

sesar magazine



editorial

Dear readers,

Welcome to this first issue of the new SESAR magazine. SESAR, Europe's ambitious air traffic management (ATM) modernisation programme, has started its technical activities in June this year. The time frame of the programme is extremely challenging. But in order to be able to start properly, the SESAR Joint Undertaking (SJU) and our partners had to do a lot of work together in order to have the programme start on a sound foundation. As a result, we will have started roughly 70% of the almost 300 SESAR projects by the end of the year. You will see that a lot is happening at SESAR. To keep you up-to-date with all the latest developments, we have set-up new communication channels. The present magazine will be published at least three times a year; regular electronic newsletters will serve you the latest on the programme. Above all our brand new website is your quickest access to what is hot at SESAR and the Joint Undertaking.

We hope you find this magazine informative and interesting and look forward to your comments!

Patrick Ky, SESAR Executive Director

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SESAR – where are we today?

The four key performance targets of the SESAR programme are clear. By 2020 we will enable a threefold increase in capacity, improve safety by a factor of 10, reduce by 10% the environmental impact per flight and cut ATM costs by 50%. But how do we get there?

The SESAR programme, executed in cooperation with the 16 members, including Eurocontrol, comprises 16 work packages and 294 projects. SESAR is not only revolutionary in its goals but also in its approach: it is built as a public-private partnership, in which all members are committed to deliver solutions to ATM challenges. It is a new way of working, making sure that the projects deliver tangible results, that these results are validated in an operational environment to ultimately boost European industry. Since the official kick-off on 3 June 2009, some 150 projects were initiated, which



translates into one new project per working day. It also means that the programme is absolutely in line with the annual work programme target which says that 205 of all attributed projects have to be launched this year. The number of projects already kicked-off represents € 891 million in contributions and the goal is to have all 294 projects launched by mid-2010.

founding members



interview

“SESAR is also about quick wins”

An interview with Peter Sørensen, Director IATA Europe



Peter Sørensen, Director IATA Europe

Peter Sørensen has been with the International Air Transport Association (IATA) since 2006 and was recently appointed Director of its European regional office responsible for Safety, Operations and Infrastructure. Prior to this he has held the positions of manager of the Executive Director's office at the European Aviation Safety Agency (EASA) and General Secretary of the European Cockpit Association.

What are the airline's expectations for Single European Sky and the SESAR programme?

We have expectations in three main areas: firstly, identifying some 'quick wins' in the 2010 timeframe, based on currently existing technology. Although SESAR is a long-term programme, these are already coming out of the SJU now and are more urgent than ever in the current economic crisis.

Secondly, we see the need to reduce fragmentation - the airline industry has been waiting for this for a long time. Finally, we also have expectations that this common approach will lead to the validation of new concepts, procedures and technologies ready for adoption from 2013 onwards.

SESAR is expected to make improvements in terms of cost, capacity, safety and environmental impact - which of these is the most urgent from IATA's perspective?

These are the key performance indicators for SESAR and for us, and while safety is always the number one priority, all have equal importance.

Due to the current crisis we have seen a large drop in traffic and, although we are unlikely to see a full recovery until 2013, we need to look at capacity now to be ready for a new upturn in traffic when it comes. In looking for immediate improvements in flight efficiencies we have an opportunity now, while traffic is lower, to make progress in areas such as Continuous Descent Operations (CDO) and Collaborative Decision Making (CDM). The environmental benefits from these efficiencies could amount to annual fuel

“Safety is the number one priority.”

burn reductions of 265.000 tons by 2013.

Cost efficiencies are also needed urgently. Losses of around USD 11 billion are forecast for airlines in 2009, and delays and flight inefficiencies could cost up to EUR 3 billion. Furthermore, the average unit cost of flying is 70% higher in the EU than in the US - we need an improved performance-based, system-wide approach.

How can SESAR make a contribution to the IATA's own targets in these areas?

Currently, crisis mode is one of the drivers for IATA and airlines and we must focus on quick wins from SESAR to help with this.

CDM, SWIM and validation of trajectory-based management would all be positive outcomes, as would international interoperability, which would allow systems and components from different manufacturers and countries to exchange information and work with each other.

IATA sees this as a particularly important target, and SESAR can complement existing international cooperation in this and other areas, such as AIRE in the area of reducing environmental impact.

What is the added-value of European cooperation in this initiative?

This is easy to answer as the programme's European nature has a clear added value in terms of reducing fragmentation and pooling resources. There is a clear benefit to having a common management structure for R&D and including so many strong industrial partners in such a Public-Private Partnership.

How does it compare with what is happening internationally?

The FAA are developing their NextGeneration Air Transportation System (NextGen). NextGen is technologically on a par with SESAR, has similar objectives and is just as ambitious. However, it is less complex politically. The EU faces a bigger challenge because its infrastructure is normally planned at the national level.

It is absolutely essential that SESAR and NextGen are harmonised to avoid unnecessary cost and complexity for the airspace user. Both projects must deliver the promised benefits to justify the airlines investment.

IATA has just recently signed a contract to provide the SJU with technical expertise in the execution of the SESAR work programme. How will you support the SJU and what is IATA's motivation in entering into such cooperation?

Our motivation is not new – this was a need that was identified very early and drove IATA's participation in the definition phase of SESAR. We are engaging at both the operational and technological level: we need to address differences among users and ensure interoperability and consistency in uptake.

We also want to ensure that there is a focus on performance rather than just technology. We need to be able to assure our members of the affordability of future investments and the early delivery of the benefits to justify them.

How is IATA preparing for its involvement in the SESAR programme?

Obviously we take involvement very seriously and are participating in close coordination with our members and the Association of European Airlines (AEA). The main concern is to ensure coordination and avoid duplication.

We want to make sure that airlines don't come at the programme from different angles, and so work hard to ensure communication between our membership and the SJU so that we agree on the management and performance frameworks.

How do you think the programme can gain the highest possible acceptance within the airspace user's community and what has been the feedback from your members on SESAR so far?

We need consistent, simple and structured communication of what is going on in the programme, the results coming out and the future benefits. We also need continuous risk management and assurance for all participants and members that this is a continuous process, not just a one-off exercise.

For a programme of SESAR's size and complexity to be up and running has been very positively received by our members. They appreciate that the 'bull has been taken by the horns' and the programme

has moved straight from its definition phase to development without any hiatus in activity.

The programme needs to maintain this dynamism and its transparency. Keep bureaucracy to a minimum and avoid institutionalisation.

The operational validation of the developed new technologies is one of the key elements for the success of the SESAR programme. How do you see IATA's role here?

Validation is central to the programme and it is critical that there is airline participation in this. We need airlines on board in order to provide feedback from 'real life' situations in as near an operational environment as possible. IATA's membership of more than 230 airlines have a key role in making this validation secure.

“ SESAR has moved straight from its definition phase to development without any hiatus in activity. ”

interview

IATA's involvement



Gerry O'Connell, Assistant Director, Safety, Operations & Infrastructure

Gerry O'Connell, Assistant Director, Safety, Operations & Infrastructure is one of IATA's specialists in air traffic management and has already been involved in SESAR's definition phase.

Gerry, what are – from IATA's point of view – the critical elements of the SESAR programme?

Work Package (WP) B - Target Concept and Architecture, with its performance analysis of the ATM Target Concept throughout the development phase and including the ATM Business Model, is probably from our point of view the most important WP. This is the baseline information for all stakeholders and for decision making – to identify which R&D approaches are showing promise or not and which to focus on.

We also see it as very important to manage the European ATM master plan, as developed and maintained in Work Package C – Master Plan Maintenance. We need this planning WP to be understood by all stakeholders and well communicated in order to ensure the buy in from project participants and stakeholders. It is very important to obtain this commitment if the necessary investments are to be realised.

In terms of technological elements, the avionics architecture, trajectory management and SWIM are all important. We need all the information we can get in order to take practical decisions on how to use these new technologies.

What are in your views the risks of the programme and how will IATA support the programme to mitigate them?

With civil, military, and even unmanned vehicle requirements to be taken into account, managing stakeholder requirements is a key challenge and a risk for the programme. However the different user communities will co-exist in the SES and share responsibilities for the future ATM system.

We also want to avoid 'technology push'. We must focus on performance benefits for all the work carried out and to justify future deployment and investment.

More automation in ATM together with the changing role of controllers in an area as complex as ATM has many challenges including the compliance with certification and regulatory requirements

There are risks to deployment if the validation phase is not well integrated into as close to the operational environment as possible. Use of aircraft assets in live trails will significantly reduce this risk.

We need leadership from the European Commission (EC) and the SJU at the political, operational and financial levels – especially in preparing now for the deployment phase. The governance and planning for deployment is vital, as this must not be 'just another research project'. We need early answers in order to reassure users of promising cost effective solutions which meet the performance requirements. Further extension of the Public-Private Partnership may be an option to reduce the deployment risks.

focus

Focus on: interoperability

As the world's two most complex airspace blocks – Europe and the United States – develop new, modernised ATM systems, the question of their interoperability becomes paramount. Global interoperability is an essential goal when planning the development of ATM air/ground applications and systems and is consequently one of the key requirements of SESAR.



Peter Hotham is the SJU's Chief Architect, and he is in charge of interoperability.

SESAR, Europe's ATM modernisation programme takes place in the context of the International Civil Aviation Organisation's (ICAO) Global ATM Operational Concept, which provides governments and industry with objectives for the design and implementation of ATM and supporting communication, navigation and surveillance systems. "Working together on a global scale early in the life-cycle of a new concept or technology is the only way to achieve effective and efficient coordination", explains Peter Hotham, Chief Architect of the SESAR Joint Undertaking (SJU). "The SJU and its member organisations are already in close contact with ICAO and aviation authorities around the world, as well as standardisation bodies such as EUROCAE and RTCA, to inform them of the technology and procedures we are developing in the framework of SESAR. This is set to continue as SESAR development gathers pace."

“Interoperability must be achieved in both the technical (system) and operational (procedures) dimensions.”

Common standards

It is evident that harmonisation is necessary to ensure the same aircraft can safely fly throughout the world with a single airborne equipment interoperable with any ground ATM system. This is also one of the key requirements towards new air traffic management systems from airspace users as Peter Sørensen explains in this magazine on page 2-3. Interoperability requires internationally agreed standards and SESAR will deliver the technical basis for defining them through ICAO SARPs (Standards and Recommended Practices) and coordinated industry standards. The existence of such common standards will also lower costs for the manufacturing industry which will be able to design equipment for a global market.

During the ATCA Convention in October 2009, J. Randolph Babbitt, FAA administrator, underlined the importance of interoperability for the NextGen programme. "We must make sure that interoperability is at the order of the day", said Mr. Babbitt and continued, "The Obama Administration and Secretary LaHood are enthusiastic about the potential for international linkage, such as the links between NextGen/SESAR." Currently, a memorandum of cooperation between the FAA and the European Community on cooperation in basic

ATM research is being prepared covering among others the areas of information management, trajectory management, CNS and airborne interoperability, environmental issues, etc. "We seek further meaningful alignments between NextGen and SESAR as we move forward, while at the same time we have also started to cooperate with other regions in the world facing similar ATM challenges – now or in the foreseeable future", says Peter Hotham.

The technical and operational dimension

We have to recognise that different regions of the world can have very significant differences in the way they organise air traffic management. It thus may make little sense to try and have the same solutions applied everywhere. Interoperability must therefore



be achieved in both the technical (system) and the operational (common procedures) dimensions.

This approach will allow deployment of an adaptable and scalable solution to the ATM system, which can be equally applied across a wide range of airborne platforms, airspace users, airports and ANSPs (including the Military) and permit regional solutions in the framework of the overall target concept. There are of course areas where interoperability can only be achieved through the adoption of common standards at a global level. For example, the implementation of air-to-air exchanges to enable ASAS applications and collision avoidance safety-nets require global harmonisation of both the equipment and procedures to ensure the safe and efficient implementation of these concepts.

Global solutions for local challenges

Projects across the SESAR work programme, together with coordination initiatives at the SJU level, will ensure that SESAR has an effective working relationship with our international partners in the US and the rest of the world. SESAR developments recognise the need for a global view of these developments while ensuring the specific European needs are met.

SESAR was created to make a real difference for aviation in Europe, with clear capacity, safety, economic and environmental targets to be achieved, and avoid a situation in Europe where the current system fails to meet the demands from its customers and the community at large. SESAR will find a solution within a global perspective with a view to offering an equally appropriate response, once these issues arise, elsewhere in the world.



Today's partners for Tomorrow's aviation

founding members



SESAR will change today's air traffic management system to meet tomorrow's demands. Keep up-to-date with the latest developments of this exciting journey and subscribe to our regular newsletters. Visit our brand new website. Join us at our booth and conferences at ATC Global in Amsterdam from 9-11 March 2010. We're looking forward to informing you. The SESAR Joint Undertaking.



MINT project shows impressive results

Arlanda, Sweden, 25 November 2009. More than 100 people gather at Arlanda airport, gate 41, at around 9 o'clock. Most of them are aviation specialists with hundreds of hours spent on aircraft so far. But the crowd is excited as this is a special flight. It is green.

The MINT Project (Minimum CO₂ in Terminal Manoeuvring Area) is carried out in the context of the Atlantic Interoperability Initiative to Reduce Emissions (AIRE). AIRE, an agreement between the European Commission and the FAA, aims to reduce CO₂ emissions and accelerate the pace of change by taking advantage of air traffic management best practices and mature technologies. It is expected to enable the implementation of environmental friendly procedures for all phases of flight and to validate the benefits of these improvements. The SESAR Joint Undertaking is responsible for the management of AIRE from an European perspective.

Ten demonstration flights

Since June 2009, the MINT project performed a series of ten demonstration flights with a Novair Airbus A321. The trials are dedicated to investigate how modern aircraft are able to support performance based operations, leading to significant reductions in emissions and noise impact, also importantly improving the predictability in the air transport system.

MINT builds on greater navigation accuracy derived from GPS and on-board Flight Management Systems (Thales - GE FMS release 1A), known as Required Navigation Performance, up linked wind nowcasts tailored to the trajectory, as well as Continuous Descent Arrival.

“MINT flights demonstrate fuel savings of 165 kg - leading to more than 500 kg reduction in CO₂ emissions per landing.”

In addition, the flight trials fully integrated time control as an element to enable the aircraft to fly an optimal trajectory while meeting an air traffic control time gate. This procedure reduces the need for holding or 'path-stretching', therefore helping to reduce CO₂ emissions.

Increased efficiency

Through co-operation between AVTECH, the Swedish Air Navigation Service Provider (LFV), Stockholm Arlanda Airport, Novair and Airbus, the flights have demonstrated a lateral standard deviation of 0.01 nautical miles or 22 metres, which



Captain Henrik Ekstrand and his co-pilots before the green MINT flight with a Novair A321.

is less than the wing span of an Airbus A321. The different flights also showed savings of 145 kg of fuel linked to the optimised vertical descent profile, as well as 20 kg of fuel through track mile savings resulting in a total of 518 kg of CO₂ reduction compared to an average Instrument Landing System approach operated by Novair. Time wise, during the trials the aircraft met the time requirement with an average time accuracy of 8.6 seconds.

The efficiency analysis focused on fuel savings and CO₂ reductions. The analysis was made possible by normalising the fuel consumption towards reference winds, cruise altitude, temperature and weight.

The MINT project demonstrates that there are capabilities in modern aircraft that can be used to reduce the environmental load in today's air traffic system. The SESAR project has as an objective to refine these capabilities, but even more importantly to develop the link between on board systems and ground-based systems.

On board

The flight on 25 November demonstrated the new procedures to representatives from the Swedish government, aviation stakeholders, the media and staff from the SESAR Joint Undertaking. Passengers were impressed as the performed Continuous Descent Approach for example was perceptible: the aircraft was much quieter and the descending felt smoother. By the way, Novair offset 21.93 tons CO₂ caused by this demonstration flight to not spoil the eco-balance of the project. Offsetting is realised with a compost project in Egypt of Climate Neutral Group, mother organisation of GreenSeat.



short news

SESAR at ATC Global - Amsterdam



For the first time, the SESAR Joint Undertaking will be present at ATC Global in Amsterdam from 9 to 11 March 2010. Visit our booth and book your agenda to attend the annual SESAR Forum on 9 March 2010 (free & open to all but limited room capacity). A half day session where you can hear from the SJU top management and several top speakers the progress and outcome of the SESAR programme. Don't miss the AIRE announcement either, a common SESAR-FAA briefing on the results of one year of green flight trials. SESAR at ATC Global is a unique opportunity to get fully informed about the future of ATM. Don't miss it. Registration can be done through the ATC Global website (www.atcevents.com).

Council adopts aviation package

The Council in September adopted two regulations to improve the performance and safety of the European aviation system - the first strengthens the Single European Sky legislation, while the second extends the tasks of the European Aviation Safety Agency (EASA).

The Single European Sky regulation amends the existing regulations adopted in 2004. Since their adoption it has proved necessary to consolidate and address a number of challenges, relating in particular to sustainable development, to performance of the networks in terms of reduction in delays and lower costs for airspace users, and governance issues. The regulation also sets a fixed deadline for the implementation of functional airspace blocks that are a tool for a more rational and efficient European airspace. In addition, it strengthens the central network function at the EU level, as well as the principles concerning the degree of autonomy to be accorded to national supervisory authorities responsible for overseeing the provision of aeronautical services in the Member States.

The second regulation extends EASA's competences to cover in future also the safety of aerodromes, air traffic-management and air navigation services. In addition, as far as air traffic management and air navigation services are concerned, the Agency will have to coordinate common safety rules with the new Single European Sky regulation and the related implementing rules.

Clean Sky Joint Undertaking flies solo



In November, the Clean Sky Joint Undertaking has been granted administrative and operational autonomy from the European Commission. This autonomy enables it to implement its own budget and execute its own work plan. The Clean Sky initiative aims to develop cleaner and quieter aircraft in order to establish an innovative and competitive Air Transport System. It will be built upon 6 different technical areas called Integrated Technology Demonstrators (ITDs): Smart fixed wing aircraft; green regional aircraft; green rotorcraft; sustainable and green engines; systems for green operations; eco-design. Similar to the SESAR Joint Undertaking, Clean Sky is organised as a Public-Private Partnership. More information can be found at www.cleansky.eu.

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