SESAR
JOINT UNDERTAKING

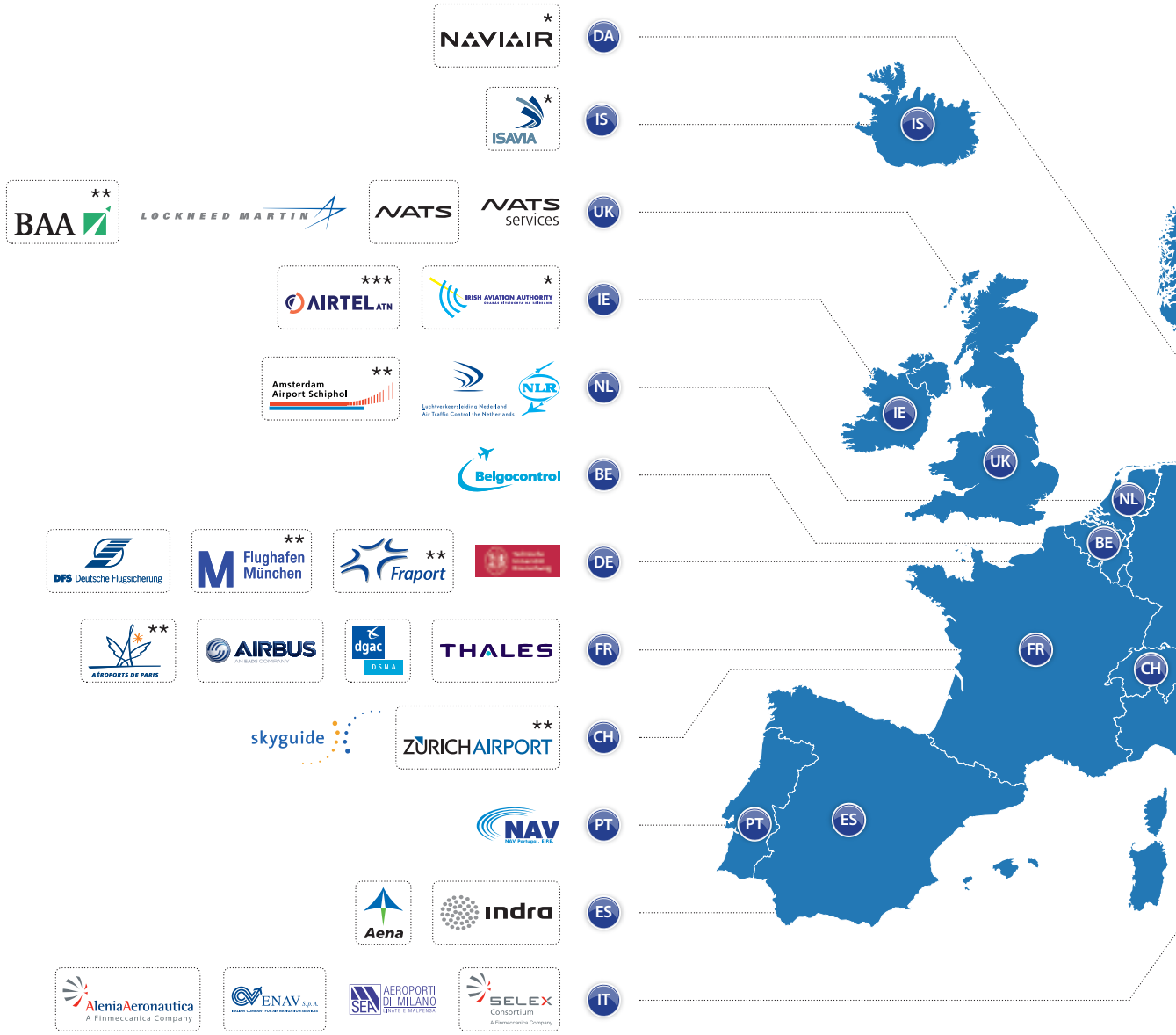
Annual Report 2010

founding members

EUROPEAN COMMISSION

EUROCONTROL

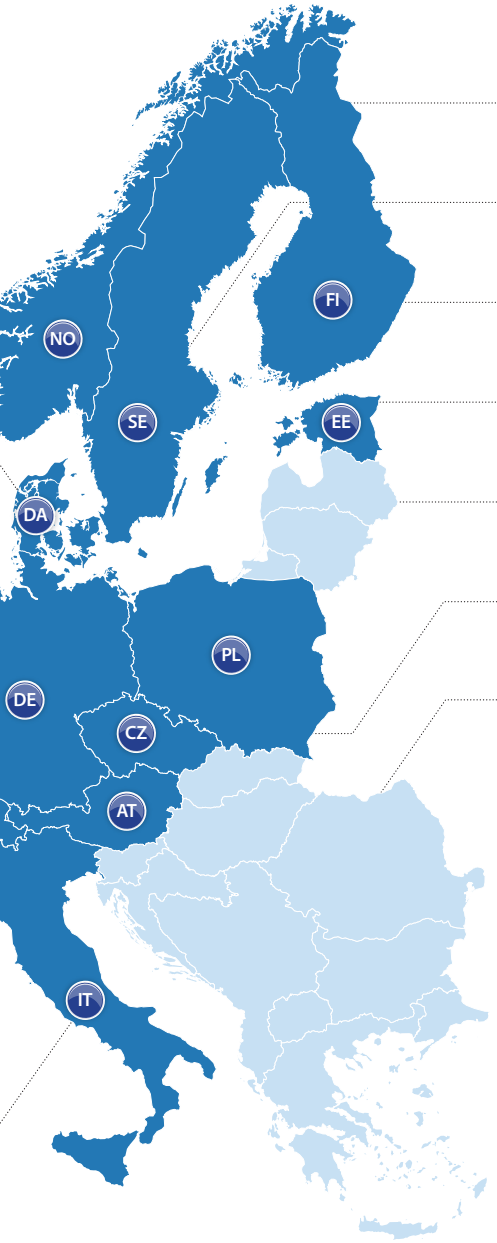
SESAR MEMBERS AND



The SESAR programme is the operational and technological answer to Europe's major air traffic management challenges. The aim of the SESAR Joint Undertaking is to ensure the modernisation of the European air traffic management system by coordinating and concentrating all relevant research and development efforts in the European Union with a view to harmonising implementation. Partnership, sustainability, user orientation and interoperability are founding principles of the SESAR Joint Undertaking's work approach.

The previous Annual Reports are available at www.sesarju.eu

ASSOCIATE PARTNERS



NO: AVINOR *, NORTHROP GRUMMAN ***, SINTEF ***

SE: AVTECH, LFV *, SAAB ***, swedavia *

FI: FINAVIA *

EE: LENNULIIKLUSTEENINDUSE AS ESTONIAN AIR NAVIGATION SERVICES *

PL: POLSKA AGENCJA ŻEGLUGI POWIETRZNEJ POLISH AIR NAVIGATION SERVICES AGENCY

CZ: Air Navigation Services of the Czech Republic, Honeywell

AT: austro CONTROL *, FREQUENTIS

CA: NAV CANADA

US: ACSS, BOEING, ThalesRaytheonSystems

MA:

AU: THALES AUSTRALIA

SESAR Consortia

* noracon — Austro Control, AVINOR, EANS, Finavia, IAA, ISAVIA, LFV, Naviair, Swedavia

** SEAC — Aéroports de Paris, BAA Airports Ltd., Flughafen München GmbH, Flughafen Zürich AG, Fraport AG, Schiphol Nederland B.V.

*** NATMIG — Airtel ATN, Northrop Grumman Park Air Systems, Saab, SINTEF

TODAY'S PARTNERS FOR **TOMORROW**'S AVIATION

SESAR JOINT UNDERTAKING

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CONTENT

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Corporate governance

The **SESAR Joint Undertaking (SESAR JU)** was created under European Union law on 27 February 2007. The SESAR JU is a truly public-private entity built on three pillars:

EUROPEAN COMMISSION

€ 700 million

EUROCONTROL

€ 700 million

THE INDUSTRY =
public-private partnership

€ 700 million

2 FOUNDING MEMBERS

The governance of the SESAR Joint Undertaking is ensured by the Administrative Board and the Executive Director.

The Administrative Board is composed of representatives from:

- the members of the SESAR JU;
- the military;
- the civil airspace users;
- the air navigation service providers;
- the equipment manufacturers;
- the airports;
- the bodies representing staff in the air traffic management sector;
- scientific institutions and the scientific community.

On 31 December 2010 the Board's members were:

Composition of the SESAR JU Administrative Board[1]

SESAR JU Founding Members	Member	Alternate Member
European Commission	Mr Daniel Calleja (Chairman)	Mr Luc Tytgat
EUROCONTROL	Mr Bo Redeborn (Deputy Chairman)	Mr Bernard Miaillier

SESAR JU Members	Member	Alternate Member
AENA	Ms Carmen Librero Pintado	Ms Mariluz De Mateo
Airbus	Mr Bernard Rontani	Mr Pierre Bachelier
ALENIA Aeronautica	Mr Nazzario Cauceglia	Mr Maurizio Fornaiolo
DFS	Mr Dieter Kaden	Mr Georg Dickhaut
DSNA	Mr Maurice Georges	Mr Thierry Liabastres
ENAV	Mr Iacopo Prissinotti	Mr Cristiano Baldoni
Frequentis	Mr Johannes Bardach	Mr Johannes Prinz
Honeywell	Mr Jean-Luc Derouineau	Mr Alexander Laybros
INDRA	Mr Rafael Gallego Carbonell	Mr Ramon Tarrech
NATMIG	Mr Aage Thunem	Ms Ann Kullberg
NATS	Mr Ian Mills	Mr Richard Deakin
NORACON	Mr Thomas Allard	Mr Niclas Gustavsson
SEAC	Mr Giovanni Russo	Mr Roland Krieg
SELEX S.I.	Mr Antonio Mattogno	Mr Stefano Porfiri
Thales Group	Mr Rémi Gille	Mr Luc Lallouette

Stakeholder Representatives	Member	Alternate Member
Military	Gp Capt John Clark	Gen. Jean-Robert Cazarré
Civil users of airspace	Mr Vincent de Vroey	Mr Pedro Vicente Azua
Air Navigation Service Providers	Mr Guenter Martis	Mr Bernard Martens
Equipment manufacturers	Mr François Gayet	Mr Patrick de Prévaux
Airports	Mr Philippe Ahrens	Mr José Thomás Baganha
Staff in the ATM sector	Mr Jean-Pierre Etienne	Mr Joël Cariou
Scientific community	Mr Peter Hecker	(vacant)

The SESAR JU Executive Director, Mr Patrick Ky, directs the execution of the SESAR programme within the guidelines established by the Administrative Board, to which he reports. To achieve this, he has the full commitment of the SESAR JU team.

The management of the SESAR JU is organised as follows:

Chief Programme Officer: **Florian Guillermet**

Chief Air Traffic Management: **Michael Standar**

Chief Technology and Innovation: **Peter Hotham**

Chief Economics and Environment: **Alain Siebert**

Chief Regulatory Affairs: **José Antonio Calvo Fresno**

Chief Communication Officer: **Eric Platteau**

Director Administration and Finance: **Carlo Borghini**

Senior Advisor for Military Affairs: **Denis Koehl**

Advisor to the Executive Director: **Fiona McFadden**

1. Updated 19 October 2010

Message from the Chairman of the Administrative Board

Daniel Calleja, Director Air Transport Directorate – EC ©SESAR JU

SESAR is the most important research and development Programme ever launched by the European Union in the field of ATM modernisation. While the Single European Sky provides the legal framework for more efficient, safer and greener air traffic management, SESAR provides the technological and operational solutions that will enable the achievement of the Single Sky objectives.

In 2010, the Commission has carried out the first intermediate evaluation of the SESAR Joint Undertaking after its first three years of operations. The results of evaluation show that, in terms of implementation of its mandate, the results obtained, its working methods and general financial situation, the SESAR Joint Undertaking is performing very well and achieves stakeholders' satisfaction.

The conclusions indicate that the Joint Undertaking is the appropriate mechanism for implementing the SESAR development phase and for the execution of the European ATM Master plan. By steering research and development activities towards deployment and actively involving stakeholders, the Joint Undertaking responds to the expectations of the airspace users, service providers and industry. This approach has allowed to leverage and pool together valuable ressources at pan-European level and beyond, capturing the skills and innovation capacity of the private sector while sharing the risks with the public sector.

In 2010, with the active participation of the SESAR Joint Undertaking, the EU and the USA concluded the negotiations for a Memorandum of Cooperation in the field of civil aviation research and development. The Memorandum, signed on 3 March 2011, offers the SESAR Joint Undertaking the opportunity to play a key role in promoting global ATM interoperability in cooperation with the US NextGen programme.

Thanks to the continued and increased efforts and commitment of the SESAR Joint Undertaking members and staff in 2010, the SESAR programme is running at full speed. The majority of operational projects are now underway and have already delivered some first results at the end of 2010. With the SESAR Release structure now firmly in place, we can expect to see the delivery of more and more elements of the future ATM system in the next months and years.

In conclusion, today the SESAR Joint Undertaking, more than ever, plays a key role not only for the success of the Programme but also for the successful implementation of the Single European Sky.

2010 has been the last year of my mandate as Chairman of the Administrative Board. I would like to take this opportunity to thank the Board members and SESAR Joint Undertaking's staff for their support and active contribution during the past years. It has been a great pleasure to help steer such an ambitious project and I look forward to seeing all our efforts become reality in a truly Single European Sky.

Daniel Calleja

SESAR
JOINT UNDERTAKING

Foreword from the Executive Director

Mr Patrick Ky, SJU Executive Director ©SESAR JU

The aviation industry made a robust recovery in 2010. We are looking at a stable growth in traffic, which will double in Europe by 2030. Given our already congested skies, the need for an effective, efficient ATM system is clear. This is where SESAR is crucial – by coordinating and concentrating research efforts across the EU, SESAR is ensuring that Europe's ATM system is modern, green and ready for the future. The European Commission recently underlined the importance of SESAR in its Transport 2050 White Paper. The White Paper highlights the need to increase competitiveness and reduce emissions in the air transport sector, and emphasises the key role of SESAR in ensuring the development and deployment of the future air traffic management system.

The SESAR JU and its members have worked hard throughout 2010 to make progress towards our ambitious targets for 2020 of enabling a threefold increase in capacity, improving safety by a factor of ten, reducing by 10% the environmental impact per flight, and cutting ATM costs by 50%. The focus during the year was on completing the programme ramp up. As a result, 2010 has seen 230 projects move into the decisive initiation phase, meaning that SESAR projects are now in execution. The SESAR JU was also proud to receive the first project deliverables in September 2010.

All this is only possible through the involvement of all aviation stakeholders. The partnership spirit within the SESAR family is the key to our work. In 2010, we have added several associate partners to the SESAR programme, including Boeing and the Moroccan Airports Authority (ONDA). We have also fostered important working relationships with key stakeholders, such as staff associations and airspace users. In addition, 2010 has been a year for furthering our international cooperation, with ICAO, the FAA and other aviation authorities around the globe – an important way of ensuring that SESAR's projects are interoperable with other systems.

In short, 2010 has been a year of enormous progress for the SESAR JU. We have moved from preparing the programme to the hard work of carrying out its component projects, and we are now actively working together with our partners to deliver concrete benefits for European ATM.

Today's Partners for Tomorrow's Aviation

Patrick KY

Part 1: Meeting our own objectives

The SJU has defined its mid-term strategic objectives for 2012, listed hereunder. Progress has been made on all objectives during 2010. The table below details the exact work and results per objective showing the achievements to date.

OUR STRATEGIC OBJECTIVES BY 2012

1. Initial 4D trajectory is validated in an operational environment supported by satellite-based technology
2. 10,000 SESAR flights, including 500 military, are performed
3. 80% of SESAR projects have tested their output in a real life environment
4. First SWIM pilots are in place to exchange data across at least five domains
5. The first remote tower is ready for operations
6. SESAR benefits are demonstrated on city pairs connecting eight European airports
7. Airspace users have signed up to the SESAR business case for time-based operations

OUR VISION

By 2012 we have created the change in European ATM that demonstrates to the world our ability to deliver benefits to the community.

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The table below gives the list of Annual Work Programme 2010 objectives and the related achievements.

Mid-term objectives (2012)	N.	2010 objectives	Timeframe	Performance measurement	2010 results
Initial 4D trajectory is validated in an operational environment supported by satellite-based technology	01-10	4D trajectory project started and contains deliverables leading towards operational validation	Q4	80% of deliverables contributing to 4D trajectory on time	60% of deliverables already delivered, while others are on time compared to the new planning resulting from the Control Gate
10,000 flights, including 500 military, are SESAR labelled	02-10	Ensure that commercial flight trials are contributing to validation, in addition to dedicated flight tests	Q3	Projects have identified opportunities for commercial flight trials	Approximately 1.500 trials performed on routinely commercial flights
80% of SESAR projects have tested their output in a real life environment	03-10	Verification and validation activities shall be planned to be performed close to operations, on platforms representative of the operational environment, and industrially based	Q3-Q4	SESAR validation platforms are identified and agreed with members	Verification and validation Release 1 identified live trials, shadow mode, real time simulation and the related Validation platforms agreed with members
First SWIM pilots are in place to exchange data across at least 5 domains	04-10	Usage of SWIM services is identified in operational validation activities on multiple domains	Q4	Draft specifications available for first SWIM pilots on five domains	SWIM multiple domains validation activities will be part of SESAR Release 2 whose planning will start in March 2012 to be ready in Q2 2012
The first remote tower is ready for operations	05-10	Validation activities of remote towers have started and contribute to the set of cases required by NSAs	Q4	First validation reports ready and robust target concept defined with NSAs engaged	Operational Services Description (OSED) has been delivered with planning of the first validations underway, as part of Release 1. The OSED has been also subject to a review by NSAs as a pilot case.
SESAR benefits are demonstrated on city pairs connecting 8 European airports	06-10	WP4 to 7 projects establish validation plans, including demonstration through city pairs	Q4	Draft validation plans available for projects involving at least 8 European airports	Validation plans for the SESAR Release 1 include the need to perform demonstrations through city pairs

Mid-term objectives (2012)	N.	2010 objectives	Timeframe	Performance measurement	2010 results
Airspace users have signed up to the SESAR business case for time-based operations	07-10	Business cases activities and contributions are clearly identified and apportioned across the programme	Q2-Q3	70% of projects are contributing to the business cases through identified deliverables	Business cases activities launched and progressed, meeting the objective and constituting a solid basis for the successful continuation. Progress already being made across all relevant business case activities in 2011
	08-10	On time assessment of the RCAs	Ongoing	Ensure compliance with the deadline for the revision of the RCAs and conclusion of the Project Initiation Phase	The activity has been performed ensuring timely decision on the conclusion of the Project Initiation Phase
	09-10	Ensure sound management of SESAR JU financial resources	Ongoing	Ensure adequate planning of financial resources. Ensure the payment of the pre-financing and co-financing and the collection of cash contribution in accordance with the MA-MFA	All transactions executed within contractual terms. Cash balance reduced by € 29.6 million
	10-10	ABAC/SAP implementation	Q1 and 2	Ensure the proper implementation and functioning of ABAC and SAP systems	ABAC/SAP implemented in June 2010. Migration of accounting data seamless
	11-10	ERM implementation	Q3	Coordinate the first ERM exercise and report the results to the SESAR JU Administrative Board	ERM exercise performed. Risk management report submitted to Administrative Board in December 2010
	12-10	Recruitment	2010	Ensure that all SESAR JU staff positions are filled by year end	Only four recruitments are ongoing: two of them already selected will start in early 2011, and the others in the following months

Part 2: Paving the way for the first deliverables

Background

The SESAR programme is divided into work packages (WPs) addressing different ATM domains, which are further organised into sub-WPs and projects, each dealing with a specific issue. The SESAR JU has selected the best partners for each project through tender procedures.

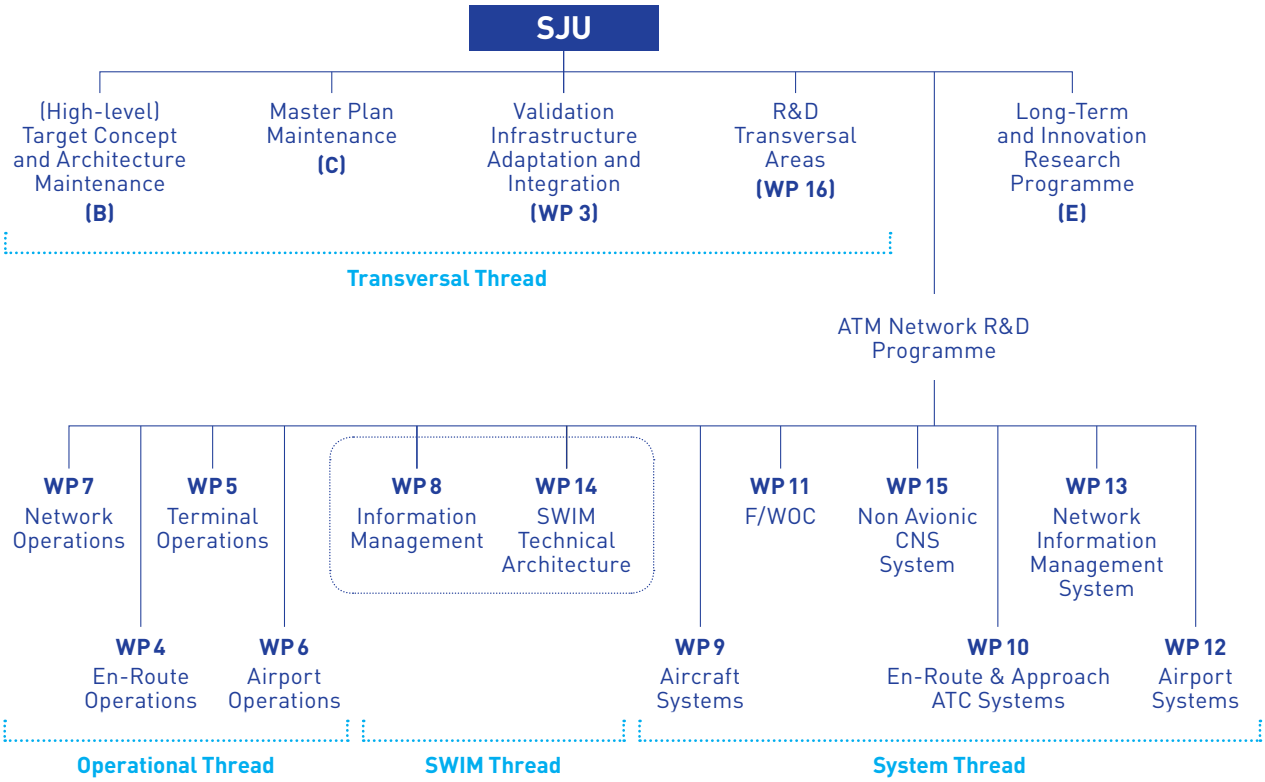


Figure: Work Breakdown Structure high-level overview

The programme is split into four different threads:

- Operational considerations are addressed under WPs 4, 5, 6 and 7,
- System considerations are addressed under WPs 9, 10, 11, 12, 13 and 15,
- System Wide Information Management (SWIM) considerations are addressed under WPs 8 and 14, and
- "Transversal" activities, such as validation infrastructure, development of safety, security, environment and human performance cases, European ATM Master Plan, target concept and architecture maintenance, are dealt with by a number of additional WPs (i.e. B, C, 3, 16).

The benefits provided by these transverse WPs will be seen through their application to other operational and system WPs. They will therefore contribute to maximising the benefits of those WPs.

At ATC Global 2010,
Patrick KY, SESAR JU Executive Director,
delivered a strong message about
the role of SESAR:

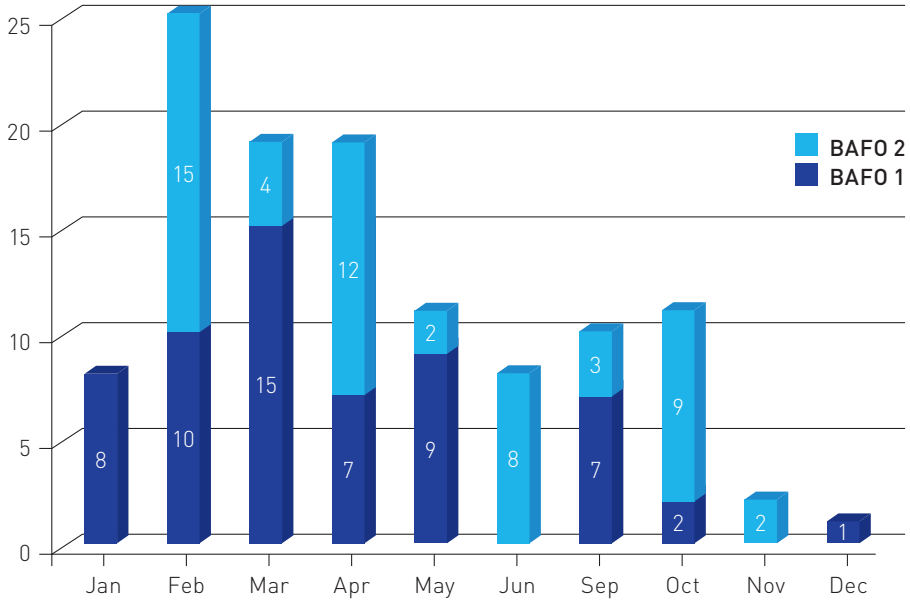
"We work with a distinct implementation goal in mind, in the short, medium and long term. For this reason end-users of the SESAR systems need to be involved in all the steps of the programme. The main challenge is now to ensure that all these actors deliver fit-for-purpose solutions which can be easily implemented. For this reason, the SESAR JU is working on "early benefits" which can be delivered in 2010-2011 and start to prepare for the change which will take place in the European Air Traffic Management."

Florian Guillermet,
SESAR JU Chief Programme Officer,
at ATC Global 2010:

"SESAR is results oriented, unites all aviation players, includes declared experts and researchers. The almost 300 projects in the SESAR programme will provide tangible results and will ultimately boost European industry. The work packages will develop and deliver the necessary operational and technical materials (specifications, procedures, prototypes, validation reports, etc) for the progressive industrialisation, deployment and operation of the new ATM system."

Summary of the status of projects at 31 December 2010

In 2010, the SESAR programme has substantially progressed to having 80.9% of its projects in the execution phase, excluding those projects that have been cancelled or suspended. The SESAR programme consists of 304 projects, including R&D and management projects. In addition to the 171 projects initiated in 2009, 114 additional projects were launched in 2010. The figure below shows the total number of projects initiated per month:



The table below provides a summary of the situation by project status at the end of 2010

	As at 31.12.09	Realised in 2010	As at 31.12.10	
Total number of projects in the SESAR programme	**304**		**304**	**100%**
of which				
Projects initiated	**171**	**114**	**285**	**93.8%**
cancelled projects	0	2	2	0.7%
suspended projects	0	11	11	3.6%
projects still under initiation	157	(131)	26	8.6%
projects in execution phase	**14**	**232**	**246**	**80.9%**
Projects to be initiated	**133**	**(114)**	**19**	**6.2%**

2010 was mainly dedicated to the final step of the Programme ramp-up. Most of the projects started their technical activities in the course of the year and the very first deliverables were handed over to the SESAR JU in September 2010. The first assessment of the deliverables as well as the first projects' control gates showed reasonable progress in the technical work (see below a list of the most significant deliverables).

This has given assurance that 2010 has paved the way to the first tangible results to be delivered in 2011 as part of the first SESAR Release.

Periodic Releases prepared in 2010 and as from 2011

Thanks to the commitment of the private and public partners involved in the Programme, SESAR will deliver its results through periodic Releases.

The first SESAR Release is the outcome of a thorough status review of the approximately 300 SESAR projects to see where early results can be achieved to quicker serve the aviation world. Projects which are included in the 2011 Release will have been verified and validated in an operational environment, allowing for a decision on industrialisation and subsequent deployment.

With the first SESAR Release, the European ATM modernisation programme will reveal initial components of the future European ATM system. The validation exercises will cover the areas of efficient and green terminal airspace operations, the initial 4D trajectory, end-to-end traffic synchronisation, as well as integrated and collaborative network management. Concrete benefits will be achieved for airlines, pilots, airports, air traffic controllers, passengers and the environment.

WP B

Target Concept and Architecture Maintenance

At the end of 2010, all projects had moved into execution: four in March, one in December (B.5 being part of BAFO II). The control gates of projects B.1, B.4.1, B.4.2 and B.4.3 took place in November 2010. Based on this outcome, a revision proposal will be presented to the Programme Committee in early 2011.

WP B chaired the Step1 Preliminary Design Review (PDR) in June 2010 and was involved in the pilot activities to test the applicability and suitability of their deliverables. WP B also chaired the System Engineering Review 1 for the first SESAR Release in November 2010.

WP C

Master Plan Maintenance

The project initiation phase for WP C management activities started in February 2010 and in June 2010 for the first projects. The project descriptions were refined during the project initiation phase, and a recommendation was made to the SESAR JU Executive Director to proceed with the project execution. The first project executions started in December 2010.

WP 3

Validation Infrastructure Adaptation and Integration

In order to ensure a clear role of WP3 within the Programme, work was conducted in the first half of 2010. The WP 3 revision framework was approved by the Programme Committee in early June 2010. It was subsequently used as the basis for completing the initiation process of WP 3 projects, which was completed in November 2010.

In the first semester, WP 3 successfully completed key activities on the collection of information about the roadmap of validation exercises in SESAR. The validation roadmap work was then continued by a task force set up by the Programme Committee. This roadmap material also became the basis of the definition of the first SESAR Release.

WP 4

En-Route Operations

At the end of 2010, out of 16 projects:

- 13 projects have moved into the execution phase;
- three projects have been suspended.

Several projects in WP 4 are involved in Release 1 exercises and seven deliverables were submitted to the SESAR JU for acceptance. These are: a project baseline definition (supporting the start of requirements identification), an operational services and environment description, safety and performance requirements, and three validation plans.

The WP and sub-WP management activities were approved at the start of 2010. WPs 4 and 5 worked together jointly to achieve their corresponding WP objectives, focusing on:

- ensuring development of Change Impact Assessment for all WP 4 projects in the initiation phase;
- supporting Step 1 PDR review in June 2010;
- supporting the definition of Release 1 scope in October-November 2010;
- adapting the internal work structure to the evolving needs of the programme, establishing a "federation" structure, enabling the integration of the Verification and Validation Roadmap operational WPs and sub-WPs approach;
- starting to coordinate delivery from operational projects to system projects;
- coordinating airspace user and staff association activities in support of WP 4 projects.

The WP and sub-WP management activities passed the first project gate review at the end of November 2010.

WP 5

TMA Operations

At the end of 2010, out of 17 R&D projects:

- 13 projects have moved into the execution phase;
- four projects have been suspended.

Several projects in WP 5 are involved in SESAR Release 1 exercises and six deliverables were submitted to the SESAR

JU for acceptance in 2010. These are: the Terminal Manoeuvring Area Roadmap, an operational concept description, a BC, 3 baseline definitions providing input to an operational services and environment description.

The WP and sub-WP management activities were approved at the beginning of 2010. WPs 4 and 5 worked together jointly to achieve their corresponding objectives, as already mentioned in the section of WP4.

Airport Operations

At the end of 2010, out of 22 R&D projects:

- 17 have moved into execution;
- Four are in initiation and expecting to move to execution during early 2011;
- One addressing the final integrated validations is planned for September 2011 in order to ensure the necessary consistency.

The first four project gates took place in the final quarter of 2010. The outcome of these review events was positive. All projects have progressed according to their plans, resulting in the first wave of deliverables being accepted by the SESAR JU. The work package and project management are successfully integrating the SESAR methodologies and practices into their activities (e.g. risk management), and airspace users and staff associations have started giving support to projects.

Networking Operations

Following the formal launch of the BAFO2 project initiation phase in February 2010, 10 R&D projects of the WP 7 were kicked-off, seven of which have now entered project execution. Thanks to a proactive project initiation phase, WP 7 has now largely caught-up with the rest of the Programme. The Short-Term Air Traffic F low Capacity Measures exercise, led by project 7.6.5, is a confirmed exercise for Release 1 in 2011.

Information Management

In 2010, almost all WP 8 projects have completed their initiation phase and moved into execution. One project still needs to be initiated in 2011.

Most of the projects in sub-WP 08.01 are working on contributions to the ATM Information Reference Model for different information domains. Their main goal for 2010 was to absorb existing information exchange models, the flight object model, the weather exchange model, etc., in what is called the 'initial load' of the AIRM. This initial version was delivered to the SESAR JU in August 2010.

The projects in sub-WP 08.03 have generally started later than in 08.01 because of more time required for the initiation phase. Consequently, the initial cycle of information service model developments was skipped, so as to remain synchronised with the AIRM delivery schedule. The identification and definition of a first set of information services is set for early 2011.

In addition to the work on information models and information services, there has also been progress on defining the information management function (primarily governance aspects), the supervision aspect of SWIM and the operational requirements concerning registry services.

Aircraft Systems

At the end of 2010, out of 30 R&D projects:

- 22 have moved into execution;
- Two are in initiation and are expecting to move to execution in early 2011;
- Six will be launched in the following years, up to 2013.

Major projects have already started to deliver first outcomes, such as functional requirement documents or architecture elements. Most of the projects are progressing according to their original schedule, although a few have adapted their schedule in order to remain aligned with operational projects which started

later than originally foreseen, or to manage internal constraints. The first batch of project gates were hosted during the final quarter of 2010.

En-Route & Approach ATC Systems

At the end of 2010, out of 22 projects:

- 13 projects have moved into the execution phase;
- One project has been suspended;
- Seven have not yet started and are planned to start in early 2011.

Four projects were part of the first project gate reviews in December 2010, and they showed good progress.

Six deliverables were submitted to the SESAR JU for acceptance. These are: three baseline definitions providing input to technical specifications, a verification plan, two internal projects and input to the definition of requirements.

Flight Operations Centre System

The competitive dialogue process for WP 11 was successfully completed in July 2010 and a call for tender was published by Eurocontrol, on behalf of the SESAR JU, on 2 August 2010.

The WP 11 Description of Works v2.0 addresses the two independent sub-work packages:

- SWP 11.1 Flight and Wing Operations Centres
- SWP 11.2 Meteorological Services

Evaluations were held in November 2010 with the recommendations of the Proposals Analysis Board currently with Eurocontrol. The decisions will be published in January 2011. The amount of contributions for SWP 11.1 is estimated at Đ30 million, with a level of co-financing of Đ15 million. The amount of contributions for SWP 11.2 is estimated at Đ10 million, with a level of co-financing of Đ5 million

Airport Systems

At the end of 2010, out of 29 R&D projects:

- 22 have moved into execution;
- Four are in initiation and expecting to move into execution in early 2011;
- One has been cancelled;
- Two remain suspended, but possibly considered for re-launch in early 2011.

The first four project gates were hosted in the final quarter of 2010. The outcome of these review events was positive, with all projects having progressed well, resulting in the first wave of deliverables being accepted by the SESAR JU. In particular, projects were progressing in alignment with the schedules of dependent projects.

Network Information Management System (NIMS)

Following the formal launch of the BAFO2 project initiation phase in February 2010, six WP 13 R&D projects have kicked-off, five of which have been approved for project execution by the end of the year. Thanks to a proactive project initiation phase, WP 13 has now largely caught-up with the rest of the Programme.

System Wide Information Management technical architecture

At the end of 2010, six projects are in execution mode, one project is suspended until early 2011 and the last project is about to be approved to start its execution in 2011. One of the projects in execution has principally completed its work and will formally close out in Q1 2011.

The assessment, and where possible the uptake, of results from the SWIM-SUIT project in WP 14 was successfully completed in 2010. At the same time, a good start was made in describing the existing technology landscape and identifying suitable technology options for initial SWIM middleware implementation.

Non-Avionic CNS System

At the end of 2010, out of 19 R&D projects:

- 15 have moved into execution;
- One has been cancelled;
- Three are planned to be launched in 2011 & 2012.

Most of the projects are progressing according to their original schedules, and major projects have already started to deliver first outcomes. In the final quarter of 2010, the first batch of project gates were hosted. The outcome of these review events was positive, with all projects having progressed well, resulting in the first wave of deliverables being accepted by the SESAR JU.

R&D Transversal Areas

The Project Initiation Phase for WP 16 started in February 2010 for management activities and in April for the first projects. The first project executions started in September 2010 as planned.

At the end of 2010, out of 27 R&D projects:

- Eight have moved into execution;
- Three have been authorised to start the execution phase and will actually start in January 2011;
- Ten are in initiation and are expecting to move to execution during early 2011;
- Six are to be initiated during the first half of 2011.

Projects 16.6. participated in the Step1 Preliminary Design Review (PDR) in June 2010 and were also involved in the pilot activities in order to test the applicability and suitability of their respective reference material for transversal area assessments.

Long Term and Innovative Research Programme

The first WP E call for proposals for ATM research networks was issued in February 2010. The evaluations were made in April 2010 by independent experts and led to the launch of two networks, one in the automation theme and one in the complexity theme. A second call was subsequently issued in July 2010 for the economic theme only but no proposal passed the selection criteria.

The selected networks (ComplexWorld and Hala!) became operational in July 2010 and September 2010 respectively. In 2010, they have both produced deliverables, such as the communication and animation tools, and published their first domain strategy papers. In addition, they have both completed the selection of their first set of PhD subjects (half a dozen PhDs each).

The first WP E call for proposals for ATM research projects opened in July 2010 and closed in October 2010. 17 projects were recommended for SESAR funding. They will start in early 2011 and will be linked to the relevant networks and to the relevant SESAR projects in order to ensure beneficial exchange of results for the Programme.

Timeline

15 February 2010	First call published for WP E research networks
9-11 March 2010	SESAR Joint Undertaking takes part in ATC Global for the first time
6 & 8 April 2010	Two first gate-to-gate green transatlantic flights under AIRE are operated from Paris-Charles de Gaulle to Miami airports by Air France and American Airlines
26 April 2010	SESAR completes its first deliverable – Providing the functional baseline to be used for SESAR project 9.33 "ATS Datalink Operational Improvements"
18 May 2010	Signature of a framework contract with the European Low Fares Airlines Association (ELFAA), bringing its expertise into the SESAR work programme
26 May 2010	Signature of two «joint declarations» with Latin American aviation leaders, laying the foundation for closer cooperation in civil aviation between the EU and Latin America
3 June 2010	SESAR work programme celebrates its first birthday
18 June 2010	European Commission and US Federal Aviation Administration (FAA) conclude negotiations on a Memorandum of Cooperation in civil aviation research and development
13 July 2010	18 additional projects, involving 40 airline, airport, ANSP and industry partners, selected to expand AIRE
19 July 2010	SESAR Joint Undertaking endorses 13 associate partners. Among others, the Boeing company, Thales Australia, the Polish Air Navigation Services Agency and the Moroccan Airports Authority (ONDA) will from now on participate in the work programme
2 August 2010	First call published for WP E research projects
10 November 2010	EASA and SESAR sign cooperation and working agreements to secure EASA's support regarding the implementation of the SESAR work programme

Other related activities performed

AIRE and environmental issues in the SESAR programme: achievements 2010

In 2010, the SESAR JU, in alignment with the 2008 Administrative Board's mandate, continued to manage the activities related to the Atlantic Interoperability Initiative to Reduce Emissions (AIRE). By taking advantage of ATM best practices and using existing technologies, AIRE aims to accelerate the implementation of environmentally friendly procedures for all phases of flight, and to validate the benefits of these improvements. Under this initiative, airlines, air navigation service providers, the manufacturing industry, and airports work together to perform integrated flight trials and demonstrations validating solutions for the reduction of CO2 emissions.

Airlines, ANSPs, the manufacturing industry, and airports all work together to perform integrated flight trials and demonstrations validating solutions for the reduction of CO2 emissions

In March 2010, six successful co-financed projects launched in 2009, were closed. AIRE achievements so far include:

- Six efficient consortiums comprising of 18 partners, including five airlines and five ANSPs;
- 1152 trials performed;
- CO2 savings per flight ranged from 90 to 1,250kg and the accumulated savings during trials were equivalent to 400 tons of CO2;
- Awareness raising and increased motivation of crews and controllers to carry out more environmentally friendly activities;
- High international attention and interest in the initiative.

Eighteen new projects were selected for co-funding during 2010 following a call for tender, resulting in a significant enlargement of the programme's geographical coverage and partners. These projects have a maximum duration of 15 months with the majority of them extending to the end of 2011.

Two projects cover surface trials, five relate to terminal operations, four focus on en-route/oceanic, and seven relate to gate-to-gate.

In total, some 40[2] partners involving eleven airlines, seven airports and/or airport authorities, 14 air navigation service providers, and ten industrial partners will demonstrate that significant efficiency gains can be achieved through new procedures using existing technology. The FAA is effectively contributing to three projects with technical and operational support.

2. Some partners are at the same time ANSPs and Airport authorities

More than 5,000 trials are expected and other airlines will voluntarily join existing trials.

Synergies between the AIRE activities and the SESAR programme have been identified and two technical workshops were organised in 2010 to promote information sharing, to discuss assessment and reporting, to plan trials and to derive recommendations for the way forward. The main aim is to make effective use of the testing opportunities of AIRE to validate some of the technical concepts being developed in SESAR.

Four projects dealing exclusively with environmental matters have been initiated within the SESAR programme:

- Project 16.6.3 Environment support and coordination functions;
- Project 16.3.1 Development of the SESAR environmental validation framework;
- Project 16.3.2 Support to development of performance indicators;
- Project 16.3.7 Future regulatory scenarios and impacts.

These projects, in particular 16.6.3, will develop the SESAR environmental reference material encompassing: assessment tools, models and methodology, and setting the common approach to conduct environmental impact assessments. These tools will apply throughout the programme to assess the environmental benefits resulting from WPs 4 to 15 specifically reporting on the work being carried out to attain the 10% fuel efficiency per flight Master Plan target. WP B is also working in parallel on the refinement of the environmental targets of the Master Plan.

OPTIMI: achievements 2010

Following the tragic loss of Air France flight 447 over the Atlantic in June 2009, the European Commission asked the SESAR JU to find solutions to better track aircraft in oceanic and remote low density airspace. The Oceanic Position Tracking Movement and Monitoring project (OPTIMI) was launched to address this issue, and to speed up rescue reaction times, accident analysis and diagnosis. In 2010, 13 ANSPs, airlines, engineering and manufacturing companies and an air transport communications provider (SITA) were involved in OPTIMI studies.

In December 2010, OPTIMI delivered a set of recommendations which could result in concrete benefits in various areas, including search and rescue services, accident and incident investigation services, safety, ANSPs and airspace users. These recommendations include extending OPTIMI tests to other flight information regions in the South Atlantic Tracks area, and conducing further research into the medium term solutions identified - the "Central repository of FANS-1/A and AOC messages" and "Flight Data Recorder Down Linking Systems".

To complement those results, the SESAR JU also signed a contract on SAT-OPTIMI in 2010, after an open call for tenders. SAT-OPTIMI is a study that uses the output from OPTIMI to present the options for the best use of satellite infrastructure and technology to ensure full deployment of oceanic and remote tracking services. The study will report by April 2011 and will include, among other things, timing, investment and operations cost estimates, as well as a business and service model for tracking services, giving a clear direction on the deployment for aircraft tracking services over oceanic, remote continental and polar regions. Final information available on www.sesarju.eu

European ATM Master Plan update: achievements 2010

In June 2009, the SESAR JU Administrative Board adopted the European ATM Master Plan endorsed by the Council of the EU on 30 March 2009. At the same time, the Administrative Board tasked the SESAR JU with presenting a proposal for the first update of the European ATM Master Plan by the end of March 2010.

In September 2009, the SESAR JU obtained support from its Administrative Board to set up a specific working group, composed of representatives from the SESAR JU members, airspace users, staff and military, to work on this topic.

This working group analysed the European ATM Master Plan, focusing in particular on the IP1, Regulatory Roadmap, Standardisation Roadmap and Risk Management aspects. The proposed updates, which are of a technical nature and have no substantial impact on the overall SESAR budget, performance or timescale, were presented to and adopted by the Administrative Board at its meeting on 30 April 2010.

The SESAR JU informed the Single Sky Committee about this update, with no objections from the Member States.

Maintenance of the ATM Master Plan is an ongoing process

The maintenance of the ATM Master Plan is an ongoing process that does not stop with this first update. Among other topics, the next versions will cover the assessment of the military needs and costs associated with SESAR deployment, and the update of the Risk Management Plan with the related mitigation actions and allocation of responsibilities. In this sense, a Master Plan update will be launched by WP C.1 in autumn 2011. The objective of the campaign will be to prepare a proposal for a comprehensive update of the European ATM Master Plan that will take in consideration the results achieved by WP C.2, focusing on building deployment scenarios. Wide consultation, involving airspace users, national authorities, the military and stakeholders from non-European countries, will support the process.

Part 3: Involvement of everyone is vital

By uniting the whole aviation community and bringing together both public and private stakeholders, SESAR aims to eliminate the fragmented approach of current European ATM. Experts from airspace users, airports, air navigation service providers, the manufacturing industry, aviation associations and organisations, the scientific world, regulators and administrations work together to make the programme a success. SESAR also has a number of non-EU members, demonstrating its strong commitment to developing interoperable solutions.

"We need the involvement of all air transport actors to ensure applicability and acceptance of the SESAR technologies and procedures. The diversity of our members and partners is the key to success of our programme".

Patrick Ky, SESAR JU Executive Director

Involvement of the civil and military airspace users

At the end of 2009, 10 contracts were signed with major airlines, while in May 2010 an additional contract with the European Low Fares Airlines Association (ELFAA) was signed to add "low cost" expertise.

In May and June 2010, Patrick Ky, SESAR JU Executive Director, met with the CEOs and COOs of several European airlines (Lufthansa, BA, Air France-KLM, Brussels Airlines, and Iberia) to discuss the current state of the SESAR Programme and its impact on the airlines. The airlines were very positive, and showed interest in supporting the execution of the European ATM Master Plan by getting involved in the technical and economic work.

The airlines showed interest in supporting the execution of the ATM Master Plan by getting involved in the technical and economic work

During 2010, the SESAR JU Senior Military Advisor worked together with Eurocontrol and the European Defence Agency (EDA) to further progress the involvement of the military community in the activities of the SESAR Programme. The Military Engagement Plan for SESAR (MEPS), drafted by Eurocontrol and endorsed by the SESAR JU, is expected to be put in place and become fully operational in 2011. The MEPS will enable the full participation of national military experts in all relevant aspects of the work programme, via a structured organisation, including the formation of specific panels to collate all military input in specific technical or operational domains.

for SESAR

Involvement of the professional staff organisations

The full integration of staff associations' representatives into the programme at different levels is ongoing. Since the start of 2010, the SESAR JU has held quarterly one day meetings with the staff associations to assess progress and discuss aspects of the Programme aspects impacting on the staff associations. Staff association members have also started contributing to some projects through deliverable production or review.

At the end of 2010, the SESAR JU Administrative Board approved the setting-up of an International Validation Team, composed of staff association members (air traffic control officers, pilots, and air traffic safety electronic personnel), who will participate in SESAR validation exercises. The list of proposed members for this team will be finalised in early 2011.

Relations with the Member States

The SESAR JU has continued to report on the progress of the SESAR Programme to the Single Sky Committee as well as to the Provisional Council of Eurocontrol. Furthermore, during the year, bilateral meetings or SESAR workshops took place at the request of the specific EU or Eurocontrol member states.

Bilateral meetings or SESAR workshops were organised with EU or Eurocontrol member states

The SESAR JU will continue to support member states in particular for the organisation and conduct of national events aiming to inform national stakeholders on the Programme, its institutional set up and relevant activities. In particular, this was done in Spain, UK, Ukraine, Turkey and Norway during the course of 2010.

Relations with civil and military NSAs and EASA

The SESAR JU has continued to be active in the relevant forums in which regulatory authorities coordinate and take decisions, such as:

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- The Single Sky Committee,
- The Eurocontrol Safety Regulatory Commission,
- The Regulatory Interface and Coordination Board – Area Northwest (RICBAN).

National Supervisory Authorities (NSAs), both civil and military, are regularly involved in providing advice on the progress of the SESAR programme to facilitate the future implementation of the results and anticipate possible issues stemming from it. A Memorandum of Understanding for the provision of expertise has been signed by seven authorities, covering

a comprehensive pan-European geographical scope. In 2010 experts received a detailed picture of the SESAR Programme and, as a launch of their advisory activity, they were also asked to provide their views on a test case.

The SESAR JU interacts with the NSAs through the National Supervisory Authorities Coordination Platform, under the umbrella of the Single Sky Committee. The SESAR JU participates in this forum on an ad hoc basis with the aim of consulting the NSAs on the deliverables of different WPs, which could have relevance for the activity of the NSAs during the deployment phase (safety cases, security analysis, cost-benefit analysis, environmental studies).

EASA's involvment in the SESAR work programme is ensured through the signature of a Letter of Agreement

On 10 November 2010, the SESAR JU and EASA's Executive Directors signed a Letter of Agreement to secure EASA's provision of safety advice regarding the implementation of the SESAR programme results. It is foreseen that Eurocontrol's safety experts will support EASA in this activity.

The SESAR Scientific Committee

The Scientific Committee met twice during 2010, in May and December. At least one member of the scientific committee now follows each of the WP E research networks that have been launched, providing advice and support to the network as well as an effective feedback link to the wider committee.

The Scientific Committee provided input and guidance for the preparation of the first call for WP E research projects. Members also participated in the evaluation and selection of PhD projects managed by each research network.

Scientific Committee members have represented SESAR in research conferences, developed papers at the request of the Executive Director and presented papers at conferences with the support of the SESAR JU.

Clean Sky

Coordination with Clean Sky focuses on specific areas of common interest and starting project level discussion and alignment, these are:

- AIRE & WP 16 (SESAR gate-to-gate aircraft operation improvement for fuel and environmental savings, environment metrics and modelling and the Clean Sky Technology Evaluator work),
- WP 9 (Aircraft Systems in support of SESAR trajectory-based operations and Clean Sky trajectories for green operations),
- WP 11 (SESAR MET for ATM, the Clean Sky COMET and other activities).

During 2010, the exchange of information was covered by a confidentiality agreement between SESAR and Clean Sky in

December 2010. Consequently, a closer way of working in the areas listed above and appropriate visibility of the content of respective projects are expected to enable meaningful and beneficial project level coordination during 2011.

International cooperation (NextGen and similar activities)

The SJU and FAA agreed on a number of coordination plans on technical issues in late 2010

In June 2010, the European Commission, on behalf of the EU, reached agreement on an initial version of a Memorandum of Cooperation with the USA, currently addressing interoperability between SESAR and NextGen. Although the memorandum was in a state of informal agreement during 2010, the cooperation on high priority technical areas began. This activity started with the first 'informal' coordination meeting with the FAA in September 2010, and agreement on a plan of action for the development of coordination plans for the high priority areas.

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During Q4 2010, several meetings and teleconferences took place, resulting in a number of coordination plans being agreed between SESAR JU and the FAA. SESAR project and SESAR JU Members' involvement in cooperation activities should begin in early 2011, following formalisation of the memorandum, scheduled for March 2011.

Throughout 2010, the SESAR JU also welcomed a number of delegates from non-European countries. In August, the SESAR JU hosted a high-level visit from the Brazilian Department of Airspace Control (DECEA).The DECEA delegation and the SESAR JU exchanged information on their respective air traffic management planning tools (the Brazilian ATM Plan and the European ATM Master Plan) as well as work programmes, and on specific initiatives such as AIRE and OPTIMI.

In June, the SESAR JU met with a delegation of Indian Civil Aviation decision-makers. The SESAR JU gave a detailed update on the set-up of the SESAR programme, the progress so far and the main areas of technological modernisation expected through SESAR.

In October, a delegation from the European Commission and the SESAR JU met with officials from the Mexican government, Civil Aviation Authority, ATS service provider and several airlines and industries of the aeronautical sector. The result was an agreement on a Memorandum of Understanding, which will be signed by the European Commission and the Mexican Ministry of Communications and Transportation in early 2011.

In May, the SESAR JU and some of its members participated in the first EU-Latin America Civil Aviation Summit in Rio de Janeiro. The event was jointly organised by the European Commission, the National Civil Aviation Agency of Brazil (ANAC) and the Latin American Civil Aviation Commission (LACAC), and resulted in the signature of two «joint declarations» that will lay the foundation for closer cooperation in civil aviation between the EU and Latin America. As part of the summit

programme, Patrick Ky, SESAR JU Executive Director, also presented the SESAR Programme in a dedicated session on 'EU and Air traffic management and new technologies'.

Communicating

In 2010, the SESAR communication strategy focused on further engaging the Programme's internal stakeholders, i.e. the staff working at the Members' organisations, and on thoroughly informing the external target groups on the SESAR Programme progress.

For the roughly 2,000 experts working on the Programme, regular e-newsletters, a communication campaign on the SESAR 2012 vision and its seven strategic objectives, and a first internal meeting at the world's largest ATM exhibition, ATC Global in Amsterdam, were highlights in the SESAR JU's internal communication.

Given the far-reaching impact of the SESAR Programme on the way flying will be organised in future, external communication targeted the aviation community at large including, for the first time, passengers. In 2010 the website, being the SESAR JU's main communication channel, attracted a record 135,000 visitors with an average of 11,000 per month. Moreover, the database of contacts to which the monthly e-newsletter is delivered was extended to 17,000 valid contacts. Frequent flyers were targeted through a pro-active campaign in seven of Europe's main airports, including the distribution of a special leaflet to inform passengers about SESAR and its ambitions. For the first time, the SESAR JU had an active presence at ATC Global in Amsterdam, which was met with high interest by the more than 5,000 visitors of the fair. Four conferences were organised – including a high-level update on the Programme as well as a joint EU-FAA conference on AIRE – and a number of SESAR JU experts were available for questions and discussions at the SESAR JU's booth.

"Public-private partnerships can reinforce the efficiency of public policies and business strategies. In this respect, the SESAR Joint Undertaking is a good example of a win-win operation."

Jean-Claude Marcourt, Minister of Economy – European Belgian Presidency

Part 4: Financial Information

Budget Revenue

The SJU received in 2010 cash contributions from the EU for an amount of EUR 41.0 million (Commitment amounted to EUR 105.0 million), from Eurocontrol for EUR 11.6 million and from the other members for EUR 3.6 million.

The resources made available by the SJU Members, were used in accordance with the SJU Financial Rules and, consequently, in line with the principles of the European Union Programmes providing the funds.

The European Union cash resources were drawn for EUR 22.0 million from the 7th Research & Development Framework Programme (FP7) and for EUR 19.0 million from the Trans-European Transport Network (TEN-T).

Members' contributions are treated as increases in net equity once assessed, validated and recognised.

Budget Expenditure

Payments amounted to EUR 84.9 million and could be broken down as follows:

- Staff cost EUR 3.6 million, including salaries, taxes and social security
- Administration EUR 3.6 million, comprising rentals, IT and PR
- Operations EUR 77.7 million including WPs, industrial support, AIRE, Airspace Users, OPTIMI and other Programme-related expenditures.

In total the SJU executed 1215 payments; EUR 55.6 million was paid to the Members (EUR 53.2 million of pre-financing and EUR 2.4 million of co-financing).

2010 marked an accelerated ramp up of the Programme which was supported by the usage of the available financial resources through the pre-financing of the initiated projects and the co-financing of those entered into the execution phase. The operating expenditure showed an increase of 24% over the previous year. In parallel the positive cash surplus was reduced by EUR 29.5 million. The acquisition of goods and services has gone through the procurement process according to the SJU Financial Rules ensuring fair competition among the potential suppliers and efficient use of the SJU funds. The co-financing relates to the deliverables accepted in 2009 whose costs were reported into the Members' Interim Financial Statements and referred to the production of the Project Initiation Report (PIR) and Management Initiation Report (MIR).

Balance Sheet

All figures in EUR	31/12/2010	31/12/2009
I. NON-CURRENT ASSETS	**108.575.803**	**55.145.147**
Intangible fixed assets	**865.999**	**457.111**
Tangible fixed assets	**479.400**	**567.448**
Furniture and Vehicles	34.522	5.673
Computer Hardware	62.752	151.508
Other tangible assets	382.126	410.267
Long-term Pre-Financing	**107.230.404**	**54.120.588**
II. CURRENT ASSETS	**57.387.142**	**87.176.135**
Short-term receivables	**230.513**	**513.396**
Tangible fixed assets	**479.400**	**567.448**
Current receivables	69.327	198.126
Sundry receivables	310	38.375
Accrued income	160.876	164.404
Deferred charges	-	112.491
Cash & cash equivalents	**57.156.629**	**86.662.739**
TOTAL ASSETS	**165.962.945**	**142.321.282**
III. CURRENT LIABILITIES	**144.519.752**	**50.149.825**
Accounts payable	**8.069.279**	**8.097.972**
Current payables	257.588	5.229.358
Accrued charges	7.381.334	1.115.410
Taxes, salaries and social security	-	28.721
Other accounts payable	430.357	1.724.483
Co-Financing to be paid to the Members	**55.100.098**	**10.116.510**
Contribution from Members to be validated	**81.331.743**	**31.935.343**
Cash Contributions from Members to be accepted	**18.632**	**-**
TOTAL LIABILITIES	**144.519.752**	**50.149.825**
NET ASSETS (Total Assets less Total Liabilities)	**21.443.193**	**92.171.457**
IV. NET ASSETS	**21.443.193**	**92.171.457**
Contribution from Members	**227.828.834**	**158.567.045**
European Union	179.552.000	138.552.000
Eurocontrol	42.200.336	20.015.045
Other Members	6.076.498	-
Accumulated contribution from Members used previous years	**(66.395.588)**	**(8.119.953)**
Contribution from Members used during the year (EOA)	**(139.990.053)**	**(58.275.635)**
TOTAL NET ASSETS	**21.443.193**	**92.171.457**

Economic Outturn Account

All figures in EUR	2010	2009
OPERATING REVENUE		
Contributions from Members	-	-
Other Revenues	-	433.518
Total operating revenue	0	433.518
OPERATING EXPENSES		
Administrative expenses	(6.970.399)	(6.005.477)
Staff expenses	(4.037.695)	(3.485.089)
Fixed assets related expenses	(488.883)	(177.170)
Other administrative expenses	(2.443.821)	(2.343.218)
Operational expenses	(133.239.266)	(52.987.514)
Other operational expenses	(133.239.266)	(52.987.514)
Total operating expenses	(140.209.665)	(58.992.991)
DEFICIT FROM OPERATING ACTIVITIES	(140.209.665)	(58.559.473)
NON-OPERATING ACTIVITIES		
Financial operations revenues	198.073	288.353
Financial operations expenses	(4.172)	(4.515)
Other non operational income	25.711	
Total non-operating activities	219.612	283.838
CONTRIBUTIONS FROM MEMBERS USED DURING THE YEAR	(139.990.053)	(58.275.635)

Disclaimer:

All financial figures contained in this report are subject to the final observations of the European Court of Auditors and the final approval by the SESAR JU Administrative Board (in accordance with Article 5 (i) of the Statutes of the SESAR JU annexed to Council Regulation (EC) No 219/2007 of 27 February 2007 and as amended by Council Regulation (EC) No 1361/2008 of 16 December 2008).

For the latest information, please consult our website:

www.sesarju.eu

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