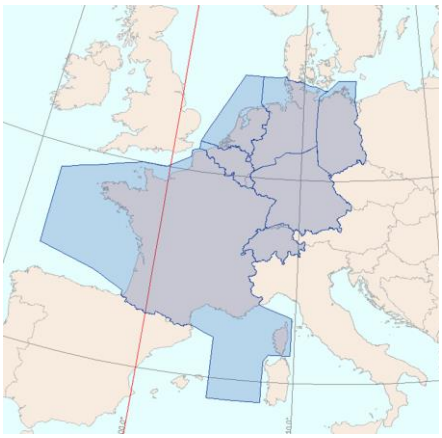
FABEC Safety Case Report



Functional Airspace Block Europe Central

FABEC SCR

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ABSTRACT

The objective of this FABEC safety case is to demonstrate how the development and establishment of the Functional Airspace Block Europe Central (FABEC) will be conducted safely in accordance with the Single European Sky (SES) legislation.

This safety case is a legal document, which provides structured and logical arguments, supported by evidence, to back up the claim that FABEC is and will remain adequately safe as of June 2012. This claim is supported by evidence to show that the regulatory framework is appropriate, that there is adequate safety oversight, and that the service provision within the FABEC is and will remain safe.

CONTENTS

1 INTRODUCTION

This chapter introduces:

- The purpose of this Functional Airspace Block Europe Central (FABEC) safety case;
- Why FABs are required by EC, and what they are meant to deliver (in broad terms)
- The requirements that this FABEC safety case is aimed at satisfying;
- An overview of the construction of the FABEC safety case report.

Notes:

The development of this document is incremental. To enable reviewers to understand which elements of the document are complete, and which elements are still being developed, the following methodology has been applied:

Italics are used as a prompt that further development is needed.

Any issues that require resolution are highlighted with a red background.

Text highlighted in yellow is a placeholder used to highlight that further additional supporting material is needed.

The objective of this FABEC safety case is to demonstrate how the development and establishment of the Functional Airspace Block Europe Central (FABEC) will be conducted safely in accordance with the Single European Sky (SES) legislation. The regulations which are applicable are listed in chapter 3.7.

1.1 SINGLE EUROPEAN SKY BACKGROUND

At present, the European air traffic management system is fragmented.

Air traffic control in Europe is provided by 36 different air navigation service providers. European airspace is mainly organised on a national, rather than multinational, basis.

This allows for improvements to be made regarding efficiency, cost effectiveness and reducing the flight length for the airlines, hence reducing gas emissions. In spite of the current economic downturn, experts predict that air traffic in the FABEC area will continue to grow to reach close to 8 million flights/year by 2018 (compared to 6 million flights in 2007).

The European Commission has called for the rationalisation of the European network to take place without delay to accommodate the predicted traffic levels in a safe, effective, and environmentally friendly manner – whilst reducing costs. This improvement must ensure effective cooperation between civil and military users who share the airspace.

The restructuring of European airspace into **functional airspace blocks** is the backbone of the Single European Sky (SES), Europe's air traffic management rationalisation programme.

A functional airspace block is a portion of airspace extending over several countries that is managed in an integrated fashion, in line with the actual needs of the airspace users. In a FAB, the provision of air navigation services and related ancillary functions are optimised and/or integrated. Air traffic flows are not constrained by national boundaries. This leads to greater efficiency. They will allow for flexible forms of cooperation between air navigation service providers. In a FAB, States retain their respective national sovereignty.

Because the FABEC is implemented at a State level, the oversight of ANSPs within FABEC is included within the scope of this safety case.

1.2 SINGLE EUROPEAN SKY LEGISLATION

The first SES legislative package was adopted in 2004, and amended by SES II in 2009. SES II requires air navigation service providers (ANSPs) to meet a series of binding performance targets involving safety, flight and cost-efficiency, environmental and capacity issues. SES II requires that States shall implement their respective FABs by 04 December 2012.

According to the amending Regulation (EC) 1070/2009 ref [1] of 21 October 2009 which amended EC550 Art. 9a, Functional Airspace Blocks must meet the following **9 basic requirements**:

1. A Safety Case
2. Optimum Use of Airspace taking into account air traffic flows
3. Ensure consistency with the European route network
4. Be justified by their overall added value
5. Ensure a smooth and flexible transfer of responsibility for air traffic control
6. Ensure the compatibility between the different airspace configurations
7. Comply with conditions stemming from regional agreements concluded within the ICAO
8. Respect regional agreements in existence, in particular those involving European third countries
9. Facilitate consistency with Community-wide performance targets

Additional SES legislation applicable to FABs was developed after 2004 and is also taken into account (In particular Regulations (EC) 2096/2005 Ref [2], and 1315/2007 Ref [3]).

Based on the complete set of SES regulations, the FAB Focal Point Group under EC has developed a draft checklist (version February 2010) to verify compliance with SES legislation and general objectives and spirit of FABs. This checklist contains the following requirements:

1. Evidence on the fulfillment of conditions to establish a FAB

   (**Summarizing the 9 basic requirements of Regulation (EC) 1070/2009 [1] of 21 October 2009 Art. 9a**)
2. Draft State Agreement*
3. Agreement on Supervision between States
4. Agreement on Supervision between National Supervisory Authorties (NSAs)
5. Arrangements between ANSPs
6. Evidence of cooperation between States on Flexible Use of Airspace across national borders
7. Written agreements between civil and military authorities in the FAB
8. Agreement between NSAs regarding the division of responsibilities regarding supervisory tasks (optional)
9. Charging Scheme for the FAB (optional)
10. Performance Plan for the FAB

These requirements are further developed within this safety case where they effect the safety claims and evidence.

1.3 FABEC DELIVERABLES

The requirements listed in the previous section have associated FABEC deliverables, which have been divided into 2 categories:

1. Deliverables which will be **submitted to the Commission** to meet regulatory requirements

    a. FABEC State Agreement
    b. FABEC NSA Memorandum of Cooperation
    c. FABEC ANSP Cooperation Agreement
    d. FABEC Safety Case (Snapshot December 2011)
    e. FABEC Cost Benefit Analysis (Snapshot December 2011)

2. Deliverables **developed internally within FABEC** to enable establishment of FABEC. These deliverables will not be formally submitted to the Commission.

    a. Description of FABEC Airspace Design changes leading to performance improvement
    b. FABEC Communication Plan
    c. FABEC Social Dialogue Committee ToR
    d. FABEC States Agreement on the Joint Designation of FABEC ANSPs
    e. FABEC State Governance Arrangements
    f. FABEC NSA Manual for common activities
    g. FABEC Airspace Management Policy
    h. FABEC Priority Rules
    i. FABEC Harmonized Procedures Tactical ASM
    j. FABEC Charging Regime Agreement
    k. FABEC Performance Plan(s)
    l. FABEC Performance Management System

This safety case is the deliverable identified as item 1.d.

The SES II REGULATION (EC) No 550/2004 (Airspace Regulation) specifies in article 9a:

1. By ...* Member States shall take all necessary measures in order to ensure the implementation of functional airspace blocks with a view to achieving the required capacity and efficiency of the air traffic management network within the Single European Sky and maintaining a high level of safety and contributing to the overall performance of the air transport system and a reduced environmental impact. Member States shall cooperate to the fullest extent possible with each other, in particular Member States establishing neighbouring functional airspace blocks, in order to ensure compliance with this provision. Where relevant, cooperation may also include third countries taking part in functional airspace blocks.

2. Functional airspace blocks shall, in particular: (a) be supported by a safety case;

See context C1 of the safety argument in chapter 6. Commission Regulation 176/2011 [4] on FAB Information requirements was developed and released in early 2011, and specifies in article 3 and part II of the Annex the minimum requirements for demonstration of compliance with article 9a of 550/2004. These requirements are listed in chapter 9 of this safety case, and a traceability matrix has been added which maps each requirement to the evidence provided in this document.

The process for constructing this safety case is explained in more detail in chapter 4.

1.4 SAFETY CASE ROADMAP

A safety case is a legal document, which provides structured and logical arguments, supported by evidence, to back up a claim regarding the safety of a subject. In this safety case, the claim is that FABEC is and will remain adequately safe as of June 2012.

Further details of the claims, arguments and evidence are contained in Chapters 5 and 6.

Chapter 2 of this safety case defines the scope of the safety arguments, and the time boundaries that are being considered within that scope.

Chapter 3 contains a description of the FABEC airspace, the parties involved in undertaking regulation and oversight of the FABEC, as well as the parties responsible for providing safe services within the affected Airspace.

Chapter 4 provides a description of the process used to develop this safety case.

The high level safety claim that is used to demonstrate that FABEC is safe is provided in Chapter 5.

Chapter 6 contains the decomposition from the higher level safety claim to the evidence required to demonstrate that the FABEC is safe to implement.

Any assumptions made during the drafting of this safety case are described in Chapter 7.

Chapter 8 states the conclusion of the safety case.

Chapter 9 contains a traceability table from the applicable Implementing Rule requirements to the safety case arguments and evidence.

Chapter 10 provides details regarding any recommendations that should be fulfilled after the implementation of the FABEC.

The glossary is contained in chapter 11, and the references are provided in chapter 12.

2 SCOPE & TIME BOUNDARIES

This chapter describes:

- The scope of the safety case arguments;
- The time limitations that the safety case arguments apply to.

As stated earlier, this safety case will form a part of the file that will be submitted to the European Commission for the FABEC. It is therefore limited to arguing that those elements of safety that are required to ensure compliance with all applicable safety regulations are adequately addressed within the FABEC development, as of June 2012.

This safety case covers:

- The Framework for safety regulation from the States perspective;
- Safety oversight of the FABEC ANSPs and arrangements for NSAs cooperation;
- Safety management arrangements intra FABEC, and within each ANSPs, and how this is developing, including interfaces with NSAs and adjacent FABs.

The scope of the FABEC for which the safety must be argued is as described in the System Description in chapter 3.

Because the FABEC is implemented at the States level, the oversight of ANSPs within FABEC is included within the scope of the safety case.

It was agreed within the Overall Safety Case Assembly and Report (OSCAR) subgroup and with the Standing Committee for Safety (SCS) and National Supervisory Authority Task Force that this FABEC safety case is not considered to be a “safety related change” as defined by EC 1315/2007. As a consequence, the FABEC safety case does not need to be approved by the FABEC NSATF and the creation of FABEC does not require the formal acceptance of the FABEC NSATF within the framework of Commission regulation 1315/2007.

This safety case excludes quantified arguments of safety for FABEC. The reason being that the FABEC is considered to be an institutional change to regulation, airspace, and ANSPs, and how they cooperate, hence quantified claims cannot be substantiated within this context.

Likewise, this safety case does not claim that FABEC will be a level of 3 or more safer than what existed prior to the FABEC creation. This is because it is not possible to substantiate such a claim at this stage. It will, however, address the safety management processes that will be established and refined within FABEC in order to enable such claims to be made as the FABEC continues to develop and mature.

The arrangements for maintenance of this safety case after the establishment of the FAB are described in chapter 4.

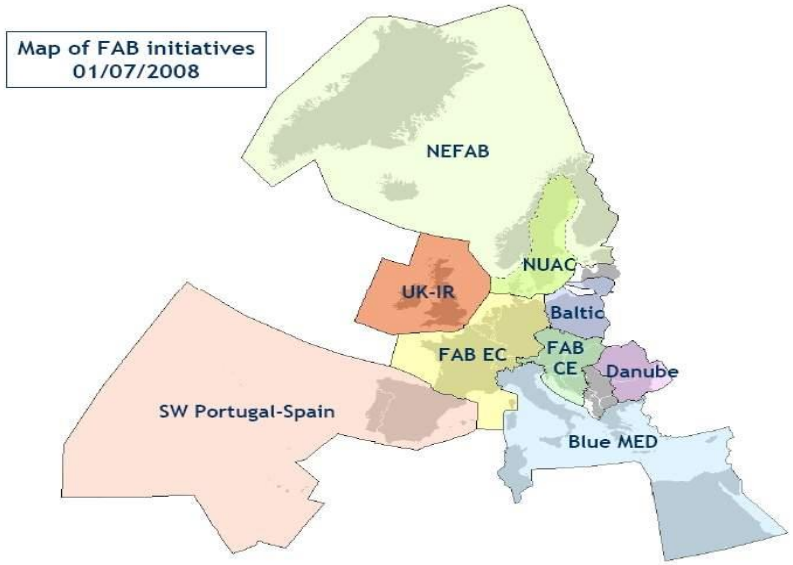
3 FABEC DESCRIPTION

This section describes the context C2 (see chapter 5) for the safety argument of the FABEC, i.e.:

- The different FAB initiatives in Europe, and places FABEC in context with the other FABs
- The FABEC airspace
- The Air Navigation Services provided, at a high level
- A brief description of the different parties involved in safety within FABEC and their safety roles.

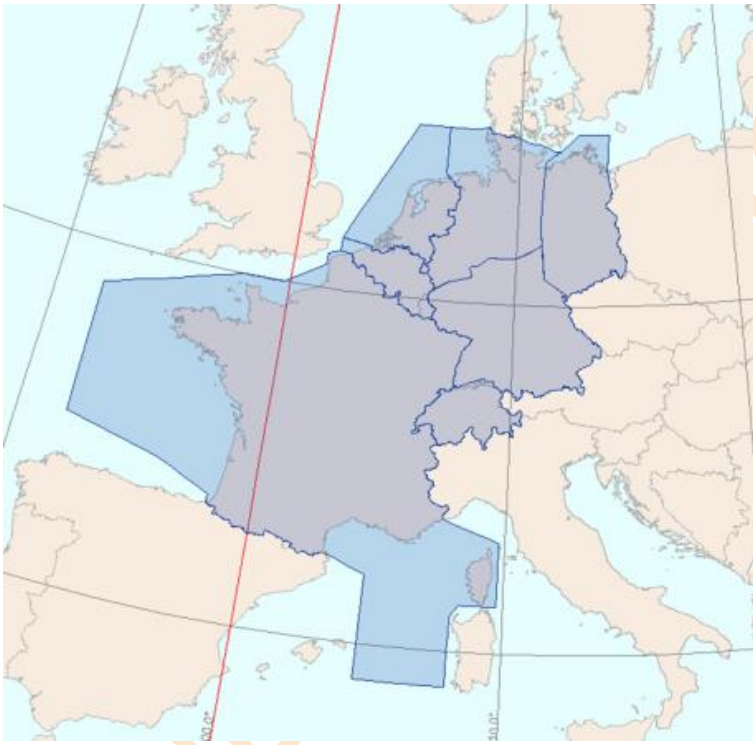
3.1 EUROPEAN FAB DEVELOPMENTS

The diagram below shows FABEC and its relationship to other FAB developments within Europe.



3.2 THE FABEC AREA

The **Functional Airspace Block Europe Central – FABEC –** covers the airspace of six States (**Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland**) located in the core of the European continent. This airspace is one of the busiest and most complex in the world. Most of the large European airports and major civil and military airways are located in this area. Owing to its size and central position in Europe, FABEC is a cornerstone of the Single European Sky.



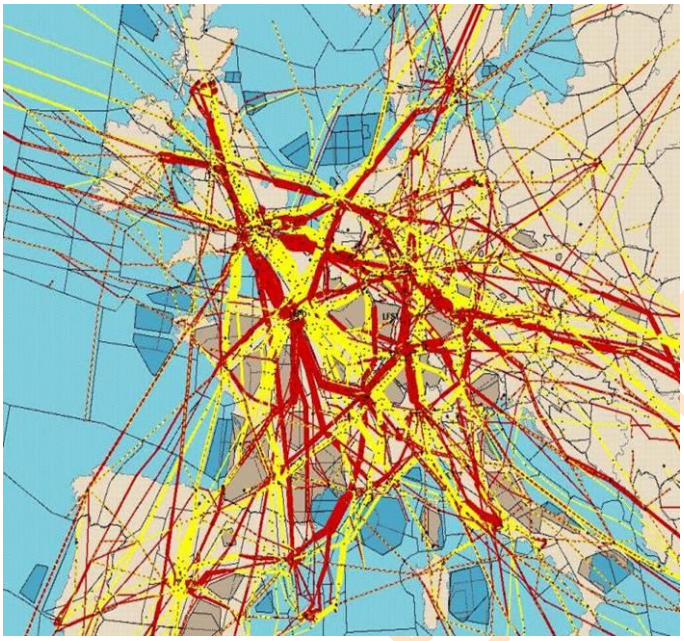
3.3 FABEC AIRSPACE CHARACTERISTICS

The FABEC airspace is characterised as follows:

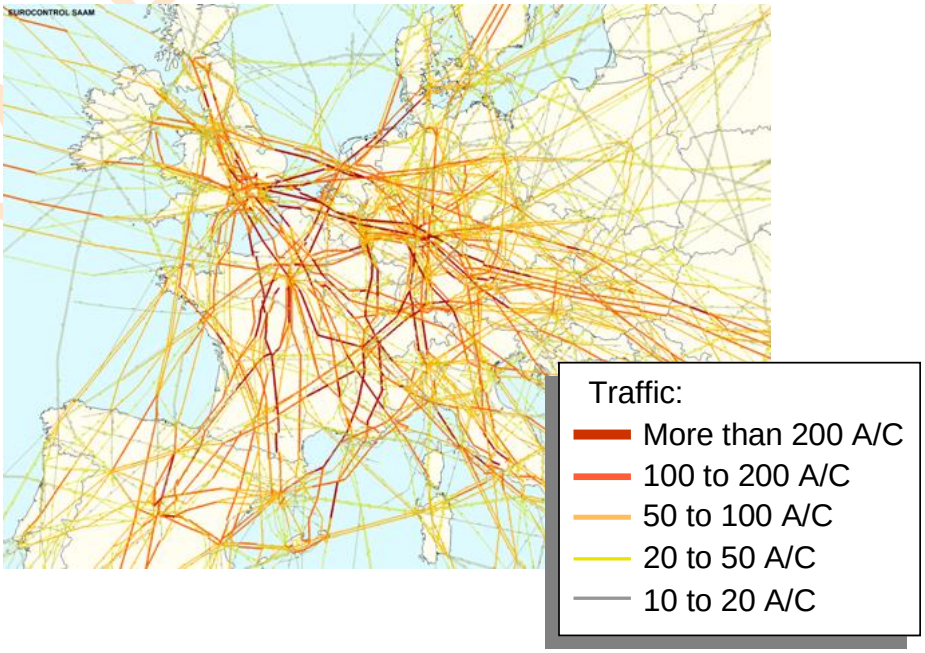
- a **complex and dense ATS route network;**
- a dimension of **1.7 million km², ** equating to **9%** of the surface area of the European continent;
- **6 million flights** per year, equating to **55%** of all European air traffic;
- a forecast **traffic growth of 50%** between 2006 and 2018, resulting in **close to 8 million flights by 2018;**
- about **410 military/special areas;**
- some **370 control sectors;**
- **14 air traffic control centres** (Brussels, Bordeaux, Brest, Marseille, Paris, Reims, Bremen, Munich, Karlsruhe, Langen, Maastricht, Amsterdam, Geneva and Zürich);
- **some 240 airports** operating instrument flight rules (IFR);
- **3 major intercontinental hub airports** (Paris, Amsterdam, Frankfurt) **and proximity to the London airports;**

The core area of Europe has one of the highest air traffic densities in the world and is characterised by closely interlaced civil and military routes.

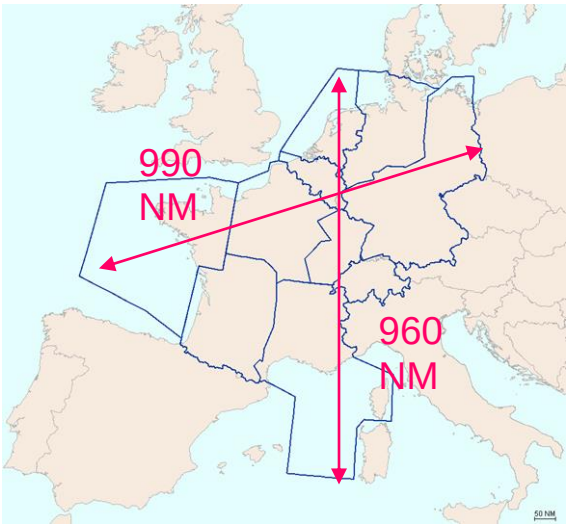
(Source: EUROCONTROL SAAM)



Traffic flows on route network - The complex and dense FABEC ATS route network records particularly dense traffic on some routes. The chart shows high traffic density in the central core area and also surrounding the major airports in Paris, Amsterdam, Frankfurt, Munich, Brussels and Zürich.



Airspace dimensions, FIRs and UIRs



With a total dimension of 1.7 million km^2, the FABEC airspace has a dimension of 960 nautical miles (or 1,780 km) from north to south and 990 nautical miles (or 1,835 km) from eastern Germany to western France.

FIRS and UIRs

The FABEC airspace comprises the flight information regions (FIRs) of Bremen, Langen, Munich, Amsterdam, Brussels, Paris, Reims, Marseille, Bordeaux, Brest, the upper information regions (UIRs) of Hannover, Rhein, Brussels, France and the FIR/UIR of Switzerland.

This is confirmed in the FABEC States Agreement Ref [5] and the FABEC Treaty [6}.

These FIRs and UIRs contain around 240 airports with instrument flight rules (IFR) operations, some 410 military/special areas and around 370 control sectors.

3.4 FABEC AIR NAVIGATION SERVICES

The FABEC air navigations services include:

- ❑ Air Traffic Services
- ❑ Communications, Navigation and surveillance services
- ❑ Aeronautical Information Services
- ❑ Meteorological services

3.5 FABEC INSTITUTION AT 2010

The FABEC treaty [6] states that a functional airspace block is created by mutual agreement of the six states listed in section 3.6. It also creates a FABEC council to govern the FABEC. The treaty does not create an international organisation with an international personality.

For the purposes of this safety case, it is assumed that the NSAs and ANSPs will follow a cooperation/coordination approach, possibly evolving to an integrated approach over the longer term.

3.6 THE PARTNERS

The FABEC programme is driven by civil and military partners of six States:

- High-level officials from the Ministries of Transport and Defence of Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland
- The seven civil air navigation service providers designated in these countries:

  - ○ Belgocontrol, Belgium
  - ○ Direction des services de la Navigations aérienne (DSNA), France
  - ○ DFS Deutsche Flugsicherung, Germany
  - ○ Administration de la Navigation aérienne (ANA), Luxembourg
  - ○ Luchtverkeersleiding Nederland (LVNL), the Netherlands
  - ○ EUROCONTROL Maastricht Upper Area Control Centre (MUAC)
  - ○ Skyguide, Switzerland.

- The **military air navigation service providers** (skyguide (CH); DFS and the German Air Force (D); the Royal Netherlands Air Force (NL); the Belgian Defence (B and LUX) and DIRCAM (FR).

- The roles and responsibilities of these partners are as follows:

  - ❑ State/Regulatory Authorities

    - ○ State arrangements for regulation of military
    - ○ Designation of ATS & Met providers (Ref EC550/2008 arts 8 & 9)

- National Supervisory Authorities
  - To closely co-operate on the supervision of air navigation service providers within FABEC
  - To perform appropriate oversight of the ANSPs providing services within their Airspace. Ref to [549/2004] and [1315/2007] and EASA regs [EASA AR.GEN] and [EASA AR .ATM/ANS] to be developed. EASA term for NSA is 'Competent Authorities'.
  - Supervision of military where conducted in States according to National procedures
  - Supervision of certified MET and AIS providers

The NSAa of each FABEC State are:

- **Luxemburg:** *Direction de l'Aviation Civile*
- **Germany:** *Bundesaufsichtsamts für Flugsicherung*
- **Belgium:** *Belgium Civil Aviation Authority*
- **The Netherlands:** *National Supervisory Authority the Netherlands*
- **Switzerland:** *Federal Office Of Civil Aviation (FOCA)*
- **France:** *Direction de la Sécurité de l'Aviation Civile (DSAC) Direction du Transport Aérien (DTA)*

An up to date list is available at:
http://ec.europa.eu/transport/air/single_european_sky/national_supervisory_en.htm

3.7 APPLICABLE REGULATIONS

The following regulations are deemed applicable to this FABEC Safety Case:

- EC 549/2004 Ref [7] (amended by 1070/2009 [1]);
- EC 550/2004 Ref [8] (amended by 1070/2009 [1]);
- EC 551/2004 Ref [9] (amended by 1070/2009 [1]);
- EC 1315/2007 [3] ;
- Commission Regulation 176/2011 [4]
- EC 2096/2005 [10].

4 SAFETY CASE DEVELOPMENT PROCESS

This chapter provides a description of the process that was used to develop this overall FABEC safety case. It describes:

- ❑ How the safety claims and arguments were constructed;
- ❑ The role of the OSCAR sub-group and its membership;
- ❑ How the evidence has been gathered and documented;
- ❑ How stakeholders have been consulted to verify and validate that this safety case is adequate and representative and makes sense;
- ❑ How this safety case will be maintained post FABEC implementation.

The FABEC Safety Case Report was constructed using the following steps:

- The requirement for a FABEC safety case was identified during a FABEC Standing Committee for Safety strategy meeting held in early 2010.
- As a result of identifying this requirement, a decision was taken to establish a sub group of the SC Saf to start developing the FABEC overall safety case. When this decision was communicated by the chairman SC Saf to the FABEC NSA task force, they also expressed an interest to be involved in the safety case development activities.
- A sub-group of both the SC Saf and the NSA Task Force, called the Overall Safety Case Assembly and Report (OSCAR) was established in March 2010. The ToRs of this group are contained in Ref [11]. This sub-group is represented by selected core members from the NSAs of France and the Netherlands, along with core members of the safety departments of the ANSPs of Belgocontrol, DFS, DSNA, LVNL, MUAC, and Skyguide.
- The OSCAR sub-group met several times to develop the high and low level claims and arguments, and to gather the evidence to support the claims. A plan was also assembled to manage the development and delivery of this safety case. Ref [12]
- In parallel to the above activities, the European Commission developed Regulation EU no 176/2011 on the information to be provided before the establishment and modification of a functional airspace block, which contains more specific requirements on the content of a FAB safety case.
- The OSCAR sub-group also identified several regulatory and other requirements documents which could be applicable to the content of this safety case. These documents were reviewed and requirements captured in the OSCAR Requirements document, which is shown in chapter 9.
- As the safety case has been developed, it has been reviewed for clarity, brevity, consistency and accuracy by various stakeholders including members of:
  - The OSCAR sub group;
  - The Standing Committee for Safety;
  - The NSA Task Force;
  - The AFG
  - The ANSP Strategic Board
  - The 6 States FABEC Group
- The template for the safety case report has been adapted from that used within the MUAC Safety Management System to develop System Safety Cases. The use of this template helped to trigger key questions about what must be considered within the safety case, and how these considerations should be applied within the subject area of FABEC.

- Goal Structured Notation has been used to develop the safety claims, arguments and evidence. See Appendix A for further explanation. This technique enables the developers to concentrate on the key elements that support a valid and logical argument. The technique also provides readers and reviewers of the safety case with an improved clarity of the overall safety case argument structure, for what is potentially a very complex change.
- The safety case has been developed incrementally according to a schedule agreed by the OSCAR members. Evidence has been gathered by members of the OSCAR subgroup, and inserted into the different incremental versions of this safety case. Hence, the safety case is building up the foundation backed by evidence to satisfy the claim that FABEC will be safe to implement in 2012, and will remain safe beyond implementation.

4.1 SAFETY CASE MAINTENANCE

Need to describe the responsibilities for maintaining this safety case after FABEC implementation, and the circumstances that will result in updates being required e.g.

When the FAB is modified by:

- ❑ *Changes to the defined dimensions of the FAB in space and time (Chapter 3)*
- ❑ *Changes in coordination arrangements with the network management functions (still to be described)*
- ❑ *Changes having an impact on the European Route Network*
- ❑ *Changes having an impact on neighbouring: FABS; Member States; or third countries.*
- ❑ *Changes in FABEC governance*

Need to describe arrangements for managing such changes, updating the safety case, and informing Member States, EASA and the Commission and other interested parties of these changes.

Need to describe how the member States will ensure modifications do not affect continued compliance with Article 9a of Regulation EC 550/2004.

Arrangements for proving information in the annual report to the Member States (Art 12 (1) of Regulation EC 549/2004) *for those changes which don't come under the items listed above.*

5 SAFETY ARGUMENT

This chapter provides a brief description of the overall argument structure, and the use of Goal Structured Notation.

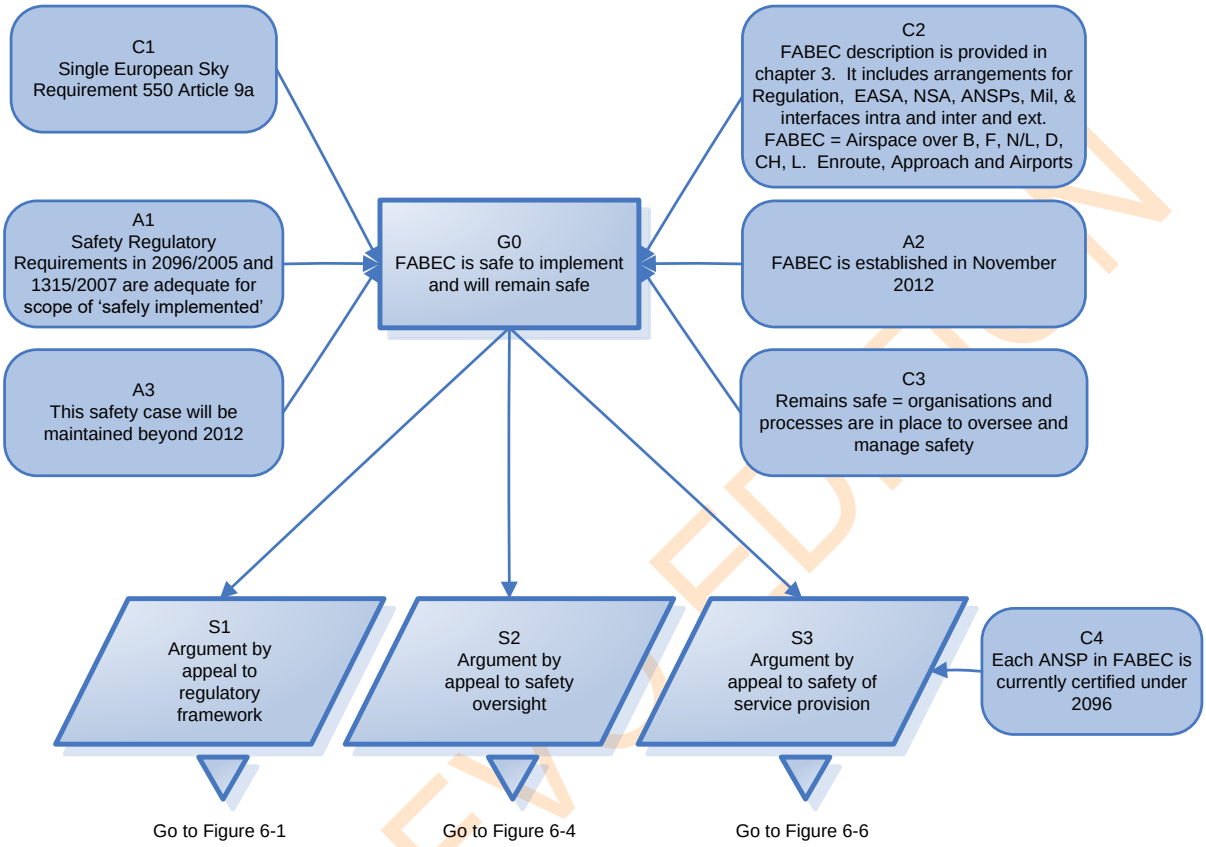


Figure 5-1

5.1 GOAL G0 – FABEC IS SAFELY IMPLEMENTED AND WILL REMAIN SAFE

The GSN above provides the structure and top-level view of the safety argument that the FABEC is safe to implement and will remain safe. The context C2 is described in Chapter 3.

The Assumptions A1 relates to the FABEC being an organisational change, and hence, in order to argue the FABEC is implemented safely, compliance with these high level safety regulatory requirements needs to be shown. This assumption needs to be validated, and is developed further in Chapter 7.

The three pillars of the safety strategy relate to the regulatory framework for the FABEC, the safety oversight of FABEC ANSPs, and the safety of services provided by those ANSPs. This includes inter and intra coordination between the regulators, NSAs, ANSPs and adjacent airspace users. These safety arguments are further developed as follows in chapter 6:

- Section 6-1: Safety Argument – The regulatory framework is appropriate for the FABEC
- Figure 6-4: Safety Argument – There is appropriate and coordinated safety oversight
- Figure 6-6: Safety Argument – The service provision within States is safe and will remain safe.

6 SAFETY ARGUMENT DESCRIPTION

This section describes the strategy for each first level goal (G1 to G3) referred to in figure 5-1, and provides the associated lower level details. The safety arguments are always defined with reference to 'Evidence', which is provided in tables below the main argument. For example, "(E12)" refers to Evidence item 12 in a table.

6.1 GOAL G1 – FABEC REGULATORY FRAMEWORK IS APPROPRIATE

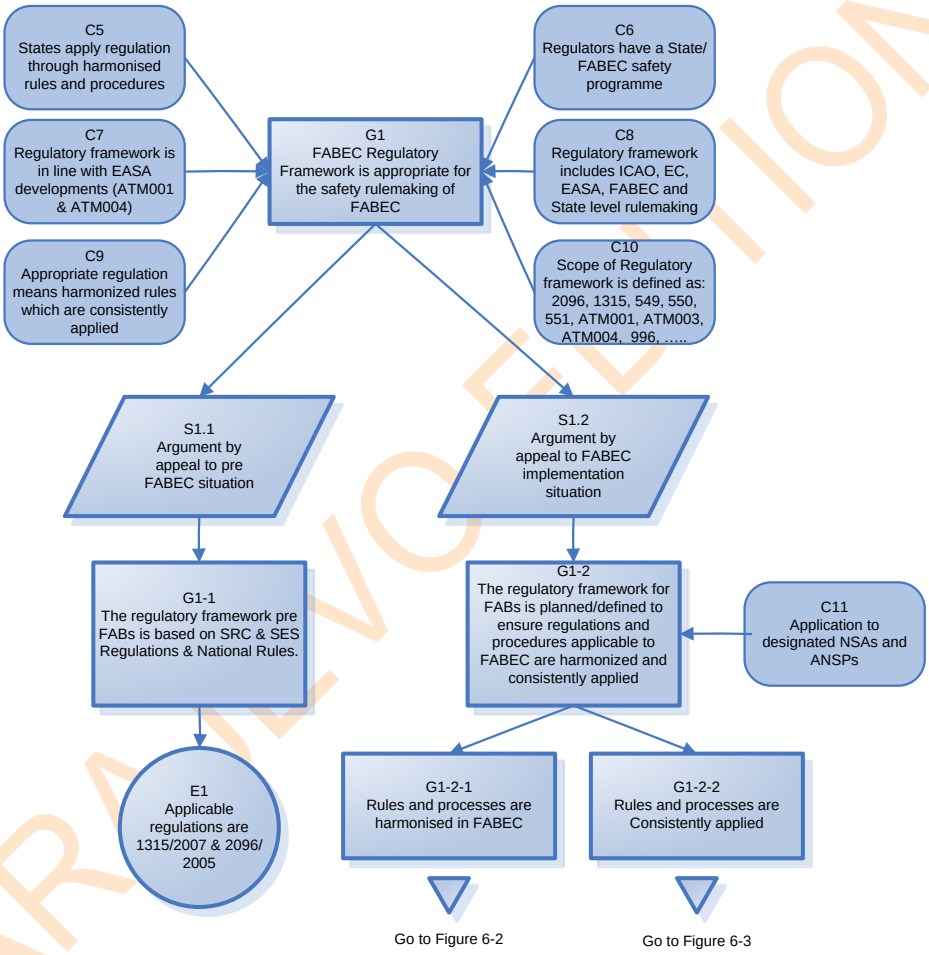


Figure 6-1

Goal: FABEC Rulemaking framework is appropriate for the safety rule making of FABEC.

See Figure 6-1.

This goal is further developed along 2 specific strategies: the pre FAB situation, and the FAB implementation situation.

Evidence	
E1	For the pre FAB situation, the regulatory framework is defined as utilising safety oversight through 1315, 549, 550, and ensuring ANSP compliance under the Single European Sky Regulation 2096-2005. These are referred to from section 3.7.

6.1.1 Harmonised FABEC Rulemaking Processes

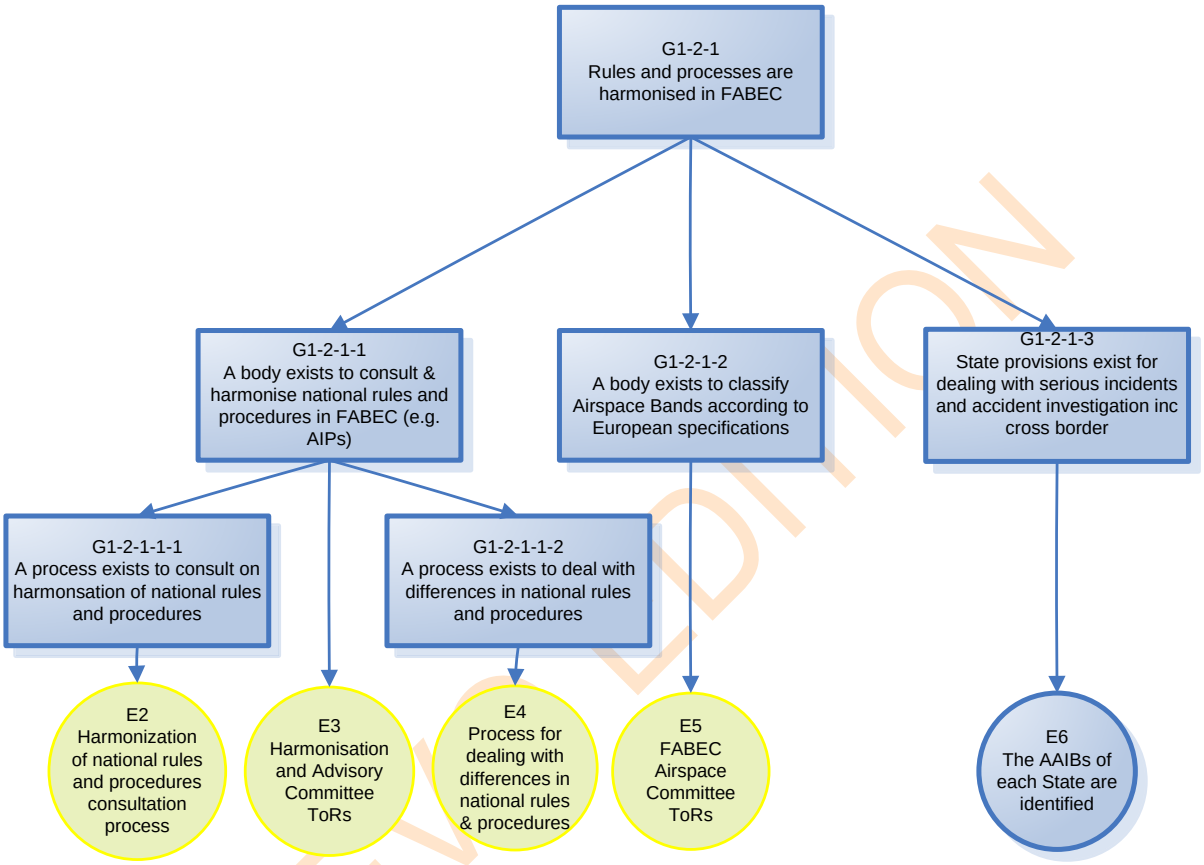


Figure 6-2

Evidence	
E2	Provide a reference to the process that is used for the harmonisation of national rules and procedures, including AIPs. Refer also to G1-2-1 for evidence of which NSAs and ANSPs are consulted. Also, provide evidence/description that all FABEC NSAs and FABEC ANSPs are consulted as part of the process. Responsible for delivering: Laurent Chapeau Due Date: For version 0.8.
E3	Article 24 of the FABEC States Agreement calls for a Harmonisation & Advisory Committee [Ref 6]. The Harmonisation & Advisory Committee is the body established/planned, reporting to the FABEC council, which will establish and implement processes to oversee the consultation and harmonisation of national rules and procedures. Provide ToRs of this body and confirm they will indeed do what we have claimed. [Ref?] Responsible for delivering: Laurent Chapeau Due Date: For version 0.8.
E4	Provide a reference to the process that is used for dealing with differences in National Rules and Procedures, and confirm that this is applied or planned. [Ref?] Responsible for delivering: Laurent Chapeau Due Date: For version 0.8.
E5	Article 24 of the States Agreement calls for an Airspace Committee [Ref 6]. Provide evidence (such as ToRs) that the Airspace Committee is established and

Evidence	
	that it has as part of its remit the classification of Airspace bands. Responsible for delivering: Laurent Chapeau Due Date: For version 0.8.
E6	The AIBs for each State within the FABEC are as follows: ▪ **Luxemburg:** *Administration des Enquêtes Techniques* ▪ **Germany:** *Bundesstelle für Flugunfalluntersuchung (BFU)* ▪ **Belgium:** *Service public fédéral mobilité et transports* ▪ **Nederland:** *De Onderzoeksraad voor veilgheid* ▪ **Switzerland:** *Aircraft Accident Investigation Bureau* ▪ **France:** Bureau d'Enquètes et d'analyses pour la sécurité de l'aviation civile (BEA)

6.1.2 FABEC Rules and Processes are consistently applied

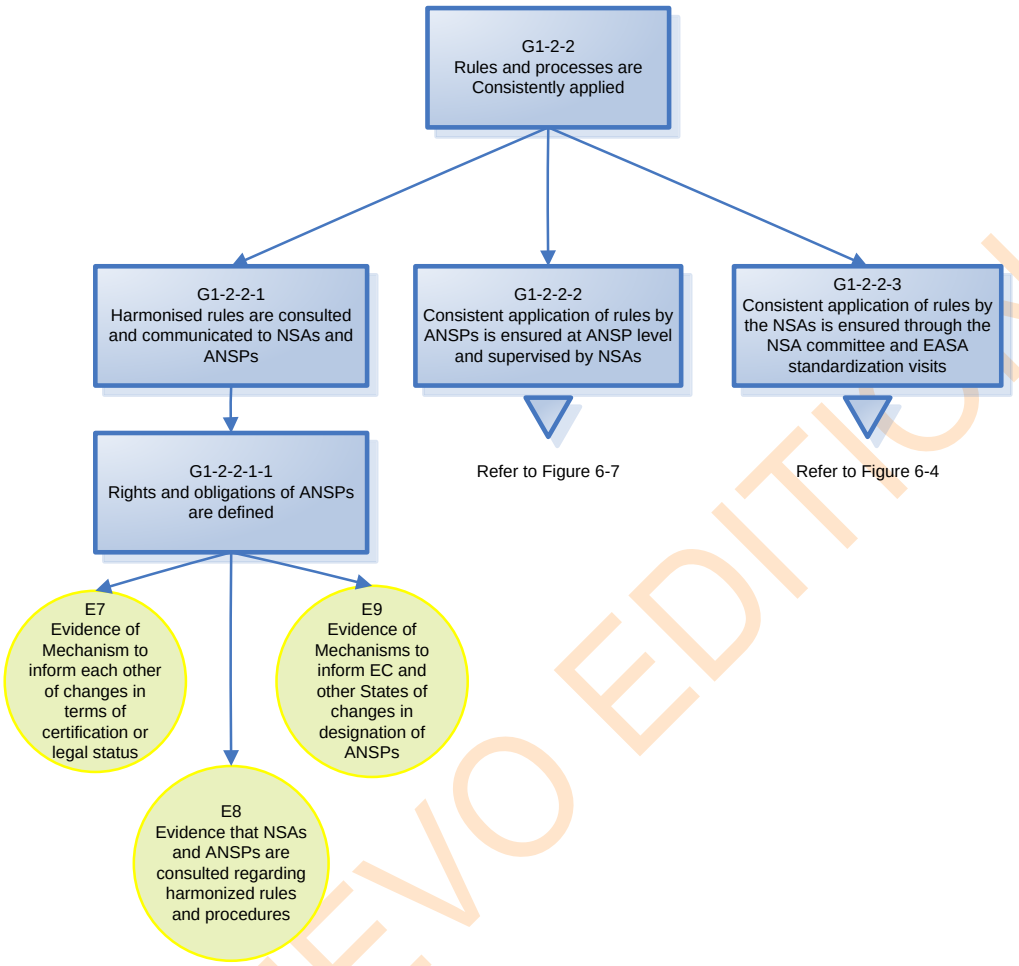


Figure 6-3

Evidence	
E7	Evidence of mechanisms to inform stakeholders of changes in terms of certification or legal status [Ref?]. Also links to G3-1-4. Responsible for delivering: Frederik Demeyere Due Date For version 0.8.
E8	Refer to Goal G1-2-1-1 for evidence of the process for consultation on harmonisation of national rules and procedures. This evidence item shows that the process for consultation and communication on harmonisation of rules includes consultation with all relevant stakeholders (NSAs, ANSPs,) and there is consistency between rule makers, NSAs and ANSPs. [Ref?] Responsible for delivering: Frederik Demeyer Due Date For version 0.8.
E9	Evidence of mechanisms to inform European Commission and other States of changes in designation of ANSPs. [Ref?] Responsible for delivering: Frederik Demeyere Due Date For version 0.8.

6.2 GOAL G2 – THERE IS APPROPRIATE SAFETY OVERSIGHT OF ANSPS AND COORDINATED OVERSIGHT OF THE FABEC

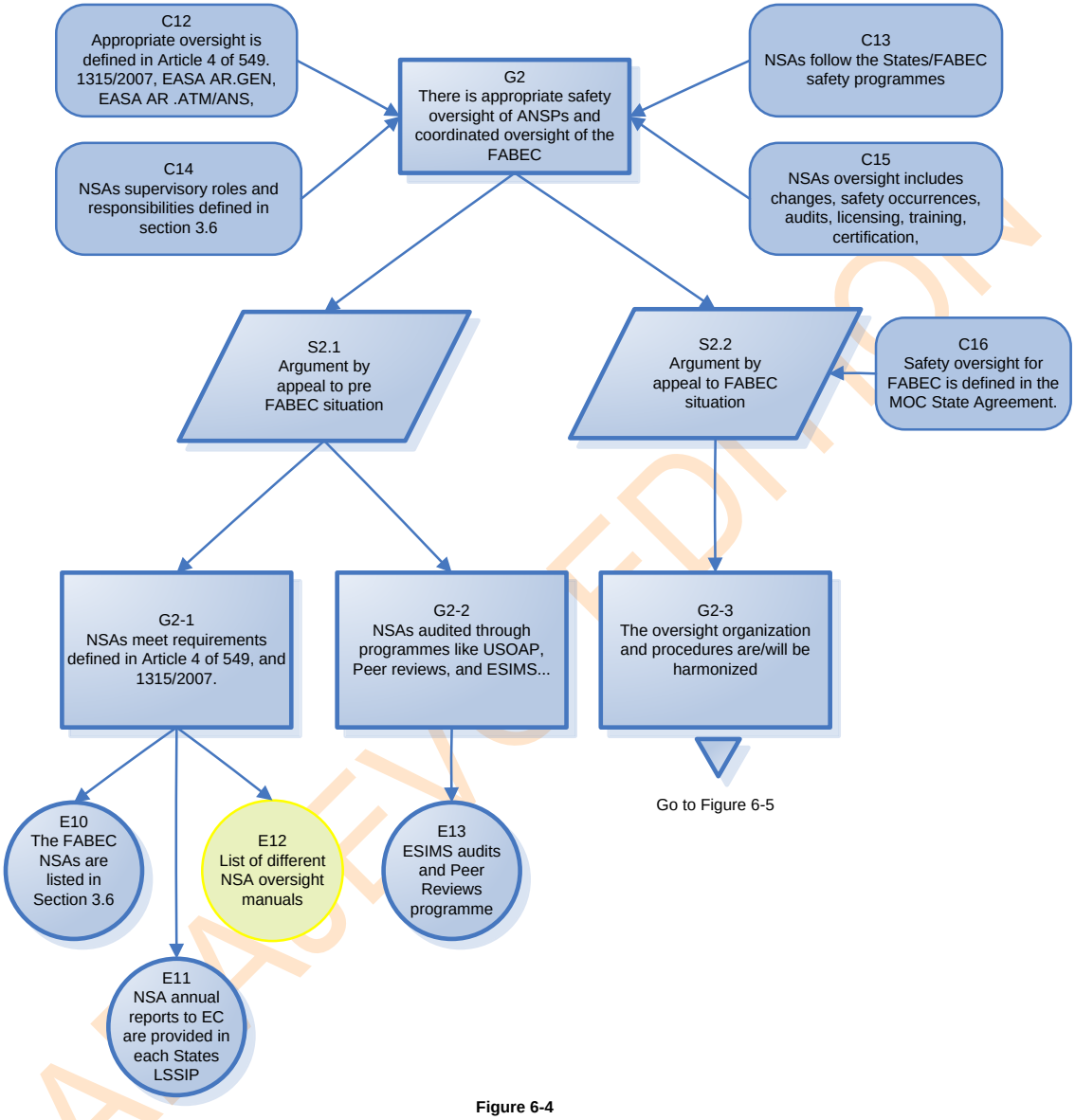


Figure 6-4

Goal: There is appropriate safety oversight of ANSPs and coordinated oversight of the FABEC.

See Figure 6-4.

This goal is further developed along 2 specific strategies: the pre-FABEC situation (See Figure 6-4); and the FABEC situation itself. (See Figure 6-5).

Evidence	
E10	The NSAs of each State are listed in section 3.6.
E11	Annual reports of each NSA are provided annually to Eurocontrol through the Local Single Sky ImPlementation/Local Convergence and Implementation Plan program, as managed by Eurocontrol (on behalf of the European Commission). A

Evidence	
	reference has been provided to the web site where the various reports of the FABEC States are stored. http://www.eurocontrol.int/lssip/public/standard_page/LSSIP_Table.html] – see also E27.
E12	Provide references to the different NSA oversight manuals. Responsible for delivering: Frederik Demeyere Due Date: For version 0.6.
E13	The ESARR Implementation Monitoring and Support (ESIMS) Programme was established in 2002 to monitor the rate of ESARR adoption by States. In 2005 a formal audit approach in line with the ICAO Universal Safety Oversight Audit Programme (IUSOAP) was developed. Since 2005, the ESIMS Programme has focused on auditing States' ATM safety oversight capabilities. The audits cover the relevant legislative and institutional arrangements as well as the ATM safety regulations in place, the safety regulatory arrangements and their capacity (policy and principles, rulemaking procedures, safety oversight and personnel licensing, and resources and staff competency). On-site audits are followed by the development of a State Corrective Action Plan which is incorporated into the Final Audit Report. The States participating in the ESIMS Programme are EUROCONTROL Member States and those ECAC Member States who are not members of EUROCONTROL but who have agreed to participate in the Programme. The European Commission has investigated with Member States and EUROCONTROL practical ways to implement the Peer Reviews of National Supervisory Authorities (NSA) as prescribed in Article 9.1 of Regulation (EC) N°. 2096/2005 – Common Requirements [Ref 2]. Peer Reviews are intended to promote and implement best practices used by NSAs for supervisory tasks, to arrange for a common approach to the supervision of ANSPs (notably as regards cross-border service provision), and to lead to harmonisation of NSAs' arrangements throughout the European Community. While the process brings added value, it does not replace the audits of States / NSAs, nor can it provide assurance about the compliance of NSAs with safety mandatory provisions. It is the Commission's intention to achieve a Peer Review of the NSAs between early 2010 and the end of 2012, principally making use of the Functional Airspace Block (FAB) context. The grouping of Peer Reviews according to FAB structures brings benefits in terms of capitalising on lessons learnt, and is considered to be the most cost-efficient and effective means to achieve the objectives. Furthermore, certain FABs are composed of both EU and non-EU States. Hence, the FAB Peer Review mechanism could be utilised as a tool to assist the Community and its Member States to support the extension of SES to States that are not members of the EU. NSA Peer Reviews are executed FAB-to-FAB and are scheduled through 2011. The scheduled ESIMS audits and the past results for each Member State can be found on the Eurocontrol website: http://www.eurocontrol.int/src/public/standard_page/esimsprogramme.html This website also contains information regarding the Peer review programme.

6.2.1 The oversight organisation and procedures are/will be harmonised

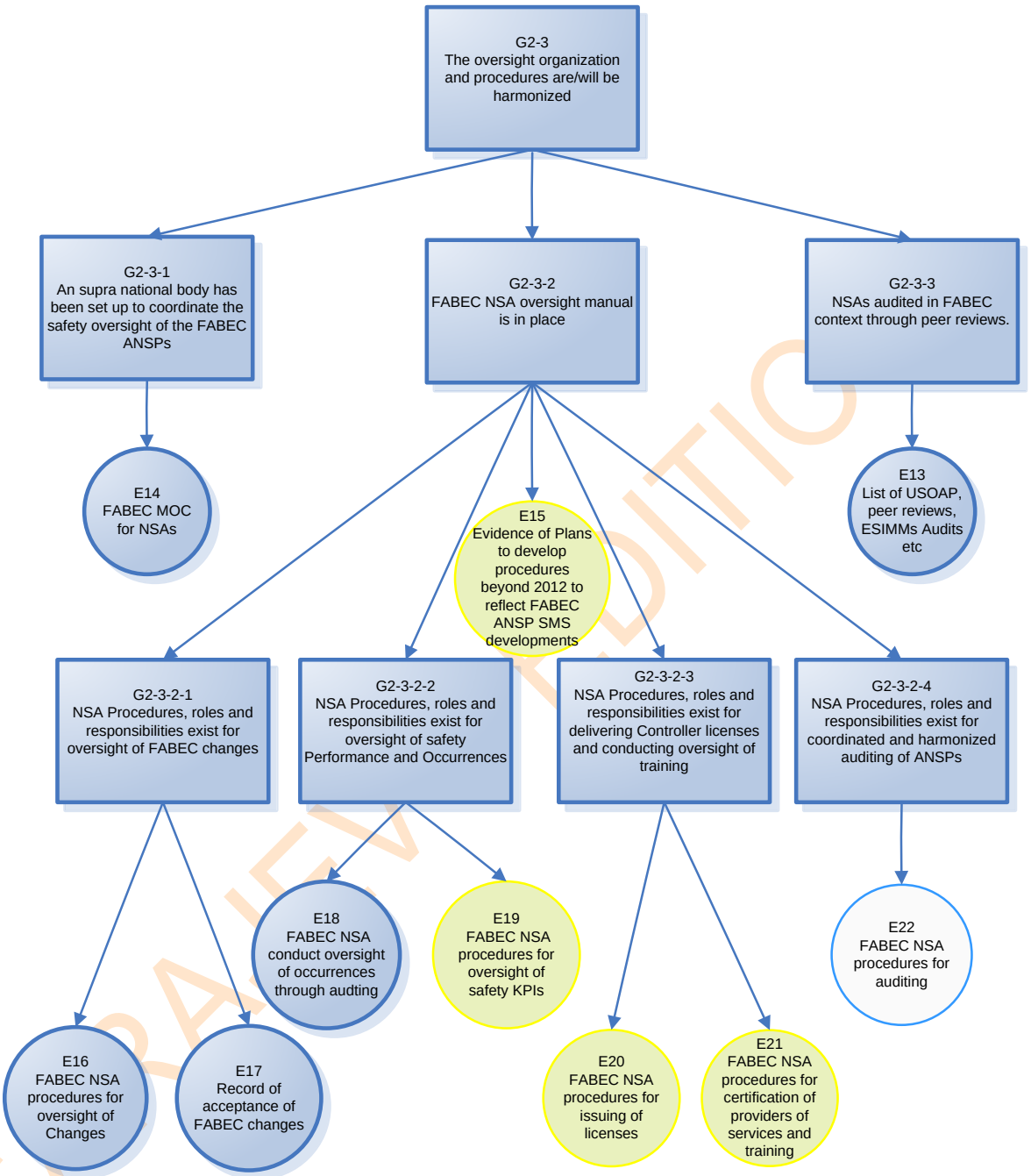


Figure 6-5

Evidence	
E14	FABEC NSA Cooperation Agreement Ref [13] This agreement stipulates that the 6 States of the FABEC will cooperate on the supervision of the ANSPs within the FABEC.
E15	The plan for dealing with subsequent NSA procedures to be developed [Ref?] Terms of Reference of FABEC NSA Manual working Group. E15 should be yellow. Responsible for delivering: Frederik Demeyere Due Date For version 0.6

Evidence	
E16	Procedure for the notification & review of FABEC changes. [14]
E17	Annex 1 of the procedure for the notification & review of FABEC changes states that a record of the acceptance letters for NSA accepted FABEC changes is kept in a dedicated folder. [14]
E18	This NSA procedure for oversight of occurrence management is covered by the audit procedures. Refer to E22.
E19	Safety performance is monitored by the Safety Performance Task Force. The National Supervisory Authority Committee will assist the SPTF/Finance & Performance Committee to monitor this as of 2012. The NSA Manual WG proposed a joint working group with SPTF to develop the NSA procedure for assisting the SPTF/FPC. [Ref?] Responsible for delivering: Frederik Demeyere Due Date Version 0.8
E20	This procedure for issuing controller licenses to be developed by the NSA Task Force [Ref?] Responsible for delivering: Frederik Demeyere Due Date Version 0.8
E21	This procedure for certification of services and training providers is to be developed by the NSA Task Force [Ref?] Responsible for delivering: Frederik Demeyere Due Date Version 0.7
E22	The plan exists for the development of a harmonised NSA auditing procedure [Ref?], however, for the establishment of FABEC in 2012, FABEC will consist of separate ANSPs, hence a harmonised auditing procedure is not required at FABEC implementation. Placeholder for post 2012 developments as part of safety case maintenance. Responsible for delivering: Frederik Demeyere Due Date Version 0.8

6.3 GOAL G3 - SERVICE PROVISION WITHIN FABEC IS AND WILL REMAIN SAFE

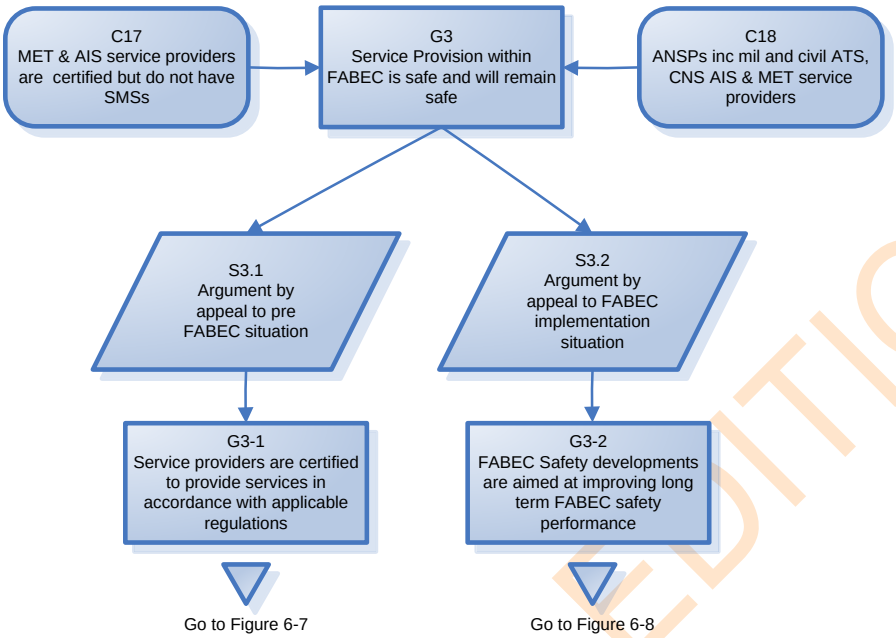


Figure 6-6

Goal: Service provision within FABEC is and will remain acceptably safe.

See Figure 6-6.

This goal is further developed along 2 specific strategies: the pre-FABEC situation (See Figure 6-7); and the FABEC implementation situation. (See Figures 6-8 and 6-9).

6.3.1 FABEC Service Providers are already certified

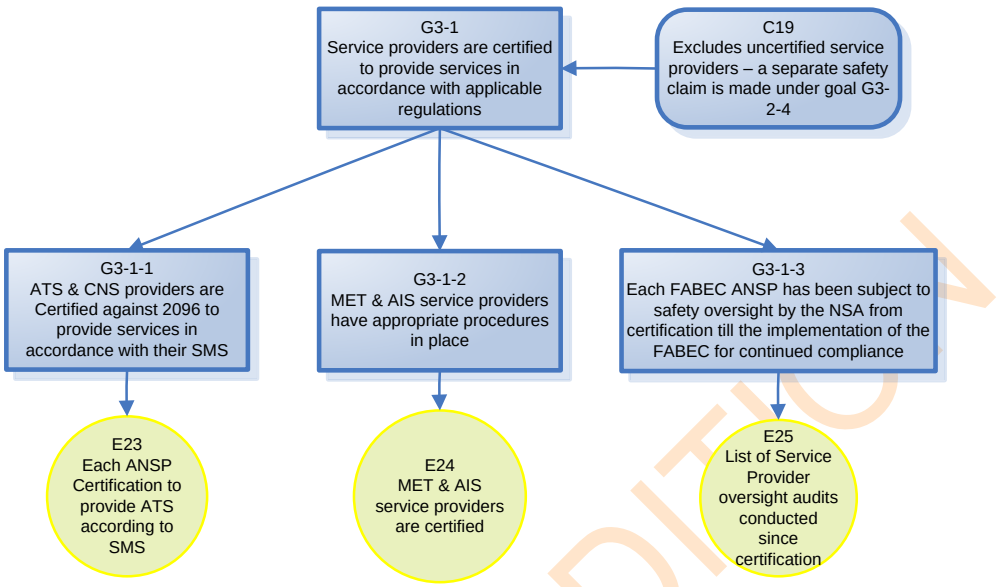


Figure 6-7

Evidence	
E23	Need to provide a reference to each certificate issued by the NSAs to each ANSP covered within the scope of this safety assessment? Or maintain a list of certificates and refer to this list, or provide a reference to a list kept at European Commission level – NSA call – do we concentrate just on 7 providers, or ALL providers, or just designated providers. [Ref?] Responsible for delivering: Laurent Chapeau & Frederik Demeyere Due Date : For version 0.6.
E24	Provide a reference to the certificates for MET & AIS providers [Ref?] Responsible for delivering: Laurent Chapeau & Frederik Demeyere Due Date : For version 0.6.
E25	The NSA annual reports to States contain an overview of oversight audits conducted for compliance since the service providers were certified. Refer to evidence E11 about LSSIP reports. The oversight audits conducted are as follows: ❑ LVNL ❑ Skyguide ❑ Belgocontrol ❑ etc Responsible for delivering: Frederik Demeyere Due Date: Initial list for version 0.6 and an update for Version 1.0.

6.3.2 Goal G3-2 FABEC developments are aimed at improving safety performance

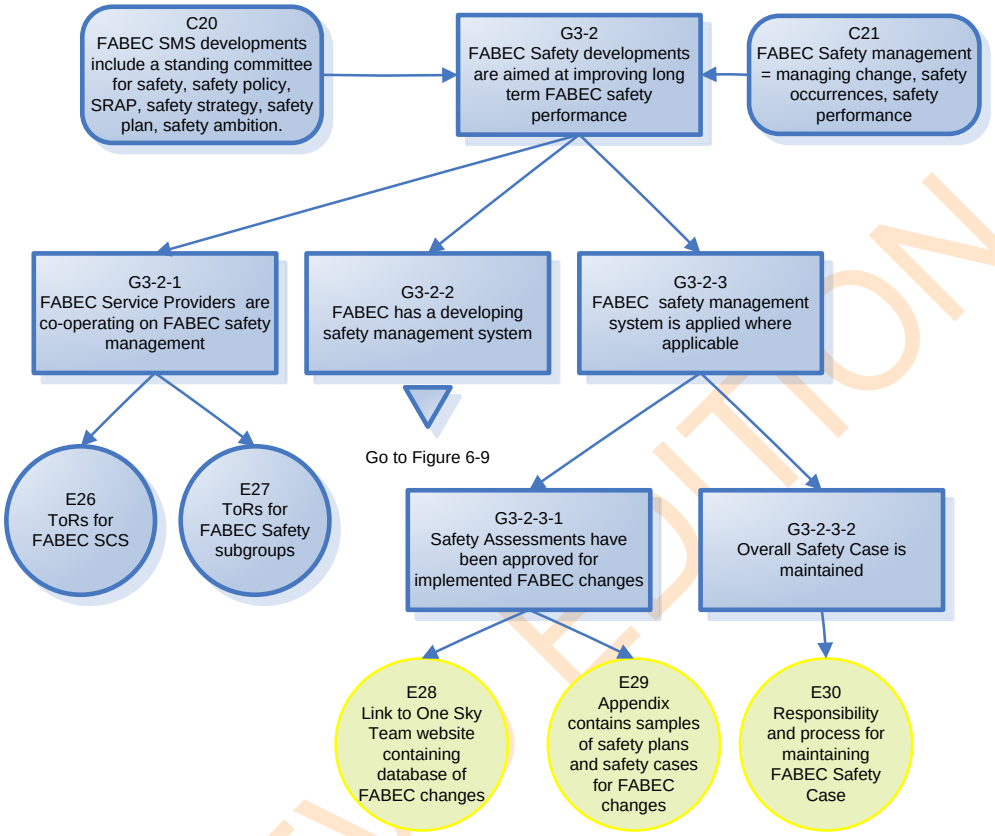


Figure 6-8

Evidence	
E26	The Terms of Reference of FABEC Standing Committee for Safety [15] state that this is a body of the governance structure for the ANSPs cooperation on safety within the FABEC program. It shows that the membership includes the different representative ANSPs safety directors/managers of the FABEC ANSPs. The SC SAF is assuring a joint implementation and operation of a safety management system (FABEC SMS).
E27	ToRs for safety sub groups: ❑ Safety Risk Assessment Process (SRAP) workgroup has been set up to establish the procedure for undertaking risk assessments. This workgroup has already delivered the SRAP process, excluding option 3, which is a common FABEC safety risk assessment methodology. The specification Ref [16] for contractor support for the development of option 3 contains the terms of reference to develop this option by 'integrating the best elements of the existing individual methodologies'. This workgroup is currently active in developing this methodology and anticipates to deloiver the methodology prior to end 2011. ❑ Safety Performance Monitoring sub group Terms of Reference Ref [17] state that this sub group is established to define a framework (methodology, indicators, reporting, target setting) for safety performance management, to define, organise and implement processes at FABEC level for gathering, monitoring and reporting on FABEC safety performance. The SPM-SG is preparing the ground for a harmonised / joint implementation and operation of

Evidence	
	the safety performance management processes within the safety management system (FABEC SMS) inside the ANSPs. ❑ The Safety Occurrence Management System (SOMS) subgroup Terms Of Reference [Ref 18] state that this group is established to enable safety monitoring and improvement within FABEC and to define / propose the necessary standards for a harmonized approach and a centralized management of safety occurrences, including • Notification and reporting (internal and to institutional bodies, incl. KPI) • Investigation ➢ principles for occurrence analysis ➢ principles on contributory factors incl. human factors and contextual conditions ➢ principles for severity / risk analysis • Recommendations • Lesson dissemination • data repository • data exchange and measurement in a Just Culture environment. ❑ InTACT is an InTernational Audit Co-operation Team which shares resources and practices for auditing and surveying between DFS, Skyguide and DSNA. Its Terms of Reference are contained in [Ref21]. The other ANSPs have been invited to participate in this initiative, which they are considering. ❑ The Overall Safety Case Assembly and Report ToRs are described in chapter 4 – follow this link [11].
E28	The link to the one sky team database containing the FABEC Task Forces Safety Management Plans and associated safety cases provides evidence that the FABEC SMS is applied for FABEC changes. [Ref?] Responsible for delivering link: Mathieu Pleyers. Due Date: For version 0.6.
E29	Add as appendices to this safety case the safety plans and assurance for each change (request of AFG), e.g. AMRUFRA, etc are also contained on this site and should be downloaded and added as an appendix. Responsible for delivering appendices: Keith Cartmale. Due Date Final Version of this safety case.
E30	No longer explicitly required in the IR. It is implied that it is still needed in Art 5 para 2 of the IR. However, EASA stated it is required. Maintain OSCAR group to do updates. Have as a standard agenda item to trigger updates via SCSaf and NSAC. Need to provide a reference to the process and responsibilities for maintaining and updating the FABEC Safety Case. [Ref?] Responsible for delivering: Frederik Demeyer (e-mail Frederik). Due Date Version 0.8. Links to E7, E8, and E9.

Note: The goal G3-2-3 is limited to application of the SMS specifically for safety assessments, because this was deemed a priority by the FABEC Standing Committee for Safety. It is anticipated that the scope of this goal will expand post FABEC implementation as other important elements of the FABEC SMS are applied at FABEC level, rather than just at ANSP level, for example, safety performance monitoring and management. Likewise, the scope of G3-2-2 should reduce in size.

6.3.3 FABEC SMS is developing

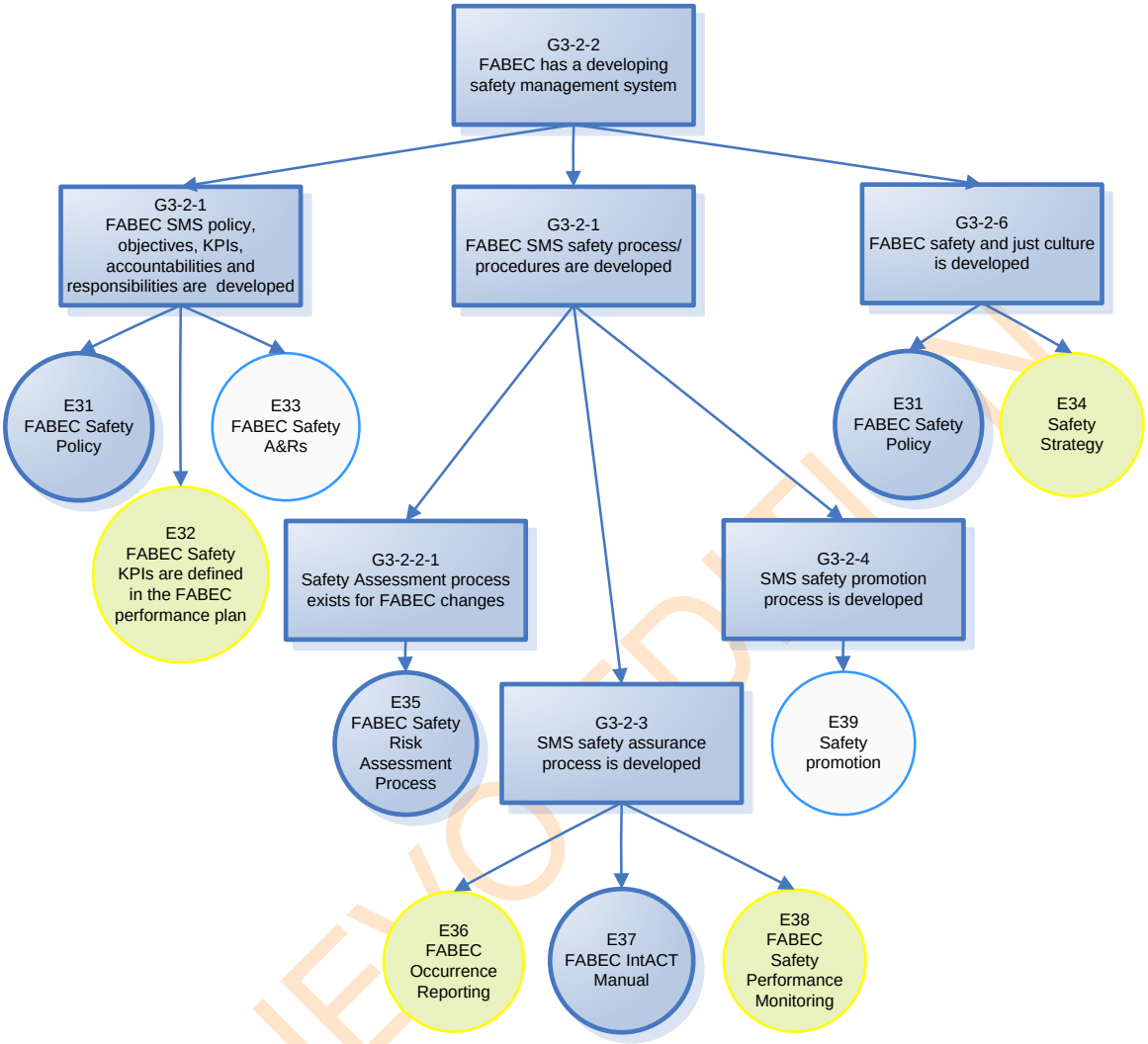


Figure 6-9

Evidence	
E31	FABEC ANSP Strategic Board Safety Policy describes the priorities for FABEC safety given the limitations of FABEC ASB responsibilities for service provision, and the safety responsibilities of existing FABEC ANSPs. [19].
E32	FABEC Performance plan with the EU-wide Performance Indicators on Safety that the SC Safety will develop could be used as evidence. [Ref] FABEC Performance Plan will be provided to the EC by end June 2011 at the latest. It will use the 4 safety KPAs being developed by Herve in SPM. Question, do we need to refer to both FABEC performance plan and SPM handbook (it is E38)? Responsible for delivering: Nicolas Dubois Due Date Safety case version 0.6.
E33	A&Rs of CEOs/AFG etc – Not needed for FABEC 2012 – placeholder for post 2012 developments as part of safety case maintenance.
E34	Prior to FABEC implementation, the safety culture and just culture aspects are covered by existing ANSP arrangements. The FABEC safety culture and just culture aspect are expected to develop after FABEC implementation. The Safety Performance Monitoring sub-group will be monitoring each ANSP as part of its work, which includes safety culture (a sub-set of safety maturity KPI) and just culture, and any improvements will either be

Evidence	
	developed under own ANSP initiative or within the scope of FABEC safety performance improvements. Refer to E38. The ASB safety policy [19] covers areas such as data sharing, communications, and just culture. However, this does not fully cover the safety culture aspects. The FABEC Safety Strategy (updated version for post 2012 activities) contains more information on how this will be developed. Responsible for delivering: Keith Cartmale Due Date Version 0.7
E35	FABEC SC Saf Implementation Phase Safety Risk Assessment and Mitigation Process describes how safety risks are identified and managed for FABEC related changes. This process is subject to further development and regular updates as the FABEC SMS develops. [20]
E36	Safety Occurrence Management System Handbook [Ref?] Responsible for delivering: Marc Vettovaglia Due Date Version 0.8
E37	International Audit Cooperation Team Manual [21] describes the methodology, scope of application, the IntACT organisational structure, etc, for undertaking audits of member organisations against safety, security and ISO requirements in support of international harmonisation. The participating organisations in this version are DFS, Skyguide and DSNA. Other organisations are looking into the feasibility of participating as FABEC develops.
E38	Safety annex to the FABEC Performance Management System/States performance management group. Responsible for delivering: Marc Vettovaglia Due Date Version 0.6.
E39	Existing ANSP arrangements address this under 2096 certification so not developed and further for 2012 safety case. Safety Promotion beyond 2012 will be developed in subsequent versions of the safety case after 2012, so it is a placeholder here to be addressed as part of safety case maintenance.

7 ASSUMPTIONS

This section describes the assumptions which have been made in preparing this safety case. These assumptions are precisely worded to enable each assumption to be validated as the safety case is developed.

There may also be assumptions made as a result of safety issues arising during the safety case development. The nature of the underlying safety issue will be clearly defined.

ID	Assumption	Validated (Yes/Partial/No)	Evidence / remarks
A1	The Safety Regulatory Requirements in 2096 and 1315 are adequate for scope of 'safely implemented'	Partial	It is assumed that the FABEC implementation is an organisational change. As such, high level safety requirements such as those contained in 2096 and 1315 must be complied with in order to show that FABEC implementation is adequately safe. To be validated through review and acceptance by stakeholders.
A2	FABEC is established in November 2012	Partial	This is a planning assumption in order to be able to assemble the safety case. Should the date of establishment slip, the goals and evidence will likely need to be updated. To be validated prior to June 2012, when version 1 of this safety case will be submitted to the European Commission.
A3	This safety case will be maintained beyond 2012	Yes	Early versions of the IR on establishment and modification of FABs contained explicit requirements to describe the arrangements for updating the safety case. In the version of Nov 2010, this text was removed. However, it is stated in Article 5 para 2 that the commission shall be notified 6 months in advance of modifications, and that the information supplied to establish the FAB (including this safety case) shall be updated. A goal has been provided under G3 to describe the arrangements.
A4	In lieu of a decision, we assume (in order to develop the safety case arguments) that the approach for the FABEC development will be a cooperation/coordination model between the	Partial	The ideal situation is a single ANSP, with a single yet separate NSA, supporting the 6 States who have responsibility for the Airspace above their respective territories. However, in order to progress with developing this safety case to present it to the EC in 2012, it has been necessary to

ID	Assumption	Validated (Yes/Partial/No)	Evidence / remarks
	ANSPs and NSAs, evolving to an integrated approach.		assume that the institutional arrangements at that time will be based on cooperation and coordination. To be monitored as the FABEC institutional arrangements are developed. To be validated through review and acceptance by stakeholders.

8 CONCLUSIONS

The degree to which this safety case version 0.6a is substantiated is as follows:

- The safety goals and claims are considered robust and have been reviewed by safety experts at States level and at ANSP level;
- The evidence to substantiate the claims is 38% completed for this version, and are planned to be 60% completed for the official version 0.6 due on 1st July;
- Subsequent version 0.7 should increase this to 66%, and version 0.8 will be 97% complete assuming all evidence is delivered as planned;
- Chapters 1, 2, 3, 5 and 9 are complete;
- Chapter 4 will be completed when the safety case maintenance process has been developed;
- Chapter 6 will be completed in incremental deliveries as the evidence becomes available;
- Chapter 7, 11 and the annexes will be updated prior to the release of this safety case version 1.
- Chapter 8 will be updated in each version;
- Chapter 10 will be updated as needed;

A review with EASA will be conducted to determine whether this safety case and the approach will satisfy their requirements. This review is designed to reduce the risk that the safety case is not deemed adequate at FABEC implementation.

When all safety case chapters are completed, and evidence provided, it is concluded that the FABEC is safe to implement and will remain acceptably safe.

9 REGULATORY REQUIREMENTS

The requirements that may be applicable to the content of the FABEC overall safety case are described in the OSCAR requirements document, which is maintained by the OSCAR group.

The applicable requirements stem from several different sources. These include:

- Draft Implementing Rule (v1.0) – information to be supplied…to establish FABs.
- Regulation EC 549/2004 (the framework regulation)
- Regulation EC 550/2004 (the service provision regulation)
- Regulation EC 551/2004 (the airspace regulation)
- Regulation EC 552/2004 (the interoperability regulation)[1]
- FABEC States agreement (v2.0)

A summary of the requirements on the content of the FAB Safety Case as described in the 'Commission Regulation number 176/2011 on the information to be provided before the establishment and modification of a functional airspace block' is provided below to aid traceability to show that the requirements have been addressed in this safety case.

	Reg (EC) No 550/2004 Art 9a	FAB IR	Interpretation /(deliverable)	Safety Case Evidence Ref
1.1	(a) **be supported** by a safety case	(a) the common safety policy	FABEC AFG Safety Policy Paper	E31
1.2		(b) description of arrangements for dealing with accident and incident investigations	All three safety argument pillars describe arrangements through AAIB, to NSA & ANSP processes.	E6, E18, E36
1.3		and plans how to address safety data collection, analysis and exchange	These are covered by the same processes as described above but just for NSAs and ANSPs	E18, E34, E36. E38.
1.4		(c) a description of the way in which safety is being managed to avoid degradation of safety performance	See the complete Safety Argument described in **FABEC Safety Case Report.**	In addition to other refernced evidence items, E1, E3, E5, E10, E11, E13, E14, E15, E23, E24, E26, E27, E30.
1.5		(d) a description of arrangements allocating responsibilities for setting safety targets, safety oversight and	Safety Rulemaking, Oversight & enforcement covered by the regulatory and supervisory pillars of the safety case. Safety Target setting not covered	G1 & G2

[1] The interoperability regulation is out of scope of the SCS activities, and hence is not explored further with regards to the impacts on the FABEC safety case.

	Reg (EC) No 550/2004 Art 9a	FAB IR	Interpretation /(deliverable)	Safety Case Evidence Ref
		accompanying enforcement measures	because there is no intention from EASA until post FABEC implementation phase. However, safety performance is covered for NSA and ANSPs.	E19, E32, E38.
1.6		(e) safety assessments for operational changes resulting from the establishment of the FAB	**Safety Assessment**(s) for each FABEC operational change endorsed by NSAC.	E16, E17, E28, E29, E35.

10 RECOMMENDATIONS

This section will contain a prioritised list of recommendations for the FABEC, traceable to the Safety Conclusions.

The following recommendations are made as a result of this SCR:

ID	Recommendations	Recommendation Owner

11 GLOSSARY

All Abbreviations and Definitions used.

Abbreviations, Acronyms & Definitions	
Accept	To take responsibility for the use of the safety case. In this case, the Commission takes responsibility that FABEC, based on its safety case, is safe to operate.
ANSP	Air Navigation Service Provider
Approve	To take responsibility for the contents of the safety case. In this case, the Chairmen of the HLIP takes responsibility that the contents of the safety case is acceptable to be presented to the commission.
EC	European Commission
Endorse	To confirm that the safety case meets the requirements. In this case, ASB & 6 States confirm that the safety case is covering what is required, specifically, the requirements of the Implementing Rule, plus any additional documented requirements of stakeholders.
FABEC	Functional Airspace Block Europe Central
FIR	Flight Information Region
OSCAR	Overall Safety Case Assembly and Report
NSA	National Supervisory Authority
Prepared	To take responsibility for the creation of the safety case, and ensure it is to a satisfactory standard.
SES	Single European Sky
SC Saf	Standing Committee for Safety
SRAP	Safety Risk Assessment Process
UIR	Upper Information Region

APPENDIX A - XXXXX

Xxxxx

A1 HEADING

Xxxxx

A1.1 Heading

Xxxxx

APPROVALS

	Position / Name	Signature	Date
Prepared:	OSCAR Sub-Group Leader K Cartmale		
Endorsed:	Chairman ASB Dany Weder		
Approved:	Chairman High Level Implementation Board ?		
Accepted:	European Commission {*Name*}		

CHANGE RECORD

Edition / Revision	Date	Pages Affected	Remarks
00-01	17/03/10	All	First draft of the Strawman safety case report
00-02	14/04/10	All	Further development
00-03	03/06/10	All	Update to incorporate review comments received from OSCAR members
00-04	05/11/10	All	Update of GSN – tidy up of references and up-issued to Robust Draft strawman status
00-05	02/02/10	All	Updated to reflect comments from AFG, NSA and SCS review. Evidence requirements defined and incorporated.
00-06	01/07/11	All	Updated to reflect comments from AFG, NSA and OSCAR review. Evidence requirements refined and revised, some evidence delivered and referenced.

12 REFERENCES

1 Amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system

2 Regulation EC 2096/2005 laying down common requirements for the provision of air navigation services

3 Regulation EC 1315/2007 on safety oversight in air traffic management and amending Regulation (EC) No 2096/2005

4 Regulation EU no 176/2011 on the information to be provided before the establishment and modification of a functional airspace block

5 Agreement relating to the establishment of the Functional Airspace Block Europe Central between the Federal Republic of Germany, the Kingdom of Belgium, the French Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands and the Swiss Confederation (version 2.0)

6 TREATY RELATING TO THE ESTABLISHMENT OF THE FUNCTIONAL AIRSPACE BLOCK "EUROPE CENTRAL" BETWEEN THE FEDERAL REPUBLIC OF GERMANY, THE KINGDOM OF BELGIUM, THE FRENCH REPUBLIC, THE GRAND DUCHY OF LUXEMBOURG, THE KINGDOM OF THE NETHERLANDS AND THE SWISS CONFEDERATION

7 Regulation EC 549/2004 (The Framework Regulation)

8 Regulation EC 550/2004 (The Service Provision Regulation)

9 Regulation EC 551/2004 (The Airspace Regulation)

10 Regulation EC 2096/2005 laying down common requirements for the provision of air navigation services

11 Overall Safety Case Assembly & Report Terms of Reference

12 OSCAR plan

13 FABEC NSA Cooperation Agreement

14 Procedure for the notification and review of FABEC changes

15 FABEC Implementation Phase Terms of Reference Standing Committee Safety

16 Procurement Specification for the 'Support SAF SC workshops for the development of a FABEC Safety Assessment and Risk Mitigation Methodology'

17 Safety Performance Management Subgroup (SPM-SG) Terms of Reference

18 Safety Occurrence Management System Terms of Reference

19 FABEC ANSP Strategic Board Safety Policy

20 FABEC Implementation Phase SCS Safety risk assessment and mitigation for FABEC changes

21 International Audit Cooperation Team (IntACT) Manual version 3 dated January 2011.