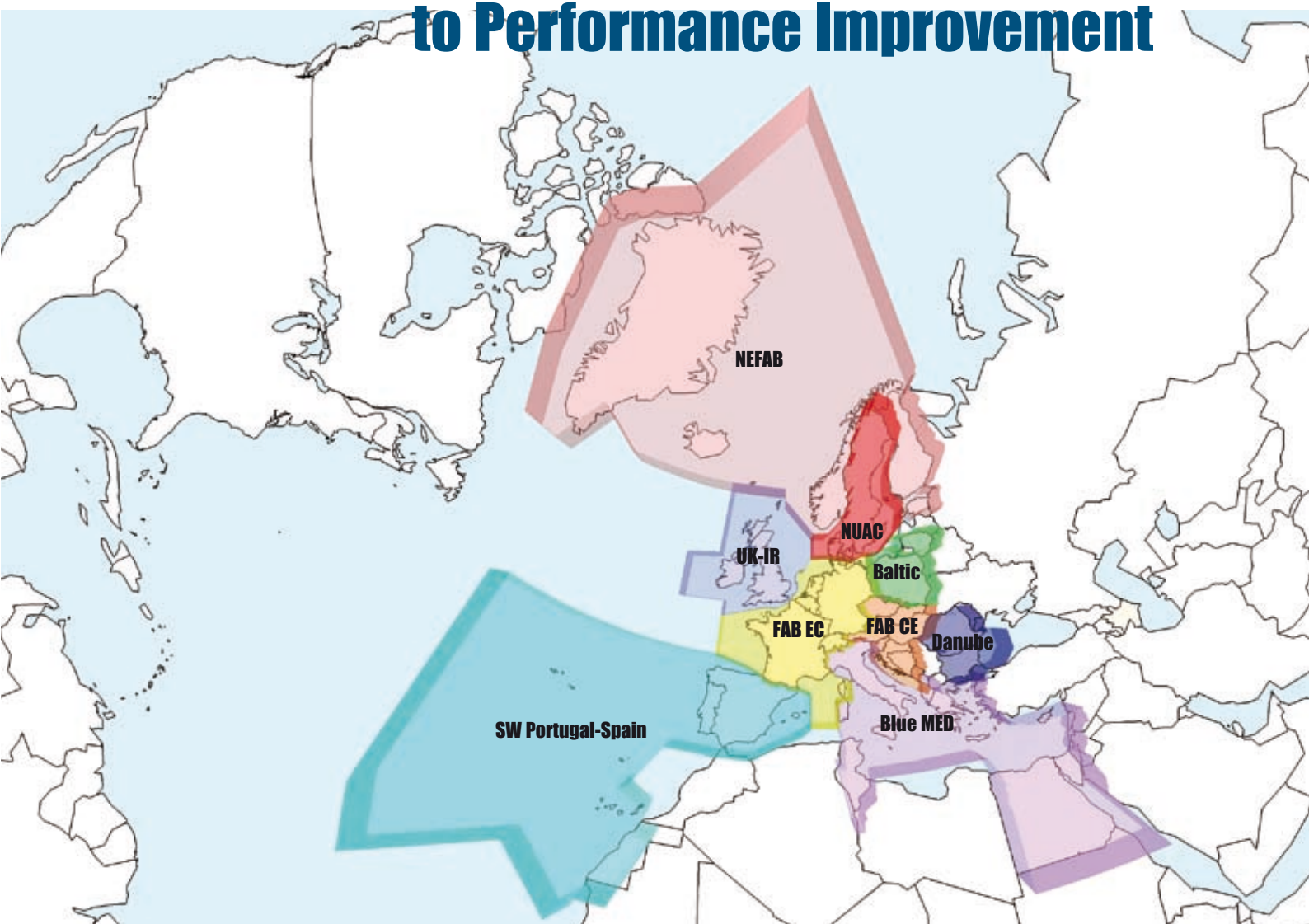


PERFORMANCE REVIEW COMMISSION

# Evaluation of Functional Airspace Block (FAB) Initiatives and their contribution to Performance Improvement



Produced by the EUROCONTROL Performance Review Commission  
upon the invitation of the European Commission DG-TREN

EXECUTIVE FINAL REPORT

October 2008

## **Background information**

This report presents an independent evaluation of FAB initiatives and their contribution to performance improvement in the Member States and associated States of the European Union.

It was prepared by the EUROCONTROL Performance Review Commission for the European Commission, at the latter's request.

The report was developed through extensive formal and informal consultation with European ATM Stakeholders at every stage of the project.

The final report was presented to the European Commission in October 2008.

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### SUMMARY

This report has been produced by the independent Performance Review Commission (PRC) of the EUROCONTROL Organisation, upon the invitation of the European Commission DG-TREN.

This Executive Final Report is an executive summary of a detailed final report which is available on PRC website. It provides a factual and independent assessment of the nine Functional Airspace Blocks (FAB) initiatives at 1<sup>st</sup> July 2008. It identifies a number of key factual assessments and proposes several recommendations to Member States, the European Commission and ATM stakeholders to foster the creation of FABs with a view to improving ATM performance in Europe.

### KEYWORDS

Functional Airspace Blocks (FABs)	Airspace Regulation	European Commission
Air Traffic Management (ATM)	Performance Measurement	States involvement
Single European Sky (SES)	Performance Improvements	ANSP cooperation

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## TABLE OF CONTENTS

<b>1</b>	<b>EXECUTIVE SUMMARY.....</b>	<b>I</b>
1.1	BACKGROUND.....	I
1.2	ABSTRACT.....	I
1.3	ASSESSMENT OF THE NINE DECLARED FAB INITIATIVES .....	II
1.4	CONCLUSIONS AND RECOMMENDATIONS .....	IV
<b>2</b>	<b>FACTUAL ASSESSMENT SUMMARY, CONCLUSIONS, RECOMMENDATIONS .....</b>	<b>9</b>
2.1	INTRODUCTION.....	9
2.2	SUMMARY OF THE PRC'S FACTUAL ASSESSMENT AS OF 1 JULY 2008 .....	9
2.3	CONCLUSIONS AND RECOMMENDATIONS.....	23

## TABLE OF FIGURES

FIGURE 1-1:	FAB PERFORMANCE FRAMEWORK .....	I
FIGURE 1-2:	MAP OF FAB INITIATIVES - JULY 2008.....	II
FIGURE 1-3:	TIMESCALE AND MAIN MILESTONES FOR IMPLEMENTATION OF FABs .....	IV
FIGURE 1-4:	SUMMARY OF QUANTIFIED BENEFITS FROM AVAILABLE CBAs .....	VI
FIGURE 2-1:	CHARACTERISTICS OF EACH FAB.....	11
FIGURE 2-2:	PERCEIVED STAKEHOLDER INVOLVEMENT IN FAB INITIATIVES AT 1 JULY 2008.....	14
FIGURE 2-3:	CORE HIGH DENSITY AREA .....	15
FIGURE 2-4:	ANNUAL NET BENEFITS AS A % OF TOTAL ECONOMIC COSTS (2006).....	20
FIGURE 7-5:	BREAKDOWN OF ROUTE EXTENSION SHOWING POTENTIAL IMPACT OF FABs .....	21

# 1 EXECUTIVE SUMMARY

## 1.1 Background

- 1.1.1 By letter dated 23 May 2007, the European Commission (EC) invited EUROCONTROL, and specifically the independent Performance Review Commission (PRC), to evaluate the Functional Airspace Block (FAB) initiatives and their added-value to performance improvements.
- 1.1.2 The objectives of this evaluation were (1) to describe the current initiatives, (2) to describe best practice for the drawing up of safety case and cost benefit analysis, (3) to establish a specific framework for evaluating performance improvements over time, (4) to identify key constraints and difficulties experienced and to suggest approaches to mitigate them, and (5) to suggest opportunities to amend the current governance, legal and regulatory arrangements to facilitate the creation of FABs.

## 1.2 Abstract

- 1.2.1 This Executive Final report provides the executive summary and the factual assessments/conclusions/recommendations of the detailed Final Report which is available on PRC website ([www.eurocontrol.int/prc](http://www.eurocontrol.int/prc)).
- 1.2.2 The Final Report provides a comprehensive description and an assessment of the nine declared FAB initiatives at 1 July 2008 (Chapter 4) and a comparative analysis of those (Chapter 5).
- 1.2.3 Both are based on a framework, described in annex II of the Final Report, which identifies the characteristics, scope and schedule of each FAB, describes the arrangements set out to develop the FAB initiatives, and defines Key Performance Areas (KPA) and Key Performance Indicators (KPI). Figure 1-1 summarises the KPAs and KPIs.

**Figure 1-1: FAB Performance framework**

Safety	Efficiency			
	Economic	Operational	Environmental	Technical
Airspace events per flight Safety maturity Compliance with ESARRs	Financial cost-effectiveness KPIs	ATFM Delay Horizontal routing extension Delegation of ATS services provision Alignment of FAB with main traffic flows Airspace use and design: <ul style="list-style-type: none"> <li>• Implementation of SES FUA</li> <li>• Airspace design and capacity planning process</li> </ul>	Environmental impact due to horizontal routing extension	Interoperability of ATM systems Commonality of ATM systems

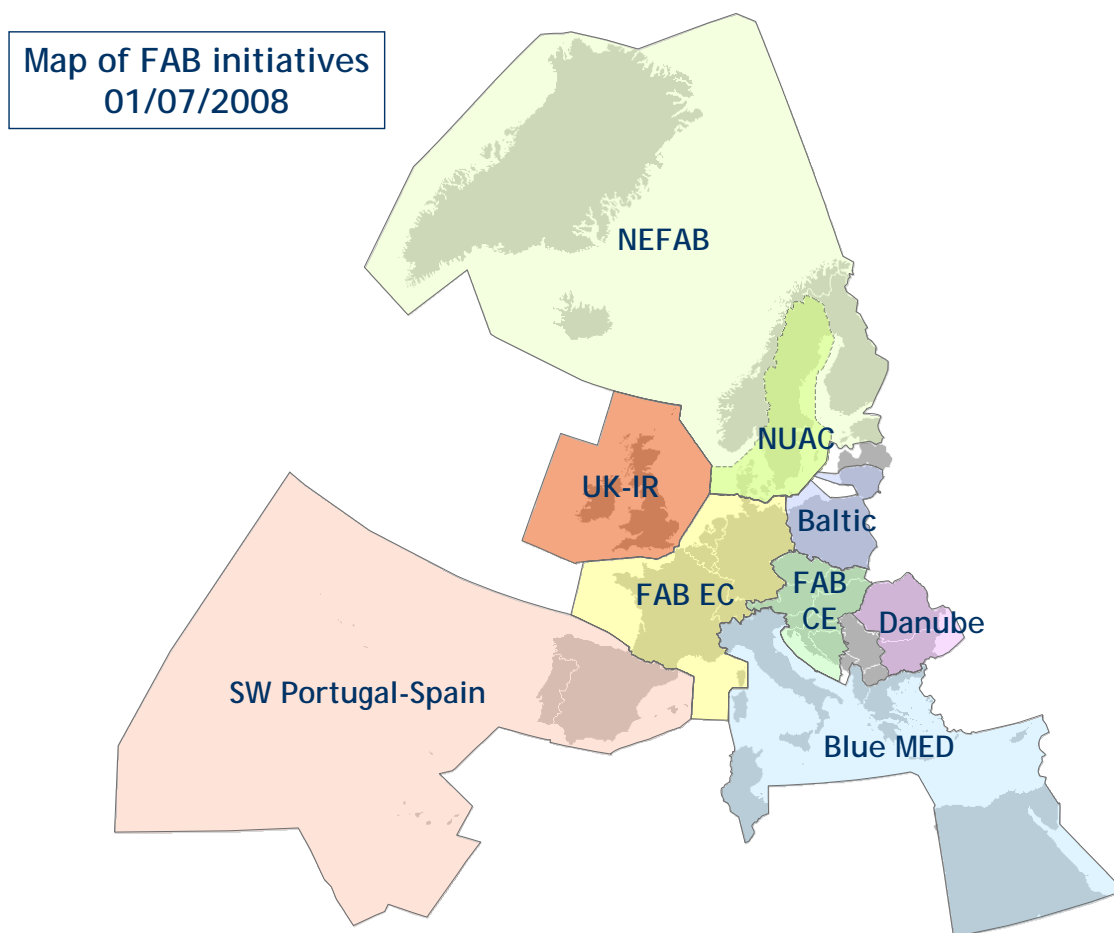
- 1.2.4 The origins and evolution of the FAB concept are recalled in Chapter 3 of the Final Report. Chapter 6 of the Final Report reviews Cost-Benefits Analyses (CBAs) and approaches to safety cases. Chapter 7 of the Final Report presents conclusions and recommendations which can be found in Chapter 2 of this Executive Final Report.
- 1.2.5 The Final Report has been produced based on more than 50 meetings, extensive documentation and consultation:

- Visits to the FAB representatives and formal “dossiers” validated by them,
- Written consultation, using comments received on the Interim Report (19 Feb. 2008) and draft Final Report (12 Sept. 2008), both displayed on the web;
- Oral consultation at two open meetings (22 Oct. 2007 and 25 Sept. 2008);
- Presentations and comments in different meetings (Single Sky Committee, Provisional Council Coordinating Committee, ANS Board, CMIC, ETF, ATCEUC, etc).

**1.3 Assessment of the nine declared FAB initiatives**

1.3.1 Nine FAB initiatives were declared to the European Commission at 1 July 2008. Their characteristics vary significantly (see map in Figure 1-2). FAB EC, which is located in the core area of Europe, is the largest FAB initiative (37% of flight-hours and costs).

**Figure 1-2: Map of FAB initiatives - July 2008**



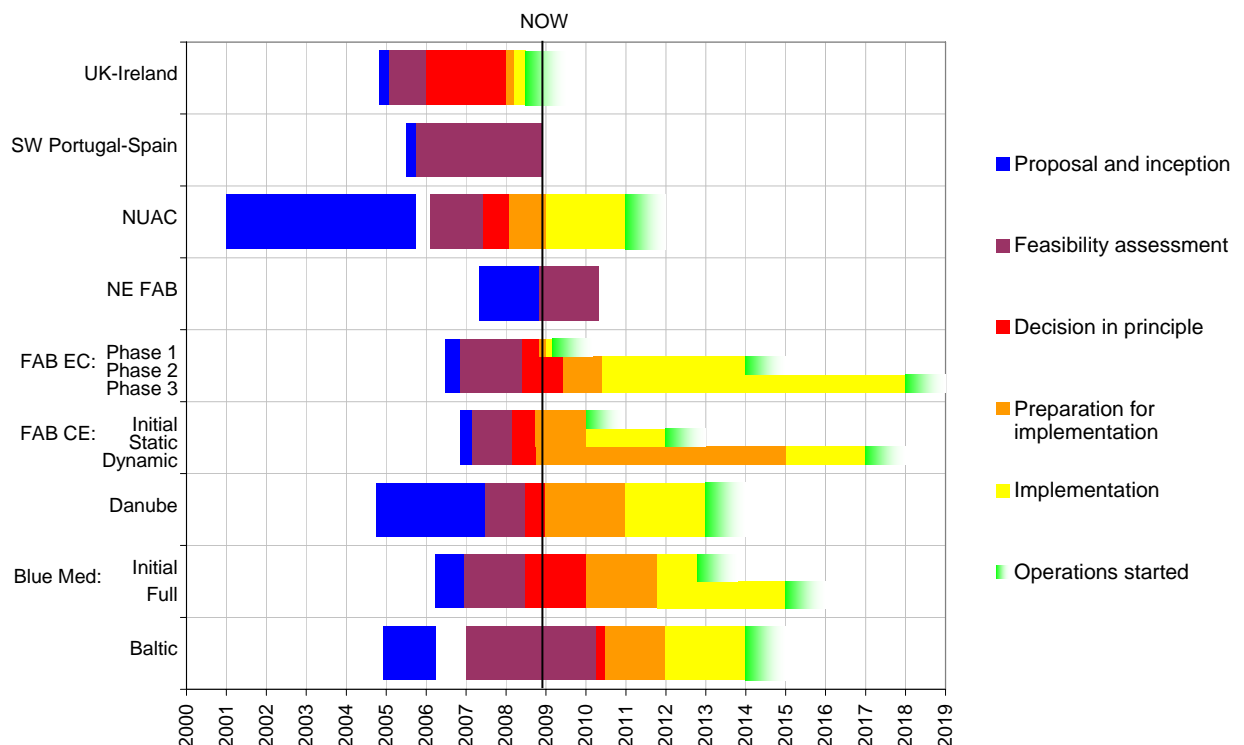
1.3.2 At 1 July 2008, all 27 States of the European Union were involved actively in a FAB initiative except Latvia. Latvia had undertaken discussions with the Baltic initiative and was participating in the NEAP co-operation initiative, but was not a member of any FAB.

- 1.3.3 There are significant differences in the actions that are proposed, the progress that the FAB initiatives have made, the timescale over which implementation is expected, and the arrangements adopted for implementation.
- 1.3.4 All FABs plan to cover, to some extent, the SES I legislative requirements of airspace and operational changes. A number of FABs have also extended their plans to address issues of service provision integration, ATM systems, training and ATFM.
- 1.3.5 The PRC's assessment of progress made by the nine FAB initiatives during the course of the study (August 2007 - July 2008), and planned next steps, is as follows:
- **Baltic FAB:** There was limited progress during the first half of 2008. The initiative put a TEN-T bid for funding of a feasibility study in June 2008 and expect to produce a feasibility study by Q1 2010. Although relatively small, this FAB could foster significant performance improvements in the area, where there are specific issues, such as high traffic growth and the Kaliningrad area. A strong commitment by concerned States and ANSPs, the addition of Latvia to the FAB, and close links with neighbouring FABs would raise the prospect for benefits.
  - **Blue Med:** There has been significant progress in 2008: the feasibility study was completed and a declaration of intent was signed by the CAA Director Generals in July 2008. Blue Med associates non-EU States, such as Egypt and Tunisia, which are important interfaces of the SES. The Definition phase (to be) agreed at a Ministerial conference in November 2008 should seek performance improvements beyond the relatively modest ones identified in the first economic assessment.
  - **Danube FAB:** Progress has been made with Stage 2 of the feasibility assessment, which the concerned States and ANSPs have endorsed. The relatively high performance benefits identified in the CBA would need to be confirmed, and performance targets set for implementation. A decision whether to move to a preliminary design phase is anticipated towards the end of 2008.
  - **FAB Central Europe:** The finalisation of the Master Plan, CBA and safety assessment, in March 2008 along with the ANSPs Memorandum of Cooperation and Member States Declaration of intent (with a MoU to follow at the end of 2008) demonstrates real progress over the period for FAB CE. A phased implementation is expected to start in 2009 with an initial scenario, followed by static and dynamic scenarios. It will be important to seek further benefits, as those identified in the CBA are relatively low.
  - **FAB Europe Central:** The comprehensive feasibility study and CBA indicate prospects for high performance improvements in relative and absolute terms. FAB EC is on the critical path to meet the capacity requirements in the densest part of European airspace. Owing to its size and central position in Europe, the success of FAB EC will be important for the success of the SES. The strong involvement of all parties concerned is an important success factor.  
  
The phased implementation will be launched with an official declaration in November 2008 starting with eight targeted key task forces.
  - **NEFAB:** NEFAB is in the early stages of preparation. A pre-feasibility study was undertaken during the summer of 2008 covering a high level CBA, safety assessment and identification of possible show stoppers. The feasibility study is expected to be completed by May 2010.

- NUAC:** NUAC is one of the most developed projects. It shows prospects for significant performance improvements. The ANSP CEOs have decided to proceed with the operational alliance option (having considered merger and alliance scenarios). But this needs to be confirmed with a final political decision by the Member States before the end of 2008. NUAC may become one of the service providers in NEFAB.
- SW Portugal-Spain:** There has been limited progress during the first half of 2008. In October 2008, the two ANSPs have decided to launch in 2009 the development of a feasibility study of the FAB improvements, making use of simulation tools (areas, routes, sectors) and including a CBA, to be performed during 2009. It will be important to generate significant performance improvements in the area, whether through a FAB, or otherwise.
- FAB UK-Ireland:** This FAB was officially declared to the EC in June 2008 and started its operations. The first meetings of the FAB Management Board and Supervisory Committee took place in July and August 2008, respectively. The Board is now focussing on key priority areas and developing concrete projects for this FAB to deliver genuine performance improvements. Significant performance improvement should be sought, beyond the modest ones identified in the CBA.

1.3.6 There are wide variations in FAB schedules. The main milestones of FAB initiatives are summarised in Figure 1-3.

**Figure 1-3: Timescale and main milestones for implementation of FABs**



## 1.4 Conclusions and recommendations

1.4.1 The objective of SES regulations is to improve ANS performance. This first PRC evaluation of FABs shows that FABs can be an effective tool, amongst others, to reach SES performance objectives – provided there are a shared vision, ambitious



objectives, and strong commitments from the stakeholders to effectively reach these objectives.

- 1.4.2 In fact, the proposed SES II package reinforces the FAB concept, the objective of which is “*to optimise and/or integrate the provision of ANS and related ancillary functions*”. This is a clear step forward.
- 1.4.3 During 2008, six (out of nine) FABs have devoted significant effort and resources in developing feasibility studies. One FAB initiative, FAB UK-Ireland, was declared officially in June 2008 and came into effect in July 2008. It is clear that the legal obligation to create FABs has generated a positive momentum for co-operation between ANSPs and between Member States, and opportunities for performance improvements beyond those achievable individually. This should be preserved and reinforced.
- 1.4.4 States should reaffirm their commitment to create FABs during the discussion on SES II in the Transport Council of the European Union in December 2008. Moreover, in order to further strengthen the momentum and focus the attention of all involved stakeholders, the PRC suggests that more detailed deadlines are introduced in SES II concerning the creation of FABs.
- 1.4.5 Most significant progress has taken place where there was a strong involvement of all key stakeholders (States, staff, military and airspace users) as well as cooperation between NSAs. The PRC therefore recommends strongly developing or strengthening social dialogue between staff representatives and ANSP management. It also recommends organising effective cooperation of NSAs and emphasising the need to address military issues and civil-military coordination.
- 1.4.6 Since all FABs follow boundaries of existing FIRs (and current ATS delegations), and that most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB, there is a need to ensure the connectivity of the European network across FABs.
- 1.4.7 Improvement in flight-efficiency within each FAB provides significant opportunities for savings to airspace users and benefits for the environment. However, since approximately one quarter of European route extension issues can only be solved across FABs and Europe-wide, a strong and effective network management and design function at European level, as proposed in SES II, is crucial.
- 1.4.8 The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, will be key for an efficient route design and management of traffic flows.
- 1.4.9 Clearly each FAB is different and faces different political, operational, technical and economic challenges. The evaluation has identified that FAB initiatives show wide differences in scope, timescales and approaches. It is therefore clear that a flexibility of approach needs to be maintained, as long as performance improvements are delivered.
- 1.4.10 Several FAB initiatives implicitly or explicitly consider one or more of the following ANS cooperation scenarios: co-operation agreement, operational alliance (some joint functions) and merger. A progressive evolution is sometimes foreseen, although no clear intentions and schedules have been defined so far. It is interesting to note that a representative staff organisation advocates the full merger scenario in the MOSAIC project.

- 1.4.11 A comparison of feasibility studies shows that a lot of effort is devoted in each FAB on the same issues and with similar results. Moreover, most FAB initiatives have reported similar impediments to the creation of FABs. Greater guidance and coordination for the establishment of FABs would help avoid misunderstandings and duplication of work. The PRC therefore proposes some concrete ideas for the development of guidance/requirements in terms of operational concept, safety, ATFCM/ASM, interoperability of systems, charging, sovereignty, liability, and CBAs.
- 1.4.12 In particular, the issues of sovereignty and liability require careful attention from an early stage within the FAB in order to find and implement the proper legal arrangements which might require amendments to Aviation Acts, contractual arrangements between ANSPs and full involvement of the military.
- 1.4.13 The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, is key for an efficient route design and management of traffic flows.
- 1.4.14 By October 2008, only six CBAs (or high level economic appraisal) had been received, albeit with various levels of maturity and completion. Available CBAs were organised differently and built on different assumptions, which makes a comparison of expected performance benefits challenging.
- 1.4.15 Nevertheless, for illustration purposes, the PRC has attempted to evaluate the net projected benefits in 2013 and in 2018 for each FAB, and to relate these benefits to the 2006 total economic costs (ANS provision costs + costs of route extension and ATFM delays incurred by airspace users). A summary of this comparison is presented in Figure 1-4.
- 1.4.16 Although only orders of magnitude should be considered, double digit benefits are anticipated from FAB EC, NUAC and Danube. This confirms that FABs are one of the SES tools to improve ANS performance. It will be important to ensure that such levels of improvement are achieved.
- 1.4.17 Moreover, the evaluation shows that most savings are expected from improvements in flight-efficiency and delays, rather than savings in ANSPs' service provision costs. As the latter form the bulk of ANS total costs, this indicates room for yet further improvements.

**Figure 1-4: Summary of quantified benefits from available CBAs**

	<b>2013 benefits in M€</b>	<b>2013 benefits as % of 2006 total economic costs</b>	<b>% from flight efficiency or delay</b>	<b>2018 benefits in M€</b>	<b>2018 benefits as % of 2006 total economic costs</b>	<b>% from flight efficiency or delay</b>
<b>Blue Med</b>	14 – 49	1 – 5%		14 – 71	2 – 7%	
<b>Danube *</b>	29 – 52	12 – 22%	99%	29 – 52	12 – 22%	99%
<b>FAB CE</b>	6	1%	53%	21 – 30	4 – 6%	55%
<b>FAB EC</b>	260	8%	77%	1150	36%	83%
<b>NUAC</b>	47	17%	72%	51	18%	81%
<b>UK-Ireland</b>	12	1%	100%	40	4%	63%

\*: Assumptions and expert judgements would need to be confirmed.

- 1.4.18 Notwithstanding the fact that it is one of the requirements for FABs, no “Safety Cases” could be developed at this stage, since they can only be performed when the FAB is fully specified operationally. The corresponding wording in SES I (Article 5(2) of the airspace Regulation) would need to be replaced by “Safety assessments”.
- 1.4.19 A number of FABs have identified specific performance indicators and associated performance objectives/targets. This anticipates some of the SES II proposals. Where applicable, and with some prerequisites, setting performance targets at FAB level in lieu of national level would have several advantages:
- It would reduce the number of local target setting processes and the work of the European Commission, NSAs, users and the Performance Review Body;
  - It would reinforce the cohesion of ANSPs, reduce fragmentation while keeping the bottom-up approach, and give a very concrete meaning to FABs.
- 1.4.20 There are prerequisites for setting performance targets at FAB level in a SES II context, in particular clear accountability and oversight for meeting the targets, a degree of prior convergence in performance, a common approach to performance management and common performance reporting in the respective FABs.
- 1.4.21 Finally, it will be important to monitor progress and maintain pressure on FABs to deliver genuine performance improvements and meet the planned deadlines and deliverables. The PRC recommends that a similar review of FABs is undertaken periodically, using the same framework to assess progress made with reference to the situation at 1 July 2008 presented in this report, and to the respective FAB plans.

The detailed Final Report is available on PRC website: [www.eurocontrol.int/prc/](http://www.eurocontrol.int/prc/)

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## 2 FACTUAL ASSESSMENT SUMMARY, CONCLUSIONS, RECOMMENDATIONS

### 2.1 Introduction

- 2.1.1 This chapter provides factual assessments, conclusions and recommendations from the PRC's Evaluation of Functional Airspace Block initiatives at 1 July 2008. They are based on initial findings and conclusions presented in the Interim Report, a second round of visits, information update and validation with FAB representatives as required, extensive consultation of all stakeholders and PRC's independent assessment.
- 2.1.2 The first part presents 16 "factual assessments". These factual assessments cover the following areas:
- A) Review of the nine FAB initiatives;
  - B) Their expected impact on performance.
- 2.1.3 The second part gives PRC conclusions and 22 pragmatic recommendations to reinforce the FAB initiatives in order to reduce ANS fragmentation and further improve their performance.

### 2.2 Summary of the PRC's factual assessment as of 1 July 2008

#### A) Review of the nine FAB initiatives

##### **Factual assessment 1: Progress in some but not all FAB initiatives in first half of 2008**

As indicated in the Interim Report (19 February 2008), the progress of FAB initiatives until the end of 2007 was generally disappointing and this resulted in:

- The EC Communication (COM(2008) 389/2, June 2008) and suggested amendments to the SES through the SES II package;
- Airspace users explicitly expressing their dissatisfaction with progress (as confirmed by IATA's letter to the PRC dated 25 June 2008 and comments made by airlines in the first Stakeholders Consultation meeting in October 2007).

During 2008, six FABs initiatives made substantial progress: Blue Med, Danube, FAB-CE, FAB-EC, NUAC and FAB UK-Ireland. These FAB initiatives invested significant effort and resources in feasibility studies, and in the case of UK-Ireland implementation of the FAB Management Board. During its latest round consultations, the PRC found that:

- More detailed plans, including identification of the preferred options/scenarios for the FAB and Cost Benefit Analyses were becoming available;
- Member States were becoming more involved in the process through co-operation agreements and involvement in performance target setting or objectives for the FAB;
- A number of FAB initiatives were developing innovative approaches to NSA co-operation, civil-military co-ordination, airspace users' involvement;
- Significant cooperative momentum has been created among ANSPs in some of the FABs.

In the same period, there was relatively little progress in the development of the SW Portugal-Spain FAB and the Baltic FAB.

Several Nordic ANSPs, after a pre-Feasibility Study, agreed in March 2008 to officially

launch a new FAB initiative, NEFAB. So there were in total **nine** declared FAB initiatives at 1 July 2008. These FAB initiatives are reviewed in Chapter 4 of the Final Report.

One EU State (Latvia) and three States bound by bilateral agreements with the EU (Serbia, Montenegro, and FYROM) are due to develop FABs, but were **not** actively participating in a FAB at the same date.



#### **Factual assessment 2: UK-Ireland FAB officially launched, but uncertain benefits**

At 1 July 2008, the UK-Ireland FAB was the first and only FAB that had been notified to the European Commission. This FAB initiative is described in detail in Section 4.11 of the Final Report.

The UK-Ireland FAB has defined working relationships between States, NSAs and ANSPs in three Memorandums of Understanding. The FAB Management Board model relies upon airspace users being actively involved and taking a crucial role in the development of improvements for the FAB. This means that a significant responsibility is passed on to airlines and they will need to commit significant resources to fulfil this role.

As the timing and magnitude of the changes are still to be decided by the FAB Management Board, the benefits of the model are uncertain and will need to be monitored over time.



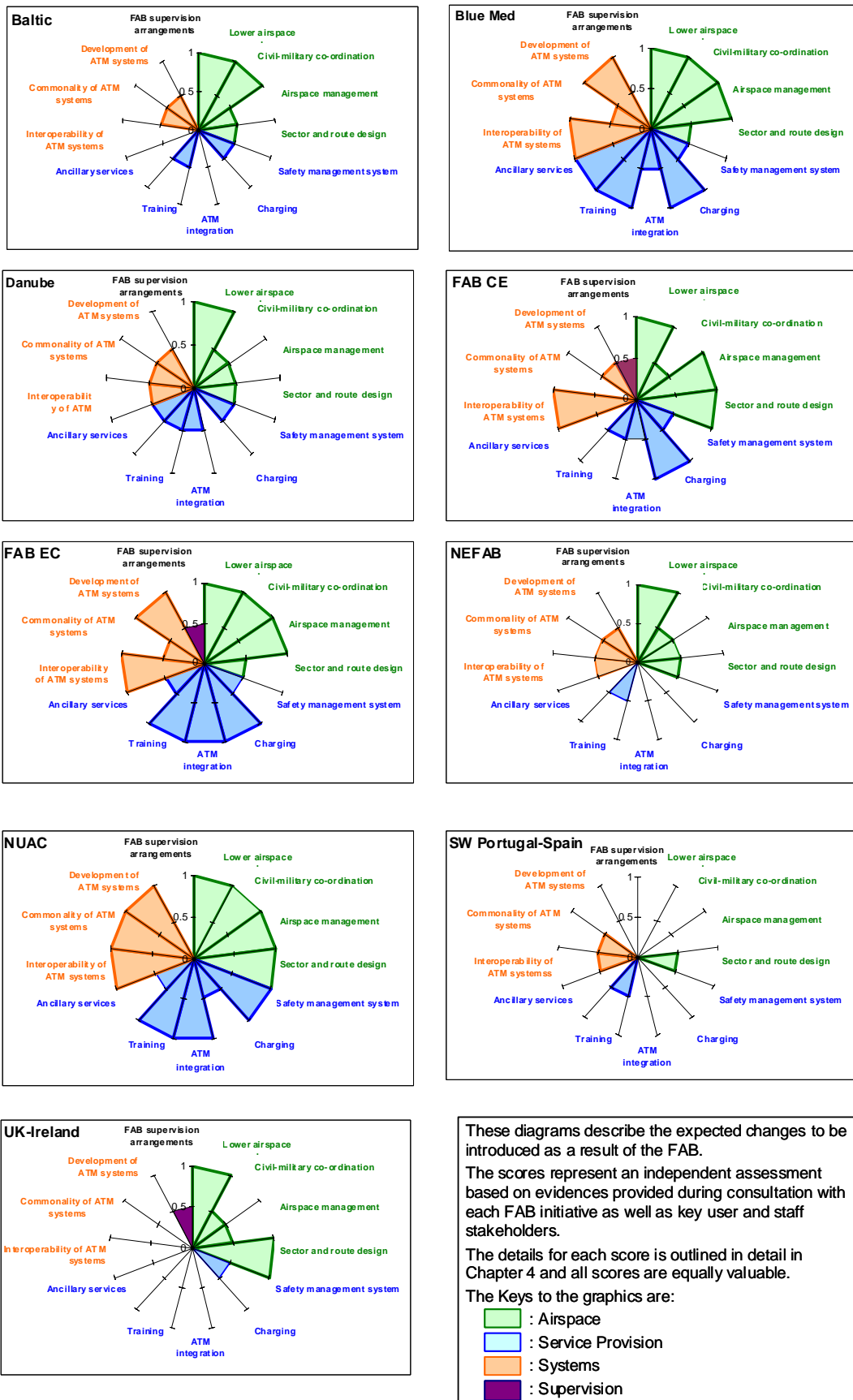
#### **Factual assessment 3: Wide differences in scope**

There are wide differences in the scope of changes expected from FAB initiatives as shown in Figure 2-1 below and in an analysis across FABs presented in Chapter 5 of the Final Report.

All FABs plan to cover, to some extent, the original legislative requirements of airspace and operational changes, but a number of them have extended their plans to address issues of service provision, systems, training, and Air Traffic Flow Management.

This makes sense from an organisational and change management perspective, and is in line with the definition of FABs in the SES II package issued in June 2008. However, it increases the complexity of the programme of work and potentially lengthens the time to implementation and achieving some of the benefits of the FABs. Moreover, the wider scope has sometimes reflected a lack of clear objectives from Member States.

Figure 2-1: Characteristics of each FAB



These diagrams describe the expected changes to be introduced as a result of the FAB.

The scores represent an independent assessment based on evidences provided during consultation with each FAB initiative as well as key user and staff stakeholders.

The details for each score is outlined in detail in Chapter 4 and all scores are equally valuable.

The Keys to the graphics are:

- Green: Airspace
- Blue: Service Provision
- Orange: Systems
- Purple: Supervision



**Factual assessment 4: All but one FABs address upper and lower airspace**

All FABs, except one, address both upper and lower airspace (See Figure 2-1). This is positive, as it allows greater optimisation of flows and better interaction with the TMAs. It goes beyond the current requirements of SES I and anticipates amendments proposed in the SES II package.

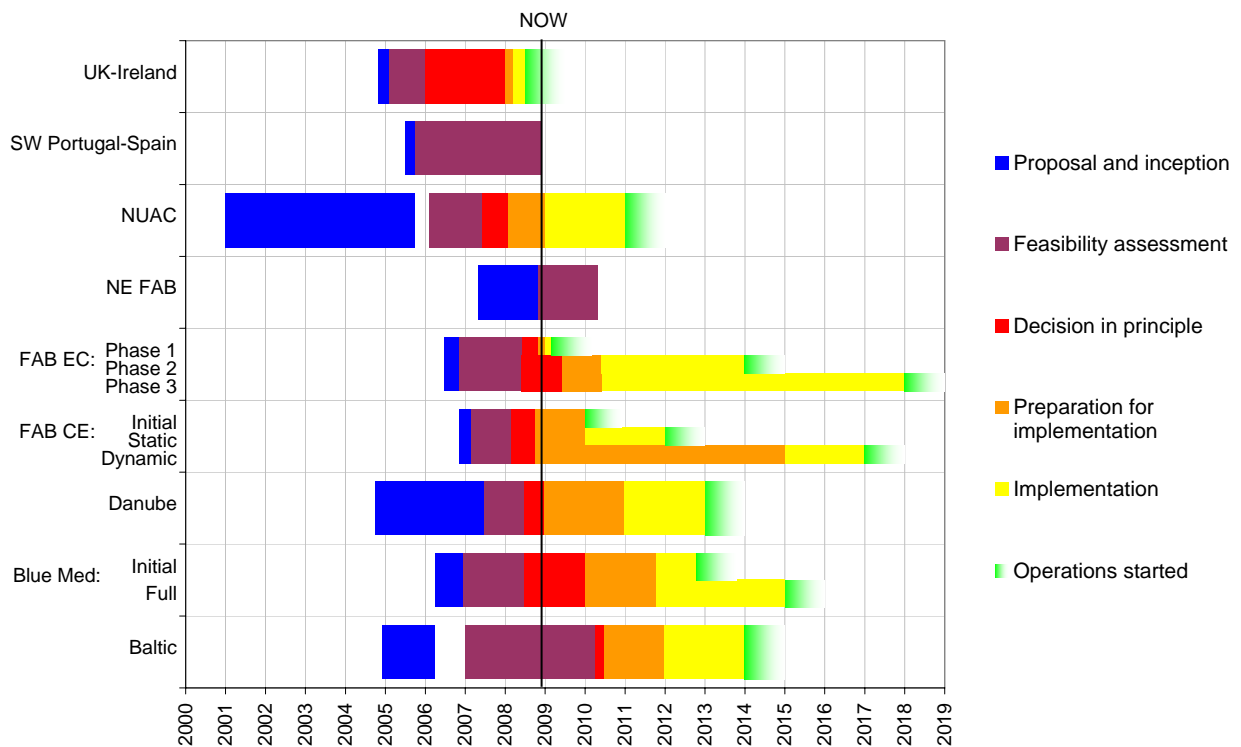
2.2.1 In the proposed amendments to the SES legislation, requirements concerning FABs are not limited to upper airspace.



**Factual assessment 5: Large differences in timescales and approaches**

Large differences in timescales and deployment strategies are observed: an explicit phased approach for FAB CE and FAB EC, and an implicit phased approach for most other initiatives.

2014 is the latest target date for the start of operations of known FAB initiatives. The current planned timescales of the initiatives are reviewed in detail in Section 5.5 of the Final Report.





**Factual assessment 6: A range of co-operation models**

A number of FABs have examined, at least in a preliminary assessment, different institutional options for the FAB (UK-Ireland, NUAC, Danube, FAB EC). These have examined a range of co-operation models, including co-operation agreements, operational alliances (some joint functions) and operational/organisational mergers.

Available information, notably from NUAC, indicates prospects for greater performance improvements from the stronger co-operation arrangements.

To date, FAB initiatives have preferred co-operation agreements and operational alliances, at least as a first step. This represents a pragmatic approach even if, in some FABs, the merger option remains the long term objective.

It is interesting to note that a representative staff organisation advocates the merger scenario in the MOSAIC project.

2.2.2 FABs have the potential not only to improve flight-efficiency and related environmental impact, but also ANS direct costs through genuine business rationalisation and integration (service provision, support functions and common ATM systems/infrastructure). The analysis of some feasibility studies with different institutional options have shown that improvements in both direct and indirect ANS costs could be achieved through FABs, with the most promising benefits stemming from full merger scenarios. To date, the pragmatic approach for co-operation agreements taken by FAB initiatives is generally in line with the Co-op framework proposed by the European Transport Federation.

2.2.3 In this context, it should also be noted that the staff-led initiative MOSAIC explicitly proposes a full operational and organisational merger of several ANSPs, with the creation of a (civil/military) integrated inter-State public sector ANSP in core Europe. The progressive streamlining of technical infrastructure and support functions is expected to bring significant savings (scale effect), although costs and benefits are not quantified at this stage.

**Factual assessment 7: Various level of stakeholders involvement**

Airspace users, staff and military representative have been involved in the FAB feasibility in very different ways and depth.

2.2.4 The PRC has assembled statements by stakeholders on their perceived involvement in the FAB initiatives at 1 July 2008, which are summarised in Figure 2-2 below.

**Figure 2-2: Perceived stakeholder involvement in FAB initiatives at 1 July 2008**

FAB	Users	Staff	Military
FAB Baltic	Little involvement to date. PRC understands BANC starting to launch process (October '08)	None before FAB more mature PRC understands BANC starting to launch process (October '08)	No involvement. However, already close co-operation outside the FAB
FAB Blue Med	Users have expressed their dissatisfaction with level of involvement. Consultation meeting took place in June and intention for more involvement in next phase.	Limited consultation to date. Some consultation in June and September	Initially limited but now involved with working groups and will be involved in Definition Phase
FAB Danube	Some consultation through open stakeholder meetings, but no significant influence	Working group for social dialogue, staff perception after good start limited involvement after 2007 (to open consultation)	Limited involvement to date
FAB CE	IATA member of steering committee, Austrian on two working groups. Airlines concerned their advice not taken on board	Some involvement will be stepped up during the next phase. Staff disappointed with their level of involvement to date.	Military involved in two working groups. In future will be involved in JMACB
FAB EC	Extensive consultation with users	Some consultation, but consider it limited to information transfer	Civil/ Military working group in feasibility study
NEFAB	Minimal involvement, information exchanged	Minimal involvement, information exchanged	Minimal involvement, information exchanged
FAB NUAC	Regularly involved in co-ordination groups and contributed to the Definition phase report	Regularly involved in co-ordination groups and contributed to the Definition phase report	Regularly involved in co-ordination groups and contributed to the Definition phase report
SW Portugal-Spain FAB	Minimal involvement, information exchanged	Minimal involvement, information exchanged. Do not fully understand the development of the project	Minimal involvement, information exchanged
FAB UK-Ireland	Some involvement in feasibility phase. Key role in implementation phase with Chair of Service Provision working group of FAB Management Board	Trade unions involved. However, differences in perception of management and trade unions as to the extent of influence. TUs will at least be involved in Service Provision Working Group	Military involved with feasibility study. Representatives of the military have been appointed to the FAB Management Board.

2.2.5 As the FABs mature, greater involvement of the three key stakeholders is formalised, e.g. the Management Board in the UK-Ireland FAB, and the Joint Civil-Military Co-ordination Board in the FAB CE. In FAB EC, the civil-military co-ordination plans produced by the working group will be taken forward. However, arrangements for the involvement of Military ANSPs in the feasibility stage are still under consideration.



**Factual assessment 8: All FABs follow existing FIRs and ATS delegations**

The bottom-up approach to FABs has resulted in FIR and ANSP groupings, following existing boundaries and ATS delegations, rather than operational effectiveness. Geographical necessity and alliances also played a role.

While this may be at odds with the operational logic of FABs in the SES I legislation, addressing mainly airspace fragmentation, this is consistent with FABs as defined in the

proposed SES II package, addressing the “*optimisation and integration of ANSP*”.

European-wide and cross FAB airspace design and use has only been considered peripherally through existing FAB initiatives, leaving some of the most challenging interfaces unchanged. Inter-FAB European-wide airspace design should be effectively addressed at European level.

2.2.6 The existing SES I Regulation states that airspace should be reconfigured on an operational basis regardless of existing boundaries.

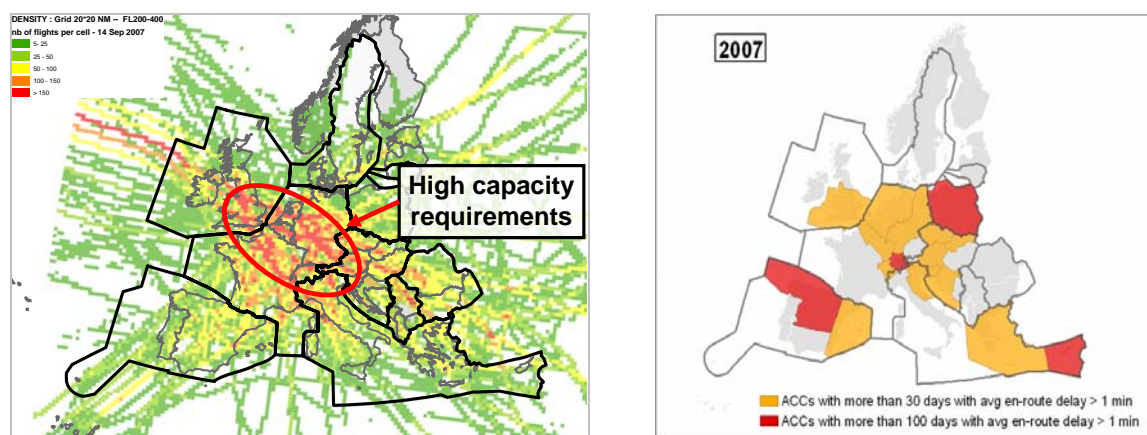
2.2.7 However, the FAB initiatives have been influenced by geography, historic political relationships and cultural commonalities. As a result of this:

- All FAB initiatives are planning to join the existing FIRs of participating Member States - there are no examples of existing FIRs being split between FABs. All boundaries between FABs will therefore be close to existing FIR boundaries, with limited delegation of service provision across FAB boundaries (which takes place anyhow, regardless of FABs).
- Some airspace reconfiguration that might have operational merit is not currently being pursued through any FAB initiative. Some of the most challenging interfaces are not being addressed within any FAB, e.g. Eastern Germany and Western Poland, North East Italy and Croatia/Montenegro.
- Some groupings are based on geographical necessity, some Member States being located at European boundaries, for example Cyprus and Greece, Portugal and Spain.

2.2.8 It should be recognised that it is not straightforward for ANSPs to participate in several FAB projects at the same time as it requires resources and adds complexity.

2.2.9 It could be argued that, as national boundaries are unlikely to be the optimal operational boundaries between FABs, this is inconsistent with the requirements of the airspace Regulation to optimise airspace design regardless of national boundaries. For example, the core area of Europe, with the highest density of civil and military traffic, spans four different FAB initiatives (left-hand-side of Figure 2-3 below). This is unlikely to be operationally optimal. On the other hand, aside from Zürich ACC in 2007, the ACCs with the highest level of delays in 2007 tend to be outside the core area (right-hand-side of Figure 2-3 below).

**Figure 2-3: Core high density area**



2.2.10 In fact, the objective of FABs is modified in the proposed SES II legislative package, as follows: “A FAB means an airspace block based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related ancillary functions are optimised and/or integrated”.

- 2.2.11 FIR and ANSP groupings resulting from the bottom-up approach tend to reduce the level of fragmentation in ANS provision, which is in line with the new objective of FABs and the bottom-up approach to FABs confirmed in the proposed legislation.
- 2.2.12 In this case, the Europe-wide and cross-FAB airspace issues remain. Most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB. Although some FABs are also looking at the design of airspace at the boundary with other FABs, this is generally a secondary issue.
- 2.2.13 Therefore, there is a risk that the current boundaries of FABs will not sufficiently improve the **connectivity** of the European network and may freeze inefficiency into it. There is a need for an adequate mechanism to ensure the Europe-wide and cross-FAB consistency of airspace design and use.



**Factual assessment 9: Cross-FAB coordination has been very limited**

Cross FAB issues are only marginally addressed. There has been limited coordination across FAB initiatives. EUROCONTROL has organised Periodic Information Meetings with FAB programme managers. There are some examples of FABs working together, but this is generally limited and secondary to the main FAB work programme. An example of this is the interaction with the South East UK area, which FAB EC has identified as an area to be given special consideration when addressing airspace design.



**Factual assessment 10: Safety assessments more appropriate than Safety Cases**

A number of FABs have undertaken safety assessments identifying hazards and potential mitigations which could arise as a result of the FAB initiatives. These are reviewed in detail in Chapter 6 of the Final Report.

No Safety Cases could be developed at this stage, since they can only be performed when the FAB is fully specified operationally. SES requirements would need to be clarified accordingly, as drawing-up of a Safety Case is one of the few requirements for the creation of FABs.

Due to limited evidence, no conclusion on best practice from safety assessment / building changes to a safety case resulting from FABs can be provided.

- 2.2.14 This requirement probably stems from a misunderstanding of the role of a Safety Case as an evolving and “live” document supporting the operational development of an ANS organisation. The Safety Case needs to be updated for any operational change, whether driven by a FAB or any other operational need.
- 2.2.15 To date, only safety assessments have been conducted by FABs. In the case of the UK-Ireland FAB, it was concluded that there were no changes to the Safety Case to be introduced by the FAB Management Board. A number of safety assessments have identified potential safety risks arising from the FAB feasibility studies and suggested mitigations. However, as these have not yet been implemented, they have not led to a change in the operational Safety Cases.
- 2.2.16 As a result, only limited evidence is available for determining the best practice for the development of Safety Cases for changes expected as a result of FAB initiatives.



**Factual assessment 11: Identified key impediments to progress in FABs**

A number of key impediments to progress in the implementation of FABs have been reported by FAB representatives and stakeholders, which have to do with operational, legal, financial and organisational matters.

2.2.17 A number of key impediments to progress in the implementation of the FAB initiatives have been reported throughout the study. The report identifies the main ones, and makes suggestions for alleviating these.

- a) **“Big bang” changes are difficult:** There is an emerging view, reflected in the more mature FAB feasibility studies that implementing a “Big bang” is difficult in relation to agreement between all stakeholders. Therefore, most FABs are taking what they consider to be more practical ‘small steps’ to implement the FAB, often encompassing a number of different phases within their implementation programme.
- b) **Loose definition of FAB requirements/ lack of guidance in SES:** The loose definition of FAB requirements in the SES legislation, and a lack of guidance and implementing rules, has led to uncertainty in terms of what needs to be implemented. The wide scope of some FABs (operational, technical, financial, human, Civil-Military) has led to much longer preparation and feasibility stages than if a narrower scope had been followed.
- c) **Lack of FAB objectives from Member States:** Some FABs have been provided with clear objectives by their Member States, including deadlines and quantified performance objectives. Others have been given no or very little guidance from their States about the objectives of the FAB, leading to delay in decision making and in achieving quantifiable outputs during the feasibility studies.
- d) **Lack of explicit incentives:** The current legislation and charging regime does not provide the ANSPs in a FAB with sufficient incentives to use the FAB as one of the tools to improve their performance (as measured by safety, operational and cost efficiency). Therefore, no real sense of urgency is provided through the existing FAB mechanism.
- e) **Different operational concepts:** In some of the FABs, a wide range of current operational concepts and practices mean that significant changes and harmonisation will be needed to implement the FAB. In some FABs where there are currently significant differences between operational concepts (FAB EC, FAB CE and Blue Med), this is a potential cause of delay in effective implementation.
- f) **Differences in governance and financial arrangements:** Some FABs have identified that different financial and ownership objectives can provide an obstacle to effective implementation. This includes differences in salaries and unit rates, treatment of VAT, shareholder objectives, value of the cost of capital, etc. This provides a real obstacle to the practical implementation of a FAB.
- g) **Liability and sovereignty:** A number of FABs reported liability and sovereignty as real challenge to the introduction of the FAB. However, others tried and tested ways of resolving these issues. These could be shared and implemented across the FAB initiatives. Sovereignty always lies with the State. Sovereignty issues can be addressed through amendments to legislation and require a full involvement and cooperation with the military. Liability issues can be resolved through contractual arrangements between ANSPs following approval of the States.
- h) **Constitutional/legal impediments in some Member States:** In some Member States, there are or have been constitutional impediments to delegation of ATS provision, either on the basis that assets used to provide the service must reside within the Member State or an express prohibition of the provision of ANS by

organisations outside the Member State. The extent of these constraints has not been investigated comprehensively for all States in this study. However, the PRC understands that this issue either remains (Germany) or has been addressed in revised Aviation Acts (Bulgaria, Romania, and Austria).

- i) **Difficulties in agreeing financial arrangements:** When FABs have considered making changes to charging arrangements, they have found it very difficult because any proposed changes will lead to some re-distributional issues among airlines. Even if the changes make sense from a “business” and operational point of view (e.g. limit the use of longer, but cheaper, routes within a FAB), some airspace users will oppose the change. This has the potential to slow down, or prevent, the change being implemented. Moreover, where ANSPs within the FAB have different corporate objectives (profit maximising, or cost recovery) this may lead to different views of the potential to redistribute costs and revenues across ANSPs in the FAB.
- j) **Lack of sharing of best practice across FAB initiatives:** A number of FABs believe that more formal sharing of best practice should take place. The current Periodic Information Meetings (PIM) process is not seen as sufficient to fulfil this purpose in the long run. Moreover, best practices should also be shared across NSAs, which is outside the scope of this forum.

## B) Expected impact on performance

### **Factual assessment 12: Various approaches and maturity of Cost Benefit Analyses**

By October 2008, only six CBAs or high level economic appraisal had been received, albeit with various levels of maturity and completion. Available CBAs were organised differently and built on different assumptions, which makes a comparison of expected performance benefits challenging.

A range of approaches have been used for these CBAs. In FAB EC and FAB CE, an assessment of staged changes and in Blue Med a “do minimum” and “do maximum” scenarios were used to illustrate the range of possibilities.

- 2.2.18 Chapter 6 of the Final Report reviews the CBAs produced by the Danube FAB, FAB EC, FAB CE, NUAC, UK-Ireland, and a high level “economic appraisal” produced by Blue Med.
- 2.2.19 There is a wide range of maturity in CBAs produced to date, and all of them are subject to revision. Some are based on extensive work, including simulations and modelling, while others are mainly based on unsubstantiated assumptions or “expert” judgements. The latter constitute a weak basis for implementation decisions.
- 2.2.20 It is therefore important for FAB initiatives (or sub-initiatives) to be specific about deliverables, timescales, benefits and costs before implementation decisions are taken. In this context, the FAB initiatives could make best use of the EC framework for “Impact Assessment” and its associated guidelines (SEC (2005)791).
- 2.2.21 In addition, these analyses should be published, so that stakeholders can monitor progress. This process would make the FABs more accountable to their customers and regulators. Such an approach is planned through the review by NSAs of all the business cases for the UK-Ireland FAB Management Board.



**Factual assessment 13: Expected benefits from available CBAs**

The SES legislator and airspace users expected FABs to provide significant improvements in performance and “quick wins”.

Due to a wide range of approaches and quality in Cost-Benefit Analyses, it is not easy to assess and compare the magnitude, timing and robustness of expected improvements from FAB initiatives. This is especially the case for safety and operational improvements.

Nevertheless, for illustration purposes, the PRC has attempted to evaluate the net projected benefits in 2013 and in 2018 for each FAB, and to relate these benefits to the 2006 total economic costs (ANS provision costs + costs of route extension and ATFM delays incurred by airspace users). A summary of this comparison is presented in Figure 2-4.

The largest relative benefits are identified for FAB EC, NUAC and the Danube FAB. Assumptions and expert judgements would need to be confirmed for the Danube FAB. Due to its central location and weight, FAB EC has a key role in improving the performance of the European ANS system. NUAC shows that strong cooperation can lead to significant further performance improvements in already well performing low/medium density areas.

Benefits arising from other FAB initiatives tend to be lower, slower or more uncertain. For FAB UK-Ireland, the timing and magnitude of the changes to be implemented by the FAB Management Board are not yet decided, and the benefits are for the time being uncertain. In general, the higher the commitment from States and ANSPs, the higher the benefits.

Feasibility studies often recommend a phased approach to implementation rather than a “big bang” approach. While this may delay benefits, this is a pragmatic approach taking into account the practicalities of change management in the ANS industry.

- 2.2.22 The objective of SES regulations is to improve ANS performance. FABs are one of the tools available for ANSPs and Member States to reach SES performance objectives. They should bring the regional component of performance improvement.
- 2.2.23 This assessment indicates that FABs are creating a positive momentum for co-operation between ANSPs and between Member States, which presents opportunities and prospects for performance improvements beyond those achievable individually.
- 2.2.24 Airspace users remain concerned that the promised benefits of SES have not yet materialised. Moreover the promised benefits of the FAB feasibility studies tend to be after 2012 and in many cases predict only modest improvements in productivity and cost-effectiveness. Airspace users do not perceive a sense of urgency from States and ANSPs to address their top priority of reduction in unit costs.
- 2.2.25 To give an indication of the relative benefits of the FAB initiative CBAs and to compare them, the PRC has made an attempt to derive the annual net benefits (direct and indirect benefits from savings in delay and flight-efficiency to users) and weight those benefits against the 2006 total economic costs for the FAB (see Figure 2-4 below).

**Figure 2-4: Annual net benefits as a % of Total Economic Costs (2006)**

FAB	2006 total economic cost in M€	2013 benefits in M€	2013 benefits as % of 2006 total economic costs	2018 benefits in M€	2018 benefits as % of 2006 total economic costs
<b>Blue Med</b>					
Scenario min	€1.070 M	€14 M	1%	€17 M	2%
Scenario max		€49 M	5%	€71 M	7%
<b>Danube *</b>					
Scenario 1,8%	€239 M	€52 M	22%	€52 M	22%
Scenario 1%		€29 M	12%	€29 M	12%
<b>FAB CE</b>					
Static	€542 M	€6 M	1%	€30 M	6%
Dynamic (big bang)		€6 M	1%	€21 M	4%
Dynamic (gradual)		€6 M	1%	€27 M	5%
<b>FAB EC</b>	€3.147 M	€260 M	8%	€1.150 M	37%
<b>NUAC</b>	€255 M	€47 M	18%	€51 M	18%
<b>UK-Ireland FAB</b>	€1.135 M	€12 M	1%	€40 M	4%

\*: Assumptions and expert judgements would need to be confirmed



#### **Factual assessment 14: Opportunity to improve flight-efficiency and environment**

Horizontal route extension (a component of flight-efficiency) is a major performance issue, with significant economic and environmental impact. This is attracting increasing attention in the debate on sustainable air transport development.

The average route extension in Europe was approximately 50 km per flight in 2007. Recognising that flight-efficiency cannot be optimised without considering potential impacts on capacity and safety, there is a limit to potential improvements. However, even limited improvements would have very positive economic and environmental impacts.

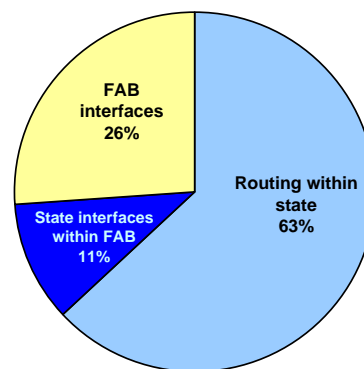
FABs have a role to play in reaching such significant performance improvements. The PRC's analysis indicates that FABs have the potential to reduce route extension by improving interfaces between participating States (which counts for 11% of route extension, see Figure 7-5). Moreover, FAB initiatives often create a momentum to address flight-efficiency issues **within** participating States (including civil-military) which has a greater potential for improvement (63% of route extension are within States, see Figure 7-5).

However, approximately one quarter of route extension issues need to be resolved across FABs and Europe-wide.

2.2.26 The average horizontal route extension for each FAB initiative have been calculated and broken down into three different components, as shown in Figure 7-5:

- Routing within a State;
- Interfaces between States within the FAB; and
- Interfaces between FABs.



**Figure 7-5: Breakdown of route extension showing potential impact of FABs**

- 2.2.27 This calculation is presented in more detail in Chapter 5 of the Final Report. It shows that the FAB initiatives can primarily address the issues of improved routing within States and between the States within the FAB. These account for 63% and 11% of all route extensions respectively. Although the issue of routing within States could in theory be addressed without a FAB, it appears that FABs are a catalyst to also address “local” issues due to:
- pressure to obtain quick wins (for example, more effective civil/military cooperation); and
  - a larger geographical area of airspace being available to find solutions to operational issues, which are more difficult to solve at national level.
- 2.2.28 The interfaces between FABs account for 26% of route extension, significantly more than interfaces between States within each FAB. Therefore, improved co-ordination of the entry/exit points between FABs is also important. Some FABs are addressing the issue of inter-FAB route design, through co-operation between FABs and surrounding ANSPs. These, however, cannot achieve the necessary pan-European dimension. A Pan-European mechanism is needed to ensure the consistency of airspace design and use across-FABs.
- 2.2.29 Indicators show that, in some cases, interfaces between States within a FAB are already quite well optimised (NUAC, FAB Spain Portugal, Blue Med and FAB UK-IR). Further operational benefits from the FAB are therefore limited, at least with these proposed groupings of FIRs into FABs.
- 2.2.30 It must be noted that different groupings based on operational requirements and not necessarily following national boundaries could provide different operational benefits, in particular with regard to interfaces between States.
- 2.2.31 Recognising that flight-efficiency cannot be optimised without considering potential impacts on capacity and safety, the PRC considers that a maximum of 30% improvement in route extension (approx. 15 km per flight) could be achieved on average across Europe. As the economic cost of route extension has been estimated at €2,400 million in 2007 (see PRR 2007), this implies that the economic value of reduced route extension could be up to €700 million per year (with fuel prices and traffic levels in 2007).



### **Factual assessment 15: Identification of performance objectives in some FABs**

Three FABs have identified, with their Member States, key performance areas and emerging targets/objectives for performance improvements: FAB EC, FAB CE and Blue Med. Others have identified key priority areas to focus the initial work of the FAB without specific quantified performance targets/objectives (FAB UK-Ireland, NUAC). Details can be found in Chapter 4 of the Final Report.

This, alongside with emerging CBAs, shows the institutional commitment to introducing change through FABs and recognising that FABs must lead to quantified net performance improvements. Moreover, it is consistent with SES II draft requirements for the introduction of regional/local performance plans, consistent with the Community-wide performance objectives.

Conversely, the absence of specific quantified performance targets has contributed to the slow pace of other FAB initiatives.



### **Factual assessment 16: Opportunity for target setting at FAB level**

The draft SES II legislation includes an option for target setting at FAB level. With some prerequisites (prior convergence in performance, proper accountability and governance, etc), this would give FABs a very concrete meaning and facilitate the implementation of the SES II performance scheme.

2.2.32 The performance scheme in the draft SES II legislation includes performance targets and means to ensure that they are met, and specific reference to “*national or regional [i.e. FAB] Performance plans*”.

2.2.33 Where relevant and feasible, setting regional (FAB-level) performance targets and allocating accountability for meeting them at FAB level would have several advantages:

- It would reduce the number of local target setting processes, and therefore reduce the cumulative efforts to be devoted by Europe-wide bodies: the European Commission, EUROCONTROL, stakeholder organisations and the Performance Review Body;
- NSAs or their groupings would have a wider field of action, have more resources and wider experience and thereby be reinforced; consultation would be more thorough; wider coverage would ensure a more balanced approach in the region;
- The coordination of NSAs, e.g. through a formal group, would be simplified;
- It would foster cooperation among ANSPs in the FABs: it would be easier for them to meet performance targets collectively, encourage joint initiatives such as joint procurement and limit opportunities of pushing issues to the neighbours. Collective accountability would also reinforce solidarity of the management and of the staff;
- It would fall short of target-setting by a European regulator and ensure that local problems are addressed locally, with full knowledge of local circumstances, thereby respecting the subsidiarity principle, and finally;
- It would give reality to the concept of FABs, and make them one of the SES building blocks, with a real impact on performance.

- 2.2.34 FAB-level target setting may not be applicable in certain performance areas (e.g. safety). There may be genuine impediments as well. Prerequisites for setting targets at FAB level would need to be identified, e.g. some degree of convergence in key performance areas (e.g. cost-effectiveness), mechanisms for allocating accountability to reach performance targets among participating ANSPs. A detailed analysis would need to be conducted concerning target setting and accountability to meet them at FAB levels.

## 2.3 Conclusions and Recommendations

- 2.3.1 The PRC conclusions and recommendations concerning FAB initiatives are grouped in 10 areas:
- A) Benefits to be expected from FABs;
  - B) Political commitment to the implementation of FABs;
  - C) Deadlines for FAB implementation;
  - D) Involvement and co-operation of all stakeholders
  - E) Ensuring consistency and connectivity of the European network;
  - F) Guidance for the creation of FABs;
  - G) A framework to address sovereignty and liability issues;
  - H) Minimum requirements for CBAs;
  - I) Exchange of information between FABs and with the EC; and
  - J) Performance reporting and target setting at FAB level.

### A) Benefits to be expected from FABs

- 2.3.2 The objective of SES regulations is to improve ANS performance. This first PRC evaluation of FABs shows that FABs can be an effective tool, amongst others, to reach SES performance objectives – provided there are a shared vision, ambitious objectives, and strong commitments from the stakeholders to effectively reach these objectives.
- 2.3.3 In fact, the proposed SES II package reinforces the FAB concept, through its objective “*to optimise and/or integrate the provision of ANS and related ancillary functions*”. This is a clear step forward.
- 2.3.4 During 2008, six (out of nine) FABs have undertaken intensive work and have invested significant effort and resources in developing feasibility studies. One FAB initiative - FAB UK-Ireland was officially implemented in June 2008 and came into effect in July 2008. It is clear that the legal obligation to create FABs has generated a positive momentum for co-operation between ANSPs and between Member States, and opportunities for performance improvements beyond those achievable individually. This should be preserved and reinforced.
- 2.3.5 The analysis of available CBAs has shown that, apart from FAB EC and NUAC, benefits arising from other FAB initiatives tended to be lower, slower or more uncertain.
- **Recommendation 1:** FAB sponsors should demonstrate significant identifiable benefits from their FAB initiatives prior to authorising further steps.

- **Recommendation 2:** In the event that the identified benefits are not significant, States should identify alternative means of achieving performance improvements. Such improvements should form part of the performance review and target-setting scheme, including any European Commission review, under SES II.

## B) Political commitment to the implementation of FABs

2.3.6 A lack of commitment and guidance from States was identified as one of the key reasons for the initial slow progress in FAB initiatives.

- **Recommendation 3:** States should reaffirm their commitment to create FABs during the discussion on SES II in the Transport Council of the European Union.

## C) Deadlines for FAB implementation

2.3.7 The European Commission proposes to introduce a deadline of 2012 for the establishment of FABs in its proposed legislation for SES II. This deadline seems to be realistic and achievable in view of the timescale of most FAB initiatives.

2.3.8 However, this deadline may need to be complemented to ensure continued progress. The phased nature of implementation planned by most FAB initiatives, including the UK-Ireland FAB that has already started its implementation phase, shows that launching a FAB does not guarantee prompt benefits.

2.3.9 In order to further strengthen the momentum and focus the attention of all involved stakeholders, the PRC suggests that more detailed deadlines are introduced in SES II concerning the creation of FABs.

- **Recommendation 4:** The following deadlines could be added into the SES II legislation:
  - By 2010 for FABs to publish a performance plan, including the profile of planned performance improvements and quick-wins;
  - By 2011 for the European Commission to adopt detailed rules or guidance on FABs as part of SES II;
  - By 2012 at the latest for FABs to implement identified quick-wins.

## D) Involvement and co-operation of all stakeholders

2.3.10 Most significant progress has taken place where there was a proper involvement of all key stakeholders (States, staff, military and airspace users) as well as cooperation between NSAs.

- **Recommendation 5:** All stakeholders, including the military, airspace users and staff representatives should be adequately involved in FAB initiatives. In particular it is necessary:
  - to develop or strengthen effective social dialogue between all staff representative organisations and ANSP management;
  - to organise effective cooperation amongst NSAs of the FAB; and
  - to address military issues and civil-military coordination.

## E) Ensuring consistency and connectivity of the European network

2.3.11 Since all FABs follow boundaries of existing FIRs (and current ATS delegations), and that most FAB initiatives have concentrated primarily on improvements to the design of airspace within the FAB, there is a need to ensure the connectivity of the European network across FABs.

2.3.12 Improvement in flight-efficiency within each FAB provides significant opportunities for savings to airlines, passengers and benefits for the environment. However, since approximately one quarter of European route extension issues can only be solved across FABs and Europe-wide, a strong and effective network management and design function at European level, as proposed in SES II, is crucial.

- **Recommendation 6:** The network management and design function identified in the SES II package should be entrusted with facilitating intra-FAB and Europe-wide consistency of airspace design and use, making use of EUROCONTROL technical expertise as appropriate.

## F) Guidance for the creation of FABs

2.3.13 Clearly each FAB is different and faces different political, operational, technical and economic challenges. The evaluation has identified that FAB initiatives show wide differences in scope, timescales and approaches. It is therefore clear that a flexible approach needs to be maintained, as long as performance improvements are delivered.

2.3.14 Several FAB initiatives implicitly or explicitly consider one or more of the following ANS cooperation scenarios: co-operation agreement, operational alliance (some joint functions) and merger. A progressive evolution is sometimes foreseen.

2.3.15 A comparison of feasibility studies shows that a lot of effort is devoted in each FAB to the same issues and with similar results. Moreover, most FAB initiatives have reported similar impediments for the creation of FABs. Greater guidance and coordination for the establishment of FABs would help avoid misunderstandings and duplication of work.

- **Recommendation 7:** The European Commission should establish guidance on the establishment and deployment of FAB initiatives. This could be in the form of implementing rules as proposed in Article 9a(7) of the service provision Regulation of the SES II package.

At operational and technical levels, the following areas are essential:

- A common operational concept;
- A coherent approach to safety;
- Air Traffic Flow and Capacity management (ATFCM) and Airspace Management (ASM) at European and FAB level; and
- Interoperable ATM systems, including the FDP system.

In addition, the guidance could include a common approach to charging, which is a desirable component of a FAB.

Such guidance will need to allow for transitional arrangements and flexibility on the timing of introduction of changes by FABs, depending on local circumstances.

## F.1) A common operational concept

2.3.16 The operational concept comprises several components, including:

- Airspace organisation and management;
- ATM service delivery;
- Conflict management;
- Demand and capacity balancing; and
- Traffic synchronisation.

2.3.17 A common operational concept, consistent with the ICAO Global ATM Operational Concept (Doc 9854) is a major opportunity to improve efficiency, capacity and quality of service through, for example:

- removing disjointed operational interfaces (improving seamlessness) between the ANSPs within the FAB and providing a uniform service across the FAB;
- better management of traffic and airspace complexity;
- allowing dynamic sectorization across ANSPs as driven by demand; and
- enabling common ATCO resource planning by moving towards a system where ATCOs can be trained, qualified and operate across ANSPs (although this might also require a common human-machine interface).

2.3.18 Therefore, the PRC recommends that:

- **Recommendation 8:** There should be a common operational concept for similar airspace within each FAB. This would allow for more than one operational concept within a FAB, where a FAB contains airspace with significantly different characteristics (for example, Oceanic airspace).

## F.2) A coherent approach to safety

2.3.19 Different approaches to safety, both in terms of regulation and safety management, are likely to limit the scope of the FAB, for example in terms of the ability to dynamically allocate staff between ANSPs for cross-border ATS delegation, and the requirements for generic sectors, common training and certification, etc.. In addition, as there are some common network functions, such as airspace design, AMC and flow management, there must be a coherent approach to safety for those functions.

2.3.20 The application of a common operational concept and common ATM systems must also comply with safety regulations and the safety management systems (SMS) of the participating ANSPs. In order to avoid the complexity of meeting a set of slightly different safety requirements and the associated duplication of effort, a single approach to safety across the FAB would be the most effective solution, although it is not necessary. Mutual recognition and delegation could also be applied as an alternative, as at the Maastricht Upper Area Control (MUAC) Centre. However, this would be more unwieldy than a single safety management system. The single safety management system would have the advantage of fewer interfaces and lower complexity.

2.3.21 Training and certification of ATCOs and engineers is also closely linked to safety. Similarly to safety, training and certification could be organised through a variety of schemes subject to mutual recognition and/or delegation. Alternatively a single, approved scheme could bring economies of scale and lead to more uniformity.

2.3.22 Moreover, no FABs have yet established a safety case notwithstanding the fact that it is one of the few mandatory requirements listed in Article 5(2) of the airspace Regulation. Since a “Safety Case” is a live document used to provide evidence that a known state of a system and associated operations meets their safety requirements, Safety Case cannot be established prior to the operation of the FAB. Therefore, safety assessments, rather than safety cases, should be required for the creation of FABs in SES legislation.

- **Recommendation 9:** A coherent approach to safety is an essential characteristic of a FAB. In particular, common reporting standards should be developed at FAB level to contribute to an increase in reporting and safety awareness reflecting principles of a “Just Culture”.
- **Recommendation 10:** For some of the emerging safety issues, European level solutions need to be developed to avoid duplication of effort and multiple solutions. For example, a common safety approach for UAV operations and for dynamic sectorization.
- **Recommendation 11:** the SES requirement for a FAB to provide a “Safety Case” should be replaced by a requirement to produce a “Safety Assessment”.

### F.3) Organisation of Air Traffic flow and Capacity management (ATFCM) and Airspace Management (ASM)

2.3.23 Some FABs propose to create airspace design functions, airspace management cells (AMCs), and flow and capacity management functions/units at FAB level.

2.3.24 In order to improve efficiency, and not to create a third layer of organisation, these functions/units would have to **replace** rather than duplicate activities that are currently undertaken at ANSP level. A European flow management unit would still be required for Air Traffic Flow and Capacity Management (ATFCM) at European level.

2.3.25 The approach to network management in each FAB must be consistent with the overall European Network Management and Design function proposed by SES II.

- **Recommendation 12:** Air Traffic Flow and Capacity Management (ATFCM) and Airspace Management (ASM) should be organised at FAB level provided that these functions replace functions currently undertaken at ANSP level, and that they be subject to common requirements. An effective European Flow Management Unit remains necessary to provide ATFCM across FABs, a single contact point for airspace users, and a focal point for Cooperative Decision Making (CDM) involving airspace users, airports, and FAB or national ATFCM/ASM units.

#### F.4) Interoperability of systems

2.3.26 FABs, and ANSPs within FABs, are taking different approaches to ANS systems. However, while considering that ANSPs will have to comply to the future SESAR requirements, interoperability and overall efficiency would need to be ensured through:

- Common system development, sourcing and procurement;
- Common maintenance processes and personnel;
- Greater commonality in technology, systems and their associated support processes;
- Common or interoperable Flight Data Processing and Human Machine Interface, facilitating the application of a common operational concept and enabling mobility of ATCOs;
- Global and/or Europe-wide interoperability standards.

2.3.27 The PRC recommends that:

- **Recommendation 13:** The ATM systems used by ANSPs in a FAB should be equivalent in terms of functionality and performance output. They should be fully interoperable within the FAB. Global/Europe-wide interoperability standards should apply across the FABs. FABs should progressively reach common specifications, procurement and maintenance and have regard to emerging SESAR requirements.

#### F.5) A common approach to charging

2.3.28 FABs will operate within the Common Charging Scheme Regulation. However, this allows considerable flexibility in the precise mechanisms used, e.g. defining charging zones, allocating costs and applying incentive schemes.

2.3.29 Article 4 of the charging scheme Regulation provides that when States have decided to create a common cross-border charging zone (for instance within a FAB), “*Member States concerned shall make the appropriate arrangements to ensure consistency and uniformity in the application of this Regulation to the airspace concerned*”. Nevertheless, when creating a FAB, State do not necessarily have to create a common cross-border charging zone.

2.3.30 Although some of the FAB initiatives are planning a common unit rate within the FAB, others consider that this is not necessary to achieve the objectives of the FAB.

2.3.31 Recital 9 of the charging scheme Regulation provides that “at the time when the Commission will draft its report on the creation of FABs, the Commission will assess the difficulties that may arise from maintaining separate unit rates within a functional airspace block”.

- **Recommendation 14:** The definition and implementation of an appropriate charging regime within FABs, irrespective of national boundaries, is key for an efficient route design and management of traffic flows. The charging regime in a FAB should allocate revenue to service providers within each FAB on the basis of where services are actually provided, rather than on the basis of national boundaries.



- **Recommendation 15:** In the event that a FAB initiative decided that a common unit rate should be introduced for the FAB:
  - the impact of redistribution of charges between airspace users should be taken into account and national unit rates should preferably have converged;
  - a mechanism should be introduced between the States/ANSPs participating in the common unit rate to allocate the revenues to each State/ANSP on the basis of a key to be regularly defined by States/ANSPs;
  - a mechanism should be introduced to ensure a minimum discipline between the ANSPs participating in the common unit rate in order to ensure a uniform approach in cost control in the area.
- **Recommendation 16:** In order to carry out the requirements of Recital 9 of the common charging regulation, a detailed review should be undertaken in the near future to see whether the flexibility of the charging scheme Regulation has facilitated the reorganisation of the airspace and the provision of air navigation services within each FAB.

## G) A framework to address sovereignty and liability issues

- 2.3.32 Different FAB initiatives expressed different views as to whether sovereignty or liability issues were a difficulty in the context of cross-border ATC delegation. Although some considered that the Überlingen case provided a sufficient clear precedent for determining liability of States and ANSPs, others thought that these issues should be clarified by the European Commission based on international law. In addition, some FABs suggested that European legislation could be used to address constraints arising in national laws on cross-border provision of ANS. However, while deserving careful attention, both sovereignty and liability issues should not be considered as show-stoppers for the establishment of FABs.
- 2.3.33 A review of some aviation acts and/or constitutions has shown that possible difficulties may exist in implementing the SES, in particular the creation of FABs and the cross-border provision of air navigation services. This particular issue deserves great attention. In some cases, aviation Acts have been modified accordingly (Austria, Bulgaria, Romania) while in other cases, some constraints are built in a constitutional act (Germany).
- 2.3.34 NSAs have a particular status in the SES II emerging legislation. It is important that in the cross-European context, the roles to be performed by NSAs are clearly understood and their ability to act nationally but in a European context has a uniform effect on the efficiency of the ATM system.
- **Recommendation 17:** The European Commission should:
    - undertake a study on legal impediments to the implementation of SES in national legislations of Member States, in particular with regard to the creation of FABs and cross-border provision of air navigation services.
    - provide guidance on the appropriate legal framework for liability that States and ANSPs have when services are provided on a cross-border basis, using available documents already developed by EUROCONTROL such as the “Model State Level FAB Agreement” as well as the “Guidelines on generic military requirements to be considered when establishing a FAB”. This should clarify that the State is always ultimately liable for accidents that occur within its airspace; and

- having regard for the role and effectiveness of NSAs, make appropriate legislative proposals requiring all States to remove any restrictions on the designation of service providers based in other States, or multi-national service providers, avoiding protectionism, provided appropriate safety and other regulatory requirements are met.

## H) Minimum requirements for CBAs

2.3.35 The EC has adopted a common framework for "Impact Assessment" and issued Guidelines (SEC (2005)791). The Impact Assessment framework has been well tested in particular in cross-domain areas. It structures the evaluation, and provides an aid to decision-making, including on qualitative and quantitative impacts but also cost and benefits. FABs should make best use of this framework.

2.3.36 A number of weaknesses in CBAs are identified in Chapter 6 of the Final Report. The approach to the production of CBAs has been very different across FABs.

- **Recommendation 18:** Any future CBA should be developed in consistency with the EC common approach and guidelines on Impact assessments (SEC (2005)791). In particular, these CBAs should:
  - Have a clear and justified reference case, to provide a realistic assessment of what is likely to occur if the FAB does not proceed. In order to avoid overstating the benefits of the FAB, it is important that this is based on realistic assumptions and takes into account other improvements that may be made: for example through SESAR, and other business initiatives;
  - Identify precise initiatives to be implemented as a result of the FAB, and provide a business case for each of these initiatives. The business case should include detailed deliverables and timescales, and provide estimates of the benefits and the investment, transition, social and operating costs. The business case should also include key dates for implementation of initiatives and realisation of benefits, and set out metrics that can be monitored;
  - Rely on validated facts and plans rather than assumptions;
  - Use substantiated assumptions for discount rates, values of passengers' time, etc.
  - Cover the full range of stakeholders that will be affected by the FAB, including ANSPs, staff, civil and military airspace users, States and passengers.

## I) Exchange of information between FABs and with the EC

2.3.37 There has been only limited communication and sharing of best practices across-FABs for both NSAs and ANSPs. The PRC considers that proper links need to be established, as they could save significant time and resources.

2.3.38 At present, there is informal co-operation between FAB project managers through EUROCONTROL Periodic Information Meetings, which is designed to facilitate exchange of information and best practice. There is no formal mechanism for regular communication among NSAs and with the European Commission, except through the Single Sky Committee or for TEN-T funding.

- **Recommendation 19:** In order to improve communication and share best practices across FABs for both NSAs and ANSPs, the European Commission should establish:
  - A formal process to exchange information and best practices between FABs, both for ANSPs and NSAs;
  - An improved channel for communication between FABs and the European Commission for FAB-related matters.

## J) Performance reporting and target setting at FAB level

- 2.3.39 Although only orders of magnitude should be considered, double digit benefits are anticipated from FAB EC, NUAC and Danube. This confirms that FABs are one of the SES tools to improve ANS performance. It will be important to ensure that such levels of improvement are effectively achieved.
- 2.3.40 Moreover, the evaluation shows that most savings are expected from improvements in flight-efficiency and delays, rather than savings in ANSPs' service provision costs. The latter forming the bulk of ANS total costs. This indicates scope for further improvement.
- 2.3.41 A number of FABs have identified key performance areas and are discussing performance targets. This anticipates the proposals contained in the SES II package. Where applicable and with some prerequisites, setting targets at FAB level instead of at national level would have several advantages:
- It would reduce the number of local target setting processes and the work of the European Commission, NSAs, users and the Performance Review Body;
  - It would reinforce the cohesion of ANSPs, reduce fragmentation while keeping the bottom-up approach, and give a very concrete meaning to FABs.
- 2.3.42 The new SES II performance scheme should respect the subsidiarity principle, and allocate the responsibility for setting and accountability for meeting performance targets at the level where it best fits, recognising the roles of States, NSAs and ANSPs.
- 2.3.43 With FABs, there are potentially three levels of responsibility for ANS performance: national, regional (FABs) and European. This presents an opportunity to better address regional level issues, but a risk to dilute and blur responsibilities. Depending on KPAs and local circumstances, responsibility for local targets in a SES II context should be either at national or FAB level, but not both.
- 2.3.44 As discussed in § 2.2.32 et seq., the draft SES II legislation includes an option for target setting at FAB level. There are prerequisites for setting performance targets at FAB level in a SES II context, in particular clear accountability and oversight for meeting the targets, a degree of prior convergence in performance, a common approach to performance management and common performance reporting in the respective FABs.
- **Recommendation 20:** A common approach to performance management should be introduced within each FAB. To this end, a common approach to performance reporting is necessary in order for all members of the FAB to contribute and to manage performance in a similar way, and to report progress at European level in a common form.

- **Recommendation 21:** Where relevant and feasible, specific quantified performance targets should be set for FABs, as foreseen in the SES II proposal related to performance scheme (i.e., introduction of binding performance targets as part of national or **regional** performance plans<sup>1</sup>). Local performance targets, established under SES II, should be set at either national or FAB level, depending on local circumstances and KPAs, but not at both levels. These would need to be accompanied by an appropriate mechanism to ensure clear accountability for overseeing and meeting those targets at the proper level (State, NSA and ANSP) and incentivise compliance with the targets.

2.3.45 As FABs are an important SES tool to foster performance improvements, it will be important to monitor progress and maintain pressure on FABs to deliver genuine performance improvements and meet the planned deadlines and deliverables. The PRC recommends that a similar review of FABs is undertaken periodically, using the same framework to assess progress made with reference to the situation at 1 July 2008 presented in this report, and to the respective FAB plans.

- **Recommendation 22:** The progress of FABs should be periodically reviewed, both at local level by NSAs and at European level by the European Commission using the assessment framework defined in Annex II to this report. Progress would need to be compared with targets and timelines outlined in the FABs feasibility studies and implementation plans. This would be part of the SES II performance scheme if performance targets are set and monitored at FAB level.

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