



Tender Specifications
annexed to
Invitation to Tender
Ref. SJU/LC/0059-CFT
*Performance of a study on the
macroscopic impact of SESAR*

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1. INTRODUCTION

1.1. Acronyms and terminology

ATM	Air Traffic Management
SESAR	Single European Sky ATM Research Programme
SJU	SESAR Joint Undertaking (European Union body under Council Regulation (EC) No 219/2007 as amended by Council Regulation (EC) No 1361/2008)
ANSP	Air navigation service provider
ANS	Air Navigation services
ATM Master plan	SESAR Master plan and the European ATM Master plan
FAB	Functional Airspace Block
GAT	General Air Traffic
ICAO	International Civil Aviation Organisation
IP	Implementation Package
IR	Implementing Rule
OAT	Operational Air Traffic
SJU	SESAR Joint Undertaking
TS	Technical Specifications
EU	European Union

1.2. Overview of this call

The SESAR Joint Undertaking (SJU) envisages selecting a single company for the signature of a Contract for the performance of a study on the impact of SESAR and the provision of complementary advisory services.

The present call for tenders is divided into two lots:

- **Lot 1: Performance of the study on the impact of SESAR,**
- **Lot 2: Performance of complementary advisory activities.**

Tenderers shall bid for both lots.

More detailed description of the services covered by Lots 1 and 2 is given in Section 2 below (“Terms of Reference”).

Fact sheets and reference documents have been attached to these Tender Specifications to provide background information. The bidders are invited to read and consult the facts sheets

and the reference documents before proceeding with reading the Tender Specifications, as the information contained therein is essential for the correct understanding of the objectives of the Study.

1.3. Contractual framework

The Contract to be awarded as a result of this call for tenders will cover both Lot 1 and 2 and will be divided as follows:

- **Lot 1: Basic Services - Performance of study on the impact of SESAR**
Implementation of activities under Lot 1 will commence upon entry into force of the Contract (please refer to the draft Contract attached to the Invitation to tender).
- **Lot 2: Optional Services - Performance of complementary advisory activities.**
The activities under Lot 2 will be implemented through work orders depending on the SJU needs and budget availabilities (please refer to the draft Contract attached to the Invitation to tender). Please note that signature of the Contract imposes no obligation on the SJU to purchase the services under Lot 2. Only implementation of the Contract through work orders is binding on the SJU.

1.4. What is SESAR

The Single European Sky Air Traffic Management Research Programme (SESAR) is a European initiative aiming at modernising and harmonising the European Air Traffic Management (ATM) systems ensuring sustainable, safe and efficient air transport development through a performance driven approach. The Programme is composed of three phases: *(for more detailed information please see the Fact sheet n°1 attached hereto).*

- the **definition phase (2005-2008)** whose objective was to define the future concept of operations based on the 4D trajectories, time based operations and wide information sharing system among all the relevant stakeholders. The cost of this phase was 60 million EUR, financed with 50% funding from the EU and 50% from EUROCONTROL.
- The **development phase (2008-2013)** of the Programme is characterised by coordinated and focussed research, development and validation activities that aim at developing the equipment, standards and procedures that will constitute the new systems. This phase is currently on-going and is managed by the SESAR Joint Undertaking, a Union body established by Council Regulation (EC) 219/2007 of 27.02.2007, as amended by Regulation (EC) 1361/2008. The estimated cost of the development phase is 2.1 billion EUR. The EU, Eurocontrol and the ATM industry have committed to fund each 33% (700 million EUR each) of the estimated cost of development.
- The **deployment phase (2014-2020)**, based on the results of the development phase, will consist of large scale production, procurement and implementation of the new ATM infrastructure and the corresponding aircraft equipment.

A. The European ATM Master plan

The definition phase resulted in a set of deliverables, the main one being the SESAR Master plan (D5), which is the commonly agreed roadmap for the accomplishment of research activities and gradual deployment of the results. The SESAR Master plan has been endorsed by the Council of the European Union on 30 March 2009 and became the European ATM Master plan (hereinafter referred to as the ATM Master plan). Since it has been endorsed by the Ministers of Transport of 27 Member States, the ATM Master plan, although not being a legally binding document, is a commonly agreed European roadmap for the development and deployment of the future ATM systems in Europe.

The ATM Master plan in fact defines a new ATM concept identifying functions and processes and their corresponding interactions and information flows, concerned actors, their roles and responsibilities.

The ATM Master plan, besides being the commonly agreed roadmap for the deployment of the technologies, standards and procedures, also contains the initial costs and investment needs for the major categories of the stakeholders (initial business case).

B. What is deployment of SESAR?

The deployment phase of SESAR consists of the following three implementation packages defined in the ATM Master plan:

- (a) **The Implementation Package I (IP 1)** containing the basic functionalities of the SESAR system, sets the baseline for the future deployment of more advanced functionalities, which are however required and necessary for the future achievement of the full paradigm shift towards the 4D trajectories and time based operations.

The IP 1 functionalities and technologies are those which do not require any further research efforts as they have been validated, and are available to be deployed among the stakeholders. This means that as soon as the Implementing Rules have been developed, and voted in the Single Sky committee, they must be deployed among the stakeholders by the given date.

- (b) **Implementation Package II** (corresponding to the service levels 2 and 3 of the European ATM Master plan), is composed of ATM elements which need further research and development and which can be proposed for standardisation and implementation in the timeframe as of 2014.
- (c) **Implementation Package III** (corresponding to the service levels 4 and 5 of the European ATM Master plan) is composed of the most advanced elements of the SESAR's Concept of Operations allowing the full transition to the 4 D trajectory management and time based aircraft operations, whose deployment reaches the timeline beyond 2020.

C. The timeline for the deployment of SESAR

It is essential that the core elements of the ATM concept are implemented timely and consistently throughout the European ATM network to enjoy their full benefits. This requires coordination and synchronization across countries and stakeholders, and the key question of this Study is, how and which financing mechanisms (private and public, as well as combined) would represent effective incentives for early, coordinated and sustainable benefits at network level, taking into account the objectives and legislative framework of the Single European Sky (SES) policy and the different instruments to support ATM infrastructure development.

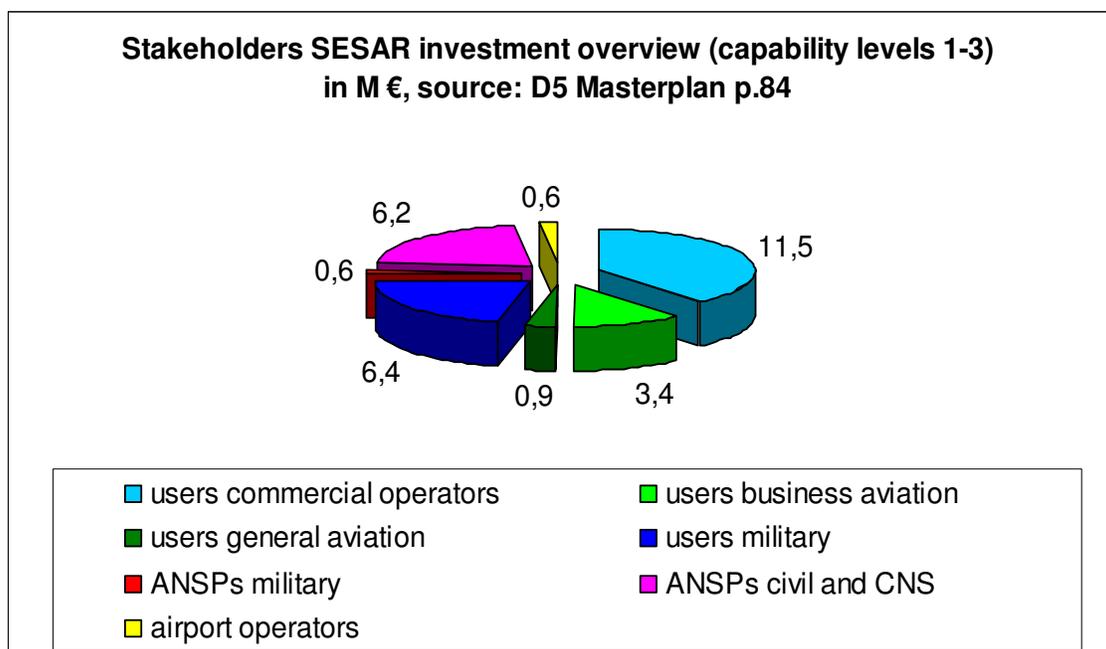
The deployment of SESAR's systems, technologies and standards will start in reality as soon as the products (outputs of the development phase) are available, meaning they have been validated.

As the SESAR Programme is structured in a layered manner and composed of different levels of performance (service levels) and different complexity and technology readiness levels, the deployment of SESAR systems will start as soon as the implementation of functionalities defined in the first set of the Implementing Rules of the Implementation Package I is undertaken by the stakeholders.

The SESAR Programme is also expected to deliver "early benefits" (before 2014- such as continuous descent procedures in the context of AIRE initiative, which is a trans-Atlantic initiative aiming at performing flight trials), which after validation, could be also deployed throughout Europe.

Therefore the deployment of SESAR products, systems and procedures needs to be seen as a gradual process, where the development activities run in parallel to the deployment activities.

Currently, the initial business case of SESAR, as presented in the deliverable D5 of the definition phase identifies EUR 30 billion of investment needs for the capability levels 1-3, as presented below:



The vast majority of the investments will be borne by the commercial airlines (11.5 billion €), followed by the military (6.4 billion €), and the civil air navigation service providers (6.2 billion €) (refer to the results of the definition phase).

2. TERMS OF REFERENCE

2.1. Lot 1 – Performance of a study on the impact of SESAR

A. Context of the Study

The first stage of SESAR implementation is approaching, with a key milestone date set in 2013. Concurrently, EU institutions will imminently be deciding on an EU multiannual financial and institutional framework for the period 2014 - 2020.

It has also been noted that generally there has been limited awareness of SESAR and its economic impact inside the national Governments, especially outside the air transport departments.

As a result, the objective of this Study is to quantify and analyze the macroscopic implications of the SESAR Programme. The analysis will provide useful input to the discussions on the new EU multiannual framework.

B. Scope of the Study

The scope of the Study is to provide the SJU with an assessment of the macroscopic impact of SESAR. This includes an impact assessment covering EU and EUROCONTROL Member States, as well as an individual analysis of 3-4 key countries¹ (or groups of countries), to be defined after award of the contract. The analysis would cover not only the economic impact of SESAR but also the societal, infrastructure and technological/industrial impact.

C. Objectives of the Study

The outputs of the Study should provide answers to the objectives described below.

- (a) Robust and validated quantification of the macroscopic impact of SESAR, assessing:
 - i. The economic and employment impact on the transportation industry, 3rd parties, Governments and society at large
 - ii. The strategic, infrastructural, technological and other non-financial elements in the implementation of SESAR
- (b) Tailoring of the analysis to the national situation of 3-4 key countries (or groups of Member States)¹.

¹ EU and/or EUROCONTROL Member States.

D. Project Management, Timeframe, meetings, deliverables

Project management

Activity	Responsible Party
Project Steering Committee	SESAR Joint Undertaking appointed persons, including a representative of the European Commission The Contractor is expected to appoint a senior partner to advise the Steering Committee members in their decision making
Project Management	SJU appointed persons & The Contractor dedicated project manager
Subject Matter Experts	The Contractor is expected to provide personnel with the expertise to cover the spectrum of knowledge for the deliverables in this contract

The Contractor shall provide full secretarial support at all meetings that they attend in relation to this project.

The Contractor shall also be responsible for organizing all activities described in this technical specification and in the proposed offer unless indicated otherwise by the SJU.

Meetings

Meetings shall normally take place in Brussels at the SESAR Joint Undertaking offices. Any other proposed meetings must be approved by the SJU.

Deliverables

The Contractor shall deliver the following:

1. Reports and presentation material:
 - a) A Project Management Plan defining the project work plan, including deliverables, milestones, and, if relevant, any request for stakeholders' involvement in the study ;
 - b) A Final publishable report² containing the results of the study which shall answer the objectives specified in point 2.1 C) above, providing, in a dedicated section, conclusions as to the macroscopic impact of SESAR and the results of the analysis to the national situation of 3-4 key countries (or

² in MS Word or compatible software.

groups of Member States)¹. The final report should include an executive summary.

c) A final publishable presentation³.

2. Models:

a) A validated analysis model⁵ on the economic impact of SESAR at Member State level.

The final deliverables shall be finalized within 90 days from the signature of the contract, except if mutually agreed otherwise in writing by the parties.

The deliverables shall be provided to the SJU in English language in 5 paper copies, as well as a CD ROM containing the electronic version of the reports, presentations and models in Microsoft Office format (or similar format).

2.2. Lot 2: Performance of complementary activities

The services which may be requested by the SJU under Lot 2 would consist of activities such as:

- Follow-up activities related to the study performed under Lot 1;
- Support to dissemination activities related to the study performed under Lot 1;
- Complementary services related to the model, validation of the model, or new requirements (e.g. new countries to be considered).

2.3. Price

The maximum allocated budget for this Service Contract as whole is **600.000,00 EUR**.

This amount is broken down as follows:

- Maximum allocated budget for **Lot 1: 500.000,00 EUR**
- Maximum allocated budget for **Lot 2: 100.000,00 EUR**.

3. ASSESSMENT OF THE OFFERS AND AWARD OF THE CONTRACT

3.1. Introduction

Proposals for Lots 1 and 2 will be assessed **jointly and as a whole** in accordance with the criteria laid down below. The assessment will be strictly based on the content of the received offers and in the light of the criteria set out hereunder.

The assessment procedure will be carried out in three consecutive stages:

- Stage 1 – assessment in the light of exclusion criteria (see section 3.2. below),
- Stage 2 – assessment in the light of selection criteria (see section 3.3. below) and
- Stage 3 – assessment in the light of award criteria (see section 3.4. below).

³ in MS PowerPoint format or compatible software.

The aim of each of these stages is:

- To check on the basis of the exclusion criteria, whether tenderer can take part in the tendering procedure;
- To check on the basis of the selection criteria, i.e. legal, economic and financial, technical and professional capacity of each tenderer;
- To assess on the basis of the award criteria each offer which has passed the exclusion and selection stages.

3.2. Assessment in the light of exclusion criteria

To be eligible for participating in this contract award procedure, the tenderer⁴ (and in case of consortium, the coordinator and each consortium member) cannot be in any of the following exclusion grounds:

- (a) They are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;
- (b) They have been convicted of an offence concerning their professional conduct by a judgement which has the force of *res judicata*;
- (c) They have been guilty of grave professional misconduct proven by any means which the contracting authority can justify;
- (d) They have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or with those of the country of the contracting authority or those of the country where the contract is to be performed;

Accordingly, tenderers (and in case of consortium, the coordinator and each consortium member) must provide a **Declaration on Honour** (see Annex I), duly signed and dated, stating that they are not in one of the situations referred to above.

Nota Bene:

The tenderer (and in case of consortium, the coordinator and each consortium member) to which the contract is to be awarded shall provide, within 15 days following notification of award and preceding the signature of the contract, the following documentary proofs (**originals**) to confirm the declaration referred to above:

- For points a) and b) above a recent extract from the judicial record or, failing that, an equivalent document recently issued by a judicial or administrative authority in the country of origin or provenance showing that those requirements are satisfied.
- For point d) recent certificates issued by the competent authorities of the States concerned.

⁴ Where parts of the services are intended to be subcontracted the tenderer has also to ensure that the subcontractors satisfy the exclusion criteria as indicated in section 16 of invitation to tender Ref. SJU/LC/0...-CFT.

Where the document or certificate referred to above is not issued in the country concerned, it may be replaced by a sworn or, failing that, a solemn statement made by the interested party before a judicial or administrative authority, a notary or a qualified professional body in its country of origin or provenance.

The SJU may waive the obligation of a tenderer to submit the documentary evidence referred to above if such evidence has already been submitted to the SJU for the purposes of another procurement procedure and provided that the documents are not more than six (6) months old starting from their issuing date and that they are still valid. In such a case, the tenderer shall declare on his honour that the documentary evidence has already been provided in a previous procurement procedure and confirm that no changes in his situation have occurred.

Please refer to the following web page for additional information regarding the relevant requirements and model documents under national laws of the EU Member States:
http://ec.europa.eu/internal_market/publicprocurement/2004_18/index_en.htm.

3.3. Assessment in the light of selection criteria

The tenderer must have the overall capabilities (legal, economic, financial, technical and professional) to perform the contract. All the requirements listed below must be met in order to enter the next phase of the assessment in the light of award criteria.

Please note that in the selection phase, assessment focuses on the quality of the track record and not on the quality of the (technical) offer.

3.3.1. Legal capacity

Tenderers (and in case of consortium, the coordinator and each consortium member) are requested to prove that they are authorised to perform the contract under the national law as evidenced by inclusion in a trade or professional register, or a sworn declaration or certificate, membership of a specific organisation, express authorisation or entry in the VAT register.

The tenderer (and in case of consortium, the coordinator and each consortium member) shall provide a dully filled in and signed Legal entities' form (see section 7 b) of the invitation to tender Ref. SJU/LC/0059-CFT).

3.3.2. Economic and financial capacity

In order to prove its sufficient economic and financial capacity to perform the contract, the tenderer (and in case of consortium, the coordinator and each consortium member) shall present one of the following documentation:

- Evidence of professional risk indemnity insurance;
- Balance sheets (or extracts from balance sheets) for at least the last two years for which accounts have been closed;
- Statement of overall turnover during the last three financial years

If, for some exceptional reason which the SJU considers justified, the tenderer (and in case of consortium, the coordinator and each consortium member) is [are] unable to provide the

references requested here above, the tenderer (and in case of consortium, the coordinator and each consortium member) may prove the economic and financial capacity by any other means which the SJU considers appropriate.

3.3.3. Technical and professional capacity

Tenderer [Consortium] is required to prove that he has sufficient technical and professional capacity to perform the contract. To that end, he shall provide the following information:

- A detailed description of the main current activities of the tenderer,
- Detailed CVs of the team that will be responsible for carrying out the project.
- Evidence of counselling governmental agencies in the field of economic development, public finance, aerospace and defence, technology
- Evidence of skills and expertise to develop studies on similar subjects with a decisive impact on the decision making process

3.4. Assessment in the light of award criteria

3.4.1. Technical evaluation of the offers

Only the offers meeting the requirements of the exclusion and selection criteria will be evaluated in terms of quality and price for the award of the contract.

The contract will be awarded on the basis of the economically most advantageous offer.

The Quality Score of each technical offer covering the services will be evaluated in accordance with the award criteria and the associated weighting detailed in the table below:

N°	Award criteria (covering both Lots)	Weighting
1.	<p><u>Understanding:</u></p> <ul style="list-style-type: none"> - Understanding of the overall assignment - Understanding of the challenges and possibilities - Understanding of SESAR 	30
2.	<p><u>Presentation:</u></p> <ul style="list-style-type: none"> - Clarity and precision of the proposal - Quality of the ideas proposed to achieve the assigned objectives - Quality of the approach to ensure the successful achievement of the assignment. 	30
3.	<p><u>Tenderer Expertise:</u></p> <ul style="list-style-type: none"> - Evidence of previous experience in counselling governmental agencies in the field of economic development, public finance, aerospace and defence. - Evidence of competence in all fields relevant for the study, such as strategy, finance, economics, risk and innovation/technology deployment. - Global representation or network, with local 	40

	<p>presence or experience in each relevant countries (consulting and research capabilities)</p> <p>- Quality and relevance of the team and of the team members (through detailed CV's of relevant personnel).</p>	
Total number of points		100

3.4.2. Financial evaluation of the offers for Lot 1& 2 and recommendation for contract award

The offer must reach **60 %** or more per criterion and **70 points** or more globally in order to be admitted to the financial evaluation.

The contract will be awarded to the offer which offers the highest ratio quality/cost by applying the following formula:

<p>Ratio quality/price of tender “Y”</p> <p>=</p> <p>(Lowest price for Lot 1/price of tender Y for Lot 1 x total quality score of tender Y) x 90%</p> <p>+</p> <p>(Lowest price for Lot 2/price of tender Y for Lot 2 x quality score of tender Y) x 10%</p>

ANNEX I

DECLARATION ON HONOUR

[To be completed and signed by the tenderer [the coordinator and each consortium member]]

The undersigned:

Name of the individual/company/ organisation:

Legal address:

Registration number/ID Card No.:

VAT number:

Declares on oath that the individual/company/organisation mentioned above is not in any of the situations mentioned below:

- a) they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;
- b) they have been convicted of an offence concerning their professional conduct by a judgement which has the force of *res judicata*;
- c) they have been guilty of grave professional misconduct proven by any means which the SJU can justify;
- d) they have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or with those of the country of the contracting authority or those of the country where the contract is to be performed;

I the undersigned understand that contracts may not be awarded if during the procurement procedure the individual/company/organisation mentioned above:

- is subject to a conflict of interest;
- is guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in the contract procedure or fail to supply this information;

Full name:

Date & Signature:

ANNEX II

Template for submission of the Financial Proposal for Lot 2

Tenderers shall submit their Financial Proposal for Lot 2 by filling in the table below.

Please note that in applying Section 3.4.2 of the Technical Specifications (“*Financial evaluation of the offers*”), the following weighting factors will be used to determine your final price for Lot 2. :

- for the category “Partner”: **15%**
- for the category “Manager”: **20%**
- for the category “Consultant”: **65%**

Consequently, your financial price for Lot 2 will be calculated by adding up the unit fees per category of personnel, after applying the corresponding weighting factors set forth hereabove. For more details on the financial evaluation, please refer to Section 3.4.2 of the Technical Specifications.

Staff by category	Unit	Unit price in Euro (excl. VAT)
Partner	man-day	<i>[to be completed by the tenderer]</i>
Manager	man-day	<i>[to be completed by the tenderer]</i>
Consultant	man-day	<i>[to be completed by the tenderer]</i>

ANNEX III

FACT SHEETS



Fact sheet 1: The SESAR Programme

The SESAR Programme is one of the most important research and development projects ever launched by the European Union in the field of air traffic management (ATM). Its objective is to provide technological solutions in the area of the Air Traffic Management for the full and successful achievement of the Single European Sky legislation. While the Regulation 1070/2009 will provide a revised legal framework for a more efficient, performance driven, safer and greener procedures for the air traffic management, the SESAR Programme will deliver technological solutions, functionalities, systems and proposals for standards, which will be deployed in Europe.

The whole ATM Network R&D SESAR Programme activities will develop and deliver the necessary operational and technical materials (specifications, procedures, mock-ups, prototypes, validation reports, etc.) for the progressive industrialisation, deployment and operation of a new ATM system.

The SESAR Programme is composed of three phases:

- a) **The definition phase (2005-2008)**, whose aim was to define the roadmap for the achievement of ATM performance levels and to establish a high level work plan defining the content of the next generation of ATM systems, and identifying the necessary elements for its realisation. The consortium of the definition phase was composed of 30 organisations including the Air Navigation Service Providers, the industry and the airlines. The technological coordination was entrusted to Eurocontrol.

The definition phase of the SESAR Programme ended in May 2008. It resulted in 6 documents:

- i. D1: Air Transport Framework – the current situation;
- ii. D2: the ATM Performance Targets;
- iii. D3: the ATM Target Concept;
- iv. D4: the ATM Deployment Sequence;
- v. D5: the SESAR Master plan: this document is the core stone of the definition phase. It is a commonly agreed roadmap for the research activities and for the deployment of the SESAR's technological outputs
- vi. D6: the Work Programme for 2008-2013

Upon a proposal from the European Commission based on the SESAR Master plan, the Council of the EU endorsed the "European ATM Master plan" in its Decision of 30th of March 2009. On the same date the Council adopted a Resolution confirming that the modernisation of ATM and the proposed timelines for the achievement of this modernisation remain high political priority at the EU level.

As requested by the Council in its Resolution of 30th of March 2009, the European ATM Master plan will be updated in 2010, after appropriate consultation process including the Single European Sky Committee.

- b) **Development phase (2008-2013)**, which will develop the necessary elements on the basis of the Definition phase findings.

a. The financing of the development phase:

The estimated cost of the development phase amounts to 2.1 billion EUR and is financed through three channels combining public and private funds. The European Union, being the founding member together with Eurocontrol, has committed 700 million EUR from two different programmes to the Joint Undertaking. Half of this amount stems from the 7th Framework Programme for Research and Development of the European Community and another half from the multi-annual programme of the Trans-European Transport Network Programme. The industrial partners, selected in a competitive process, are also expected to commit 700 million EUR. Eurocontrol also contributes 700 million EUR.

b. The governance of the development phase and the current model of the private-public partnership

The Joint Undertaking has been established under Article 171 of the Treaty establishing the European Union.

The specific mandate of the SESAR Joint Undertaking is laid down in the Article 1 par. 5 of Regulation (EC) 219/2007, as amended by Regulation (EC) 1368/2008.

To resume, the mandate of the Joint Undertaking is defined as follows:

- a) Coordinating and concentrating all relevant ATM research of the development phase, in accordance with the ATM Master plan
- b) Ensuring the necessary funding of the development phase
- c) Ensuring the involvement of the stakeholders
- d) Organising the technical work; including the validation activities
- e) Ensuring the supervision of the activities related to the development of common products

Following the amendment of the basic regulation, the Joint Undertaking statutes changed from private entity to a Union body.

The management of the Development Phase of the SESAR Programme is entrusted to the SESAR Joint Undertaking, a Union body in charge of the coordinating and concentrating all relevant ATM research, as well as of the execution of the European ATM Master plan.

The executive decisions are taken by casting the votes at the Administrative Board, composed of the three founding members, the selected members, which carry out the work, and the airlines. Please consult the list of the members of the Administrative Board of the SESAR Joint Undertaking available at <http://www.sesarju.eu/about/board>

c. The operational activities of the Development Phase:

The new Concept of Operations of SESAR resulting from the definition phase aims at moving from today's airspace based trajectories to the time based operations of "4-D trajectories", where all the relevant stakeholders have access to the most up to date and precise information through the System Wide Information Management (SWIM).

The Work Programme of the SESAR Development Phase is divided into following thematic areas and Work Packages (WPs):

(1) Operational ATM research will be addressed under WPs:

- WP 4: En-route Operations
- WP 5: Terminal Management Areas (TMA) Operations
- WP 6: Airport Operations
- and WP 7: Networking Operations

(2) System research considerations are addressed under WPs:

- WP 9: Aircraft systems
- WP 10: En-Route & Approach ATC Systems
- WP 11: Flight Operations Centre System
- WP 12: Airport Systems
- WP 13: Network Information Management System
- and WP 15: Non Avionics Communication-Navigation-Surveillance (CNS) Systems

(3) System Wide Information Management (SWIM) considerations are addressed under WPs:

- WP 8: Information Management
- WP and 14: SWIM Technical Architecture

(4) Transversal activities: such as validation infrastructure, development of safety, security, environment and human performance cases, maintenance and updates of the ATM Master Plan, of the Target Concept and its Architecture, are dealt by a number of additional WPs, which are B, C, 3, 16. It is expected that transversal WPs will contribute to maximising benefits of operational and system Work Packages.

The SESAR Programme is composed of almost 300 research projects or transversal activities.

The Work Breakdown Structure is presented below:

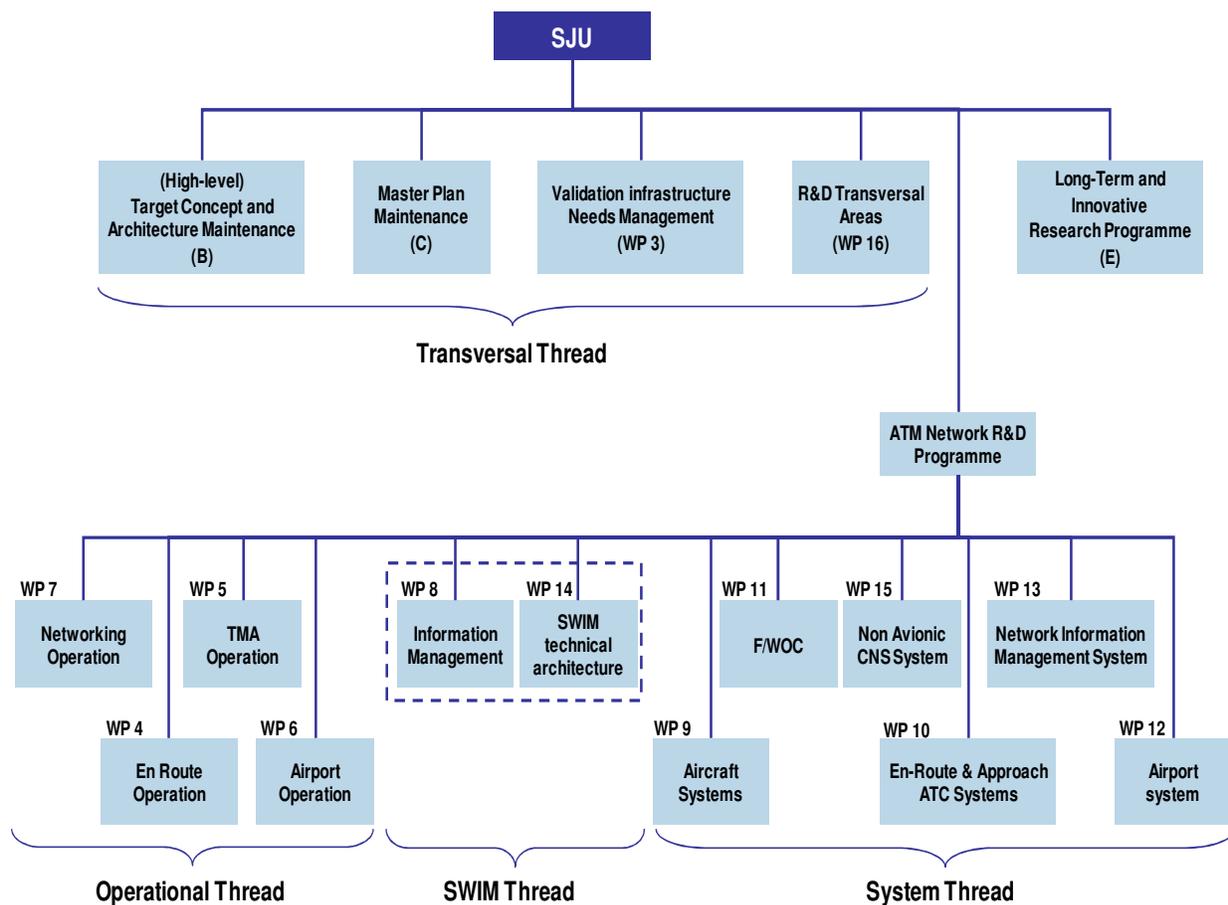


Figure: Work Breakdown Structure high-level overview

Detailed description of the Work Packages can be obtained via the SESAR JU webpage under the following link:

http://www.sesarju.eu/public/standard_page/wp.html

Detailed Technical Description of Work can be obtained via the SESAR JU webpage under the following link:

http://www.sesarju.eu/public/standard_page/library_list.html

Deployment phase (2013-2020), through which there will be large scale production and implementation of the new air traffic management infrastructure, composed of fully harmonised and interoperable components which guarantee high performance air transport activities in Europe.

Fact sheet 2: Single Sky legislation

1 History and background

Air traffic management (known under the English acronym: **ATM** – Air Traffic Management) constitutes, together with airports, **the infrastructure** of air transport. Using an image of railway transport, we may say that air traffic management provides with the "rails, markings and beacons" for airplanes together with the equipment intended to ensure traffic surveillance and flight expedite flows.

Historically traffic control mission has been ensured by national civil administrations. These administrations were therefore in charge of regulating and monitoring air carriers, airports and air traffic management.

The creation of the internal market and the liberalisation of the air transport sector have led to the reorganisation of it. However, in the ATM area such a trend has prompted the establishment of specific entities gathering air navigation service providers in the vast majority of the Member States.

Air traffic management technology is in many ways **obsolete** today. Means of communications between pilot and traffic controller are carried out through a technology that dates from the 50s (NavAids and Radio Telecoms); radars, treatment of flight plans etc. date from the 70s. The level of automation is still low which keeps air traffic controllers **productivity** at a very low level (on average 0.7 aircrafts per hour are controlled by a single controller). An aircraft stays in general between 3-5 minutes in a given sector of airspace controlled by the controller, which requires a lot of coordination. To date, an increase of traffic has automatically led to a proportional increase in traffic controllers. This shows the need to speed up **technological innovation** and new ways of operational organisation.

The **Community legislation "Single European Sky I"** (adopted in March 2004) has provided several positive elements to the European ATM system:

- a. The establishment of an institutional and legal framework for Community action, within which a partnership with stakeholders has been put in place.
- b. The separation between service provision and regulation tasks, the harmonisation of the regime for licensing of traffic controllers, the transposition of the "Eurocontrol Safety Regulatory Requirements (ESARRs)" into the EU ATM body of law.
- c. More efficiency in the airspace utilisation through its flexible utilisation and coordination between the civil and military.
- d. A transparent and common system of "en route" charges.
- e. The acceleration of innovation, interoperability of equipments⁵ with notably the implementation of the Single European Sky technological pillar: the SESAR programme.

⁵ Important to note that each State had in the past Developer its technology in an isolated manner

2 The Single European Sky second package – SES II

The second legislative package (Regulation EC 1070/2009) of the Single European Sky has been adopted in October 2009 by the European Parliament and the Council and entered into force on 4th December 2009. Its implementation is now the crucial issue.

The second legislative package has three pillars: (1) a legislative framework for the performance in the areas of safety, environment, capacity and flight efficiency; (2) a reinforcement of the network management; and (3) the integration of air navigation services in functional airspace blocks (FABs).

- 1) **Performance regulatory framework:** as ATM is a monopoly, a regulatory system is necessary the establishment of performance plans in support of the airspace users needs. Through a **performance** assessment body (Performance Review Body), **the Commission will act as an economic regulator and will adopt targets** for the European network, while national supervisory authorities will propose national or FAB targets, after consultation with the airspace users and the service providers. In addition the Commission will ensure the compatibility and coherence between the local and network targets. The new system will put in place financial incentives for the purpose.
- 2) **Network management:** the ATM sector provides the infrastructure for aviation, but the latter is increasingly under pressure: the smallest incident in any link of the chain will impact the whole network. The Commission shall have to designate an European ATM network manager which shall be requested to:
 - ensure that routes and airspace are managed from a true European perspective in order to have for airlines shorter routes;
 - synchronise the deployment of the SESAR infrastructure in the Member States;
 - coordinate the management of the radio spectrum allocated to aviation;
 - ensure that traffic problems are tackled from a "gate to gate" perspectives.
- 3) **Integration into Functional Airspace Blocks (FABs):** the deadline of 2012 has been retained for the effective implementation of the 9 regional ongoing initiatives. The FABs initiatives are bottom- up initiatives, depending on the will and strategy of cooperation of the Air Navigation service providers and the National Supervisory authorities of the States and aim at increasing the cost-effectiveness of the service provision in Europe and delivering operational benefits (such as for example: improving the capacity in the airspace block, improving the routes structure, providing common procurement strategy and training).

The efficiency of the Single Sky implementation depends as well on the progress made in other areas: safety, technology and airport capacity. For this reason, the new Single Sky legislative measures are integrated into an "**aviation package**". Together with the abovementioned elements, other crucial aspects are: (1) the extension of competences of the European Air Safety Agency (EASA); (2) the SESAR programme deployment; and (3) the Action Plan for the improvement of the airport capacity and safety efficiency.

The intergovernmental organisation **Eurocontrol** could be designated as the technical agency in support of the Single European Sky if it does comply with the EU requirements such as separation between regulatory and service provision related activities.

3 Key Data

- Air carriers finance air navigation services through two type of tariffs called 'en route' and 'terminal' (approaching the airports), calculated according to the aircraft volume. A charge is levied for each flight performed in the airspace falling within the competence of the States. This charge takes into account the distance flown and, less than proportionately, the aircraft weight. This way the air carriers pay on a yearly basis € 6 billion for "en route" services and € 2 billions for "terminal" services, therefore **€ 8 billion** in total.
- The ATM sector employs 37.000 people, out of which approximately 15.000 controllers. The traffic is about **10 million flights** in 2007, with peaks of 50.000 daily, and it is managed through more than 60 air control centres in the EU. This fragmentation of service provision causes an additional cost that has evaluated around € 3 billion. In comparison the United States manage twice as much traffic that Europe with only 20 air control centres with a similar ATM cost.
- Civil aviation is safe transportation mode. However **3 accidents linked to ATM** happened since 2000 in Milan-Linate, Paris-CDG and Überlingen ("en route" collision).
- The impact of civil aviation on **environment** has been evaluated as approximately **3%** of the total CO2 emissions. Increased flight efficiency through the rationalisation of air navigation service provision may improve the environmental efficiency per flight by a range of between 6 à 12%.

ANNEX IV

Background documents to be consulted and understood before submitting the offers

- 1. Air transport key facts:**
 - a. http://ec.europa.eu/transport/air/doc/03_2009_facts_figures.pdf

- 2. SESAR Programme and SESAR Joint Undertaking:**
 - a. Council Regulation (EC) 219/2007, amended by the Council Regulation (EC) 1368/2009
 - b. SESAR concept of Operations (D3 of the definition phase)
http://www.sesarju.eu/sites/default/files/documents/reports/DLM-0612-001-02-00_0.pdf
 - c. European ATM Master plan, as endorsed by the Council on 30th of March 2009:
http://www.sesarju.eu/sites/default/files/documents/reports/European_ATM_Master_Plan.pdf
 - d. SESAR Activity Report 2007-2008
http://www.sesarju.eu/sites/default/files/documents/reports/SesarJU_AnnualReport07-08.pdf

- 3. Structure of the SESAR's public-private partnership:**
 - a. Regulation (EC) 219/2007 amended by Regulation (EC) 1368/2008;
 - b. the list of the Administrative Board Members at:
<http://www.sesarju.eu/about/board>

- 4. Single European Sky legislation:**
 - a. The four basic regulations 549/2004, 550/2004, 551/2004, 552/2004, as amended by the Regulation (EC) 1070/2009 entered into force on 4th of December 2009, in particular:
 - i. Objectives of the Single European Sky
 - ii. Provision on the common projects
 - iii. Interoperability Regulation

- 5. Performance Review Report prepared by the Performance Review Unit of Eurocontrol**
http://www.eurocontrol.int/prc/gallery/content/public/Docs/PRR_2009.pdf

- 6. The Air Traffic Management ATM Cost Effectiveness Report, 2008 Benchmarking Report prepared by the Performance Review Unit with the ACE working group, June 2010**
http://www.eurocontrol.int/prc/gallery/content/public/Docs/ace2008/ACE_2008_Benchmarking_Report.pdf

ANNEX V

Glossary

- ▶ *Air navigation service providers (ANSPs)*: means any public or private entity providing air navigation services for general air traffic;
- ▶ *Air Navigation services (ANS)*: means air traffic services; communication, navigation and surveillance services; meteorological services for air navigation; and aeronautical information services
- ▶ *SESAR Master plan and the European ATM Master plan (ATM Master plan)*: means the key deliverable of the Definition phase of the SESAR programme, which is a roadmap for the development and deployment of the new ATM system in Europe. The SESAR Master plan is build on different levels of maturity of different functionalities from the least advanced to wards more advanced (from service levels 0 to 5) and structured into three Implementation Packages IP1, IP 2 and IP 3.

The Council of the European Union endorsed the SESAR Master plan in its Decision of 30th of March 2009, which became a politically agreed common roadmap for the implementation of SESAR and since then is referred to as the European ATM Master plan.

- ▶ *Functional Airspace Blocks (FABs)**(Please refer to Article 9 bis of the Regulation (EC) 1070/2009*: means an airspace block based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related functions are performance-driven and optimized with a view to introducing, in each functional airspace block, enhanced cooperation among air navigation service providers or, where appropriate, an integrated provider. The FABs initiatives are bottom up initiatives led by the States and their scope of actions varies. Most of them are at the stage of pre-implementation and feasibility assessments, exploring different cooperation options and analyzing costs and benefits.

Currently there are 9 initiatives listed below: (1) the Baltic FAB, (2) the Danube FAB, (3) the Blue Med FAB, (4) the South-West (Spain Portugal), (5) the FABEC (Europe Centrale), (6) the FAB CE (Central Europe), (7) the FAB UK-Ireland, (8) NEFAB, (9) NUAC –please note that FABs 8 and 9 are negotiating a possible cooperation scenarios.

Further reading, composition and the assessment of the FABs can be obtained via the reports of the Performance Review Commission of Eurocontrol. The Regulation (EC) 1070/21009 sets the deadline for the implementation of the FABs by December 2012.

- ▶ *General Air Traffic (GAT)*: means general air traffic means all movements of civil aircraft, as well as all movements of State aircraft (including military, customs and police aircraft) when these movements are carried out in conformity with the procedures of the ICAO;
- ▶ *ICAO*: means the International Civil Aviation Organisation, as established by the 1944 Chicago Convention on International Civil Aviation;

- ▶ Implementation Package I: The Implementation Package I containing the basic functionalities of the SESAR system, sets the baseline for the future deployment of more advanced functionalities, which are however required and necessary for the future achievement of the full paradigm shift towards the 4D trajectories and time based operations. The Single Sky Committee agreed the European Commission to draft the mandates to develop the first set of seven Implementing Rules and 10 Union specifications in December 2009.

The IP I functionalities and technologies are those which do not require any further research efforts as they have been validated, and are available to be deployed among the stakeholders. This means that as soon as the Implementing Rules have been developed, and voted in the Single Sky committee, they must be deployed among the stakeholders by the given date.

- ▶ Implementation Package II (corresponding to the service levels 2 and 3 of the European ATM Master plan), is composed of ATM elements which need further research and development and which can be proposed for standardisation and implementation in the timeframe 2014.
- ▶ Implementation Package III (corresponding to the service levels 4 and 5 of the European ATM Master plan) is composed of the most advanced elements of the SESAR's Concept of Operations allowing the full transition to the 4 D trajectory management and time based aircraft operations, whose deployment reaches the timeline beyond 2020.
- ▶ The Implementing Rules (IRs): are technical specifications, including binding implementation deadlines, which are formally adopted through the Comitology procedure including the vote at the Single Sky committee. They are directly binding on the Member States and stakeholders concerned.
- ▶ Operational Air Traffic (OAT): The needs of military aviation and ATM support often reach beyond the scope of civil aviation and are therefore not sufficiently covered by ICAO provisions for General Air Traffic (GAT). The military therefore require Operational Air Traffic (OAT) to provide regulatory provisions and ATM arrangements for successful military training and mission accomplishment. This, however, is implemented on a national basis. Since Single European Sky legislation will harmonise airspace design and arrangements for airspace use at European level, namely with the creation of functional Airspace Blocks (FABs), the European military community must overcome this national fragmentation to be interoperable with the future EATMN.
- ▶ SESAR Joint Undertaking (SJU): The SESAR Joint Undertaking has been established by the Regulation (EC) 219/2007 under the Belgian law as an entity which is in charge of the management the development phase of the SESAR Programme. Since 1.1.2009 the SJU is formally recognised as an EU body, following the amendment of the Council Regulation⁶ establishing the SJU. Purpose of the amendment was to align the SJU's statute to those of the Joint Technology Initiatives in the 7th Framework Programme for research and technological development (2007-2013)⁷. The amending Regulation (EC) 1361/2008 was adopted on 16.12.2008.

⁶ Regulation (EC)219/2007 of 27.02.2007

⁷ Clean Sky, IMI, ENIAC, Hydrogen Fuel Cells, ARTEMIS

The amended SJU Regulation formally fixes the EU contribution to the SJU at 700 million EUR (350 million EUR from FP7 and 350 million EUR from TEN-T). Eurocontrol, second founding member contributes 700 million EUR to the Programme, mostly through the in kind contributions. The remaining 700 million EUR are granted by the industrial members, who have been selected following a two- steps selection process. After the initial call for expression of interests 15 core members have been selected on the grounds of their technical expertise and of their financial soundness. The second step consisted of selecting the best offers for the parts of the Technical Work Programme of the SESAR Joint Undertaking.

The SJU concluded the first round of accession of 15 “core” members with the signing of the individual membership agreements on 12.06.2009. On the same date Eurocontrol concluded a specific agreement with the SJU as a founding member, defining its role and contribution to the SJU.

Immediately after the accession of the new members in July 2009, the SJU kicked off the research and development activities selected through the first invitation to submit offers. Not all the work packages were covered by this invitation and not all the projects were awarded after the evaluation. In July the SJU launched a second invitation for offers for the remaining 4 work packages and non-allocated projects from the first invitation.

- ▶ Users: means all aircraft operated as general air traffic.