

sesar magazine

editorial

Our vision for 2012

Aerospace is one of the fields which has seen tremendous technological changes in the last 50 years. Since the first jet airliner flew in 1949, use of commercial aviation has grown more than seventy-fold. However, this radical increase is not mirrored in air traffic management where the same technologies as in the 1950s are still used. Europe chose to make a change happen by putting up SESAR.

Staff at the SESAR Joint Undertaking and its members are well aware of their responsibility. We are determined to achieve our goal of modernising European Air Traffic Management. As a consequence, we agreed on an ambitious vision to have created by 2012 the change in European ATM that demonstrates to the world our ability to deliver benefits to the community. This vision is translated into seven strategic objectives which include concrete targets such as the validation of the initial 4D trajectory; the establishment of the first SWIM pilots; performance of 10,000 SESAR flights, including 500 military; outcome testing of 80% of SESAR projects in a real life environment; taking into operation of the first remote tower, etc. You can find all seven strategic objectives on page 2 of this newsletter.

SESAR clearly focuses on early and strong benefits for the whole ATM community. Consequently, timely validation in real operational environment is paramount. Our seven strategic objectives will remind us every day of our validation roadmap cornerstones. SESAR is one programme with one vision and plenty of action. The articles of this magazine will give you an update on some of our topics. For more information, go to our website www.sesarju.eu and subscribe to our monthly electronic newsletter.

Kind regards

Patrick Ky, SESAR Executive Director

Happy birthday SESAR!



The SESAR work programme celebrated its first anniversary on **03 06 10**. By the time this newsletter goes to print and just one year after the technical kick-off, 85% of the **300 SESAR projects** were launched, half of them have passed the preparatory initiation phase and commenced the actual research and development work. So far, 1,500 experts at the 16 members in 17 countries are working to develop the future ATM system. In 2010, the focus is on achieving early benefits. Some of the priorities for the coming months are projects on information management, route-assignment and guidance as well as the airborne side of trajectory management. Additionally, with the continuation of AIRE, further cuts in aircraft emissions will be achieved.

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founding members



“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”

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 5 domains

5 The first remote tower is ready for operations

6 SESAR benefits are demonstrated on city pairs connecting 8 European airports

7 Airspace users have signed up to the SESAR business case for time-based operations



interview



Michael Standar,
SJU Chief Air Traffic
Management

“ConOps: what's the story?”

**Three short questions to Michael Standar,
SJU Chief Air Traffic Management on the status
and next steps of the SESAR Concept of Operations.**

1. Michael, where are we today with the SESAR Concept of Operations (ConOps)?

The first thing to remember is that the SESAR ConOps was set out in the SESAR Definition Phase. In the SJU ConOps storyboard it was structured into three steps to realise the paradigm shift necessary to modernise the European ATM system. In step 1, we move from the current day to time-based operations, focused on better use of existing technology and optimising communication between ground and airborne equipment. Step 2 introduces trajectory based operations through the 4D trajectory. As new technology is involved, international standardisation bodies and ICAO will be engaged. The third and final step will be a fully integrated performance based ATM System supported by System Wide Information Management, SWIM – the intranet of the air. These three steps are not sequential but start in parallel, aiming at gaining early benefits for the air transport sector.

At the moment the ConOps is following the original plan designed in the Definition Phase. Our transversal project, work package (WP) B4.2 together with the operational WPs 4, 5, 6 and 7 are developing a clear operational roadmap per step with the goal of identifying dependant projects. We need to take on board input from the experience we gain in the work programme. This first step of the storyboard approach will lead to validation & verification results that together with the evolving needs of the ATM environment will lead to a concept update.

2. What are the most important features of the SESAR ConOps?

For me, there are two main cornerstones in our concept. First, all air transport actors will in the end share all relevant information and second, the 4D trajectory will become a reality. The connection and usage of airborne capabilities in daily ATC-operations will change our way of working. This will require close cooperation between National Supervisory Authorities,

NSA's, and airspace users in order to determine both the safety and business benefits of the new capabilities early on. The validation part of SESAR is very important as it will deal with the safety and business aspects, validating as close as possible to real life operations in a live environment whether airborne or ground based.

3. What are the next steps?

We are currently working on a concrete validation & verification roadmap for step 1 with an outlook for steps 2 and 3. By concrete we mean a clear picture of the operational and technical

content of step 1 of SESAR. This will also allow us to evaluate the business benefits from all ATM partners' perspective. It is truly an exercise with close cooperation of all members. The outcome will be a list of projects which are dependent on one another which will contribute to achieving time based operations, step 1, and a plan for how and when the projects content will be validated. We will also determine which validation sites and prototypes will be used, which projects and companies/ organisations will be involved. We are not operating in isolation and will connect the validation sites with the 'real' world, such as airport interfaces.

SESAR Scientific Committee:

Building on innovation and long-term solutions



Creating a healthy body of research spread across a wide range of research organisations is the vision of the SESAR Scientific Committee. The committee held its second meeting in May 2010, where the group of twelve renowned scientists discussed among other topics the outcome of the recent call for research networks.

In the framework of work package E on innovative and long-term research, each of the following four main research themes should be covered by a research network: 1) Legal aspects of the paradigm shift expected by the introduction of SESAR; 2) Implications of moving into higher levels of automation; 3) Mastering complex systems safely; 4) Economics and performance. Research networks were selected for the second and third theme and further calls will be launched in the summer. Each of the networks will have a correspondent from the Scientific Committee to assure optimal advice and coordination. The Scientific Committee was set-up to reinforce the SESAR work programme's innovative and scientific approach to building the future Air Traffic Management systems and procedures. Advising the SJU's Executive Director, Patrick Ky, the group provides expert opinion and scientific guidance.

Broad horizons

An interview with Frank de Winne

Frank de Winne, a European Space Agency (ESA) astronaut, is committed to research and to finding simple solutions for complex situations. As a member of the SESAR Scientific Committee, he actively supported the SJU in defining research themes for its innovative and long term research programme. Mr de Winne returned in December 2009 from a six months mission to the International Space Station. During this flight De Winne became the first European and the first non-American and non-Russian Commander of the ISS. After his long-term spaceflight, Frank De Winne is still performing several mission related tasks which include post-flight rehabilitation, debriefings and outreach activities.

1. Mr De Winne, as an astronaut and long-time member of ESA, why did you decide to join the SESAR Scientific Committee?

SESAR is an interesting project which will enhance the competitiveness of the European industry and which fosters inter-



Frank de Winne, European Space Agency (ESA) astronaut.

national cooperation. I am generally interested in everything that brings Europe to the forefront. Additionally, as a former Air Force pilot, I was an "ATM customer" and therefore know the life of air traffic controllers a bit. New procedures and technologies can make their work only easier and safer.

2. The Scientific Committee will deal with different research themes – 'Legal aspects of paradigm shift', 'Towards higher levels of automation in ATM', 'Mastering complex systems safely', 'Economics and performance'. Which of the four areas are you mostly interested in?

Probably due to my experience as an astronaut, I am mostly interested in finding simple but safe solutions to complex situations. I have seen in my career that solutions for the same problems developed in Russia, Europe, Japan or the US can sometimes differ greatly. Mostly, it is the simple solution that does the trick. At the same time, systems – especially in the case of SESAR – need to guarantee performance.

3. SESAR is a public-private partnership. How do you evaluate this working together partnership approach in reaching new goals?

I think such an approach is great, if it works. To be honest, I was quite sceptical in the beginning due to the experience we had with Galileo. The industry is only fully committed if it sees a return in investment. The advantage of SESAR is that all its members are stakeholders – they need a modernised ATM system and they need to comply with the new system in the end. And from what I have seen so far, it seems that this partnership is successful.

4. Research & development budgets are cut in many organisations or even countries due to the economic crisis. How do you see this evolution?

It is extremely unfortunate and actually the opposite should be happening. A crisis can always be seen as a down point

but also as an opportunity, as a possibility for innovation. We should now invest more in research to be ready with innovative solutions just in the moment the crisis is over. We are very fortunate in Europe that our social systems have to a large extent dampened the negative effects of the crisis. On the other hand, such a safe system also makes people reluctant to move forward, to change. Now would be the time to innovate, to renew our industries, to give more creative ideas a chance. SESAR for me is a great example for transforming difficult circumstances into something positive. By renewing the current air traffic management system, we will save money, time and will be more environmental friendly.

You can also see from the past that societies which continued to explore, evolved. Others stand still or even disappear. Exploration for me is an equivalent for advancement and we should always insist on broadening our horizon.

5. On the OasISS mission, you took over as Commander of the Mission in October. What was the biggest challenge to coordinate colleagues with such different backgrounds?

Most important and challenging was for sure to keep the spirit high. My task as commander was to create the optimal conditions on board so we could accomplish all objectives as a team. A space mission is quite difficult for everybody. The tasks are not easy, we are far away from home and above all we come from different countries with sometimes quite different mentalities. It is important to stay motivated at all times. We depend on each other.

6. On the same mission, you undertook a programme of scientific experiments and technology demonstrations from different scientific institutions. How did you see this work?

First of all, astronauts are not scientists. But each of us receives a daily programme which also involves tasks or demonstrations research institutes ask us to do. They range in very different disciplines of physical and biological sciences. Such tests can also involve so called life science experiments. In other words, the astronaut performs tests on himself. We do have the right to refuse such life science experiments but it hardly ever happens. As I said before, I think science and research are key to advancing, to exploring new horizons. I am very committed to this idea.

7. You are a goodwill ambassador for UNICEF Belgium. What were your reasons to get engaged?

UNICEF is a great organisation. They apply an integrated approach to make fundamental changes in the living conditions of children. Like for all UN agencies, it is the goal of UNICEF to make the lives of people better. By targeting children, mostly by educating them, this change is sustainable. If you look for example at Africa, I'm convinced that only the African people can solve its problems. But we have a responsibility of helping them. And in order to do that in a sustainable way, we need to start with providing education to all the African children, especially the girls. That's an investment in the next generation and also in our future.

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For more information on ...
ESA, go to www.esa.int
UNICEF, go to www.unicef.org
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SESAR in-depth

AIRE 2: More partners, more locations, more trials for more results

The successful AIRE (Atlantic Interoperability Initiative to Reduce Emissions) initiative will not only be continued but considerably enlarged in 2010/11. Through a call for tender, new project proposals were selected to perform integrated flight trials and demonstrations validating solutions for the reduction of CO2 emissions for surface, terminal and oceanic operations. Additionally, the SESAR Joint Undertaking (SJU) will sponsor seven projects for conducting green gate-to-gate trials, among others between France and the French West Indies.

The AIRE 2 call has brought in more partners with new trials in additional locations such as Austria, Belgium, the Czech Republic, Germany, Canada, Morocco, and Switzerland. "We particularly welcome the high number of new partners in new regions. We have more ANSPs, more airports and more airlines involved which are in the position of transferring the trials into day-to-day operation", says Patrick Ky, Executive Director of the SJU.

Other new features of the programme are for example gate-to-gate flight trials performed between European city pairs as an addition to complete green transatlantic flights. Demonstrations will be performed in the most congested European airspaces and on the busiest European airports (e.g. Schiphol). Some projects will focus on vertical and speed optimisation, while

partners which have already participated in 2009, will expand results achieved so far with a strong link to deployment and routine use of previously tested procedures. AIRE will build the first blocks of the SESAR ConOps by testing SESAR 4D trajectory based operations and SESAR's concept of performance-based navigation. Another highlight of AIRE will be the performance of a series of transatlantic green flights with the world's largest airliner, the A380.

"The proposals we have received are highly interesting. I am especially happy that partners in high traffic density and complex areas have chosen to participate in AIRE. Green ATM operations are for the benefit of the environment, citizens and European business", comments Alain Siebert, SJU Chief Environment and Economics. The selection procedure for the call was finalised end of June and all contracts are expected to be signed after the summer break.

In 2009, 1,152 trials were performed by 18 partners in five locations through the framework of AIRE. AIRE is a programme designed to improve energy efficiency and aircraft noise in cooperation with the FAA. The SJU is responsible for its management from a European perspective.

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[For more information on AIRE and the 2009 results, visit our website at www.sesarju.eu/environment.](http://www.sesarju.eu/environment)

The pilot's AIRE experience



Captain Claude Godel

Captain Claude Godel (53) was pilot in command on the first complete green transatlantic flight performed by Air France on 6 April from Paris Charles de Gaulle to Miami airport. So far, he obtained 13,500 flight hours. He has been with Air France for 28 years where he held different management positions such as A320 Technical pilot and Head of Flight Standards. Currently he is in charge of Regulation and International Affairs. For the

SESAR magazine, Captain Godel describes his experience as AIRE pilot.

1. [Captain Godel, in how many AIRE flights have you already participated? Can you tell us more about these flights?](#)

Air France is involved in several AIRE initiatives but my own

experience is essentially based on the Paris-Miami sector. This flight is considered ideal as it permits to cross many airspaces, all belonging to AIRE partners, and, at the same time, it allows demonstrative taxi time improvements in Paris CDG and Miami as well as an innovative "tailored" approach in Miami.

2. [From a pilot point of view, what is the difference between an AIRE and a 'normal' flight?](#)

The AIRE flight is the almost perfect flight for a pilot. On a normal flight you never know how you will be incorporated in the traffic but as a pilot you are sure that you will fly level at non optimal altitudes, have to beg ATC for better speed, better lateral track; in one word, you spend your time negotiating or accepting non optimal compromises. The AIRE flight needs more pre-flight preparation but, once off-block, the pilot can expect to fly the best track from beginning to end, at the best speed and the best altitude. Isn't that the pilot's dream? One other way to explain it is to compare it with driving a car: on a normal flight you will have to stop and start many times at each traffic light, but



on an AIRE flight the traffic lights change to green just on time for you.

3. What are the advantages and challenges to perform an AIRE flight?

The main advantage is predictability: from the moment you take off, you take the best flight path knowing that ATC will help you to fly it. CO2 and fuel savings are logic consequences. The challenge is to continuously ensure that the next ATC centre is aware of your arrival and your intentions.

4. What is your personal view as a pilot on green flights?

The whole principle of green flights is a virtuous circle: by optimising the path, the pilot shortens the flight time, burns less fuel, produces less CO2, reduces the costs, leaves fewer place for contingencies, is in line with the modern passenger's aspirations and finally finds a new interest and a new pleasure in his job.

5. In your view, what is needed to have not only green flight trials but to include the green procedures into day-to-day operations?

The first green transatlantic flight was a combination of current best practices. It needed serious preparation and coordination but showed clearly that most of today's green procedures could be used already now in day-to-day operations. I think about reduced taxi time, taxiing with half of the engines running, tailored arrival in Miami etc. These are procedures which Air France has already started to implement. For the others, it will need some technical improvements based on ADS (automatic aircraft to ground communications) in order for ATC to ensure "green slots" to all operators. In my opinion, the information needed to allow multiple green flights in the same airspace is already available on board of modern airliners but not yet used enough by the ground ATC computers. I am confident that SESAR and NextGen will soon provide these necessary innovations.

SESAR focus: Airports – the ATM bottleneck?

Preparing airports for tomorrow



Flughafen München GmbH

Airports are the nodes of the air traffic world and as a consequence they are facing the highest traffic density of the entire network. If an airport is saturated, it will become a bottleneck delaying inbound and outbound flights. Flights will have to wait on the ground blocking airport resources or fly holding patterns in the air increasing fuel burn and thus emissions. As a result resources will be wasted and passengers will arrive late at their destination – an unsatisfactory situation for all parties involved.

That's why in 2009 six major European airport operators formed the SEAC consortium to become a member of the SESAR JU. The six members – BAA Airports Ltd, Flughafen München GmbH, Fraport AG, Schiphol Nederland B.V., Aéroports de Paris and Flughafen Zürich AG – represent some of the busiest airports in Europe.

SEAC member airports are actively involved in topics related to airport design, infrastructure and operations. Work package (WP) 6 'Airport Operations' has been designed to describe all the ATM related operational procedures at airports and integrate them into the concept of operations while WP12 'Airport Systems' will then build the related system prototypes for validation. The consortium is for example leading sub work package 'Collaborative Airport Planning' with the strategic projects Airport Operations Plan, Airport Capacity & Flow Management and Airport Operations Centre. These projects will set the framework for the integration of airports in ATM and the performance driven strategic planning at airports. Other projects will build on existing Collaborative Decision Making procedures and focus on the integration of turnaround and recovery management.

Reducing delays through SESAR

Thorsten Astheimer, SEAC coordinator and Senior Project Manager SESAR at Fraport, explains here below why SEAC is a SESAR member and how cooperation between the airports works.



Thorsten Astheimer

1. SEAC is mainly involved in WPs 6 and 12 on Airport Operations and Airport Systems. What are the challenges in involving airports in the ATM chain?

Today there are more than 1,500 airports throughout Europe. They all differ from each other in terms of size, traffic mix, operating procedures, ownership and business model. But all these airports are

part of the ATM process chain managing the turnaround of aircraft between two flights. One of the SESAR goals is the introduction of new procedures and technologies to increase air-space capacity. This will only produce benefits for the passengers if the airports can handle that traffic efficiently. Consequently, airports have to be made a part of the ATM-Network integrating the local planning in the Network Operations Plan. Integrated planning and information sharing will be the basis for collaborative decisions and a performance driven airport management.

However, there will not be one solution that fits all airports. The major challenge will be to reach these goals while at the same time giving each airport the room to account for its local situation and to pursue its individual business plan.



2. Where do you see early benefits for airports and passengers in the SESAR programme?

With SWIM (System Wide Information Management) and the development towards an Airport Operations Plan providing a more performance oriented planning, airport operators will get a much clearer view on the actual traffic situation. This will increase predictability of daily operations a lot which in turn will allow airports to make better use of their resources.

The main benefit for the passenger will be reduced delays at airports and better flight information in cases of bad weather and other disruptions.

3. From a practical point of view, how is the SEAC team set-up and how does your collaboration look like?

SEAC is not a company with an own budget and employees. It is a consortium combining and steering the SESAR related efforts of the six member airports. The various SESAR projects are staffed by experts from the SEAC members. The consortium established a Supervisory Committee on top management level. In addition, SESAR project managers of each company together with several experts meet on a regular basis in a technical coordination group. Over the past few years we have experienced a very constructive, open and trustful way of working together. SEAC has a small but very motivated team for the upcoming challenges.

Advancing telecommunication technology at airports



Communication between airport, air traffic control centre and aircraft on the ground is reaching saturation as existing data links can no longer handle the increase in traffic and new applications. Based on standard WiMAX (Worldwide Interoperability for Microwave Access) technology, the Indra-led project 15.2.7 'Airport Surface Datalink' (in association with project 9.16 which addresses the airborne side) aims at defining and testing a new generation of airport surface data link system fit for tomorrow's aviation needs.

Providing airports and airlines with more bandwidth capacity is necessary to overcome the current bottleneck at airports. Nowadays, the speed in which information is transferred between airport, air traffic control centre, airline operation centre and the aircraft on the ground can be compared to a 56k modem while households already use broadband Internet connection. With more capacity, information can not only be shared quicker but more information will be exchanged at lower cost. This is especially interesting for airlines as they will be able to feed

their flights with the latest news from the airline operation centres. The project is in compliance with SESAR's and Next-Gen's Future Communication Infrastructure vision, to ensure that pieces fall in place on time.

Pressure is high on the project to advance quickly as it has tight links to other SESAR projects. The most prominent one is SWIM, the intranet for ATM, with interfaces to all new data links. While the first project prototypes are expected to be delivered end of 2011, standardisation of the new technology is a priority to ensure aircraft and airports can interoperate. To adhere to this challenging time schedule, the project members need to shift WiMAX technologies to the allocated spectrum (5GHz band), a protected aeronautical band. Simulations and real airport measurements need to be run prior to actual prototyping. Additionally, mobility between base stations has to be met with appropriate handover procedures. Secure user registration via an access service network and quality of service are further current cornerstones of the project.

“The lowest common denominator is not good enough”

Alberto Martínez (Indra) is the project manager for SESAR project 15.2.7 and answers to three short questions on the project and on being part of the SESAR family.



The Indra team working on project 15.2.7: Alberto Martínez Albacete, Eduardo Polo Cortina, Belén Ruiz Jimenez, Daniel Peón Quirós and Antonio Correas Uson.

ested in this technology as it will allow them to share more information at a lower cost. Current communication technology used is outdated and is limiting the possibilities to expand air traffic. Our technology will be validated through operational projects by end of 2013.

What is the most important to you as a SESAR project manager?

On this project, I work with five Indra engineers and more colleagues from the other SESAR members. In my opinion, the decisive thing for all SESAR projects is to come to a demanding consensus when involving all these different partners. Finding the lowest common denominator is not enough when you are changing a whole industry. I highly appreciate having the opportunity to work with different partners and high standards.

How big is the Indra involvement in the SESAR programme?

Indra is involved in 124 different projects, in virtually all work packages. Additionally, we co-lead work packages 10 'En-Route & Approach ATC Systems' and lead 12 'Airport Systems'. We also play an important role in communications systems, navigation and air traffic surveillance programme as well as in the creation the future ATM intranet. Having been selected for so many of the projects is seen as an acknowledgment of our expertise in air traffic management.

Alberto, where are we today with project 15.2.7 'Airport Surface Data link'?

Our advantage is that WiMAX, the technology we are using, is already there. We now have to customise it according to aviation needs. For example, it needs to be shifted to the allocated spectrum of 5 GHz which is a protected aeronautical band. For that we need to run tests at airports before we can start with the actual prototyping. We want to come out with an actual prototype by the end of 2011 as a lot of other projects depend on it. You can imagine that especially airlines are quite inter-

short news

SJU meets CEOs and COOs of major airlines



Patrick Ky, Executive Director of the SESAR Joint Undertaking met in May and June with the CEOs and COOs of several

European airlines (Lufthansa, BA, Air France-KLM, Brussels Airlines, and Iberia).

Aim of the meetings was to discuss the current state of the SESAR programme as well as the impact of SESAR on the airlines. "SESAR is the only way forward to positively respond

to the new challenges in aviation. The implementation of SESAR will ask for large investment. But SESAR is committed to overcome this challenge and to build a strong business case in partnership with the airlines", said Patrick Ky. The airlines reacted positively on the explanations and showed interest in supporting the execution of the ATM Master Plan by getting involved in the technical and economic work. The SJU will in the coming weeks and months strive for organising similar meetings with more airlines.

Military advisor joins the SJU team



Including all airspace user and service provider actors in the SESAR programme is one of the

key principles of the SESAR Joint Undertaking. Consequently, Major General Denis Koehl (retired) joined the team as Senior Advisor to the Executive Director for Military Affairs in mid-May. Denis served 33 years in the French Air Force and obtained his pilot's wings in 1982. In his new role, Denis will serve as an interface between the SJU work programme and military stakeholders. Some of his key responsibilities are to ensure that the military perspectives are fully taken into consideration in SESAR, in particular for the business case, operational concept and validation activities; to be the primary point of contact for relations with the relevant military authorities; and to facilitate coordination with the relevant organisations in the military community, in order to ensure that SESAR developments are fully interoperable with corresponding military developments.

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