consideration.

Experience (lessons learned)

In many areas of Europe, the utilisation of airspace is managed by a joint civil/military unit (AMC) for the benefit of all airspace users. This model has proved to be successful and should also be considered for the management of a FAB. Within the European optimisation of airspace, military air traffic should be coordinated by a unit geared to a particular FAB, if necessary across national borders. The creation of a regional joint civil/military AMC for a FAB could therefore support the efficient use of military cross border operations and/or the management of Cross Border Areas.

7.3 Safeguard of National Security and Defence Policy Interests

Analysis

Member States are responsible for the definition of their own security and defence policies with the consequence that national requirements for the Armed Forces differ from State to State. Airspace is considered as a common resource for all categories of users, whereas Member States sovereignty over their territory and their responsibilities related to public order, public security and defence matters must be acknowledged. The SES regulations do not affect the power of Member States to adopt measures to ensure sufficient airspace for adequate education and training purposes of their Armed Forces.

Various commonality characteristics might be a favourable factor when considering the establishment of a FAB. Many Member States do have different commitments and obligations within international organisations which will have to be taken into account accordingly. However, Member States may be capable of reaching agreements concerning their national defence interests.

Enhanced co-operation with national Air Defence Units will be subject to corresponding activities within international organisations as States are bound by international conventions (e.g. ICAO, rules of the high seas etc.) Political and legal issues stemming from co-existence of NATO and/or Non-NATO States will have to be subject to negotiation and agreements at State level.

Challenges/opportunities

Where integrated civil/military provision of services is already in place, there might be an opportunity to use the experiences towards the development of best practise solutions.

Some military missions, like actual security flights for example, will continue to require a final decision-making process at national level, where respective legal provisions, specific rules and appropriate procedures are in place. Member States will have to address these sovereignty issues in the FAB agreement at States' level.

Experience (lessons learned)

Sovereignty of a State's airspace is a key principle of the Chicago convention and EUROCONTROL Revised Convention, however compromises to remove nationality as a reservation to the provision of ATM will be a key to success of a border crossing FAB. It is important to recognise that national sovereignty can be maintained even if ATM services are provided by an entity from a different nation. For example, many States have routinely used delegation of air traffic services to enhance airspace efficiency without any surrender of sovereignty over airspace.

7.4 Representation of the Member States Armed Forces interests in the creation and management of Functional Airspace Blocks

Analysis

According to a general statement on military issues related to the Single European Sky, Member States have declared their willingness to enhance civil-military co-operation and to facilitate the dialogue between their Armed Forces in all matters of ATM.

The safe and efficient use of European airspace can only be achieved through close co-operation between civil and military organisations. The representation of competent national military authorities in the development, decision making and implementation process of FAB will ensure a broad consensus with the Member States sovereign responsibilities and their national and international obligations.

Challenges/opportunities

There are both opportunities and challenges for all civil and military partners involved to elaborate on written agreements and supplementary arrangements which should satisfy their different operational requirements to the maximum extent possible. Military authorities of the Member States may also take the chance to describe principle requirements for the efficient provision of services which should be reflected in the creation and management of FAB.

Agreements related to the service provision in FAB should consider the necessary degree of military expertise in the overall management and operation of FAB airspaces. Depending on different forms of civil/military co-operation throughout the Member States, there might be individual national requirements with regard to the military representation in the FAB service provision.

Taking into account national military requirements, the concept of flexible use of airspace has to be fully and uniformly applied by all users of airspace. The agreed FUA principles might be adopted within the framework of State agreements on FAB.

Experience (lessons learned)

Military flying operations will constitute a significant factor in proportion to the total use of FAB airspace. Where collaborative airspace planning processes between civil and military authorities are in existence, military requirements for the use of airspace are normally taken into early consideration. Joint civil/military planning bodies will facilitate the creation of a border crossing FAB and support the achievement of efficiency gains.

7.5 Further assessments by the Military Authorities

Analysis

The establishment of FAB shall enable optimum use of airspace and be justified by an overall added value. The establishment of FAB could facilitate the temporary allocation of larger blocks of airspace for military training and exercises encompassing enhanced cross border co-operation within the whole scope of air navigation services. For military operations, the optimum flight performance will be measured against criteria like the timely availability of sufficient airspace dimension, overall mission effectiveness or the ability to maintain operational freedom. Ideally, there should be a “win-win” situation for all partners which should encompass the Armed Forces of the Member States.

Supplementary arrangements with regard to charging of State Aircraft might become necessary. Today, there are different national solutions in place to cope with military air traffic. Many States keep military aircraft, in general, free of charges, whereas other States distinguish between military aircraft operated according to GAT or to OAT flight rules. Even if certain categories of flights may be exempted from air navigation charges within FAB, Member States shall have to pay air navigation service providers for the cost of exemptions granted to these categories of flights.

The calculation of exempted flights will be based on service units generated and applicable unit rates.

Furthermore, military authorities will have to study and investigate in depth the possible impact on their own organisations. This might also include new concepts and requirements for an adequate provision of military expertise in the integrated management of FAB and/or additional manpower needed for airspace management activities in national or possible regional AMC(s).

Provisions regarding contingency measures will have to be considered accordingly, especially with respect to written agreements on operational issues and technical solutions. The FAB infrastructure should be able to safeguard national security requirements and provide for interoperability and uninterrupted co-ordination with all national Air Defence organisations and Tactical Air Defence Command and Control Units involved. Special consideration might be necessary in the light of FAB agreements between NATO and Non-NATO States or between EU and Non-EU States.

Challenges/opportunities

The creation of FAB may offer some opportunities for the Member States Armed Forces with respect to enhanced military/military co-operation. This may include the harmonised specification of operational requirements for the provision and joint use of airspace as well as the temporary allocation of larger volumes of training airspaces.

Member States agreements should also specify arrangements regarding the payment of air navigation charges for certain categories of exempted flights, especially for State Aircraft operating over the territory of adjacent States. The impact on military budgets, internal military structures or the provision of adequate manpower will require a detailed analysis and investigation by the competent military authorities. Upon the establishment of FAB, it might become a challenge for all partners involved to minimise additional financial impact on national military operations and training.

Any participation of military manpower and human resources in the FAB organisation, management and/or service provision, including the necessary provision of military expertise in a single civil/military AMC, will become a subject to individual assessment by the military authorities involved and will subsequently require respective decisions at Member States' level.

8 Area of Interest Legal/Institutional/Organisational

Introduction

The obligation under Community law to establish a FAB rests with the States. In introducing this provision to establish a FAB, the Airspace Regulation provides limited guidance to States as to how to meet this legal requirement. The objective of this section is to highlight a number of legal and institutional aspects which will have to be considered by States (and their nominated/established NSA(s)) as well as by air navigation service providers.

The experience gathered through delegation of ATS already provided useful insight on key legal and institutional issues. This experience also confirms the need to appropriately address a number of key legal issues in the context of the establishment of FABs, in order to ensure that States fully meet their obligations under the SES Regulations as well as at the international level, i.e. under the Convention on International Civil Aviation (hereafter the Chicago Convention).

8.1 The relation between States' sovereignty and the establishment of a FAB

Analysis

Sovereign States are responsible for the provision of air navigation services in the airspace over their territory in accordance with whatever arrangements they have taken to provide those said services (Articles 1 and 28 of the Chicago Convention). States may also accept responsibility to provide air traffic services in airspace over the high seas or in airspace of undetermined sovereignty, on the basis of regional air navigation agreements (ICAO Annex 11, Chapter 2).

It must be noted that the establishment of FABs will not affect the regional air navigation agreements which are approved by the ICAO Council. These are two

distinct processes. In accordance with ICAO Annex 11, portions of the airspace over the high seas or in airspace of undetermined sovereignty where air traffic services will be provided shall be determined on the basis of regional air navigation agreements. It is then the responsibility of States to designate over the airspace over the high seas or in airspace of undetermined sovereignty the service providers that will provide such services. States will furthermore have to ensure, when services are provided over the high seas that these services are provided in accordance with ICAO Annex 2, which application is mandatory over the high seas.

The Framework Regulation specifies that the application of the SES Regulations and implementing rules shall be without prejudice to Member States' sovereignty over their airspace as well as to the rights and duties of Members States under the Chicago Convention.

The SES Regulations therefore apply without prejudice to States' sovereignty and to their security and defence requirements (which must be safeguarded when establishing a FAB). It must be underlined that States establishing a multi-State FAB which results in the provision of air navigation services by another State or entity do so without derogation to their national sovereignty.

The mandatory establishment of FABs is a State responsibility. Accordingly, the Airspace Regulation, which applies over the airspace of Member States as well as over the airspace falling under their responsibility⁹, foresees that the establishment of a multi-State FAB will require an agreement between the States concerned, further to consultation with other interested parties, such as the Commission and other Member States. The FABs to be established shall meet the requirements of Article 5 of the Airspace Regulation. Formally, and as underlined by the European Commission, the establishment of FABs in accordance with the Airspace Regulation therefore reflects a bottom up approach (States establishing the FABs and informing the European Commission accordingly).

⁹ Article 1.3 of the Airspace Regulation specifies that this Regulation shall apply to the airspace within the ICAO EUR and AFI regions where Member States are responsible for the provision of air traffic services. This may include airspace over the high seas, if a Member State has accepted that responsibility on the basis of a regional air navigation agreement.

Opportunities and Challenges

The recognition of the principle of States' sovereignty and responsibility with respect to provision of ATS when establishing FABs will assist in reaffirming the key role of States. The agreement between States concerning the establishment of FABs should provide the opportunity to establish a clear legal framework when States are not providing air navigation services themselves, and should therefore encompass and address delegation of the responsibility to provide ATS. The agreement between States will therefore provide the appropriate legal framework for the service providers jointly designated by States in a FAB to make the necessary operational arrangements through Letters of Agreement (i.e. allowing delegation of ATS responsibilities at the service providers' level).

The challenge will be to establish a comprehensive framework which will recognise the responsibilities of States and the relations with the different entities which will play a role in multi-States FAB (in particular, ANSPs and NSAs). It will have to be in line with States' international obligations and also take into account the military component (defence department). The latter is part of that State and therefore decisions of State with respect to FABs will have to encompass where appropriate the view and requirements of the military.

In order to assist States to properly address their responsibilities regarding the establishment of multi-State FABs, which will most likely imply cross border arrangements, the need to provide guidance material and tools has been strongly advocated. The required tools and guidance material will assist States in fulfilling their international responsibilities as well as those under the Airspace Regulation with respect to the establishment of FABs. It is submitted that through those tools, several of the issues identified under the Legal and Institutional part of this report can be adequately addressed at States level. Model arrangements for States concerning the establishment of FABs, could, *inter alia*, support States and avoid fragmentation. All supporting material and model arrangements will be developed and agreed upon at the appropriate political level and will be aligned, where appropriate, with the SES Regulations.

Experience (lessons learned)

Annex 11 of the Chicago Convention, dealing with Air Traffic Services, underlines that “if one State delegates to another State the responsibility for the provision of air traffic services over its territory, it does so without derogation of its national sovereignty.” (*ICAO Annex 11, Note regarding Article 2.1.1*)

The numerous experiences encountered with delegation of ATS have not put in question this commonly agreed principle. The issue that has arisen however is the extent to which States have been involved in the delegation of ATS arrangements over their territory. Those situations where delegation has been addressed only at the operational level between operational centres have raised important legal questions, in particular regarding to the ultimate responsibility of States with respect to air navigation service provision (Article 28 of the Chicago Convention).

In order to address those issues, and to assist States with delegation of ATS, a Model Agreement on Delegation of ATS was developed by EUROCONTROL. The objective of this Model Agreement, adopted by the EUROCONTROL Provisional Council in 1999, was to provide the proper legal framework for bilateral inter-centre Letters of Agreement addressing delegation of ATS. Further to a Decision of the EANPG, an ICAO State Letter, where States were requested to use the Model Agreement, was also issued (dated 23 October 2000). This Model Agreement can already provide an overview of the main issues that will have to be addressed by States when establishing a multi-State FAB.

8.2 Joint designation of certified ATS providers and definition of their rights and obligations

Analysis

In accordance with the Service Provision Regulation, States will have to jointly designate certified ATS providers in a multi-State FAB.¹⁰ Specific rights and obligations of ATS providers in a FAB will be defined by the State(s) that have designated the service provider(s). There are no formal constraints on States in exercising their discretion on local conditions (additional and non-conflicting) to be applied in the FAB through the establishment of those rights and obligations on ATS providers.

General obligations on ATS providers (and ANSPs in general) will be imposed through the Common Requirements on the provision of air navigation services (draft Regulation should be published before the end of 2005), which will need to be complied with in order for ANSPs to be certified. Article 7.4 and Annex II of the Service Provision Regulation also allow certain conditions to be attached the certificate to be issued to ANSPs.

The establishment of a multi-State FAB needs therefore be accompanied by the joint designation by the States concerned of the certified ATS provider(s), at least one month before the implementation of the block, as required by Article 8.4 of the Service Provision Regulation.

It must be underlined that, in accordance with Article 10 of the Service Provision Regulation (which is not strictly related to FABs), ANSPs “may avail themselves of the services of other service providers that have been certified in the Community”.¹¹ Those relationships will have to be formalised by written agreements or equivalent legal arrangements. In case of the provision of ATS, for which providers must be designated, or meteorological services, when its providers have been designated on

¹⁰ Article 8 of the Service Provision Regulation provides that ATS providers shall be designated. Article 9 of the same Regulation provides that providers of meteorological services may be designated by States.

¹¹ Article 10 addresses the relations between the service providers.

an exclusive basis, the ANSPs will require the approval of the States concerned before availing themselves of the services of another ANSP.

The provisions of Article 10 do not affect the need for joint designation in a multi-State FAB of ATS providers. It however seems to offer a possibility for designated providers to avail themselves of the (specific) services of other service providers, providing that the requirements of Article 10 are met, including, in case of ATS provision, the approval of the States concerned.

Opportunities and Challenges

The joint designation and definition of the rights and obligations of the ATS providers will contribute to the establishment of an adequate FAB legal framework. It will also assist States in exercising their responsibilities with respect to air traffic service providers. States will be required to jointly agree on the service provider(s) that will provide ATS over the airspace under their responsibility and to establish the necessary relationships with this or those provider(s).

It must be noted that through the definition of rights and obligations, States may be in a position to create, *inter alia*, additional safety or operational requirements. The possibilities for States to impose additional rights and obligations will also have an impact on the harmonisation of provision of air navigation services which is aimed to be achieved through the draft Regulation on common requirements for the provision of air navigation services. This could have an impact on the joint designation of the service provider(s) within a FAB.

Experience (lessons learned)

The Maastricht UAC constitutes an example of where four States¹² have jointly entrusted an air traffic services provider (EUROCONTROL) to provide those services over their respective (or part of) territory. The eight CEATS States¹³ have also been through the same process and the CEATS project is currently being implemented.

¹² Belgium, Germany, Luxembourg and the Netherlands.

¹³ Austria, Bosnia and Herzegovina, Croatia, Czech Republic, Hungary, Italy, Slovak Republic and Slovenia.

In both cases, the joint designation is reflected in an Agreement between the States and EUROCONTROL. Those Agreements set the basis for the operation of ATS and define the rights and obligations of the Organisation (service provider) and the States.

There are therefore positive experiences and arrangements of States jointly agreeing on the service provider(s) that will operate within a joint defined airspace.

8.3 Supervision in a FAB

Analysis

States whose airspace, or parts thereof, is contained in a FAB will have to conclude an agreement with respect to supervision of the service provider(s) in that FAB.¹⁴ Different arrangements are available for States under the SES Regulations to fulfil (part of) their supervisory functions (through NSAs, recognised organisations).

The notion of supervision in a FAB raises many issues which have to be addressed at States' level, as the SES Regulations leave the responsibility for supervision with the States. A multi-State FAB will involve different States and potentially several service providers, which themselves have to be supervised according to the SES Regulations. The Service Provision Regulation, at Article 2.3, specifies that States need to conclude an agreement on the supervision in a multi-State FAB.

From a legal perspective, different arrangements can be envisaged: one NSA for the whole FAB; a multi-State or supranational entity; joint arrangements between NSAs, etc. The SES Regulations contain no specific requirements or restrictions regarding the status of the NSAs (public or private entity, intergovernmental body, etc.). They only provide that the NSA shall be independent of ANSPs, at the functional level at

¹⁴ The NSA that will certify an ANSP could in principle ensure also its supervision. There are however no requirements in the SES Regulations which specify that the certifying NSA must be the one supervising; the Service Provision Regulation provides that NSAs shall make appropriate arrangements for close cooperation to ensure adequate supervision of ANSPs holding valid certificates from one State that also provide services over the airspace of another State.

least, and that Member States shall ensure that NSAs exercise their powers impartially and transparently.

In the SES context, the basis for the work of NSAs are the SES Regulations, whose application they have to supervise on a national or regional level. The Common Requirements for the provision of air navigation services (regulation to be published before the end of the year 2005)¹⁵ and ESARR 1¹⁶, with respect to safety, will also govern or relate to the tasks of the NSAs. ESARR 1 specifies that the agreement between States on the supervision of ATM services relating to FABs which extend across the airspace falling under the responsibility of more than one State must specifically ensure that the responsibilities for ATM safety oversight must be identified and allocated in a manner which ensures clear points of responsibility to implement each requirement that ESARR1 imposes on NSAs as well as visibility for States of the safety oversight mechanisms operated as a result of such an agreement. It also underlines the need for States to establish means to regularly review this agreement and its practical implementation in the light of safety performance measures, in order for all States concerned to have visibility of that means and its results.

Note. ESARR 1 is addressed in further detail in para 3.1 “Safety requirements”

In that regard, it should be noted that within the SES Regulations, the NSA function relates to the application of the SES legislative framework (in particular, the common requirements for certification, the conditions attached to the certificate and designation) and not the overall supervisory responsibility of States over which airspace air navigation services are provided. In the SES context, the formalisation of this supervisory function aims to ensure that States properly exercise this function in the context of their obligations created by the SES Regulations.¹⁷ The overall responsibility for sovereign States to adequately oversee and enforce the entirety of their regulatory responsibilities remains unchanged.

¹⁵ Most provisions of ESARRs 3, 4 and 5, will be made mandatory under community law through the draft Regulation laying down Common Requirements for the provision of air navigation services and the draft Directive on a Community Air Traffic Controller Licence.

¹⁶ Binding on all EUROCONTROL Member States further to its approval by the EUROCONTROL Commission on 5.11.2004. States will have three years comply with provisions of ESARR 1, time within which ESARR 1 will be transposed into EC law in accordance with Article 4 of the Service Provision Regulation.

¹⁷ This includes all regulatory requirements and conditions (including safety ones) related to the certification and designation process.

Opportunities and Challenges

Further to the corporatisation of ANSPs and the ensuing changes in the CAAs and MoTs of European States, practice shows that it is becoming increasingly difficult for States to fully and effectively exercise their regulatory functions (rule making, oversight/supervision and enforcement). Lack of resources and expertise as well as a new institutional environment have been identified as (some of the) causes for this situation.

The introduction of the NSA has therefore been linked to the need for pooling of resources and expertise. Accordingly, the SES Regulations do foresee in cases of multi-State FAB that Member States concerned shall conclude an agreement on supervision with respect to the ANSP(s) in that airspace block. This should be considered as an opportunity to undertake those supervisory functions at the multi-State (e.g. joint) or supra-national level and consequently achieve a more harmonised framework with respect to supervision, with respect to the implementation of the SES Regulations as well as regarding existing national or international requirements.

The challenge will therefore be for States to jointly agree on the supervision of the providers in a FAB (and on the NSA(s) that will be tasked with those tasks) and to ensure that safe and efficient operation of the ANSP(s) in a FAB through those arrangements. The possibility for those NSAs to avail themselves of the assistance of recognised organisations for inspection and surveys tasks will also have to be addressed. Agreements between the States and at NSAs level will be necessary in order to create an adequate legal framework. Those agreements should also include arrangements for dealing with cases of non-compliance with the SES Regulations and in particular the common requirements for the provision of air navigation services. The number of NSAs tasked with supervision in a FAB as well as of ANSPs involved will clearly influence the content of the agreement between the States concerned.

An additional challenge to be considered for NSAs in the context of multi-State FAB is the possibility of a single safety case (Article 5.2 of the Airspace Regulation

specifies that FABs shall be supported by a safety case)¹⁸. This will involve much closer co-operation between NSAs and providers, and constitute an interesting exercise given that the notion of safety cases in ATS is still relatively new and evolving, posing challenges for some providers and their NSAs.

Experience (lessons learned)

The experience with multi-state service provision at Maastricht UAC reflects the need for States to ensure appropriate supervision mechanism with respect to ATS provision. As this is State's responsibility, the Maastricht States took the necessary steps to ensure appropriate supervision of MUAC. Further to the introduction of the SES Regulations, the four States are currently developing a cooperation agreement between their respective NSAs with respect to the airspace contained under the Maastricht Agreement.

The nomination of NSA(s) within the SES legal framework will provide a well-defined framework which should facilitate supervision, in particular in a multi-State context. It will call however for agreements between the States (and their NSAs) concerned and clear points and allocation of responsibility.

8.4 Regulatory environment governing a FAB

Analysis

When establishing a FAB which will involve cross border service provision, States concerned shall, as a minimum, conclude an agreement on the applicable rules and procedures. Potential conflicts of applicable regulations must be excluded. This applies to operational rules and procedures as well as other relevant rules and (national) legislation which will be applicable in the airspace block defined through the establishment of a FAB.

¹⁸ The establishment of clear points of responsibility for safety supervision in a FAB, in accordance with ESARR 1, should create an appropriate framework to deal with a safety case, including an appropriate review process.

A certain degree of harmonisation is provided by ICAO SARPs and by the SES legislative framework. The draft Regulation on common requirements as well as the draft Implementing Rules concerning Flexible Use of Airspace will assist in this respect. With the exception of supervision, the structure and provisions required to regulate provision of ATS in a FAB remain a State responsibility, not directly addressed by the SES Regulations.

Experiences with delegation of ATS and multi-State cross border functions have demonstrated that it is essential to operate in a clearly defined regulatory framework. Solutions should therefore be developed in order to achieve this objective.

Opportunities and Challenges

States, having established a multi-State FAB, will remain ultimately responsible for the services provided over the airspace over their territory. This internationally recognised principle (Article 28 of the Chicago Convention), already referred to above, addresses not only responsibilities derived from the air navigation services provided but as well as the regulatory functions of States. States having accepted the provide air navigation services over non-territorial airspace will also incur responsibilities. This confirms the need for States involved in a FAB to jointly address the regulatory environment that will prevail in a FAB.

The application of rules and procedures pertaining to ATS provision will be complex. There are on the one hand State laws and regulations found in statutes and regulations. On the other, there are operational rules and procedures, developed at high level and for local use. The various agreements will need to determine the interaction between formal laws and lower level procedures. So far as the procedures are concerned, it is generally, though by no means universally, recognised in the context of delegation of ATS that whoever provides the service should do so according to its own rules and procedures. Even so, it is also recognised that certain rules and procedures of a delegating State will still need to remain applicable in its own airspace, including filed ICAO differences. This principle may be however more difficult to achieve in multi-State FAB involving several cross border sectors and potentially different service providers.

Multi-State cross border FABs could therefore provide the opportunity to aim towards the development of one single set of rules and procedures that govern the airspace covered in that FAB or to increase harmonisation. This would require full and detailed coordination between the regulatory authorities of the States concerned in a FAB, as the establishment of one set of rules or harmonisation are objectives that can only be achieved through States. It could require modifications to national legislation and the associated actions by the States involved. Although this would entail time consuming changes, the obvious advantages – also from a safety point of view – are such that this goal warrants serious attention and feasibility assessment.

The need to achieve harmonisation of applicable rules and regulations or to create one single set of rules is a key issue with respect to the establishment of FABs. These matters are also of relevance for possible regulatory harmonisation in the different FABs that will be established by States.

Experience (lessons learned)

Experiences with delegation of ATS and multi-State cross border service provision have demonstrated that it is essential to operate in a clearly defined regulatory framework.

Solutions should therefore be developed in order to achieve this objective. A first step should be for States concerned to agree on the applicable rules and procedures.

The Model Agreement on Delegation of ATS (referred to in section 8.1) foresees the following: the rules and procedures pertaining to the provision of ATS in the Providing State shall apply when providing ATS in a portion of the airspace of the Delegating State. The objective of this provision, contained in this Model Agreement, was to ensure that, in the interest of safety and for the sake of efficiency, air traffic controllers are able to apply only one set of rules.

France and Switzerland (France delegates to Switzerland the responsibility for ATS provision in part of its airspace) adopted the approach proposed in the Model Agreement in the bilateral intergovernmental ATS delegation agreement they

concluded. The agreement also imposes the obligation on Switzerland (the providing State) to keep France (the delegating State) continuously informed of the state of the rules and procedures applicable and, in particular, of any difference with ICAO SARPs. From an ANSP viewpoint, this arrangement proved very satisfactory.

8.5 The need for a liability framework

Analysis

Initiatives to harmonise liability at the international or European level with respect to air navigation service provision, would constitute the optimal way to address liability in a FAB. It is clear that such initiatives, however desirable, can on only be entertained in the medium to longer term. Actions are therefore required in the short term in order to address liability issues in a FAB.

A FAB may involve different service providers providing services over more than one sovereign territory, potentially several NSAs, and a number of States. Again, States involved remain ultimately responsible for the services provided over their territory (Article 28 of the Chicago Convention). The potential allocation of liability between the different parties (and possibilities for recourse actions) should therefore be addressed between the States, for service provision functions as well as supervision/regulatory functions.

The liability and related insurance provisions foreseen in the draft SES common requirements for air navigation service do not address these issues from a multi-States/multi-ANSPs perspective. They however contain some basic legal requirements for service providers, which will impact and govern their liability when providing air navigation services. It must be noted that the basic insurance requirements of the draft common requirements need to be further detailed to address the greater legal/financial complexities of participation in a FAB. The cover required may need to be adjusted to reflect this and indeed the particular liability arrangements negotiated between the States.

Liability issues will therefore be more complicated and should be addressed in detail by the Parties concerned, in order to establish a clear liability environment among those Parties. In particular, the following aspects should be considered:

- The liability of States as regulators/supervisory authorities and their liability for service provision (Article 28 of the Chicago Convention);
- Sovereign immunity;
- The existing liability regimes (e.g. Warsaw/Montreal Convention for passenger rights and the soon to be revised Rome convention for persons on the ground);
- The liability of the service providers;
- Applicable law and jurisdiction;
- The relationships and right of recourse between the State(s) and the service provider(s), or between States within a FAB;
- Criminal and corporate liability of the individuals involved in service provision, management and regulatory functions.

Liability provisions need therefore be included in the different arrangements that will pertain to a specific FAB.

Opportunities and Challenges

The establishment of a liability system would assist in creating clarity and in avoiding ambiguities between the parties involved in a FAB. This should facilitate insurance coverage as well as provide users of air traffic services with a clear framework if there is ever a need to take action. This will need to reflect the roles, functions, rights and obligations of States and designated providers, of which there are likely to be more than one in a simple FAB, and their interaction with other providers including the military. Likewise with NSAs who may delegate to, or share activities with other NSAs, or delegate to recognised organisations. A clear statement, in effect of who does what, is needed as a starting point to establish responsibility and accountability.

As FABs have to be established as of April 2004, the objective is not to harmonise all liability issues that will arise in a FAB, as the different models of FABs that should, in the short to medium term, be created would render this task very difficult. Focus

should be on clear allocation of responsibilities and liabilities between the main parties, i.e. States, NSAs and ANSPs.

In the medium to longer term (and not only related to FABs), initiatives to harmonise fundamental principles dealing with air navigation services liability at the European level could be considered. Clearly any steps in that direction would create legal certainty and would facilitate the establishment of FABs with respect to liability and insurance.

Experience (lessons learned)

The particular Überlingen experience, involving delegation at the operational level of the provision of air traffic services, has revealed inadequate liability arrangements between the States and between States and service providers as well as with (most importantly) insurance companies.

It may be noted that the aforementioned ATS delegation agreement between France and Switzerland does provide for a primary liability regime whereby the Swiss ATS provider shall be liable with respect to damage caused by its negligence. The thinking behind this preferred liability regime is that, bearing in mind the current separation between the function of regulator and that of service provider, the wrongdoer (i.e. the effective service provider) should stand primarily liable. The agreement also provides that any law suit against the Swiss ATS provider is to be brought in front of a Swiss Court. In addition, should the situation so justify, France could avail itself of a recourse action against the Swiss ATS provider.

In some legal systems, the absence of a clearly defined allocation of liability might result in the ultimate liability of the State having delegated the responsibility to provide ATS. Other arrangements can only be found on a good-will basis between the players involved. The insurer will however definitely refuse any payment that lacks a clear legal basis.

8.6 Consultation within, and on-going organisation of, a FAB

Analysis

States which have mutually agreed to establish a FAB will have to make the necessary arrangements for the organisation of this FAB. This will include establishing, where appropriate, consultation and decision making mechanisms in order to ensure the on-going safe and efficient operation of the air navigation services in the FAB as well as its further evolution.

The level of integration in a FAB will determine to which extent formal consultation and decision making mechanisms will need to be established. It will be influenced by the consultation requirement of users by ANSPs that is contained in the draft common requirements.

It is foreseeable that the different decision making or consultation mechanisms, which could involve, as appropriate, States (including NSAs), ANSPs, Staff representatives and Unions, could address operational, technical, regulatory, economic and social issues which impact the organisation and management of a FAB. The details relating to such mechanism will need to be assessed in each FAB.

Opportunities and Challenges

The opportunity for States to establish clear consultation mechanisms with respect to the on-going operation and management of a FAB will assist States in fulfilling their responsibilities vis-à-vis the provision of ATS in that FAB. This mechanism could also include the ANSPs concerned, in order to address jointly any issues that will improve or facilitate provision of services in a FAB. It could provide the form for cooperation between States and ANSPs, as well as between ANSPs, which will appear necessary in most multi-State and/or multi-service provider FABs. It could reflect the principle that although FABs will be established by States, the everyday management will fall upon the designated air navigation service providers.

Experience (lessons learned)

The specific context of cross border service provision at Maastricht UAC, where one supra national service provider (EUROCONTROL) provides services on behalf of four States, has confirmed the usefulness consultation mechanisms for the States (as foreseen in the Maastricht Agreement), but as well as for ANSPs interacting in the lower airspace. The Netherlands and United Kingdom arrangements over the North Sea also contain the necessary consultation mechanisms, including consultation with the users.

It seems therefore appropriate that in a FAB, similar arrangements, adapted to this FAB “construction”, be considered.

8.7 Modalities for modification / withdrawal

Analysis

The requirements for provisions related to the modification of, or withdrawal from, a multi-State FAB in the Agreement between States establishing a FAB is foreseen in Article 5 of the Airspace Regulation. This Article also provides for transitional arrangements in such cases.

Those aspects (modification or termination) will have to be contained in arrangements between the States as well as with the designated ANSPs. Those arrangements should address, *inter alia*, the operational, financial, security and safety consequences of the possibilities for modification and termination and ensure continuity of service and an appropriate transitional phase.

Opportunities and Challenges

This provision will allow possible changes in order to, *inter alia*, meet the criteria for optimum use of airspace, as traffic flows can evolve throughout the years.

Changes related to service provision or withdrawal from a well-integrated FAB can however not be achieved overnight. Therefore the challenge will be to associate realistic modalities to the termination or modification of FAB, as well as to ensure, through appropriate transitional measures, continuity of service. It will be the responsibility of States to ensure adequate arrangements in this context. Clearly, ANSPs should also be covered by those arrangements as in most cases they will be directly related to proposals to modify or terminate a FAB. They will also be directly concerned by the consequence of such actions. Appropriate consultation with interested parties, including States and ANSPs in neighbouring FABs, should also be considered.

Experience (lessons learned)

The provisions relating to the modification to, or withdrawal from, a FAB will be based on the actual “construction” of this FAB, and in particular on the relation between the designated air traffic services provider(s). From experience, it can be concluded that changes or termination of the more operationally based delegation of ATS can be more easily achieved than the termination of the Maastricht Agreement (which resulted in the establishment of one air traffic services provider).

8.8 Appropriate arrangements for incident reporting and incident / accident investigations

Analysis

Agreements relating to the establishment and operation of FABs should include provisions on incident/accident reporting and investigation as well as trend analysis and safety data convergence, in order to establish a clear framework for, *inter alia*, the tasks relating to occurrences reporting and analysis (in line with the requirements of ESARR 2, EC Directives 94/56 and 2003/42).

It is important to ensure that any safety deficiencies identified in one sector of a FAB be shared and remedied in the whole FAB and beyond. Accident investigation could

also benefit from an agreed allocation of roles and responsibilities, in line with ICAO Annex 13 (which may not foresee a specific or appropriate role for all parties involved in a FAB and wishing to partake in an accident investigation).

Opportunities and Challenges

Reporting and analysis of incidents as well as cooperation and collaboration in accident investigation are key aspects of aviation safety. Ensuring that those tasks are properly exercised in a FAB and that any relevant information is exchanged between States, NSAs and ANSPs operating in one FAB will increase safety.

Although not solely-related to FABs, liability (civil or criminal) of individuals involved in service provision is a relevant issue and has direct link with the notion of just culture which tries to establish an environment which supports occurrence reporting. Those aspects should also be addressed by States when establishing a FAB.

Experience (lessons learned)

Existing arrangements on delegation of ATS address in most cases the competent incident investigation authorities in cases of accident and serious incidents. The Model Agreement on delegation of ATS foresees that the State in which the accident occurred will institute the inquiry and that the providing State shall be given the opportunity to appoint an observer. This is in line with ICAO Annex 13 and Directive EC 94/56.

With respect to exchange of information concerning reported incidents (including minor ones), in particular in cross border areas, the arrangements between The Netherlands and the United Kingdom regarding delegation of ATS over the North Sea constitute a good example where such cooperation is taking place. This allows the necessary analysis of information which, through dissemination of lessons learned, contributes to improving safety.

The important aspect to ensure is that in such cases, co-ordination between States duly takes place. This approach regarding accident and serious incident investigations could be elaborated depending on the complexity of the FAB.

8.9 Obligations on States stemming from the Chicago Convention and ICAO Standards

Analysis

The Airspace Regulation recognises the principle of States' sovereignty as well as the applicability of international conventions when controlling air traffic. Obligations on States stemming from the Chicago Convention as well as from ICAO Standards as contained in the Annexes to the Convention will need to be taken into account when establishing a FAB. This includes, amongst other things, requirements regarding provision of ATS over the high seas, search and rescue (SAR) issues, maintaining the Air Navigation Plan, filling of differences, aeronautical information publications, FIRs (EUIR) issues, etc.

Opportunities and Challenges

This relates not only to the need to agree on the application of ICAO Standards relating to the provision of ATS (which would fall under the requirement to achieve a clear regulatory environment) but also with respect to the application of certain key principles which find their root in the ICAO regime.

The establishment of multi-States FABs should provide the opportunity for States to address some of those aspects at the multilateral level, while keeping in line with their ICAO obligations. The implementation of ICAO standards and recommended practices in a FAB will call on a joint approach by States, in particular with respect to the need to address possible existing differences in their national transposition of those standards.

Experience (lessons learned)

The importance of filing difference in cross border service provision came across in the Maastricht UAC context. In a cross border FAB, the obligation of States to file differences to ICAO standards should be emphasised as ICAO Standards are used as the applicable operational standards. The Regulation laying down common requirements for the provision of air navigation services refers in its recitals to the need for Member States and the Commission, acting in close cooperation with EUROCONTROL, to “work towards minimising the differences notified by Member States in the application of ICAO standards in the field of air navigation services in order to reach a common set of standards between Member States within the single European sky in particular with a view to developing common rules of the air”

9 Area of Interest - Issues of Social Nature

Introduction

Change is inevitable and essential in ATM as it is in other industries. The competence, qualification, expertise and skills of staff from ANSPs, their motivation and commitment is a major enabler and driver for the necessary changes in ATM and making an effective transition towards a FAB environment. The social issues in relation to establishing FABs discussed in this chapter, encompass a range of aspects that go beyond communication and consultation between social partners. They include human resources elements in regard to staffing, employment, training, licensing, culture and human factors in ATM.

In the context of this report the term 'social partners' refers to employers and employees in accordance with national laws and / or practices. Social partners from ANSPs (employers) and employees at European and at national levels will play a key role in the development of FABs within the social dialogue process. It is through the existing social dialogue process that solutions for social issues will be identified, addressed and resolved. Social partners will develop and adopt progressively the required framework agreements in relation to a chosen solution for a FAB in full autonomy. Available best practices and experiences from similar projects in ATM, other industries as appropriate, and from studies will help to establish balanced solutions. A comprehensive process should in particular take into account the different language requirements, the diversity and differences in the "social culture" and the legal and institutional framework of participating ANSP organisations.

The following analysis cannot and does not aim to be complete and conclusive as regards possible solutions. For example, national, international or supranational organisations may have specific requirements in place for information, consultation and social dialogue. The analysis does, however, address the issues from a stakeholder point of view and anticipates that practical solutions for social issues in a FAB will be agreed and adopted with social partners in a bottom-up approach and

process. This process has already been initiated on a European level between CANSO and ETF and is facilitated by the EC.

This chapter does not aim to provide an exhaustive list of social issues or be legally or otherwise prescriptive. It highlights those items of a social nature that are of general concern to all parties from different social dialogue cultures in order to support their efforts in establishing FABs.

9.1 Information and consultation between social partners

Analysis

The legal requirements for information and consultation between social partners in a FAB will depend on the type of the legal and institutional framework of a FAB and on existing legal conditions and requirements at national and European level as laid down in existing national and European Community law. The type and nature of information, consultation and negotiation will also vary depending on the type of cooperation established between the ANSPs involved in setting up a FAB, and on existing institutional or corporate organisations of the ANSPs.

Some organisations may be subject to specific national, international or supranational requirements, depending upon their institutional backgrounds. Reference is made in particular to the European Directives regarding the establishment of a European Works Council (Directive 94/95/EC)¹⁹ and regarding a framework for setting out minimum requirements for the right to information and consultation of employees in the European Community (Directive 2002/14/EC)²⁰.

The principles and criteria for the recognition and designation of social partner organisations at EU and national levels are also laid down in Community and national law. The parties involved in the social dialogue will agree on the rules of procedures and will have the mandate to discuss, inform, consult, negotiate and agree in accordance with the identified needs and roles. It is the responsibility of the social

¹⁹ Official Journal (OJ) L254/64-72 and L10/22-23 (extension to UK)

²⁰ Official Journal (OJ) L80/29-34

partners to agree on and establish best or optimal representation of legitimate interest groups to produce a balanced summary of results.

European social partners will in principle use the EU-wide social dialogue mechanism to establish, in appropriate time, the partnership framework and processes at EU level in full autonomy. Social partners will define the practical arrangements for information and consultation when establishing a FAB. They will also investigate the social impact of anticipated changes and reach agreement regarding appropriate solutions.

The social dialogue process shall, at European and national level, as required, effectively deal with the social impacts related to establishing and maintaining a FAB. The aim should be to address and resolve, in a timely manner, issues of a social nature to the benefit of all parties. Social partners at a European level will identify and discuss the development of additional guidelines for consultation in line with best practices.

Challenges / Opportunities:

The timing of events and the content of information and consultation in a social dialogue process involving social partners within and between States participating in a FAB will be driven mainly by existing law and regulation on national and European level and is relevant for all examples of a FAB.

Social partners will identify social aspects of concern and the social implications related to the practical establishment of a FAB and will decide on the information, consultation and negotiation activities in accordance with existing, applicable legal requirements. Social partners at national level are free to agree and define the appropriate practical arrangements for consultation and information, the representation of interest groups affected, agree at what point in time the consultation and information process between social partners shall start, or establish a cross border and trans-national social dialogue, if required.

The existing social dialogue process at EU and at national level is well established and respected by social partners both acting with full autonomy during negotiations. The EC promotes the consultation of social partners and facilitates their dialogue. It is not foreseen to introduce information or consultation requirements beyond existing national and Community law. However, EU social partners are free to agree on specific requirements in this regard if deemed necessary.

In the case of cross border or trans-national FABs including non EU member States, provisions for social dialogue mechanisms will have to be developed that ensure adequate commonality and harmonisation. Consideration should also be given to include NSAs or national regulatory authorities on appropriate subjects.

The development of the adequate information and consultation process should form part of the FAB programme management and should be coordinated between the social partners involved.

Experience (lessons learned)

Experiences with change projects, merging of units or establishing new Air Traffic Control Centres in Europe show that timely and progressive representation of interest groups at local and national level before implementation of a change is important for the support, 'buy-in' and acceptance of the change by the employees affected. There is further evidence that the need for consultation and communication / information of local social partners from different localities differs depending on the individual impact, the magnitude of the change and the personal and professional requirements. Before the implementation of a FAB the different views and the impact on the social partners should be considered. This should start at an individual level (bottom-up) The designation of social partners and focal points and the assignment of clear roles, mandates and responsibilities to local partners (i.e. to gather inputs and feedback on a local level and communicate them to the right resolution for a) will ensure that social and human issues are not masked by the technical or safety aspects.

The recognition and timely representation of people from a working level in the forthcoming change process could be considered as good practice. An important first step in this regard has been achieved with the established social dialogue at EU level for FABs and with the agreements reached between employers and employees.

Access to information is crucial for the development of an effective social dialogue and provides the necessary input for social partners. At a European level tools and channels are available that support general social dialogue information dissemination.

Experience shows that adequate information of staff affected by the establishment of a change is also crucial and must be precise, consistent and sufficiently comprehensive to create a correct understanding of the situation and addresses the social and general human factors issues. Open and unbiased communication is vital for avoiding misinterpretations, reducing uncertainty and creating commitment and support for the change.

The characteristics, methods and content of practical arrangements for information and consultation between social partners in the frame of social dialogue will depend on the FAB context and on the social implications adhering to that context. No one approach can fit all social and economic circumstances. The legal, corporate and institutional organisation and the type of cooperation between ANSPs involved in setting up a FAB determine the social impacts that may emerge. The requirements for information, consultation, and negotiation between social partners are prerequisites and need to be agreed and adapted on a case-by-case manner by the respective social partners at multinational and / or and national levels.

There is also evidence from various comparative change projects that it is necessary to be aware and take account of differences in the expectations of social partners in varying working cultures. For example, in regard to the preferred ways and means of receiving information, participation in discussions and consultation and to the timing of the start of informal or formal consultations. The early involvement and preparation of employees in the up-changes will build competence and experience

and is also a means of creating confidence in the process, reducing uncertainty in of the future and ensuring better quality of the outcome of the change.

There will be differences between States participating in a FAB in regard to the time needed for involvement of the social partners and for achieving the adequate and common level of support and involvement for the change. This will depend partly on the effectiveness of the respective processes in an ANSP organisation and the earlier experiences that ANSPs may have in the implementation of changes.

9.2 Employment and working conditions

Analysis

Depending on the arrangement for a FAB, a specific Human Resources plan may be needed and agreed upon. Based on a common operational concept for the FAB it should outline the principles on conditions of work and employment, transfer and mobility, contingencies, representation, staffing deployment (i.e. quotas, targets, staffing categories, eligibility) selection and recruitment (i.e. criteria, targets, ratios, age), training and licensing, rostering and staff development, especially for operational staff.

Challenges / Opportunities

The legal and institutional implications and the working conditions and rules for the staff working in a FAB environment will need to be defined and agreed. The issues on employment and working conditions will become more prominent in a multi-State FAB involving different States and Service Providers. In these circumstances a joint effort to establish a common set of rules will be required.

Shaping and establishing a common set of rules and principles for working conditions in regard to working time, remuneration, holidays etc that suits the industry and is applicable in a multi-State / multi – ANSP FAB is a challenge that should be approached in a progressive manner. The need for common requirements and

regulation for 'safe' staffing and rostering in ATM at an EU level should be verified especially when there is no one single solution that fits the different needs and requirements. However, as a minimum, States participating in a FAB will need to define and establish rules and principles at national level first in close coordination with the involved ANSPs.

The costs of the social impact in relation to the relocation of staff, staff contingencies etc during the change-over period and / or in the longer term should be taken into account in the cost-benefit calculation for a FAB.

Experiences (lessons learned)

Safety related issues like training, licensing and rostering are in principle, based on ESARRs and ICAO rules and apply to all possible solutions for a FAB.

9.3 Staffing Arrangements

Analysis

The timely availability of an optimum number of operational staff appropriately qualified in the airspace concerned is critical to the establishment of a FAB. Best practice principles and criteria for the staffing of a FAB should thus be established and agreed between all parties involved, as appropriate. The staffing principles, requirements and policies should be developed to establish staffing targets for the FAB and to coordinate the requirements / availability of staff with the Service Providers involved in a FAB and, if necessary and appropriate, the timely determination of staff quotas.

Challenges / Opportunities

Staff planning for a FAB will need to start as early as possible and should include all staffing elements in line with operational requirements and capacity planning. Good cooperation / co-ownership among the relevant parties from Service Providers involved in a FAB should be ensured. This will support and facilitate participating

Service Providers in the FAB to take timely actions and act flexibly to changes to prevent a staff shortage / surplus and mitigate, avoid or reduce staffing risks in the establishment and operation of a FAB. At the same time staff planning for a FAB shall ensure appropriate staffing of other ANS units of the involved Service Providers.

Service Providers have established different staffing and rostering concepts, principles and rules in different States. The challenge could be to establish a common approach to staffing of a FAB and meeting operational requirements and controller capacity in staffing and rostering terms. Staffing issues may also need to be addressed and / or resolved in other operational units and sectors in adjacent or subjacent airspace of the Service Providers involved or affected by a FAB.

The staff related implications will vary depending on the solution for a FAB under consideration. If a FAB implies the merging of ACCs or the set-up of a new FAB service provider i.e. in a multi-State / multi – ANSP FAB this might impact on the staff requirements for the FAB and the organisation in its entirety. This is in addition to the organisational, financial and other effects on the remaining organisations or units. The process to establish FABs must take account of the impacts on Service Providers and their staff and should seek to agree on solutions whilst avoiding the risk of constraining capacity.

Experiences (lessons learned)

Experience from other relevant projects show that collaborative staffing efforts based on a common operational concept for a merged ATC environment with respect to the staffing needs in affected adjacent or subjacent operational units is essential. The planning of staff for both the new and the remaining ATC units should be based on a transparent approach to facilitate consultation and discussions and should consolidate the requirements in advance.

A common operational concept that describes all relevant processes in ATM from the strategic to tactical phases and establishes the link between capacity provision, efficiency and strategic staff planning should be the basis for establishing a common approach.

The staffing impact from possible centralisation or rationalisation of technical services and / or maintenance units for a FAB, needs to be considered. The financial and cost-benefit related staffing costs for both the FAB and the remaining services and units of participating ANSPs also needs to be taken into consideration.

9.4 Training, licensing and competence requirements

Analysis

Operational ATM staff working in the FAB operational environment will continue to perform the same tasks when managing and controlling air traffic. However, as there can be more than one ACC per FAB, staff may do so on the basis of a different operations concept, different ATM systems and / or in a different location and working environment, depending upon the make-up of the FAB solution. Controllers joining a FAB may also have different backgrounds in terms of their experience of traffic density, traffic complexity, equipment and / or in regard to the civil – military regulatory framework.

In any event controllers and other operational staff will need to be trained and qualified using common training principles in relation to the respective services they will provide.

A FAB may also represent a multinational environment; therefore, full cognisance should be taken of cultural and language issues in training. Commonly agreed FAB principles and plans for all operational staff and a common training framework, needs to be established based on common EU Directives and / or ESARRs and ICAO principles, as applicable. In particular, the Proposal for the EU Directive for a common European ATCO licence should be referred to.

The training of Controllers from the Service Providers will be in compliance with existing national, European or International Regulatory Requirements. Although it can be assumed that Service Providers participating in a FAB will comply with the

Regulatory Requirements, they will need to have approved Unit Training Plans and Competence schemes for Controllers (Civil / Military) joining a FAB environment and for *ab initio* Trainee Controllers for their FAB unit endorsements.

Nominated NSAs or national regulatory authorities legally overseeing the issuance of licences and endorsement should be involved in the common dialogue on regulatory aspects in cross border FABs and need to give their support and agreement to those aspects of a social nature where regulatory issues are involved.

Challenges / Opportunities

Operational staff from different ANSPs transferring to a FAB may have been trained according to different national procedures and plans; this might have an impact on requirements for conversion / transition and other training. Common FAB training principles and plans should be identified for a common operational concept established for a FAB.

Controller training will be governed by the EU directive for a common European Air Traffic Controller licence, and will be supervised by NSAs (National Supervisor Authority), nominated for a FAB. NSAs will also supervise safety related tasks of other categories of operational staff according to ESARRs.

Training principles to be applied for initial, competency and conversion training should be specified. In addition, the requirements for individual training modules and the organisational framework for the training delivery should be specified by the organisations responsible for the operation in the FAB and should be prescribed for the training provider as a service level agreement and / or training requirement document.

New operational procedures in an established FAB may require the implementation of new or additional unit endorsements. These should be issued after successful completion of approved competency and / or transition training.

There is a challenge of managing different cultures if ACCs are to be merged as part of the establishment of a FAB or in case of staff from different Service Providers transferring to a new FAB environment. Different cultures, concepts and standards may exist in the different operational environments for training and competency schemes. The issue is more prominent in regard to varying standards for OJT and the competencies and demands on OJTs in different Service Providers.

The financial impacts of additional training costs during the transition training, changeover period and in the long-term, should be taken into account in the cost-benefit calculation of a FAB.

Experiences (lessons learned)

Training implications will vary depending on the FAB under consideration. The training process for initial or unit training of *ab initio* controller students should be organised as described in common training guidelines²¹ and in accordance with the related ratings and endorsements as specified in the Manual for Personnel Licensing²². Transition training will be arranged for experienced controllers that join the FAB operational unit and should include training elements on local ATM system, the common operations concept and procedures etc. as required for familiarisation in a certain FAB environment.

Transition training and induction should also comprise team resource management in a multinational environment for all categories of operational staff. Training time and success will be determined partly by the individual performance, competency and skills background. This has to be taken into consideration in the planning and conduct of transition training for unit endorsements.

There is a wealth of experience in training coordination and development at a European level that has demonstrated the benefits of cooperation in regard to training development and harmonisation between European ATM Training establishments.

²¹ Eurocontrol Guidelines for Common Core Content and Training Objectives for ATCO Training
²² European Manual of Personnel Licensing – Air Traffic Controllers

9.5 Human factors and culture

Analysis

A FAB shall be established in line with human capabilities and limitations. To ensure and enable the continuation of a safe and efficient operational service and a smooth transition of staff to a FAB, there is a need to identify and apply human factors principles and requirements in the establishment of a FAB at an early stage to avoid risks or problems later. Special emphasis should be given to human factors and cultural aspects especially in regard to maintain and enhance safety culture, effective team performance, and adapting the working style and working methods in a changed or new working environment.

Challenges / Opportunities

Staff motivation, attitudes in regard to safety and performance, trust in new systems and managing cultural diversity will become key success factors for a FAB.

There is a challenge of managing different cultures if ACCs are to be merged as part of the establishment of a FAB or staff from different Service Providers that are transferred to a new FAB environment. Different safety, team and communication cultures may have emerged in different operational environments and this needs to be addressed and resolved.

Experiences (lessons learned)

The implications of the issues will be relevant for all FAB examples but will be more prominent in the cases of merging ACCs or the establishment of a multi-State FAB with staff transferring from different Service Providers.

There is growing evidence that diversity of team and communication cultures, attitudes to work, motivation and commitment and other 'soft' issues can become major factors in team integration and effectiveness and the effectiveness of change implementation. Specific measures to effectively managing these aspects are

needed at local levels to address and involve individuals, working groups and professional groups as part of the management of change.

The impacts of a possible new technical and operational environment established for a FAB on controller workload, trust and acceptance needs to be considered through the timely application of e.g. human factors cases to ensure a successful transition.

10 Area of Interest - Economic/Financial

Introduction

Regulations that bind or influence the pricing practises of providers must, at minimum, not work to distort or impede safety and efficiency of airspace design and organisation. The study by Wilmer, Cutler and Pickering confirmed that economic motivation to resist change was found to be strongest with respect to cross border traffic.

The existing Regulations and the Implementing Rules that are under development as a result of the mandates given to EUROCONTROL have cost implications for the States/ANSPs. Included in the legislation is the requirement for States to implement Functional Blocks of Airspace (FABs) and progress interoperability in accordance with the Implementing Rules.

This mandate has required that the economic and financial issues associated with establishment of a FAB be identified. However, there will inevitably be some overlap with other cost areas as it is not always possible to isolate those specific to the FAB.

10.1 Cost of establishing the FAB

Analysis

The costs associated with establishing a FAB will be largely dependant upon the make up of the FAB itself. A FAB with consolidated service provision on a large multi-national scale would be more costly to implement than an arrangement for cross border sharing of airspace, along the lines of delegation of ATS between two States. Nevertheless, in establishing a FAB of any magnitude there are likely to be costs associated with the:

- Project definition.

- Organisational changes.
- Systems changes.
- Studies and simulations.
- Staff training and if required staff relocation.
- Set-up of facilities for contingency.

It is worthwhile pointing out that when establishing a FAB, costs will be incurred before any benefits are obtained and it may therefore be necessary to secure additional financing.

In all the cases the financial aspects will need to be negotiated by all parties concerned and made part of the agreements on the establishment and implementation of the FAB.

The European Commission commissioned a report on the financing of ATM to achieve a Single European Sky. The report prepared by Steer Davies Gleave²³ includes a section on the costs and benefits associated with the establishment of different models of FABs. This study points to benefits that could accrue through lower operating costs. These were derived from a reduction in the number of ATC sectors needed to operate a FAB. The study assumed a global 20% reduction in sectors and associated operating costs. However, studies and airspace rationalisation programmes in Europe have shown that a reduction in ATC sector numbers is only likely at existing boundaries of ACCs when cross border sectors are introduced.

Lower operating costs are more likely to accrue with better management, associated with added flexibility in the opening/closing/collapsing of the ATC sectors. As better management of sectors can lower operating costs, other substantial savings could also be generated by economies of scale due to consolidation of ancillary services (technical support, overheads...), or to efficient co-ordination in their provision (see also 10.6 on *Cost efficiency*).

²³ Final report on the financing of ATM to achieve the Single European Sky prepared for the European Commission Directorate General Energy and Transport, published August 2004 and prepared by Steer Davies Gleave.

Challenges and opportunities

There should be a level playing field for States/ANSPs to ensure that the method and amount of the additional financing is transparent. If subsidies are made to support the cost of establishing the FAB, via public money, they should be justified and the details published.

10.2 Distribution of costs incurred in a FAB

Analysis

Costs for air navigation facilities and services incurred in a FAB are eligible for recovery from airspace users in accordance with the provisions set out in the SES implementing rules on a common charging scheme and in consistency with the provisions governing the EUROCONTROL Route Charges System and relevant ICAO policies.

Pre-operational costs for the establishment of FABs can be capitalised and subsequently be recovered.

The rules require that the airspace of the member States shall be organised into “Charging Volumes” (CVAs) that are consistent with air traffic control operations. Operational aspects will drive the delineation of the FABs.

The workshops investigated a number of options or models for the organisation of the CVAs. These options are outlined in the table below:

Option/Model	Comments
1- FAB with a single service provider over a single State	<p>This is the simplest model. In term of charging, the FAB can be considered as a CVA or can be included into a larger CVA also covering other portions of airspace (e.g. lower). These other portions can be operated by the same service provider or by different ones.</p> <p>In this latter case, revenue can be attributed to the FAB operator according to the methods explained in model 3-b) below.</p>
<p>2- FAB with a single service provider, over several States</p> <p>a) The FAB operator recovers its costs through route charges</p>	<p>This is also a simple model. Two sub-models are possible :</p> <p>In this model, if the service provider receives services from third-parties (usage of infrastructure...), these third parties will behave as suppliers i.e. bill their customer. The FAB service provider will include the corresponding amounts in its cost base.</p> <p>The FAB will be considered as one charging volume of airspace in its entirety, with a view to charging airspace users for the full service made.</p> <p>However, the States agreeing to establish such a FAB will have to also agree on all necessary commonalities (exemptions, VAT legislation, etc.).</p> <p>It is possible to create several charging volumes in a single FAB, with the objective to be as cost-reflective as possible, if the FAB encompasses several areas</p>

	<p>with different complexities. However, this situation may be complex to manage and may lead to operational distortions, having unintended consequences.</p> <p>It is also possible to include the FAB into a larger CVA, (as in model 1) to avoid distortions with neighbouring airspace.</p> <p>b) the FAB operator is a sub-contractor who will charge its customers (other ANSPs)</p> <p>In this model, the FAB is not considered as a CVA. The service provider will charge its customers (who can also be its share-holders) for the service rendered in the FAB. The distribution of costs may be done as explained in model 3-b) below.</p> <p>These costs will be added to the cost-base of the customers, these ANSPs recovering their costs through route charges for their own charging area, which covers their portion of the airspace serviced by the FAB operator.</p>
<p>3- FAB with several service providers, over one or several States</p> <p>a) although the FAB will be operated as a seamless airspace, services providers will be economically independent</p>	<p>This model will probably be the most complex, two sub-models are possible :</p> <p>In this case, the FAB will have to be divided into separate charging volumes, each with its own cost-base and unit rate. This situation is probably not the best because different pricing regimes may induce operational distortions.</p> <p>Also, it is possible to include each portion of FAB into larger CVAs, as in model 1, to avoid a different distribution of traffic within neighbouring airspace. If</p>

<p>b) Service providers will operate a de facto or de jure common joint venture but will each have their own subset of the common cost base.</p>	<p>this additional airspace is operated by the same services provider operating the adjacent portion of the FAB, there is no need to establish sharing keys.</p> <p>In this case, the FAB will correspond to a single charging volume, but the revenue should be shared between the service providers. States will have to also agree on all necessary commonalities (exemptions, applicable VAT legislation etc.).</p> <p>The revenue sharing may be based on :</p> <ul style="list-style-type: none"> - operational sharing keys (number of controllers, etc.) - financial sharing keys (% of the total cost-base attributable to a service provider applied to the generated revenue) - activity sharing keys (i.e. km controlled or number of service units generated in each subset of the FAB airspace). <p>There are risks associated to each of these types of keys. Some of them may not create a challenging enough environment for the service providers, others may create financial uncertainties that would have adverse consequences for the service provider.</p> <p>Also, it is possible to include the FAB into a larger CVA, as in model 1, to avoid distortions with neighbouring airspace. However, the revenue sharing will in this case become more complex because the revenue sharing will also include the operator(s) of the neighbouring airspace.</p>
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Challenges/opportunities

Economies of scale generated by large FABs and removal of frictional costs are expected to lead to lower charges incurred by airspace users.

For charging purposes, FABs should remain relatively stable for a reasonable period of time (e.g. for at least one year) although they may constitute non-static operational entities by nature, with a life-cycle of their own.

Uniform (charges) conditions of application should prevail within a FAB, in particular concerning exemptions, VAT regime, etc.

Operations will be impacted positively as re-routing of major traffic flows will be easier to implement within a FAB, i.e. regardless of charging constraints.

Legal/institutional aspects will have to be addressed, concerning cross border FABs in particular.

Experience (lessons learned)

The airspace of Belgium and Luxembourg is, for charging purposes, currently treated in a way that could be one of the possibilities foreseen for a FAB (cost-base, unit rate, other conditions of application, e.g. exemptions, revenue sharing).

Other features of a FAB can be identified for the charging of services provided by Switzerland over France, and, in the future, CEATS and NUAC.

MUAC has its own cost base but has no separate direct charging scheme. MUAC costs are distributed to the four participating States, using an operational sharing key (number of controllers manning the sectors). These redistributed costs are added to each national cost-base and recovered through route charges that are levied for each national charging area.

10.3 Financing the FAB - Determine the Charging volume

Analysis

The establishment of a cross border, multi-State FAB will require an agreement between the States concerned, and consultation with other interested parties, such as the European Commission and other Member States. The FAB shall also meet the requirements of Article 5 of the Airspace Regulation. The charging volume or volumes should be agreed as part of this process.

The States themselves will have to agree on the definition of the Charging volumes on a bi- or multi- lateral basis. The volumes could be determined in a number of different ways with lateral boundaries determined by the limits of the FAB. Similarly the vertical boundaries could extend from ground level or from the base level of the FAB. In all cases the volumes and consequent establishment of costs to be recovered, conditions of application and division of the revenues will be part of the agreements between the States/ANSPs.

Operational aspects should prevail when defining Charging volumes. In conformity with ICAO policies, the airspace should not be segmented solely for the purpose of generating revenue.

Challenges/opportunities

CVAs should be sufficiently large and, ultimately coincident with FABs, so as to facilitate flexibility in the usage of airspace independently from charging differentials, keeping in mind the principle of cost relatedness promulgated by the SES Service Provision Regulation.

Whenever a change is made to the boundary of an FAB, for whatever reason, the boundary of the CVA should change accordingly.

It is possible that the further design of airspace according to operational criteria could be inhibited due to the economic consequences of introducing route network

changes. This will occur when the airspace change results in a projected loss of traffic within one of the charging volumes. If a cost recovery scheme was not in place this could result in a projected loss of revenue for the ANSP/State whilst the costs associated with providing a service in the airspace remained the same. This could, as is the case today, lead to reluctance to agree airspace change that adversely affects revenue.

In a similar manner the creation of CVAs in the vertical plane could lead to Flight Level capping implemented in order to ensure that flights are retained in a specific charging volume. This would be at variance with the optimal flight profiles requested by the airspace users.

10.4 Financing the FAB - Determining Revenue Division within a FAB

Analysis

When a FAB is established over the sovereign airspace of more than one State a clear and equitable sharing of revenue must be agreed by the States concerned. This will be exacerbated when there are single or multiple service providers within the FAB.

Prior to the division of revenue the allocation of costs to the service provider(s) within each FAB must be agreed by the States concerned. This will be influenced by the arrangements made for the service provision within each FAB and will as a consequence be site specific.

Challenges/opportunities

Agreements must be reached on the unit rate or rates applicable in the charging volume(s) and on the distribution of that revenue. Whatever method is agreed it must be acceptable to all the States involved and communicated in a transparent manner to other States and the airspace users. This method should be as neutral as

possible vis-à-vis the operations and should not put pressure on the structure of the service with a view to safeguarding revenue or market shares.

The issue of a process and management of the revenue division and cost allocation will need to be addressed. This could be made within the structures already available in each State or could be achieved through the creation of a joint function for revenue collection and division for the given FAB

When the service provision within a FAB remains the responsibility of the States with each responsible for a specified area, then the costs (and revenue) must be distributed equitably amongst those involved. This 'model' would be more complex to develop than an arrangement where a FAB is operated by a single service provider.

The issue of costs for services or infrastructure that is available to the FAB but provided by the States/ACCs below, must also be made transparent and taken into account. These might include CNS infrastructure costs, AIS services, provision of radar etc.

10.5 Financing of lower airspace services

Analysis

Providing service in lower airspace is more expensive than upper airspace service provision. The current charging scheme calculates service units using distance as one of the elements of the formula: therefore, greater income is generated by traffic in the upper airspace where distances are longer but where the costs of providing the service are lower than those associated with lower airspace.

Challenges/opportunities

If Charging volumes are defined by dividing the airspace into upper/lower, operations/flight levels requested may be impacted if there are significant differences

between the costs in the different charging volumes. One of the aims of ATM planning is to ensure that the optimal flight profile is taken into account when designing the airspace architecture. However, for day to day operation the aircraft operators will make their decision on the optimal profile and requested FL based on the airspace costs, fuel and other economic influences. In circumstances where there are significant differences between the costs of various charging volumes the airspace user may wish to avoid or limit the distance flown in certain volumes of airspace.

The creation of FABs (and CVAs) in the upper airspace could increase the cost-relatedness of charges. Users would pay charges that better reflect the cost incurred by ANSP for providing the services²⁴. However a move towards more cost related provision of service would not necessarily be compatible with a sound charging policy.

Imposing a high unit rate on lower airspace would impact a specific group of operators whilst offering no alternative. It should be strongly stated that the objective of the SES is not to penalise any segment of the market, but on the contrary to offer additional opportunities, to create additional capacities and to lower the overall cost of European ATM.

Furthermore, there may in certain parts of European airspace be sound operational reasons for extending FABs or CVAs below the upper airspace. The capacity problems and the safety issues are very much linked to approach phases and to climbing /descending movements.

Current cross-subsidies have some advantages and their continuation may need to be considered and agreed when establishing a FAB. In accordance with the SES Service Provision Regulation [15(2)(d)], the cross- subsidy is allowed when justified for objective reasons, and is subject to clear identification.

The benefits that might accrue due to economies of scale may be greater if the FAB extends downwards below FL 285 into the lower airspace. The extension of a FAB

²⁴ See SPR article 15(3)(d) relating to cost-reflectivity requirements

to meet or include all or part of the lower airspace could reduce transition costs and administrative overheads.

As FABs should be based on air traffic flows and operational needs, the EUROCONTROL route charges system will be adapted: it will not prevent this optimisation, and in particular will not impose artificial separation of cost and revenues between upper and lower ATS-provision. Also, this route charge system will have to cope with configurations where more than one ANSP is involved (i.e. there may be different ANSPs for upper and lower parts of the airspace).

10.6 Cost efficiency

Analysis

Increased cost efficiency is expected from the creation of FABs. Establishing a large FAB would in theory generate cost reductions through economies of scale and removal of frictional costs (see 10.1 *Cost of establishing the FAB*).

Cost efficiency for the service providers should also come from:

- a) Benefits of reducing the fragmentation of the airspace, leading to better performance and to additional capacity;
- b) Reduction of costs due to synergies between ANSPs and co-ordination or consolidation of ancillary services. This could include the harmonisation or consolidation of ATC training, met services, ATC systems, R&D costs and AIS services.

The airspace users might reasonably expect to gain additional efficiency and cost savings through a reduction in delays and in charges.

Challenges/opportunities

The establishment of pan-European FABs offers an opportunity to review all aspects of the European aggregated cost-base with a view to streamlining it.

In particular, there are four avenues to be explored:

- FAB operators should make use of existing infrastructure and services under agreements with other ANSPs, in order to avoid any duplication.
- Ancillary services should be re-examined, to promote co-operation, complementarities and to decommission all duplicated activities at European level.
- There may be additional synergies and a more effective seamless service if services providers apply a single set of rules. The development of a common Operating Manual and common Standard Operating Procedures is a source of increased efficiency.
- Future investments may be jointly studied, developed and implemented. R&D programmes may be co-ordinated and their results shared, to avoid any duplication of effort.

The establishment of a FAB may lead to staff redeployment, from service providers losing activities to others gaining responsibilities for FAB. This redeployment, even in the public sector, is not a new concept.

A costs/benefits analysis is a prerequisite to the establishment of a FAB. Guidelines could be written by EUROCONTROL to assist Member States in performing such an analysis. These guidelines should comprise a proposed methodology (including defining amortisation principles), a compilation of possible elements of costs and benefits and a synthesis on best practices.

Where applicable, independent economic regulation may be a powerful tool to set-up objectives and create incentives for the improved performance of ANSPs. However, even in the full cost recovery regime, the service provision regulation provides for the definition of incentives aimed at promoting cost-efficiency.

11 Impact Assessment

Introduction

This impact assessment responds to section 5.2 of the Mandate from the European Commission to EUROCONTROL to support the establishment of Functional Airspace Blocks (FABs), by giving an assessment of:

- 1 The impact of the identified FAB issues on States, ANSPs, airspace users and institutional bodies, with particular consideration of the areas of safety, responsibility/liability, civil/military coordination and air navigation charges.
- 2 The impact on and interactions with other areas of the Single European Sky package.

11.1 Impact of the identified FAB issues on States, ANSPs, airspace users and institutional bodies

Operational Impact

Improvements in terms of operational efficiencies can be expected throughout the ATM system. Such benefits should translate into tangible economical benefits for the airspace users. Until such time as clarity with respect to what exactly FABs will be in the future materialises, it will not be possible to quantify, in concrete terms, the magnitude of the impact from an operational perspective.

Mechanisms exist however for the analytical examination of proposals for modifications to the pan-European ATM network, for the purpose of deriving quantified measures of the improvements which would result from the adapted airspace structures. As a function of the co-ordinated airspace adaptations which States will undertake, impacts could be measured for the purpose of ensuring

coherence in terms of providing tangible evidence of a sustained pan-European positive impact evolution.

In terms of ATC operations, it is expected that FAB establishment will eventually lead to a homogeneous operational environment in terms of ATC procedures (including separation minima and harmonised conditions for inter sector/centre control transfer) that will show marked benefits as regards to safety and capacity. An improved homogeneous operational environment could as well facilitate a harmonisation of the various present-day methodologies for the determination of sector capacities, which should represent a positive impact for the exploitation of the pan-European network.

To the extent that the requirements of the military make possible, it is expected that the FAB establishment processes which will promote a harmonisation of the civil/military handling and co-ordination procedures (i.e.: OAT/GAT) will provide a positive contribution to safety and ATC workload.

The FAB establishment processes which promote a wider sharing of CNS infrastructures within ACCs/UACs of a FAB should also provide a positive impact in terms of supporting common ATC procedures and inter-sector/ACC control transfer conditions.

Technical Impact

National Supervisory Authorities (NSAs) will need to ensure that safety cases are in place and adequate for any new facilities and equipment commissioned.

Close collaboration will be needed between all ANSPs participating in the upgrade of technical facilities in support of FAB-wide objectives, particularly for common or shared equipment. This will affect most aspects of the procurement lifecycles and details will need to be agreed for each participating ANSP. Aspects include:

- Investment plans with cost apportionments for each ANSP.
- Cost-benefit cases for the overall FAB and for each ANSP.
- Project management

- Integrated planning and steering.
- Responsibilities (and liabilities).
- Resources for testing, engineering training, maintenance .

Evolution of the FAB will probably be planned in line with the evolution of the surrounding infra-structure, e.g. Mode S, air-ground data-link. However, some of the operational changes planned could force early improvements to some aspects such as the communication infrastructure.

Collaborative investment and procurement may be needed for both civil and military ANSPs. Instances of particular relevance for the military are:

- Cross border service provision.
- Introduction of interoperable facilities for civil military situation awareness and negotiated airspace crossings; particularly in situations where the military training areas themselves may be rationalised across national borders.

EUROCONTROL, EUROCAE and various industry consortia are already involved in the development of interoperability standards and associated specifications. Some of these standards may create a need for updates to international specifications such as those produced by ICAO. However, if necessary, this will be initiated at a European level rather than for each FAB.

Social Impact

The social impacts associated with a FAB are strongly related to the actual format and arrangement of a FAB and hence cannot be considered in isolation from a legal and institutional FAB framework. Of immediate importance is the question whether a FAB will be a multi-State enterprise involving different service providers and regulatory authorities or not and hence whether it requires the establishment of common rules and principles on important social aspects.

As a basic principle, social issues upcoming in a FAB will be dealt with in accordance with existing national and European Community law and social partners' framework.

There is no obvious need for establishing a specific new regulation or framework for the ANS sector.

The establishment of a FAB will hence be governed and influenced by existing legal, institutional and organisational conditions and requirements also in regard to social aspects of importance. From a social perspective five areas are considered important and are analysed and assessed in this document in regard to their impacts for establishing a FAB: information and consultation between social partners; employment and working conditions; staffing arrangements; training licensing and competence requirements and human factors and cultural aspects.

As regards information and consultation between social partners the type, nature and content of the social dialogue process and the appropriate representation of legitimate interest groups are key factors for consideration in a FAB. Establishing the appropriate processes and means in the case of cross border or trans-national FAB and / or the involvement of non-EU member States may require adaptation to derive at an appropriate solution.

The establishment of appropriate common employment and working conditions for a FAB in line with the needs of the industry and existing national rules and principles may be one impact of a FAB. It will be the responsibility of the States that participate in a FAB to define and establish the rules and principles in coordination with the involved service providers.

Staffing arrangements for a FAB may have direct or indirect social implications for employees of participating ANSPs as well as impacting ATS capacity. The financial and cost impacts of the staffing arrangements for a FAB will need to take account also the staffing requirements for the other services and units of participating service provider organisations.

The implications of a FAB in regard to competence and training requirements and on FAB unit endorsements are obvious and will be done in compliance with existing national, European or international regulatory requirements. Differences in the adopted practices and / or standards as part of the culture may be impacting on

training requirements. Also here the financial and cost impacts of training and licensing of staff in particular in the changeover period but also in the longer term need appropriate reflection.

Finally, the impacts of establishing a FAB on safety culture, on social cohesion and team performance and the adaptation of the working environment and methods may be of importance especially if operational cultures are to be merged.

Legal/Institutional/Organisational Impact

The legal and institutional key issues identified cannot, in most cases, be considered in isolation. The strong relations between the legal and institutional issues and the operational, military, social and safety ones will need to be taken into account when establishing the appropriate legal framework for the creation of a FAB. The final configuration of a FAB will also determine the interactions between the different issues and it is therefore difficult at this stage to identify clearly the exact impact between the areas of interest underlined in the report.

The establishment of a FAB will be influenced by the requirements established by the SES legislative framework (e.g. certification, designation and the common requirements Regulation) and other national and international sets of rules. Most of those requirements (and their legal impact on the establishment of a FAB) are already reflected in the key legal and institutional issues identified in the report.

From a legal and institutional perspective, it is however important to assess and underline the impact which the establishment of a FAB will have from a responsibility and liability perspective.

With respect to responsibility/liability, the establishment of a FAB will affect all parties involved in a FAB. The level of impact will most likely depend on the complexity of a FAB, be it in terms of the number of parties involved or in terms of operational complexity. For clarification, it should be noted that “liability” is a legal consequence of “responsibility”.

The general principle governing the responsibility of sovereign States for the provision of Air Navigation Services is embedded in the Chicago Convention, Articles 1 and 28. The SES Framework Regulation recognises the rights and obligations of Member States under the Chicago Convention. This also applies in a FAB. Consequently, States remain ultimately responsible for the provision of ATS in their part of the airspace in a FAB (for both their service provision and associated regulatory responsibilities).

For this reason, in multi-State FABs, States will have to conclude a number of agreements to adequately address the consequences of their individual responsibility as referred to above. These Agreements pertain to the key issues identified for the Legal and Institutional Area of Interest in this report, such as the establishment of a FAB, joint designation, supervision, regulatory environment and – as a specific expression of State sovereignty - military requirements.

The required legal agreements for FABs mentioned above are only partly addressed by the SES regulations: Article 5.4 Airspace Regulation (establishment of a FAB); Article 2.3 Service Provision Regulation (supervision in a FAB); Article 8.4 Service Provision Regulation (joint designation). These provisions do not address, for example, the regulatory environment within a multi-State FAB, in particular with regard to operational rules, the issue of military requirements, accident/incident investigation, withdrawal from a FAB and liability/insurance. It remains the responsibility of States to ensure that those aspects are adequately addressed in a FAB.

In addition to the relationships between the States (and with respect to supervision, between the NSAs they have established or nominated), a number of arrangements with the ANSPs will have to be addressed in a FAB. Of particular importance will be the issue of liability, as the arrangements between the States and between States and air navigation service providers may need to reconcile, *inter alia*, different liability concepts under national law. This will be particularly relevant in the context of joint designation and supervision, even more so if more than one ANSP was involved.

The consequences for ANSPs must therefore be considered. The impact of the establishment of a FAB on the ANSPs involved will be a (vertical) reflection of the (horizontal) agreements between the States. It remains to be seen in what (legal) form the issues will be addressed between the States and the ANSPs in a FAB. This will depend on the State Agreement as well as possibly on the relationship between the States and the service providers and the status (state-owned, corporatised, privatised) of the service providers. It is of particular importance that the line of responsibility is clearly addressed between the States and the ANSPs in a multi-State FAB, also noting that the Service Provision Regulation provides the possibility of ANSPs to avail themselves of the services of other ANSPs.

In the liability domain, this would entail inter-party agreements on e.g. recourse arrangements, indemnification clauses, etc. The potential financial impact of these liability arrangements between the players in a FAB should also be underlined. The liability arrangements could result in a rise or decrease of insurance fees caused by, for example, changes in the limits of indemnity.

Military Impact

The establishment of FAB should contribute to a more integrated operating airspace thus achieving maximum capacity and efficiency of the European air traffic management network. Within the same airspace, commercial interests of the civil aviation will need to be balanced against diverging military operational demand and new training scenarios of the national Armed Forces.

The different nature of military operations will often demand specific procedures, special handling and support to be provided by the ANSP(s). Therefore, the modification of sectors and sector groups should focus on operational requirements of both, civil and military airspace user. Existing military route networks, temporary reserved portions of airspace, refuelling anchors etc. need to be considered accordingly, but might also be subject to further optimisation within a FAB regarding their present location, layout or activation procedures.

Existing national security and defence interests must be taken into account. Based on the agreements reached between Member States, FAB concepts of operation will have to cope with the provision of national air policing functions including priority regulations and unrestricted access to national portions of FAB airspace. If necessary, rules for State aircraft entering other States' sovereign airspace need to be amended accordingly.

Agreements at State level may require legal provisions or regulations to enable foreign military aircraft to operate on other States' territory. In some nations there might be legal restrictions regarding other nation's military operations over their territory or active military ATS/ATM operational staff executing their duties in another State.

The service provision in a FAB will not only affect civil ANSP(s), but will also have an impact on national military organisations, military staff and air traffic service provision by military units. With respect to the Social Area of Interest, more detailed investigation and assessments by the military authorities of the Member States may be necessary.

Military representatives shall contribute to the collaborative processes dealing with airspace planning, airspace design and airspace management activities. Military experts should participate in supporting activities like the required safety case study. Furthermore, cost-benefit analyses on FAB should not only be performed by the respective civil organisations but could ideally be the result of a joint civil/military assessment. Thus, there is an impact not only on the Operational area, but also a relationship with the area of Economic / Financial issues.

According to the Interoperability Regulation, account should be taken of national security requirements. Besides co-operation and co-ordination with national Air Defence organisations, further studies will be necessary to cover security and consistency of military flight plan data or contingency measures for the uninterrupted provision of ATM services. Thus, there is a military impact on the Technical Area of Interest regarding interoperability with military systems and infrastructure.

Economic/Financial Impact

Inasmuch as the Airspace Regulation requires that the establishment of FABs “be justified by their overall added value.” positive economic and financial impacts are expected. It is therefore not foreseen that States will undertake FAB implementations which do not provide for an added value.

Quantified definition of the actual economic and financial impacts of FAB implementations will be a direct function of the evolving FAB implementation planning.

11.2 Impact on and interactions with other areas of the Single European Sky (SES) package.

From a technical point of view, the implementation of FABs interacts with the SES Interoperability Regulation, because it requires the use of automatic data exchange for co-ordination and transfer. Cross border service provision requires the use of automatic data exchange for the notification of traffic information and, in some instances, ATS route crossing between civil and military elements. Data exchange facilities, including a standardised communications infrastructure, would need to be addressed in the appropriate interoperability rules in support of these functions. The design and management of the airspace will be impacted by the Implementing Rules on Flexible Use of Airspace and Airspace Design. Similarly, Implementing Rules under development on the Charging Scheme will provide the framework for further work on the costs and revenue division within a FAB.

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Annexes

- 1) Safety Case Development
- 2) Summary report of the first Informal Consultation
- 3) Summary report of the second Informal Consultation
- 4) Summary report of the third Informal Consultation
- 5) Common general principles submitted by Stakeholders
- 6) Key expectations from CANSO, IATA, JATMWG and NATO
- 7) List of acronyms

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Annex 1

Safety Case Development

Further to the issues raised in paragraph 3.1, Safety Cases for FAB should address, as a minimum, key points set out below.

Aim

This should state clearly and simply what the Safety Case is trying to show, and should be directly related to the Claim (see below) that the FAB in question is *safe* – i.e. it is free from *unacceptable* risk (see below).

Purpose

This should explain why is the Safety Case being written, and for whom. The primary purpose should be to give assurance to the ANSPs responsible for the ATM service in the FAB (these need to be identified) that it is safe, with a secondary purpose of obtaining regulatory approval from the relevant bodies.

Scope

This should explain, as a minimum:

- what the Safety Case covers (and does not cover);
- boundaries of responsibility with respect to managerial control and relationship with other stakeholders;
- relationship with other Safety Cases, if applicable;
- applicability and compliance with safety regulations and standards – e.g. ESARRs, ICAO requirements etc.

Safety Criteria

These should define what is meant by *safe*, by defining what is meant by an acceptable level of risk (see above). Such criteria might require one or more of the following:

1. The risk of an accident or incident, following the introduction of the FAB, to be less than a level of risk as defined in accordance with ESARR 4
2. The risk of an accident or incident to be no greater (and preferably less) than before the FAB was introduced.

3. The risk of an accident or incident to be further reduced as far as reasonably practicable.

Criteria #1 and #2 each represent the minimum (or *tolerable*) level of risk which in either case, when coupled with criterion #3, would define an *acceptable* level of risk. The main difference between #1 and #2 is that the former implies an absolute Safety Argument whereas the latter implies a relative Safety Argument. Furthermore, #1 requires a quantitative approach in all cases whereas #2 may be based on either a quantitative or qualitative approach, or a combination of both.

Context

It is vital to fully describe the operational environment to which the Safety Case applies and the service / system configuration on which the Safety Case (and underlying Safety Analysis) is based.

The description of the Context should include:

- the purpose of the FAB from a safety perspective;
- the interfaces with other airspace / systems including people, procedures and equipment;
- the operational environment – including all characteristics that may be affected and elements that are relied upon, when assessing acceptable levels of safety;
- A Concept of Operations that explain how the ATM service in the FAB and adjacent airspace, is intended to operate.

Argument

The core of the Safety Case should be a reasoned and well-structured hierarchical Safety Argument showing how the Aim is satisfied.

It should start with the top level Argument (or Claim) that the FAB is safe – as defined by the safety criteria – and then be decomposed into a set of principal Safety Argument such as:

- The Concept is safe in principle – i.e. subject to correct implementation. This Argument would be based on the fact that safe has been defined and that a necessary and sufficient set of Safety Requirements (covering airspace,

people, procedures, training and equipment, as applicable) for Implementation of the Concept has been derived.

- The Implementation has been done completely and correctly – i.e. fully satisfies the Safety Requirements. Typically such an Argument would be subdivided into design and realisation of the design as appropriate: e.g. for airspace changes most of the Implementation evidence would come at the design stage, from airspace design and simulation results, whereas for equipment evidence would come from both design analysis and testing.
- The Migration of the ATM service from the current airspace structure to the FAB structure would not be a significant safety risk to the on-going service provision.
- In-service Safety Monitoring of the FAB will be carried out to measure the achieved level of safety, to report and investigate all FAB-related incidents and to put in place corrective action to prevent recurrence of such incidents.

Evidence

Complementary to the Safety Argument is the provision of supporting Evidence to substantiate each branch of the Argument.

Safety Evidence is information, based on established fact or expert judgement, which is presented to show that the Safety Argument to which it relates is valid (i.e. true).

Caveats

Caveats are any conditional statements that might limit the validity of the Safety Case. They usually fall into the following categories:

- Assumptions on which the Safety Case depends;
- any Issues that must be resolved before the Claim can be considered to be valid, together with the responsibilities and timescales for clearing them;
- Any Limitations or restrictions that need to be placed on the deployment and/or operation of the “system”.

Conclusions

The conclusions should include a simple, clear statement to the effect that the Aim has been satisfied, within the defined scope, and subject to the stated Caveats.

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Annex 2

Functional Airspace Blocks (FABs)

Summary Report of the

EUROCONTROL First Informal FAB Workshop

*Hemicycle Conference Centre,
Luxembourg, September 28 – 29, 2004*

The workshop was organised into six (6) sessions, each of which addressed a particular FAB “area of interest” as regards implementation of FABs. The workshop was attended by 109 stakeholder representatives. In addition, staff from EUROCONTROL attended as a function of the workshop programme.

GENERAL

It was stated several times during the workshop that there was a requirement to define what a FAB is. It was found difficult to enter into detailed discussions with regards specific requirements unless there were to be a better understanding of what actually constituted a FAB. It was recognised that the mandate did not ask for a detailed definition of FABs. The objective of the FAB Mandate was to stimulate and collate stakeholder input from, among other means, a series of three (3), large-scale, informal workshops, so as to support the EUROCONTROL Agency’s development of a FAB inventory of key issues.

Two other main points stressed by the participants were:

there can be no single blueprint for FABs (i.e.: they can take many different shapes and forms), and
the establishment of FABs is expected to be a phased implementation rather than a big-bang development.

SESSION 1 – ECONOMIC and FINANCIAL ASPECTS

Concern over the cost on ANSPs with regard the developments of FABs was expressed. The European Commission representative advised that provisions for EC funding exist and that after 2005 there is expected to be a significant increase in the means available for support to developments required by the SES.

The need for a rigorous cost benefit analysis, including all different “sorts” of cost (including, for instance, costs related to human factors issues) was stressed. The possibility of a common cost benefit analysis model to be employed for all FAB development work was proposed. As well, the possibility for some financial considerations (e.g.: reimbursements) to military authorities incurring indirect costs in support of FAB implementations, was discussed.

If the FAB was to become a “charging volume”, this would affect the funding of air traffic services in the lower airspace. The European Commission representative advised that States may decide to go lower than FL 285 with their FABs, and that any cross-subsidy is possible as long as it is transparent.

SESSION 2 – TECHNICAL ASPECTS

Before it would be possible to provide detailed answers as to what level of technical interoperability were to be required for the establishment of FABs, there was a need to develop a common FAB “concept”. Only when such a concept had been developed and agreed would it be possible to determine the minimum requirements on technical interoperability within a FAB.

SESSION 3 – OPERATIONAL ASPECTS

It was stated that a common set of general principles is an essential pre-requisite for the delineation of FABs. Following the European Commission statement that a second mandate on FABs (intended to propose common general principles) would not be issued until 2006 at the earliest, concerns were expressed over the possibility

for States to establish FABs without the necessary tools to be able to do so. It was explained that principles could be agreed although it would be beneficial to try them before they were transformed into community law.

Although the workshop agreed the need for a set of common principles, it was expressed by one participant that there may not however be a need for a common methodology for the establishment of FABs.

The importance of civil/military cooperation at all levels in achieving increased airspace efficiency was stressed. A question was raised concerning efficiency gains that can be expected from the establishment of FABs.

A requirement for common rules and procedures were expressed.

SESSION 4 – SOCIAL ASPECTS

It was explained that EUROCONTROL does not seek to interfere in social dialogue, but instead is merely seeking to address the tasks as described in the mandate. It was stressed that the means to address, or mitigate, social impact would be included in the final report of the mandate.

The European Commission representative explained that a study is launched, generated by the Social Dialogue and financed by the European Commission, examining the social impact of SES implementation.

A fear that FABs would cause rationalisation of ATC facilities with a resulting high degree of social impact prompted discussion. It was however expected to be unlikely that there would be a reduction in the overall number of controllers in Europe. It was also concluded that FAB social issues would vary significantly depending on which model was being used in the establishment of FABs. It was stressed that much of the uncertainty and fear of change arising from the discussions, stem from a lack of clarity surrounding the question: “What is a FAB?”.

The so-called “bottom-up” approach was discussed and it was clear that the definition of bottom-up differs with respect to the differing perspectives of the various

stakeholders. The European Commission representative explained that they considered States as being the ones responsible to propose FABs, thus for the European Commission this constituted a bottom-up approach.

SESSION 5 – LEGAL/INSTITUTIONAL ASPECTS

The arrangements between the U.K. and the Netherlands over the North Sea as well as the arrangements for Maastricht UAC were presented as possible examples which could assist in the FAB discussion.

The legal implications regarding the application of ICAO Standards when establishing a FAB over the High Seas were raised in the discussion.

The question of liability and a possible harmonisation of liability regimes as regards the provision of ATS in a FAB were also raised. The European Commission representative stated it was premature for the Commission to introduce a harmonised liability regime but this was something that could be looked into at a later stage. The need for a pragmatic approach to liability was underlined.

It was noted that in certain cases existing agreements between States on cross border service provision addressed liability issues. However, it was also noted that in many cases the necessary agreements between States do not exist and that the necessary liability provisions are lacking. In this context the questions of insurance and the maximum limit of liability covered by insurance companies were touched upon briefly.

Further to a question, it was clarified that the FAB concept, as it is set out by the Airspace Regulation, should not be considered as “a legal entity”. It was highlighted that a FAB could be implemented through different legal and institutional structures. The need for flexibility was mentioned.

The work already undertaken with respect to legal and institutional aspects of cross border service provision by EUROCONTROL was underlined. The work of this group as well as the information it has gathered regarding existing cross border arrangements will be helpful for the development of best practices. The European Commission representative welcomed this idea.

SESSION 6 – MILITARY ASPECTS

Agreements at Member States' level should form the basis for supplementary arrangements between the competent civil and military authorities in order to ensure a balanced consideration of economical and defence requirements. The value of enhanced civil/military cooperation was stressed.

There is a need to consider national military interests from the start in the development of FABs. The European Commission representative explained that it had no competence with regards military issues, but that EUROCONTROL, being a civil/military organisation, was in a position to take all military aspects into account. It was confirmed the final report would address the military requirements.

The European Commission representative stated that EC funding could be made available for the relocation of military bases. The FAB concept however, is in itself an opportunity for closer collaboration between civil/military operations, as such providing the opportunity for the Military to use sufficient airspace dimensions as required for operations and training.

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Annex 3

Functional Airspace Blocks (FABs)

Summary Report of the

EUROCONTROL Second Informal Workshop on Functional airspace Blocks

*Hemicycle Conference Centre,
Luxembourg, November 22-23, 2004*

The second informal workshop on Functional Airspace Blocks was organised into six (6) sessions, each of which addressed a particular “area of interest” as regards implementation of FABs. The workshop was attended by 154 stakeholders.

Introduction

In his opening address the Chairman, Mr A Hendriks, Head of the AFN BD EUROCONTROL, welcomed all participants and reminded them of the outcome of the first informal workshop where much of the discussion had concerned itself with the fact that the definition and possible composition of a FAB was not sufficiently clear for the identification of significant issues. Nevertheless, many of concerns and items had been raised and this had provided material for further work to take place.

General Presentations

In his opening presentation the Chairman indicated that since the first workshop a series of focused Stakeholder meetings had been held using existing EUROCONTROL working arrangements where possible. These meetings discussed and refined the issues raised at the first workshop and assisted EUROCONTROL in preparing the supporting material for the second workshop and the development of three conceptual examples of FABs, designed to stimulate further discussion. The examples were not EUROCONTROL proposals of how a FAB could be structured,

nor where they suggestions of models that States could follow. They were merely presented to facilitate the consultation process by illustrating situations that States/ANSPs would be faced with under certain circumstances and using the situations to identify the issues.

The Chairman then outlined the progress of the FAB mandate work and indicated the ongoing activity that would continue after this workshop

Mr Torsten Klimke, European Commission, in an opening presentation, responded to a number of points made to the Commission in the last few months. This included: the legal status of military operations and training in the Single European Sky (SES) Regulations; feedback from a number of States on initiatives taken towards FAB implementation; a review of CEATS and MUAC arrangements to ensure compliance with the SES Regulations; the funding available to support projects through TEN-T: a reminder that a number of the identified issues already exist and are solved by States creating the opportunity for a 'compendium of best practices' to be drawn up; and finally he raised a number of open questions that need to be addressed.

This was followed by a presentation by Mr A Hallgren, EUROCONTROL, detailing the three examples of conceptual FABs that were presented to facilitate discussion. The example FABs were all built from more than one ACC and helped to illustrate that there was no single blueprint for a FAB.

After the three opening presentations the workshop was invited to raise any issues of a general nature. The Chairman pointed out that items directly related to the six areas of interest should be kept until the appropriate point on the workshop agenda.

The key issues raised under this general discussion were:

- The mandate from the European Commission is to identify issues not develop Implementing Rules.
- Social dialogue is key to the successful implementation FABs.
- The involvement of the military partners in developing FABs is paramount .
- Consolidation of service provision is one of the overarching aims of the SES although it is not specifically mentioned in the Airspace Regulation.

SESSION 1 – OPERATIONAL ASPECTS

Mr H Matthiesen, EUROCONTROL, presented the outcome of a focused Stakeholder consultation meeting held in Brussels on 28/29 October. He pointed out that the meeting had identified a number of issues which were clustered under eleven main headings. Each was described to the workshop after which discussion focused on each specific issue in turn. A number of queries requesting clarification of the text were raised. In addition, some suggestions were made to amend the text used in the slides. These were accepted but are not included in the summary below.

The significant points raised under the Operational agenda item were:

- Any development of 'Common General Principles' should be sub-divided into various component parts.
- Cost Benefit should be included as an issue.
- Every FAB will have an optimum size and that this will be site specific.
- Responsibility for a 'block' of airspace could be ceded to an adjacent FAB under specified conditions.
- The advantages of extending FABs below FL 285, particularly in airspace heavily influenced by major airports, should be investigated.
- The responsibility to develop FABs lies with the States and it is incumbent on each State to include all the relevant stakeholders.
- Harmonisation of operational procedures and rules within a FAB would be an ultimate aim.
- Strategic long term planning (e.g. capacity planning for sector groups) should be made at the FAB level whereas the ACCS are best placed to fulfil the tactical tasks connected with ATFCM.

SESSION 2 – TECHNICAL ASPECTS

Mr A Hill, EUROCONTROL, presented the outcome of a focused Stakeholder consultation meeting held in Brussels on 29 October where the meeting discussed two main topics namely the minimum technical requirements to create a FAB and the management of the evolution of the technical facilities.

The significant points raised under the Technical agenda item were:

- The operational concept for contingency within a FAB would need to be defined before the technical consequences could be investigated.
- The airspace user will expect to receive a seamless service within the FAB. This supposes identical procedures that need to be supported technically.
- The mandatory section of the interoperability Implementing Rules may be sufficient to give a minimum requirement for the initial implementation of FABs.
- Additional interoperability is under development which will lead to more comprehensive community specifications.
- Whether this interoperability will be needed for a FAB depends entirely on the operational roadmaps of the FABs concerned. The States need to confirm whether additional regulation is needed.
- Uniformity of separation standards within a FAB may not be desirable. Different standards justifiably exist today for good safety reasons.

SESSION 3 – MILITARY ISSUES

Mr H Bekeschus, EUROCONTROL, reported on the outcome of an informal consultation meeting between the Military Business Division and some national military Stakeholders. In his presentation he listed the key issues and identified the opportunities and challenges that each presented in establishing a FAB. Each issue was then and related to the three examples.

The significant points raised under this agenda item were:

- Contingency measures in crisis situations (hijack, etc.) must be addressed.
- The environmental consequences of military operations in a cross border FAB may need to be addressed.
- Criteria for certification of military service provision could be developed in the future. Responsibility for this rests with the Member States.
- Multi-lateral agreements will be necessary for centralised management of the airspace to work effectively.

- Any civil/military concept should be signed by all the civil and military partners.
- Guidelines to assist States in the development of FABs with multiple civil and military partners would be beneficial.
- TEN-T funding is available for military purposes.
- Military involvement and representation in SES remains unclear.

SESSION 4 – LEGAL ASPECTS

Mr D Stoplar, UK CAA, presented the legal and institutional aspects of FABs and reflected the outcome of a focused Stakeholder consultation held as part of the 16th Meeting of the Task Force on the Delegation of ATS (TFDATS) in Brussels. He outlined the key legal issues and stated that they did not constitute “insurmountable problems”.

The significant points raised under the Legal and Institutional agenda item were:

- The Legal and Institutional Issues are similar regardless of the size of a FAB. However they would take longer to resolve in large complex FABs.
- The Legal issues should be viewed as a means to facilitate the establishment of FABs.
- All Air Navigation Services are subject to certification, but ATS providers must be designated by States.
- Integration could take place in those areas that are not subject to designation (e.g. AIS).
- Safety is paramount when establishing a FAB.
- Confidence from the workforce is crucial and one way to assure this is through a common legal approach to social aspects
- Detailed certification requirements will be required when an ANSP based in one State provides a service in another.
- Differing rules/procedures should be addressed in the respective agreements.
- Compliance monitoring with the common requirements is a function of the National Supervisory.

- A non-punitive safety scheme/culture (A Just Culture) should apply within a FAB.

SESSION 5 – ECONOMIC ASPECTS

Mr D Renaud, Skyguide, presented the outcome of a focused Stakeholder consultation meeting held in Brussels on 8th November. The meeting had restricted its scope to the charging aspects of a FAB as the economics of setting up of a FAB were addressed by a study on financing of ATM to achieve a Single European Sky, published by the European Commission in October.

The significant points raised under the Economic agenda item were:

- Lower airspace services, due to the nature of the traffic and task are more costly.
- Cross subsidy of service provision in the lower airspace may be required for the foreseeable future.
- Economies of scale remain unproven. However there are areas where consolidation of ATC training, Met etc should bring economic benefit.
- Charging solutions are considered a matter for the individual States.
- The Airlines expect to see evidence of rationalisation of ATS in Europe in the coming years.
- The Charging scheme can impede airspace design. The cost recovery system ensures that the State recovers the costs, but this can result in a rise of the unit rate with the operators avoiding more expensive airspace. In the long term the State is forced to cut costs.

SESSION 6 – SOCIAL ASPECTS

A Skoniecki EUROCONTROL introduced this item by detailing the work programme and reminded the workshop that the mandate was to highlight the issues not to propose solutions or identify individual responsibilities. As part of the work programme a focused Stakeholder consultation meeting had been held in Brussels

on 28 October and one of the participants, Mr R Schwenk, DFS, then presented on the outcome.

The significant points raised under the Social agenda item were:

- Norway had recent experience of closing ACCs and alerted the workshop to the serious social challenges this presented.
- International Labour Laws, which include ATC, must be considered in developing social agreements.
- A 'Lessons Learned' document could be developed so that methods and processes acceptable to all social partners can be identified. However, this should not include possible solutions.
- The Airspace users have experienced changes to their business and working practises and would be happy to contribute in any further discussions.
- The year 2009 assessment point and will have no bearing on established social dialogue.
- Responsibilities are not entirely clear. The work on this mandate must not jeopardise the social dialogue already established between the Trade Unions and CANSO.

In concluding the workshop the Chairman thanked all the participants for their contributions. The inputs would be used in the drafting of the final report which will be presented to the next FAB Workshop in February 2005. The European Commission representative reiterated these thanks and indicated that progress was being made and that there was a growing acceptance of FABs.

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Annex 4

Functional Airspace Blocks (FABs)

Summary Report of the

EUROCONTROL Third Informal Workshop on Functional Airspace Blocks

*Hemicycle Conference Centre,
Luxembourg, February 17-18, 2005*

The third and final informal workshop on Functional Airspace Blocks was held in the Hemicycle Conference Centre, Luxembourg, on the 17th and 18th of February 2005. The workshop was organised into seven (7) sessions, each addressing a particular “area of interest” as regards implementation of FABs. The workshop was attended by 155 stakeholders.

Introduction

In his opening address the Chairman, Mr A Hallgren, AFN EUROCONTROL apologised on behalf of Mr A Hendriks, Head of the AFN BD and Mr Torsten Klimke, European Commission both of whom were unable to attend. Mr Hallgren welcomed all participants and updated them on the progress of the mandate. Since the last workshop a series of focused stakeholder meetings had been held that had provided valuable oral and written input. This had enabled the further development of the material presented in the binders and sent out on 2nd Feb. He pointed out that the draft final report contained some duplication of text and will be abridged before it is presented at the next ANT meeting. The participants were reminded of the timescales for the next phase of consultation:

Final date for comments to fab.mandate@eurocontrol.int 23rd Feb 2005

Amended version of the report posted on EUROCONTROL website 1st Mar 2005

ANT/36 meeting 8-10 Mar 2005

Following a summary of the two previous workshops, the Chairman outlined the aims of this one, namely to: facilitate further dialogue and an exchange of views, provide input to the sections in the draft final report covering the main areas of interest and confirm the key issues.

Presentation of the draft final report

An outline of the draft final report was presented by Mr K Harvey, EUROCONTROL. The report contains eleven sections with sections 4-10 providing the core material. A brief description of the contents was made. During the discussion on the draft report the possibility of creating a 'checklist' that States could refer to when implementing FABs was raised. Although not part of the mandate, EUROCONTROL agreed to investigate this further. The issues raised under this general discussion were:

- Expectations and future actions of the European Commission in regard to this final report.
- The timeframe for the issue of a mandate to develop Common General Principles.
- Development of an Implementation checklist.

Stakeholder Presentations

Presentations were made by four stakeholders, Mrs M. Desseaux, CANSO, Mr H. Bekeschus, on behalf of NATO, Mr G. O'Connell, IATA and Mr L. King, ETF on their five significant expectations from the implementation of FABs. The presentations were followed by a short discussion period.

SESSION 1 – OPERATIONAL ASPECTS

Mr H Matthiesen, EUROCONTROL, presented the key issues which were clustered under nine main headings. Each issue had been debated at a focused Stakeholder meeting and a number of additions or amendments had subsequently been provided. Each key issue was presented to the workshop with a short explanation on the accompanying text, after which discussion focused on each issue in turn. A number

queries requesting clarification of the text and some suggestions to amend the text were made.

The significant points raised under the Operational agenda item were:

- The key issue on the development of 'Common General Principles' might be better placed in a new Section on General Issues and retitled 'Guidance' material.
- The guidance could encompass all areas of interest.
- The development of this guidance material could begin without a mandate from the European Commission if the States so wished.
- An implication of a top down approach should be avoided and replaced by text that refers to the collaborative and co-ordinated approach.
- Text on the requirement for consultation between States be they both within or adjacent to the EU borders would be beneficial.
- The development of FABs should be viewed as part of a wider re-structuring of European ATM.
- The potential benefit of future developments could be stressed.
- States should aim for a single Operational Concept per FAB but multiple operations manuals could co-exist with a FAB.
- Harmonisation of rules and procedures would make contingency more manageable.
- Reference could be made to documentation from those States with advanced civil/military co-operation.
- The position of the European Commission in regard to the referencing of the military in the final report should be sought.
- Consolidation of service provision is not a pure operational issue. The subject might be better placed in a General Issues section.
- Text referring to the European delay target should be changed to the ECAC ATM network capacity performance target.
- The inclusion of paragraphs on CEATS under lessons learnt may not be appropriate.

In concluding the section on the operational Issues the Chairman summarised the discussions and asked whether any issues should be added to the list. None were suggested but the participants were reminded that there will be a further opportunity to put forward views at the ANT meeting on 8-10 March.

SESSION 2 – TECHNICAL ASPECTS

Mr A Hill, EUROCONTROL, introduced the technical issues (Section 5 of the draft final report) which will themselves be operationally driven. Each issue was presented and discussed and the following significant points were raised under the Technical agenda item:

- Stress that the operational aspects drive the technical requirements.
- Ensure that this section refers to Delegation of ATS not delegation of airspace.
- The right balance must be sought between the operational concept and required technical changes.
- Timing of technical change would be dependant upon the cost benefit analysis.
- Cross border risk assessment on technical issues could be considered.
- All aspects of technical change should be included.
- Status of the LCIP/ECIP document and the FAB. Would each State produce an LCIP or would there be one for a multi-national FAB.
- Synergies/advantages of sharing technologies between partners should be part of the feasibility study.

The Chairman summarised the discussions and asked whether any other issues should be added to the list of technical issues. None were suggested.

SESSION 3 – MILITARY ISSUES

Mr H Bekeschus, EUROCONTROL presented the list of key issues that were associated with Military operations. Each issue was discussed and the following significant points were made:

- The status of State Aircraft within a FAB should be clarified. State Aircraft flying as GAT must operate in conformity with the SES Framework Regulations.
- A Regional (single) AMC per FAB would be beneficial.
- Military operations over the High Seas in addition to sovereign territory in accordance with established rules will be included, where relevant.
- Including FUA principles in the FAB agreement between States (binding upon the military) might be beneficial.
- This section contains some repetition and could be abridged.
- The requirement for an institutional forum to discuss military issues within an integrated European transport policy should be included (challenges or lessons learnt)
- Contingency measures in multi-national FABs should be stressed.

SESSION 4 – LEGAL ASPECTS

Mrs A-F Pothier, EUROCONTROL, introduced the key issues contained in Section 7 of the draft final report dealing with the legal and institutional aspects of FABs. The significant points raised under the Legal and Institutional agenda item were:

- The applicability of SES regulations over the High Seas of EU States needs clarification.
- Further regulatory support from the European Commission to assist States in creating cross border operations FABs would prevent regulatory fragmentation and would be of great benefit to the States.
- International agreements on many issues (e.g. TLS, ICAO Annex 2 and Annex 11) must be made between States. A European framework would be of great assistance.
- The word ‘Joint’ will be reviewed the title of 7.3. Reference to ‘jointly designate’ will remain in the text. The reference to Article 10 of the Service provision Regulation, concerning relations between service providers (and which is not strictly FAB related) will be clarified.

- The reduction of fragmentation through harmonised rules should be included in the opportunities.
- Experiences of those States involved in the North Sea airspace improvements could be included under the consultation item.
- Stressing the need for a liability framework might be beneficial and could be considered for inclusion in the draft report.
- Text on consultation processes/mechanisms will be reviewed. .
- Staff representatives and the unions should be included in the consultation mechanisms established within a FAB.
- Safety and security should be added to the line referring to the consequences of termination/modification.
- The need for convergence of safety data would be useful for incident reporting in a FAB.
- The arrangements for minor incident reporting in the North Sea could be included in the lessons learnt.

In concluding the agenda item on the legal and institutional issues the Chairman asked whether any other issues should be added. None were suggested.

SESSION 5 – SOCIAL ASPECTS

Mr. A Skoniecki EUROCONTROL introduced the key issues associated with the Social aspects of FABs. In addition to some proposed textual amendments the significant points raised under this agenda item were:

- Involving NSAs in common dialogue on regulatory aspects in cross border FABs.
- Social section includes items that are human resource or technical in nature (e.g. licensing)
- Link between safety and social dumping could be highlighted, perhaps by recognising the importance of maintaining a high level of safety.
- The term Human Resources ‘Concept’ should be reviewed as the proposed contents refer to existing provisions.

- Existing agreements on staffing issues resulting from successful social dialogue could be stressed.
- The use of 'shall' and 'should' in the text will be reviewed.
- The issue of citizens from non-EU States employed in a cross border FAB with EU States should be clarified with the European Commission.
- The analysis under 8.4 should make it clear that there can be more than one ACC per FAB.
- The notion of ensuring that cultural and language issue be taken into account could be moved to the introduction to indicate that all aspects of a FAB are influenced by this.
- The use of the term designated in the social context should be reviewed to avoid any confusion.
- The impacts of the Lisbon Protocol could be highlighted in the introduction.

In concluding this agenda item Mr. A Skoniecki thanked the participants of the focused stakeholder meetings who had contributed to the development of this section. No further social issues were suggested for addition to the document.

SESSION 6 – ECONOMIC ASPECTS

Mr J P Soyer, EUROCONTROL, introduced the key issues associated with the Economic and financial aspects of FABs. In addition to some proposed textual amendments the significant points raised under this agenda item were:

- The potential for a reduction in fragmentation should be emphasised under the benefits (9.6) (reduction of costs through cooperation or merging between providers)
- The Economic consequences of contingency may be better placed in a Section on general issues.
- The issue of subsidies/loans and their recovery should be reviewed.
- The two key issues on costs of establishing FABs and Cost efficiency could be merged.
- Guidance on various flexible charging schemes (in line with the presentations made at the last workshop) should be included.

- Reference to the Channel Islands and NOTA should be removed from the lessons learnt.
- The issue of cost recovery for delegated ATS should be addressed.
- Charging of costs could be termed 'distribution of the operating costs' in line with the MUAC model.
- Operational requirements should take precedence over the charging schemes.
- The criteria for the sharing key is a sensitive issue and sector income or controller numbers may not be a valid proxy. This could be qualified by text on impacting the efficiency of operational performance.
- With a full cost recovery system in place the disparity between revenues in the lower or upper airspace may not be relevant.
- Financing of lower airspace services could be a better title than cross subsidy.
- Lower airspace services should always be economically viable. However charges may need to rise to ensure this.
- Article 15 of the Service Provision Regulation stresses that charges will reflect the cost of air navigation services.
- The enlarged committee on route charges does not anticipate any distinction between upper and lower airspace charging.
- Systems of economic regulation (e.g. Independent vs State) could be included.

It was agreed that the need for a Cost Benefit Analysis should be included as a key issue and if possible the text should be accompanied by a high level description of the criteria that could be used in compiling the analysis. However, the Chairman pointed out that due to the tight timescales it may not be possible to complete this description by the mandate delivery date.

SESSION 7 – SAFETY

Mr M Deboeck, EUROCONTROL, introduced the section on Safety. Although not specifically required by the mandate, this section was added after the last workshop

when it became apparent that guidance on safety was considered necessary by the workshop participants. The section aims to provide information to assist States in making the appropriate arrangements for the consultation processes and decision making mechanisms in order to ensure the safe and efficient operation of the FAB. In the final report this Section will probably be moved to a more prominent position.

In addition to some proposed textual amendments the significant points raised under this agenda item were:

- The sample safety case is in the format that is used by EUROCONTROL.
- The role of the SRC in the safety case consultation process should be clarified.
- Reference could be made to the Strategic Safety Action Plan even though it is still evolving.
- Reference could be made to specific agreements between NSAs addressing safety.
- Work is due to begin on the Target Level of Safety for inclusion in the Common Requirements.
- The responsibilities for the preparation of a Safety Case in multi national FABs should be clarified.
- The level of detail when addressing the Concept of Operations is a matter for the individual State.
- The notion of a single point of authority for ATM safety regulation should be reviewed.
- Reference to ESARR 1 should be made in this section.

In concluding the agenda item on Safety the Chairman asked whether any other issues should be added to the section in the draft final report. None were suggested.

CONCLUSION

At the end of the workshop the Chairman thanked all the participants for their contributions and presented a list of four conclusions from the two days of

discussion. These were agreed by the workshop and are included below. The Chairman reminded the participants that the input from the workshop would be used in the drafting of the final report which will be presented to the ANT on 8-10 March.

CONCLUSIONS of the workshop

- With the addition of Cost Benefit Analysis in the economic section, the FAB Mandate Draft Final Report addresses the key issues associated with the implementation of FABs,
- Concerns/Observations were discussed and FAB Mandate Draft Final Report to be reviewed as a function thereof,
- EUROCONTROL to investigate the development of a “FAB Implementation Checklist”,
- EUROCONTROL to contact the European Commission to:
 - a. Confirm EU position on the inclusion of military issues in FAB Mandate Final Report,
 - b. Confirm EU position in regard to operational requirements as the main drivers for FABs
 - c. Indicate States’ views on need for further regulatory support at the community level.

Annex 5

Principles proposed by Stakeholders

Civil Aviation Administration of the United Kingdom (UK CAA) and the Ministry of Transport, The Netherlands (MOT-NL):

A Functional Airspace Block (FAB) is an airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace regardless of existing boundaries (SES Framework Regulation, definition 25). The creation of FABs is central to the Single European Sky (SES) legislation enacted by the European Union (EU) in April 2004; the presumption is that the dissociation of airspace boundaries from national borders will increase air traffic management (ATM) efficiency throughout Europe.

Twelve (12) principles to be observed during the development of FABs are presented. They have been developed during a series of bi-lateral discussions between the UK CAA and other regulators (principally the Netherlands) and during the RICBAN (a discussion grouping of civilian and military regulators from UK, France, Germany, Netherlands, Belgium and Luxembourg) and Military ATM Directors meetings held during early June 2004, as follows:

First Principle: Safety must not be compromised

It is unlikely that safety would be the prime trigger to generate a FAB but it must remain the paramount consideration in developing one.

At the very least, existing levels of safety must be maintained and, whenever possible, they should be enhanced.

States with mature safety regulation regimes will wish their own standards to be maintained; it will be necessary to agree between States how safety assurance will be achieved.

Second Principle: National security needs must be addressed

Access to appropriate volumes of airspace at all vertical levels, is vital for military aircraft to maintain and develop capability for both defence of the Homeland and the discharging of a State's Defence/Foreign Policy.

Most military authorities will have legitimate strategic airspace requirements for large volumes of airspace to accommodate new aircraft and systems.

Ministries of Defence (MODs) must be involved in the development of FABs from the outset.

Sound civil/military cooperation, coherent with the Flexible Use of Airspace (FUA) principles, must be applied within a FAB. Such cooperation must be exercised at both regulator and air navigation service provider (ANSP) level.

Cross border training areas may well be important features within FABs.

Third Principle: Operational aims should be stated

Any strategic redesign of airspace with a simpler, more efficient route structure and enhanced civil/military cooperation should lead to enhanced safety.

A FAB should increase General Air Traffic (GAT) capacity._A FAB should reduce GAT delays._A FAB should increase efficiency for all airspace users.

The joint development process leading to a FAB and the structures so developed should lead to increased civil/military cooperation.

Whatever the aims set for a FAB, it must be accessible to all airspace users in a fair and proportionate manner.

Fourth Principle: Legal/institutional obstacles must be resolved

Sovereignty of a State's airspace is a key tenet of the Chicago and EUROCONTROL Revised Conventions, but removing nationality as a barrier to the provision of ATM is a key to the success of the trans-national FAB concept. It is important to recognise

that national sovereignty can be maintained even if ATM services are provided by an entity from a different nation.

ANSP certification, designation and supervision issues exist. States must agree on the supervision of ANSP to both address confidence and satisfy National Supervisory Authority (NSA) requirements. Once certificated, providers must comply with designation conditions to meet national or local requirements.

Liability issues of passenger rights, jurisdiction, dispute resolution and sovereign immunity will need to be exposed and resolved. Similarly, both State and ANSP liability over sovereign and high seas airspace, where States have contracted responsibility, will have to be determined.

Fifth Principle: A FAB should address a specific problem(s)

The EC and Member States have agreed that FAB development should be a 'bottom-up' process led by ANSPs and airspace users. Consistent with this approach, a FAB should only be generated when specific problems have been identified that can be resolved or eased through the creation of a FAB.

However, the EC has also indicated that a 'top-down' solution may be imposed if FAB development is not forthcoming within five years from April 2004. Were this process to develop, the EC's lack of competence in military issues could become a complicating factor given the need for close military involvement.

Sixth Principle: A FAB must satisfy a Cost Benefit Analysis.

A rigorous cost benefit analysis must demonstrate real advantage before any FAB is introduced.

The cost benefit analysis should be phased throughout the project.

Seventh Principle: An incremental approach should be employed

A major trans-national FAB will be complicated and could not happen overnight; a big bang approach should be avoided. A better approach would be a project, with defined milestones, leading to a fully formed FAB as the end state.

There is merit in gaining experience in FAB development and management through smaller, less ambitious, structures in the first instance.

Eighth Principle: Network coherence must be maintained

Assuming the sixth principle is applied, a FAB should only come to fruition if local benefits are to be realised. However, network coherency must be maintained and, preferably, enhanced.

As well as maintaining coherency in the lateral plane, it must be maintained vertically with any airspace structures above or below the FAB.

Ninth Principle: One size does not fit all

As FABs will be generated, at least in the first instance, as a result of predominantly bottom-up processes, it is inevitable that local differences between FABs will be created. Whilst there is scope for some top-down moderation, local differences should be accepted.

Tenth Principle: FABs must be customer focussed

In all probability, civilian ANSPs, through close contact with their customer airlines, will identify the requirement for a FAB. Such customer focus must be maintained throughout the design and development phases.

However, the needs of other customers (primarily military and general aviation (GA)) must also be factored into the design and development of a FAB.

Eleventh Principle: A FAB must have a consistent regulatory approach

A FAB should have a homogenous regulatory approach throughout its volume. This will require close cooperation between NSAs and other State authorities.

Twelfth Principle: Needs coherent action at all levels

As discussed, FAB development should be driven ‘bottom-up’. Clearly, close contact is required between potential industrial partners (airspace users and ANSPs) within contracting states. However, there are significant issues at stake within FABs and industry contact must be matched throughout by close liaison between National Supervisory Authorities and State authorities (involving Transport, Foreign and Defence ministries). Any activity must be integrated and subject to appropriate ministerial direction.

Principles Summary

The 12 principles outlined above are neither exhaustive nor rigid, but they reflect the aspirations and understandings of potential stakeholders in the UK and appear to have resonance with a much wider community.

AENA (Spain), DFS (Germany), DNA (France), NATS Ltd. (UK):

Ten (10) Major Principles

The debates on Functional Airspace Blocks promoted by the EC SES Information Campaign have produced a number of open questions and uncertainties with most ATM stakeholders.

Representatives of the 4 ANSP group have discussed these open questions in detail, and have come to a common understanding on some major principles to be considered in the development of Functional Airspace Blocks.

PRINCIPLE 1

The establishment of Functional Airspace Blocks (FAB) is a competence of States which shall act by mutual agreement between those concerned.

PRINCIPLE 2

Air Navigation Service Providers take the initiative to develop, in a collaborative and “bottom-up” approach, Functional Airspace Blocks (FAB) fulfilling the seven criteria of the SES airspace regulation.

PRINCIPLE 3

The primary aim of a FAB is to increase ATM performance within a FAB but also, from the network perspective, with a clear indication of costs and benefits.

PRINCIPLE 4

A FAB does not necessarily require the concentration of all ANS functions on a single site.

PRINCIPLE 5

A FAB is more than an “airspace project”. The term “Functional” indicates the strong cooperation aspect and the consideration of all relevant ANS functions and organisational aspects within a “Cooperative Functional Airspace Block Project”.

PRINCIPLE 6

A Cooperative Functional Airspace Block Project will entail different domains and perspectives, which may follow different life-cycles. Each project will progress from identification of options and their feasibility, through a definition phase to an operational phase in a continuous improvement process, contributing to the primary aim.

PRINCIPLE 7

A Cooperative Functional Airspace Block Project identifies and uses synergies, in order to improve the cost-efficiency of the involved ANSPs, in a global win-win cooperative framework (encompassing operational, technical, social, legal and financial aspects without any unacceptable consequence for any stakeholder involved in the FAB).

PRINCIPLE 8

Compatibility between upper and lower airspace will be achieved by the development of FABs in a consistent, holistic approach encompassing both upper and lower airspace, with a strong emphasis on the connectivity with major airport traffic flows.

PRINCIPLE 9

A Cooperative FAB Project shall be a transparent and cooperative process, in consultation with both the European Commission and EUROCONTROL, with the aim of guaranteeing interoperability and network compatibility, as well as sharing best practices between FAB projects.

PRINCIPLE 10

Different “models” of FABs will have to be developed on a European-wide basis reflecting different regional characteristics.

The same model might not fit both the needs of specific high density areas as well as the particular needs of ANS provision on a more regional basis.

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Annex 6

At the final workshop four key stakeholders (CANSO, IATA, JATMWG and NATO) were invited to present their five main expectations of FABs. These are reproduced below.

Note: Detailed explanations of these expectations were provided to workshop participants by representatives of the individual organisations. These, together with comments on the FAB Mandate Final Report from the same organisations, received subsequent to the workshop, have been fully assessed in conjunction with all stakeholder feedback. Where appropriate, views that had not already been elaborated upon, were incorporated consistent with the terms of the mandate to identify key issues from FABs.

CANSO's Five (5) Main FAB Expectations:

1. **WHO, WHY, WHAT AND HOW?**

Only the Bottom-Up Approach can answer the HOW question. The ANSPs shall take the initiative by launching the appropriate FAB feasibility studies embedding these issues in a pragmatic way.
2. **ANSPs need flexibility to achieve the best possible co-operation formula (Operational/Institutional/Charges/Social).**
3. **Some of the major hurdles to overcome will be: Impact on Lower Airspace, Impact on Revenues, and Social/Cultural Challenges.**
4. **ATM performance improvements will come from co-operation/synergies in different ATM functions of the ANSPs, not only from airspace design.**
5. **A pan-European perspective can give an assessment of the overall network coherence of on-going projects, but not prescribe a FAB model.**

IATA's Five (5) Main FAB Expectations:

The establishment and implementation of FABs should:

1. *Have airspace design which optimises traffic flows, increases safety and flight efficiency*
2. *Cater for traffic growth projections and optimise delay performance*
3. *Demonstrate clear cost effectiveness improvements: key PIs*
4. *Be operated as one airspace with a single charging unit and no arbitrary vertical or horizontal division*
5. *Have benefits consistent with adjacent FABs ‘assuring continuous network improvement’*

JATMWG’s Five (5) Main FAB Expectations:

The establishment and implementation of FABs needs:

1. *Human-Social issues as key to FAB success*
2. *Avoid misunderstanding on Social Dialogue*
3. *Bottom-Up approach*
4. *Managed and agreed transition into any FABs*
5. *Use European Social Dialogue protocols*

NATO’s Five (5) Main FAB Expectations:

The establishment and implementation of FABs should:

1. *Recognise prerogatives of sovereignty on security issues*
2. *Accommodate NATO airspace needs and support cross border operations of NATO air missions*
3. *Ensure priority and unrestricted airspace access to Air Defence flights on air policing missions*
4. *Facilitate co-operation & co-ordination with NATO Integrated Air Defence System (NATINADS)*
5. *Recognise commitments within international organisations*

Annex 7

Functional Airspace Blocks - List of Acronyms

AAS	Advanced Airspace Scheme
ACC	Area Control Centre
ADS	Automatic Dependant Surveillance
AFN	Airspace & Flow Management and Navigation
AGDL	Air Ground Data Link
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
AMC	Airspace Management Cell
ANSP	Air Navigation Service Provider
ANT	Airspace & Navigation Team
AO	Aircraft Operator
ARN	ATS Routes & Associated Navigation Means
ASM	Airspace Management
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
BENELUX	Belgium, Netherlands and Luxembourg
CAA	Civil Aviation Authority/Administration
CANSO	Civil Air Navigation Services Organisation
CBA	Cross Border Area
CBO	Cross Border Operations
CDM	Collaborative Decision Making
CDR	Conditional Route
CEATS	Central European Air Traffic Services
CEF	Capacity Enhancement Function
CFMU	Central Flow Management Unit
CNS	Communication, Navigation & Surveillance

CPL	Current Flight Plan
CRCO	Central Route Charges Office
CVA	Charging Volumes
DCT	Direct Routing
DMEAN	Dynamic Management of European Airspace Network
EATM	European Air Traffic Management
EC	European Commission
ECAC	European Civil Aviation Conference
ECIP	European Convergence and Implementation Plan
ESARR	EUROCONTROL Safety Regulatory requirements
ETA	Estimated Time of Arrival
EU	European Union
EUR	European Region
EUROCAE	European Organisation for Civil Aviation Equipment Manufacturers
FAB	Functional Airspace Block
FDP	Flight Data Processing
FDPS	Flight Data Processing System
FIR	Flight Information Region
FL	Flight Level
FMP	Flow Management Planning / Flow Management Position
FOIPS	Flight Object Interoperability Proposed Standard
FPL	Flight Plan
FUA	Flexible Use of Airspace
GA	General Aviation
GAT	General Air Traffic
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFPS	Initial Flight Plan Processing System
IFR	Instrument Flight Rules
JATMWG	Joint ATM Working Group
LoA	Letter of Agreement
MET	Meteorological
MIL	Military
MUAC	Maastricht Upper Area Control Centre
NAT	North Atlantic Region

NATO	North Atlantic Treaty Organisation
NSA	National Supervisory Authorities
MoT	Ministry of Transport
OAT	Operational Air Traffic
OJT	On the Job Training
OJTI	On the Job training Instructor
PC	Provisional Council
RAD	Route Availability Document
R&D	Research and Development
RFL	Requested Flight Level
RNDSG	Route Network Development Sub-Group (of the EUROCONTROL Airspace and Navigation Team)
RPL	Repetitive Flight Plan
RVSM	Reduced Vertical Separation Minima
SARPS	Standards and Recommended Practices
SES	Single European Sky
SRC	Safety Regulation Committee
TMA	Terminal Manoeuvring Area
TRA	Temporary Reserved Airspace/Area
TSA	Temporary Segregated Area
UIR	Upper Flight Information Region
