Safety Assessment of Functional Airspace Blocks: BLUE MED

Brussels 26 February 2008

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Presentation objectives:

…to explain what BLUE MED is and the main achievements so far…

…to describe the safety assessment process undertaken in BLUE MED…

…to comment on what went well so far and what can be improved..

What is Blue Med…

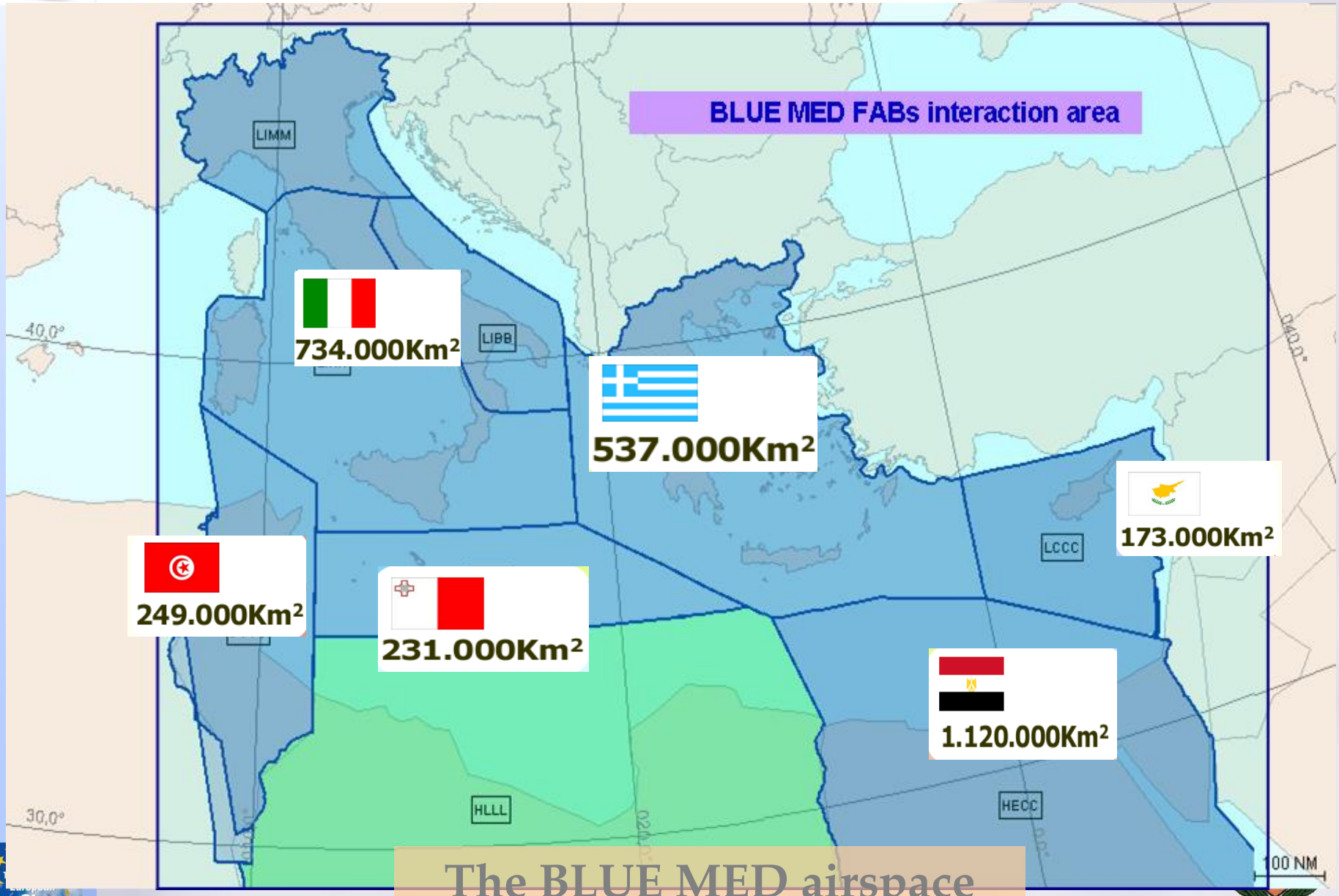
A regional ATM cooperation programme between Air Navigation Service Providers

Participating states are Cyprus, Greece, Malta and Italy

Also participating is Tunisia and Egypt, under a special status

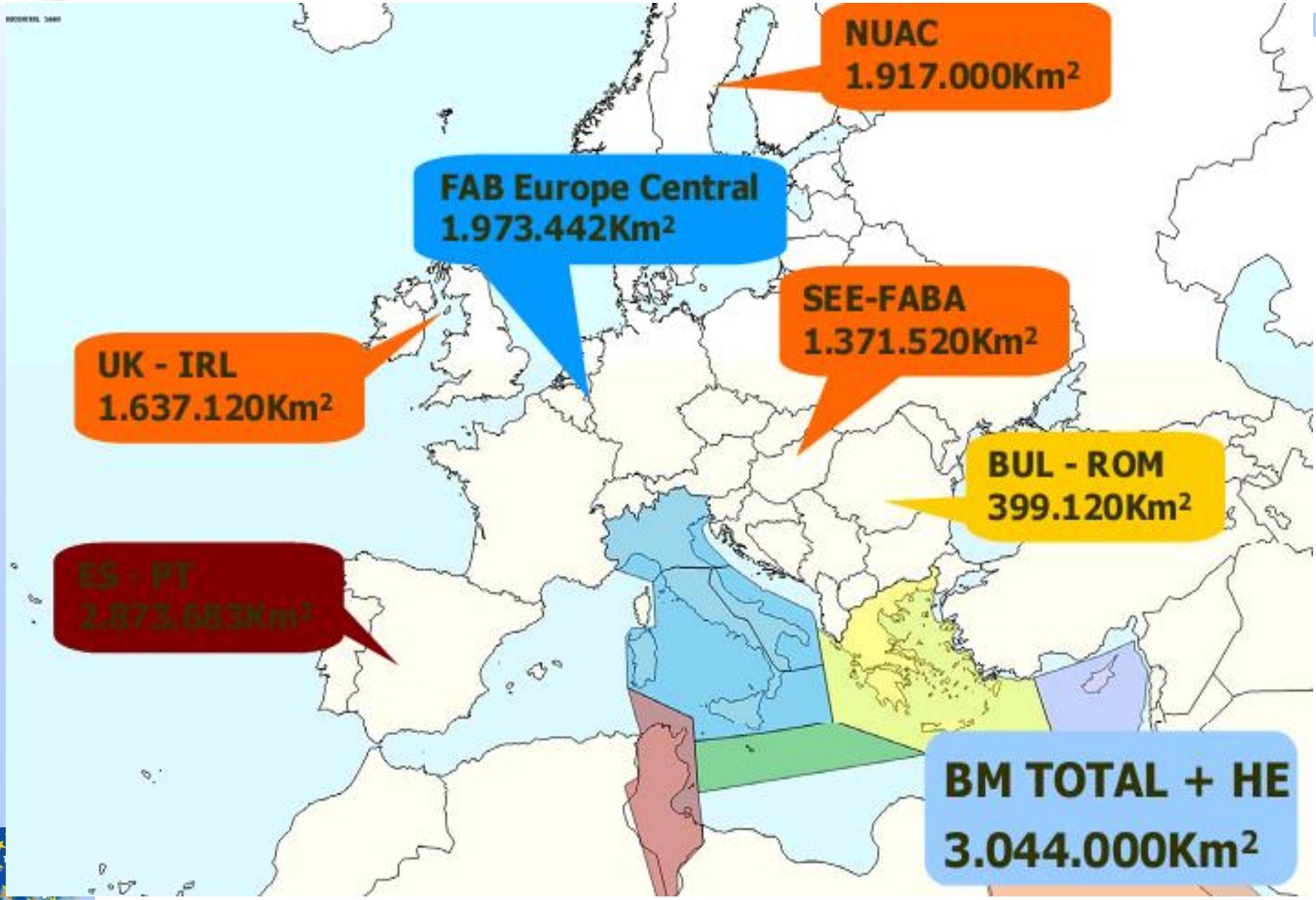
Its aim is to create a Functional Airspace Block (FAB) in the Mediterranean

FUNCTIONAL AIRSPACE BLOCK - BLUE MED – Safety Assessment

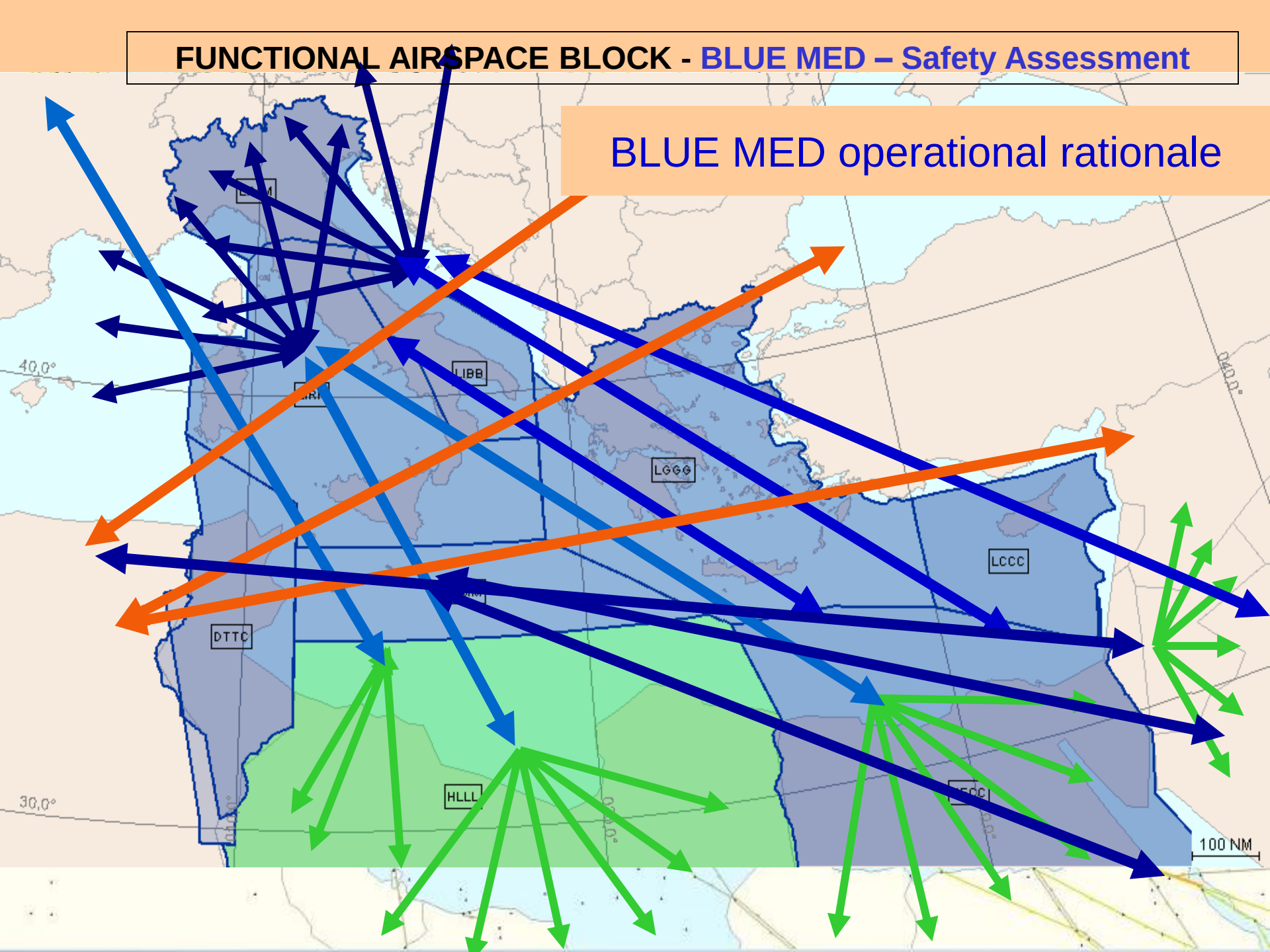


The BLUE MED airspace

FUNCTIONAL AIRSPACE BLOCK - BLUE MED – Safety Assessment



BLUE MED operational rationale



Programme phases

BLUE MED will be carried out in three consecutive phases:

Phase 1: Feasibility Study (2006 – 2008)

Phase 2: Definition (2008 – 2010)

Phase 3: Implementation (2010 – 2012)

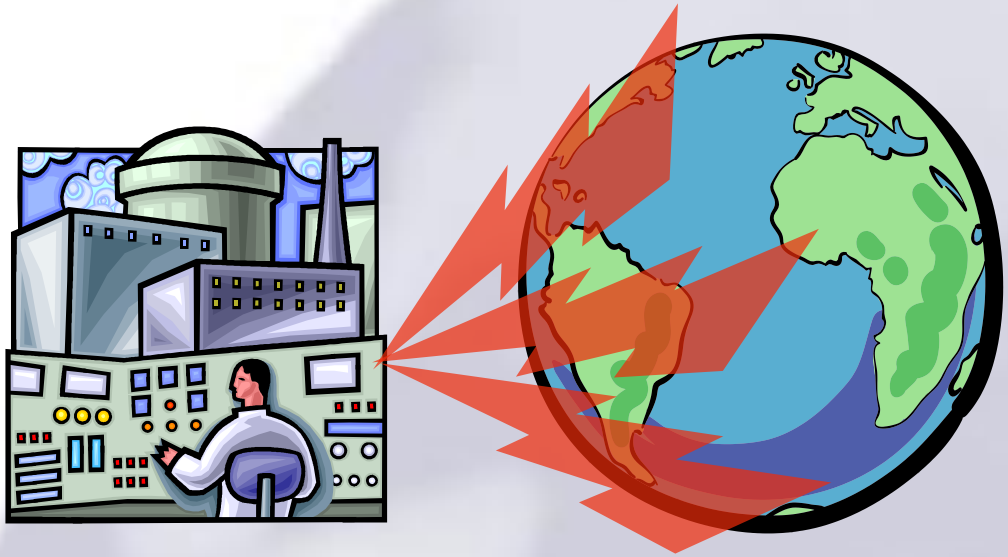
Phase 1 has started in December 2006 and will be completed by April 2008. Based on the results a political decision will be required for continuation to the next phases

Work is carried out in the framework of a **Consortium Agreement** (already signed)

Project is funded by the EU for 1 M€ corresponding to the 46.23% of the programme budget (2.163 M€)

BLUE MED Concept of Operations

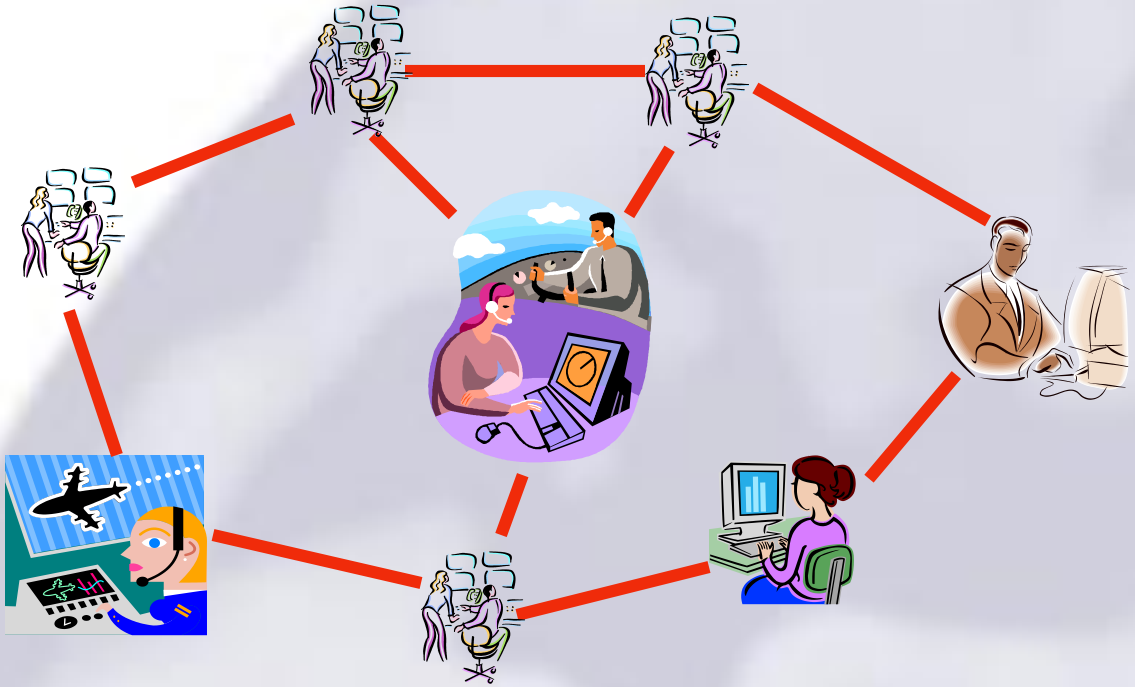
The concept of merging national ACCs into a central one, which would offer its services over a large, unified geographical area IS NOT favoured, due to the huge social and political implications that it is likely to create



MANY PROBLEMS THAT CAN DELAY FAB CREATION !

BLUE MED Concept of Operations

The **concept of operations** envisioned by BLUE MED is that of a **Virtual ACC –** i.e. the combination of single, independent ACCs, managed by different ANSPs which, however, are interconnected, harmonised and appear (to staff and users) to be working as one.



EASIER ACCEPTANCE !

Project Management – Work Breakdown structure

All ATM system elements must be analysed / studied to find the best way to implement the FAB

- WP 0 Project Management
- WP 1 Operational Analysis
- WP 2 Interoperability Analysis
- WP 3 Safety Assessment Plan
- WP 4 Financial, Legal and Social Issues
- WP 5 Dissemination and Future Plans

Overall progress to-date

Safety Assessment of BLUE MED – Why ?

Regulatory requirement…

Article5
Reconfiguration of the upper airspace

1. With a view to achieving maximum capacity and efficiency of the air traffic management network within the single European sky, and with a view to maintaining a high level of safety, the upper airspace shall be reconfigured into functional airspaceblocks.

2. Functional airspace blocks shall, interalia:
(a) Be supported by a safety case;……

Safety Assessment of BLUE MED – Why ?

Operational/business requirement…

All changes in the ATM environment must be assessed to be acceptably safe…

…because safety is the essential attribute of the quality of our service

…it enhances assurance for continuity of service

…it enables staff "buy in"

Safety Assessment of BLUE MED – Why ?

Is there a change ?...

Concept of Operations talks about…

- **New route network**
- **New (cross border) sectors**
- **New equipment as technical enablers for the operational requirements**
- **New coordination procedures**
- **New staff arrangements**

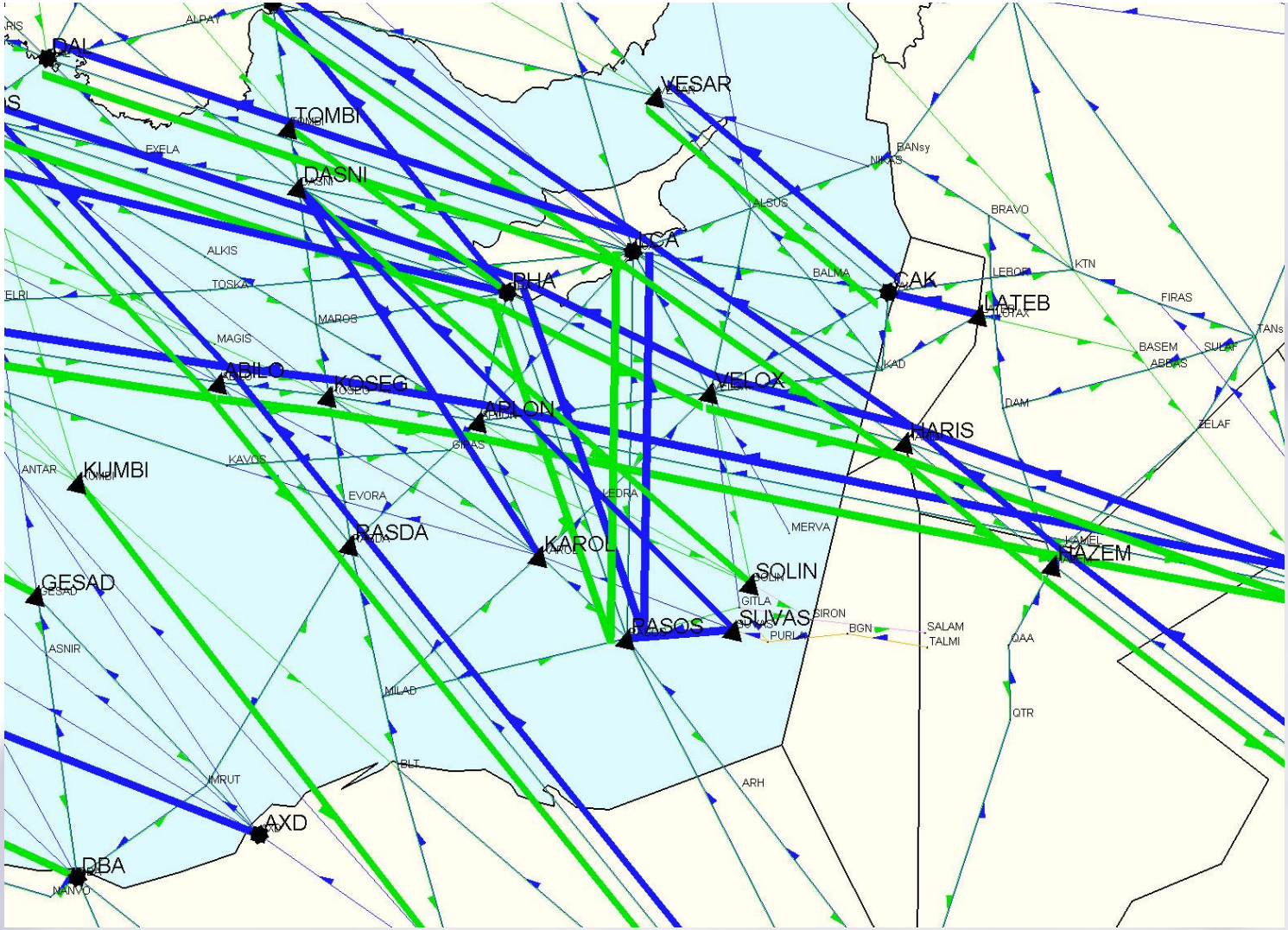
…so, yes, there is a change !

ADVANCED AIRSPACE SCHEME 2015

BEFORE BLUE MED WORK

ADVANCED AIRSPACE SCHEME 2015

AFTER BLUE MED WORK



WP3: BLUE MED Safety Assessment – Phase 1 - PMP objective

…to produce a **Safety Plan**, which, starting from the high level objectives of the project, identifies and describes a series of detailed, scheduled activities to be done in the definition, development and deployment of BLUE MED FAB Project

These activities will focus on
…producing the necessary evidence,
…which prove a set of arguments
…which claim that the BLUE MED FAB will be acceptably safe

…WP3 will use as inputs the outcomes of the WP1 (operational / airspace) and WP2 (technical)

Safety Assessment of BLUE MED – How ?

EUROCONTROL Safety Case Development Methodology

Why ?...

1. Regulatory requirement...

(EC) 551/2004, Art 5.
Reconfiguration of the upper airspace

...Functional airspace blocks shall, interalia:
*(a) Be supported by a **safety case**;.....*

2. Project type approach...

...well suited to the BLUE MED work structure. Safety evidences needed to support the safety arguments will be fed to the other work packages as project tasks (requirements)

BLUE MED - applying the Safety Case methodology

Phase 1 deliverables

- **Safety Considerations**
- **Initial Safety argument**
- **Safety Plan**

How the work was done…

Work Package leader (EUROCONTROL) planned and drove the activity, producing initial drafts of the deliverables

Safety experts from each state participated in workshop style meetings and provided knowledge of the local environment and review/improve the drafts

BLUE MED Safety Case – Phase 1 deliverables

Safety Considerations

- identify the main safety issues associated with a project
- what can we improve from a safety point of view if we implement the FAB ?
- the criteria for deciding what is "safe" in the context of the Project
- the strategy for demonstrating safety

How to…

Questionnaire, followed by brainstorming session – all ATM system elements considered : airspace structure, civil military coordination, staffing, procedures, separation standards, equipment etc..

BLUE MED Safety Case – Phase 1 deliverables

Safety Considerations: RESULTS

- identify the main safety issues associated with a project: **new route structure, cross border sectors, implementation of new technology, regulatory requirements…**

- what can we improve from a safety point of view if we implement the FAB ? **ATC operations, technical infrastructure**

- the criteria for deciding what is "safe" in the context of the Project: **Relative argument (no FAB wide TLS/RCS)**

- the strategy for demonstrating safety: **Develop a Safety Case**

BLUE MED Safety Case – Phase 1 deliverables

Initial Safety argument

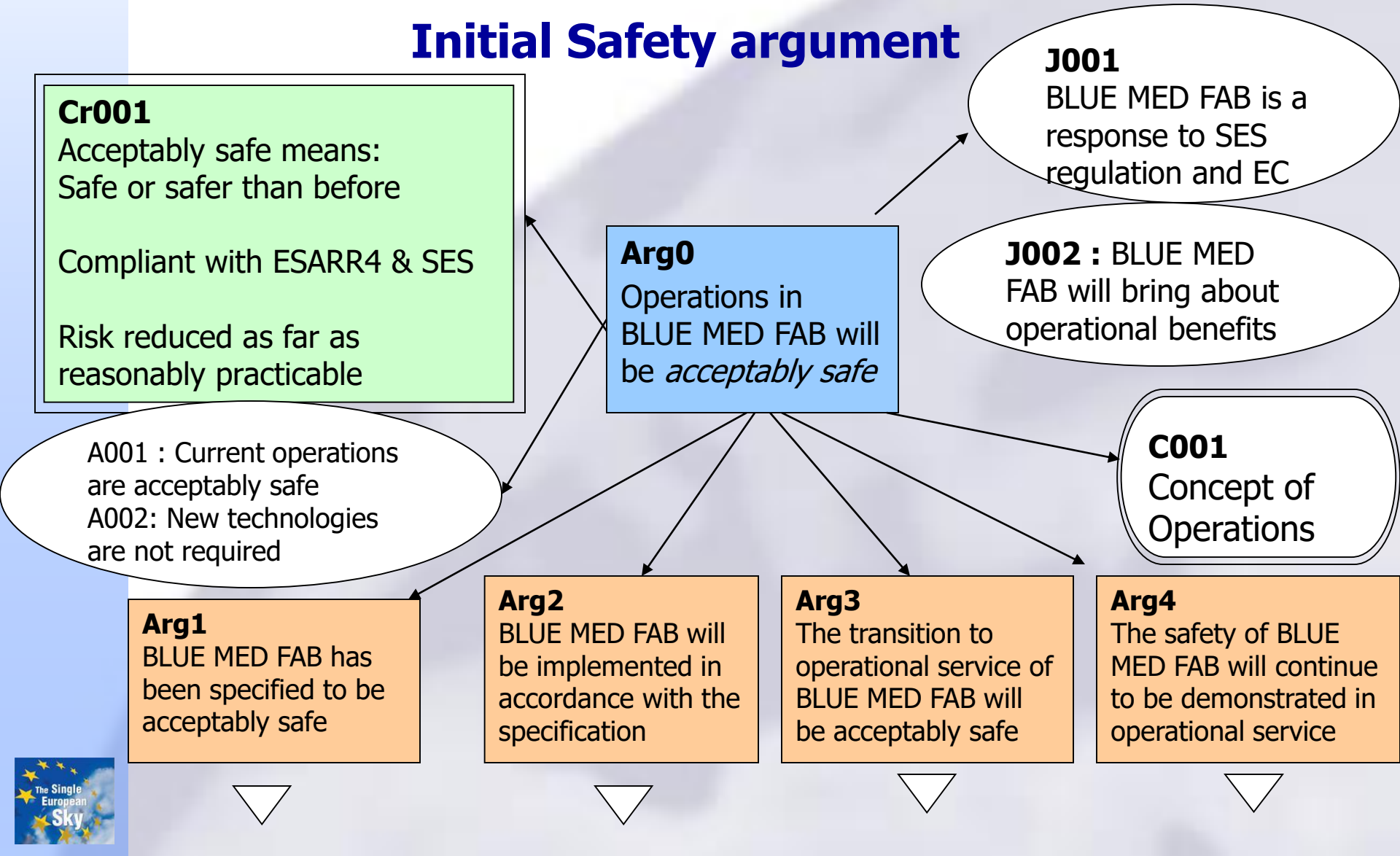
- Based on the BLUE MED FAB Concept of Operations (still high level).
- all lifecycle phases are treated BUT in little detail.
- justification, context, criteria, assumptions, regulatory requirements considered
- when further completed the Safety Argument should provide participating ANSPs with the foundation for their local safety cases as required

How to…

Expert support for initial draft, brainstorming and verification by Work Package participants

BLUE MED Safety Case – Phase 1 deliverables

Initial Safety argument



BLUE MED Safety Case – Phase 1 deliverables

SAFETY PLAN

The **Safety Plan** specifies, inter alia,

- the **safety assurance activities** that are to be carried out in order to create necessary and sufficient **evidence**
- the **means and resources** to carry out safety activities within the Programme;
- **responsibilities and accountabilities** for Safety Activities;
- the **safety deliverables** associated with the Safety Activities;
- the **relationships and dependencies** between activities and deliverables;
- the **detailed schedule and milestones** for the activities

Strategy : As the Safety Case is developed and refined, it will feed back to refine the Plan. Therefore, the detail in this plan will be iteratively developed, implying that the Plan will evolve throughout the lifecycle of the BLUE MED FAB Programme.

BLUE MED Safety Case – Phase 1 deliverables

SAFETY PLAN (example 1)

BLUE MED FAB system phases	Safety Argument	Assurance Activity	Evidence	Criteria for Success	Respo-nsibility	How to…
SYSTEM DEFINITION	**[Arg1]:** **BLUE MED FAB has been specified to be accept-ably safe**	Confirm that the **Concept of Operation** document describes adequately the **context** and **scope** of the FAB Confirm there is a comprehensive gap analysis between current operations and FAB Confirm that functionality and performance parameters are defined	**ConOps doc** **Gap analysis reports**	**Indepen dent review** **(e.g. NSA)**	**L**: WP Safety **D**: WP Safety **C**: Other WP leaders **I**:PM	**SCDM guidance material** **Expert contractor (TBD)**

Shows that the functional changes have been identified

BLUE MED Safety Case – Phase 1 deliverables

SAFETY PLAN (example 2)

BLUE MED FAB system phases	Safety Argument	Assurance Activity	Evidence	Criteria for Success	Respo-nsibility	How to…
SYSTEM IMPLEMENTATION	**[Arg2]**: **BLUE MED FAB has been implemented as specified**	Conduct of a full Preliminary System Safety Assessment **(PSSA)** as described in the SAM for all proposed design solutions	**System (incl. operational and technical aspects) validation against its specific-ations and safety requirements**	**Indepen dent review** **(e.g. NSA)**	**L**: WP Safety **D**: WP Safety **C**: WP Ops WP Tech **I**:PM	**SCDM guidance material** **SAM guidance material** **Expert contractor (TBD)**

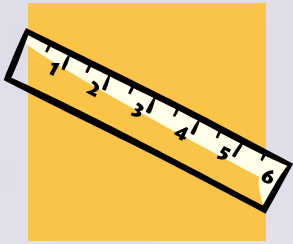
BLUE MED Safety Case – Phase 1 deliverables

Initial set of safety requirements.. (ad hoc activity !..)

	SAFETY REQUIREMENTS	Work Package 1 OPERATIONAL				Work Package 2 TECHNICAL				Work Package 4 LEGAL/HR				Comment (why requirement not or partially addressed)
		Y	P	N	NA	Y	P	N	NA	Y	P	N	NA	
AIRSPACE	**SR-AS03 Route network:** **Implement-ation of uni-directional routes**		X						X			X		The principles inspiring WP1 has been to propose new routes that would accommodate the major traffic flows along straight lines to the extent possible

Indicates interaction required between work packages

Safety as a function of FAB performance…



BLUE MED is a performance driven project. Safety improvement is one of the main criteria of its success… Therefore, safety must be measured…

In this phase, two Key Performance Areas (KPA) have been identified:

- **Reporting levels**: an increase or decrease in incident reports should indicate whether the reporting process is improving or not
- **SMS implementation**: 2 sub-indicators have been identified to quantify the SMS activity
  - **Maturity:** SMS development and implementation maturity score as defined for the ESP programme.
  - **Level of integration**: indicate how efficiently the SMS activities (e.g. safety promotion) are integrated (conducted in common) at FAB level

Additional KPA (to be considered when FAB is more mature):
Incidents per severity class

BLUE MED Safety Case – what went well…

- level of consensus / spirit of cooperation between participating states
- sharing of experiences from a variety of environments
- identification of key safety performance areas
- enthusiastic expert support by EUROCONTROL !

BLUE MED Safety Case – what can be improved…

- Interaction of the Safety Work Package (WP3) with other WPs – operational and safety meetings must be held jointly on a regular basis

- Safety Criteria:

No FAB-wide TLS / RCS has been defined (hence, difficulty in determining what is "acceptably safe")
Relative criteria used: "Safer than before…"

- Safety Plan – very high level at the moment

Not a Phase 1 issue ! Will be addressed in next phase, in cooperation with NSA/Regulators

- Modalities of the integration of non-EU states into BLUE MED

Generic BLUE MED issue. In discussion with EC

Questions

Thank you

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