Although SESAR has now definitely moved from a planning stage to executing day-to-day activities, the daily work of the more than 2,300 experts working on SESAR projects is far from routine. Across Europe, SESAR’s project teams are working on profoundly changing the face of air traffic management, and we are already starting to see the results of their hard work. The activities scheduled under the first SESAR Release are progressing well, and our programme teams have now started preparing the ground for the second Release in 2012. We still have many challenges ahead, but we have definitely made good progress so far. Several projects have entered the execution phase in recent months. In this SESAR magazine, we have two in-depth articles looking at SESAR projects. The first article outlines how industry is helping to shape future Air Traffic Flow and Capacity Management Systems (ATFCM), through project 13.1.4. The second one looks at the Dynamic DCB project, which aims to help air traffic control better manage the balance between demand and capacity during the course of daily traffic operations.

Involving airspace users in the SESAR has been a priority since the start of the programme. In 2009, ten contracts were signed with Air France & its affiliate Régional, a consortium coordinated by Lufthansa, so it seems fitting that in this edition of the SESAR magazine we have an interview with Lufthansa’s Chief Pilot, who gives us a pilot’s view of SESAR. I think it’s clear that work at SESAR will never be business as usual.

Patrick Ky, Executive Director of the SESAR Joint Undertaking

Airspace users at the heart of SESAR

Partnership is a vital feature of SESAR’s work. Through its unique structure bringing together both public and private stakeholders across the aviation community, SESAR aims to eliminate the fragmented approach of ATM. In this context, the SESAR JU has fostered important working relationships with key stakeholders, such as airspace users, both civilian and military, in order to include their input in every step of the SESAR work programme.

Involving airspace users in the SESAR has been a priority since the start of the programme. In 2009, ten contracts were signed with Air France & its affiliate Régional, a consortium coordinated by

(Continued on page 2)
It is essential for the success of SESAR that the airspace users take fully part in the programme. They participate and analyse the outcomes of SESAR projects from a technical and efficiency perspective, reinforcing the user-driven approach of SESAR technologies and procedures.

Patrick Ky, SESAR JU Executive Director.

SESAR takes into consideration the needs of the whole airspace users’ community, and in particular looks for their input in the following areas:

- Flight operations, in particular in the area of fuel efficiency
- Flight planning processes and supporting systems
- Aircraft system specifications (avionics)
- Operations control processes (OCC) and supporting systems
- Data link
- Production planning processes (aircraft scheduling, network management) and supporting systems
- Crew training (including licensing, recruitment, etc.)
- Cost and revenue evaluation

Throughout 2010, the SESAR JU worked together with Eurocontrol and the European Defence Agency (EDA) to further involve military airspace users in SESAR activities. 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. MEPS will enable the participation of national military experts in relevant aspects of the SESAR work programme, via a structured organisation. The SESAR JU also expects to structure its relationship with military authorities in order to get the right level of cooperation on issues which go beyond ATM; such as procurement, planning, security or funding.

In addition to MEPS, the involvement of airspace users has been further strengthened by the establishment of a new airspace users’ office at the SESAR JU in Brussels. The new office aims to ensure closer working relationships with the SESAR officers and programme managers, in order to enable even more dynamic and informal information exchange, coordination and participation of the airspace users in SESAR. In particular, the office will help to coordinate specific items of interest, and increase communication between the SESAR JU and contribution managers from the various airspace user organisations directly involved in SESAR.
Air traffic management modernisation on a global scale

Airspace users are a central part of the SESAR programme. More efficient ATM will help save fuel, increase predictability of flight arrivals and departures, and help reduce flight times. As so many SESAR improvements will affect airspace users, it is important to ensure that they are closely involved in the programme. In a special interview Flight Captain Werner Knorr, Lufthansa Chief Pilot, explains how he sees the role of the airspace users in SESAR, and in particular what Lufthansa and its staff hope to gain from working with SESAR.

We now have the permanent airspace users’ office at the SESAR JU in Brussels. Is this another sign of your strong commitment to SESAR?

The Lufthansa Group operated more than 1 million flights – carrying more than 91 million passengers – in 2010 and continues to be a growing company. To stay successful we have a strong interest in implementing the highest safety standards, an efficient ATM system and capacity enlargements with the lowest possible environmental impact. This is what SESAR stands for and this is why we support its goals. The answer therefore is Yes, and we are happy to see that Manfred Mohr – a very experienced Instructor and A380 project leader - was selected by the European airspace user community for this important position.

Concretely, what are your top three priorities for Lufthansa in SESAR for 2011/12?

In the next 2 years we really want to take a step forward in progressing SESAR’s more than 300 projects from ideas on paper to our daily operations. We also want to make sure that all SESAR partners keep up the pace of change, and that developments on board our planes are aligned with those on the ground. Thirdly, we have to find ways to shoulder the large investment in SESAR, without harming the opportunities of the airline industry, and in particular without making air travel unaffordable for European citizens.

How aware are Lufthansa flight operations staff about SESAR?

All our pilots are very keen to fly in a modern Single European Sky (SES). When they return from the United States they always wonder why this is not possible in Europe. The SES has been a goal for decades, but the pace of change in the last 10-20 years hasn’t been enough to make them strongly believe it will come true. It is up to the SESAR Joint Undertaking to convince them that there will now be a real revolution or evolution. And the better and faster your results, the more attention you get from them.

Could you tell us the main positive points so far in our partnership and the main areas for improvement?

The SESAR JU has really been able to bring everybody to the table: ANSPs, airports, business aviation, low fare and premium airlines, manufacturers, etc. The SESAR JU has really been able to bring everybody to the table: ANSPs, airports, business aviation, low fare and premium airlines, etc. I hope the SESAR JU will be able to keep everyone committed to the programme, because all stakeholders are needed and bonded for success. Nevertheless, we really see the need to make our steps forward faster. For the benefit of the environment and European citizens, we have to overcome our inefficient way of organising ATM.

Could you describe for us one specific project taking place in 2011 that you are particularly proud of?

As far I know, only restricted releases are planned until the end of the year. However, we are more than happy to participate whenever and wherever for Precision Area Navigation and Controlled Descent Approach projects. Hopefully, we have the chance to use more frequently and regularly the reserved military airspaces (TRAs). Last but not least, AIRE optimised flights continue to bring benefits to us and our airlines.
Paving the way in environmental standards

Air traffic management affects when, how far, how high, how fast and how efficiently aircraft fly. These factors in turn influence how much fuel an aircraft burns, the release of greenhouse and other gases from its engines and how much noise it makes. ATM enhancements, through the optimisation of horizontal and vertical flight profiles, have the potential to dramatically reduce in-flight CO2 emissions. An important part of SESAR’s work in this area stems from involvement in AIRE (the Atlantic Interoperability Initiative to Reduce Emissions), which was launched in 2007 in cooperation with the FAA. The SESAR JU is responsible for managing the initiative from a European perspective.

With the application of CDA procedures, up to 100 kg of fuel can be saved on one arrival, which means an emissions reduction of 300 kg in one direction.

Final results of this cycle of AIRE projects are expected in early 2012. However, initial results have already shown that through the optimisation of operations alone, it is possible to make significant gains in terms of CO2 emissions, and to lower noise levels in and around airports. AIRE has proven that, without major technological investment, the value of working together towards common goals can be enormous. This is the partnership spirit in practice.

AIRE in action: The REACT-CR project

One of the projects selected in 2010 under the terminal operations category is the REACT-CR project (Reduction of Emissions using CDAs in TMA in Czech Republic). The project, led by Czech Airlines, aims to implement a Controlled Descent Approach (CDA) on flights from Moscow, Amsterdam, Paris and Bucharest landing at Ruzyně Airport in Prague.

Conventional descent procedures use the principle of descent in steps, combining periods of descent with periods of horizontal flight, during which engine revolutions have to be increased. By using the proposed CDA procedure, aircraft can descend at a constant 3° angle throughout the entire approach, reducing fuel burn and therefore CO2 emissions. In addition, the initial and final approach will take place at higher altitudes above the ground, thus minimising both engine output and noise.

Czech Airlines estimate that the full deployment of CDA procedures at Ruzyně Airport could reduce CO2 emissions by approximately ten thousand tonnes annually, along with decreasing levels of noise from aircraft by 5 dB.

Czech Airlines is cooperating on this project with the Air Navigation Services of the Czech Republic, Prague Airport, and the Spanish corporation Pildo Labs. The project held its first flight trial on 13 April on a Czech Airlines flight from Bucharest, Romania, to Ruzyně Airport in Prague. Flight trials are expected to continue until September 2011, after which the project will be evaluated and a proposal for specific CDA procedures for Prague – Ruzyně Airport will be presented, with a view to implementation in 2012.
Pioneering and progressing: Assessing the progress of SESAR with Florian Guillermet

The SESAR programme was launched on 3 June 2009. Now almost two years since its launch, it’s a good time to take stock of the status of the programme’s 300 projects, assess progress in the execution of the first SESAR release and the first project deliverables. In a short interview, Florian Guillermet, SESAR JU Chief Programme Officer, gives his evaluation of the programme and the first release, and looks at some of the challenges facing SESAR in the second half of 2011.

At mid 2011, what is the situation of the SESAR programme in general?
It’s almost time to celebrate the second anniversary of SESAR’s launch, and after two years of hard work we’ve made great progress: the ramp-up phase of the programme is complete and 85% of projects are now in full execution mode; the first concrete deliverables are arriving; all the programme management processes are now in place; and the programme delivery approach through SESAR Releases has been implemented. In addition, we are now fully integrating airspace users into the programme and they will directly participate in the execution of projects. Overall, we are on track.

What is the status of the first SESAR Release? How confident are you in SESAR’s first achievements?
We are closely monitoring the progress of the first SESAR Release. So far, two exercises have already been performed according to schedule, and analysis of their results is on-going. The release monitoring and maturity assessment is mainly performed through System Engineering reviews that aim to control the way the release is being developed. The next review in June 2011, will give a much more accurate idea of the status of the first SESAR Release.

The first SESAR Release is pioneering in its approach, as this is the first time that R&D in the field of ATM has been organised in this way. Of course, not all the solutions we develop will ultimately prove to be interesting. In particular, business cases will have to be carefully assessed at the end of the Release before any decision can be made on their industrialisation. It is also important to manage expectations – this first SESAR Release is far from addressing the entire SESAR concept, but it is already quite ambitious in the fields that it covers, such as 4D trajectory, remote towers, and DMAN-AMAN integration.

What are the main challenges facing the programme in the second half of 2011?
The delivery of the first SESAR Release is of course one of our highest priorities. The complexity of the programme in terms of content and interdependencies, means that plans have to be followed quite carefully. We will surely face some difficulties, specially since we will be performing validation as close as possible to the real life environment.

In addition to the delivery of the first Release, we have started defining Release 2 based on work performed on the Validation and Verification roadmap. The first Release was mainly bottom-up and we need to progressively implement a more strategic planning approach for the future releases, connected as closely as possible to our members’ technical roadmaps. Careful strategic planning of Release 2 will help us to be aware of any potential risks that could affect progress.

In this context, a number of critical risks have already been identified from a content point of view – such as trajectory management and SWIM – and are mitigated through action plans that are being implemented and that will require significant focus and discipline from the entire programme.

The last two years have been extremely intense for all programme participants. We now have to keep the momentum going, and above all maintain participants’ motivation and enthusiasm at being part of the SESAR family. There is still a lot of challenges ahead of us!
One of the key SESAR projects in the area of Air Traffic Flow and Capacity Management Systems (ATFCM) is Project 13.1.4, managed by Dominique Latgé, from Thales. He explained how the project will enable industry to contribute to future ATFCM systems through SESAR.

SESAR project 13.1.4 deals with the impact of new roles and responsibilities on regional, sub-regional and local ATFCM sub-systems. The project, which recently started execution, is led by Thales, with participation from Indra, NATS and Eurocontrol.

Following the evolution of the Single European Sky (SES) implementing rules, the operational concepts definition in SESAR WP 7 [Network Operations] and the high level system design in WP 13 [Network Information Management System], project 13.1.4 gives the floor to industry to define a system functions mapping for each system and sub-system inside the network, for each level and each step of SESAR.

The project addresses the evolution of the Network Information Management System (NIMS) from a centralised regional system to a more collaborative and distributed system based on the Functional Airspace Blocks (FABs). One of its objectives is to help the transformation of the current regional CFMU system into marketable technical solutions for the sub-regional and local levels.

Project 13.1.4 also aims to define the collaborative decision making processes needed by this new organisation of the network. Driven by the new roles and responsibilities at the different levels (regional, sub-regional and local), the project ensures that each actor will find the right information at the right time to take the right decision.

Industry gets the floor
Projects in WP 13, project 13.1.4 is led by industry. Industry contributors will use the knowledge and experience they have developed in other parts of the world and with ANSPs at a local level in Europe.

Thales will use experience from work with South Africa’s air traffic & navigation system, where they helped to specify, develop and validate of a sub-regional system for air traffic flow management: CAMU (South Africa Central Airspace Management Unit). Indra, one of the other project partners, will use knowledge gained from work with Aena on local short term prediction tools and airspace management tools.

The project raises many questions, such as how can we integrate network operations in a local area control centre on a flow management position? What products are needed inside Europe and at FAB level? What do we need to take into account for areas outside Europe?

The position of manufacturing industry in SESAR projects, in particular in system projects related to air traffic control (WP 10), airports (WP 12) and SWIM (WP 14), makes it a strong technical enabler for information sharing, and is another key element to building a coherent industry view for the whole ATM system.

The FAB initiative, Nextgen and other world regions Thales is linked to NUAC and FABEC, Eurocontrol to FABEC and Blue Med, NATS to the FABUK-Ireland, and Indra to the SW Portugal-Spain FAB. Project 13.1.4 partners therefore have a key role in managing these links, so that the project responds to operational needs expressed by the FABs and develops future architecture solutions based on current FABs improvements. This will ensure a buy-in at each level, and a rapid deployment of SESAR solutions inside Europe.

The ATM industry partners in project 13.1.4 can also help to bridge the gap between SESAR and Nextgen solutions, thereby ensuring interoperability. Thales, for example, is planning to include Metron Aviation as a participant in its own contribution, with the aim of better responding to the expectations of the ATM community.

In addition, the product definition strategy – based on Nextgen and other world regions – will be integrated into project 13.1.4’s solutions, within the limits of SESAR’s intellectual property rights.
Next steps
The project deliverable is an architecture solution built on exchanges between industry partners and an evaluation led by Eurocontrol and NATS. This architecture definition will be implemented in the level three projects in sub-WP 13.2, and will be validated through operational validation exercises defined and managed by WP 7. The goal is to produce a first release of this architecture document by the end of 2011.

SESAR in depth

Dynamic DCB: Bridging the gap

Othmar Schnabel, Project Manager at DFS for project 7.6.5, explains how the Dynamic DCB project – including the STAM exercise for Release 1 - is bridging the gap between Air Traffic Flow and Capacity Management Systems (ATFCM) and air traffic control.

Dynamic DCB is a process that takes place on the day of operation and aims to maintain the balance between demand and capacity during the course of daily traffic operations. SESAR Project 7.6.5 (Dynamic DCB) aims to design and validate a feasible and seamless dynamic DCB process managed at network level and fully integrated with airports, en-route and airspace users’ planning and execution processes.

In step 1, the plan is to further develop short-term Air Traffic Flow and Capacity Management (ATFCM) measures, the so-called STAM.

STAM – building on ANSP achievements

Today, the crude application of ground regulations limits the traffic entering a sector through the systematic allocation of departure slots to all concerned flights, regardless of how they contribute to the expected overload. This process, although still useful in cases of major imbalance, is no longer acceptable when demand does not significantly exceed available capacity.

STAM (Short Term ATFCM Measures) consist in smoothing the sector workload by reducing traffic peaks using short-term measures such as small ground delay, flight level capping or small re-routings applied to a limited number of flights making the traffic less complex for ATC.

STAM builds on the achievements of ANSPs to improve the efficiency of the local flow management process and promotes them through:

- The definition of a unified process in accordance with the ATFM implementing rules, reconciling ATFCM planning activities with tactical ATFCM interventions up to the ATC working horizon;
- The definition of clear procedures based on this process, to ensure Collaborative Decision-Making (CDM) involving all partners, enabled by transparent information sharing throughout the network.

Stakeholder Commitment
Project 7.6.5 is led by DFS with participation from Aena, DSNA, Eurocontrol and NATS. Since its kick-off in October 2010, the project’s partners have produced the Operational Service and Environment Definition (OSED) step 1, and defined the Release 1 live trial scope and objectives.

On 1 March 2011, a workshop was held in Brussels to present the on-going work with active participation from ANSPs with 50 FMPs, airspace users, network managers, and the project members. The strong expectations of the different actors led to a very productive debate resulting in a high level of commitment. This paves the way for a successful SESAR Release 1 live trial and deployment in the CFMU 16 operational release.

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SESAR Release 1 - STAM validation exercise

A “V3” validation exercise, in the form of a live trial, will take place on 8-9 and 10 November 2011, with the participation of London, Reims and Maastricht. The trial aims to validate the overall dynamic DCB process as described in the OSED. The focus will be on areas where a risk has been identified or where gaps in the process will be covered by new prototyped features (consolidation of occupancy counts monitoring values, support to information sharing with network view on hotspots, and CDM coordination via instant messaging).

The project 7.6.5 team is working with WP 13 and WP 3 to prepare the validation infrastructure (network manager validation platform hardware and software), and a framework to capture and process the key performance area indicators that will be used in the validation report.

Validation to deployment: Bridging the gap

STAM validation activities will be carried out in two phases:

- Phase I (until end 2011) will demonstrate the benefits of improved information sharing and collaborative decision making.
- Phase II (until 2013) will focus on the support to situation analysis and measures implementation.

STAM deployment will continue beyond 2013 in order to enlarge the concept implementation to all area control centres interested in STAM.

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short news

2010 SESAR JU Annual report

The SESAR JU is pleased to announce that the 2010 Annual Report is now available. The report highlights the progress made under the different WPs throughout 2010, looks at some of the programme’s key achievements for the year, and outlines examples of successful cooperation achieved through SESAR’s partnership with all aviation stakeholders. Download the report from the SESAR website.

Patrick KY at the European Parliament

On 25 May, the TRANSPORT committee from the European Parliament held its annual hearing on SESAR. Members of the committee – chaired by MEP Brian Simpson - were presented with an update on the SESAR work programme. Patrick Ky described the main technical advantages compared to today’s system and the next steps for the coming year, including deployment. There were many comments and constructive remarks from the floor for a real push forward for the programme. The relationship with the American system NEXTGEN and cooperation with third countries was raised, as well as queries as to the future governance and funding. MEPs showed strong interest in the results of the McKinsey macroeconomic study on SESAR impact and noted the expected benefits as making a case for SESAR.

Matthew Baldwin, the Director of Aviation in the European Commission’s DG MOVE provided some clarity on the process for a Commission proposal on deployment and the funding potential while praising Mr Ky for his strong leadership of the SESAR programme.

SESAR at the ICAO Symposium: Towards one sky

The SESAR JU – together with the European Commission, Euro control & EASA - will be present at this year’s ICAO Global Air Navigation Industry Symposium in Montréal, taking place on 20-23 September 2011. The symposium, entitled “Towards one sky”, will be an opportunity for global industry partners to share their latest developments, to discuss emerging issues and to map out next steps in achieving a seamless, interoperable, global air navigation system. The four European actors will have a joint booth at the three-day event to inform and promote the EU point of view at this Global official conference. For more information visit the ICAO website: http://www.icao.int/

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