Issue 8 | April 2013

FROM INNOVATION TO SOLUTION

SESAR JOINT UNDERTAKING magazine

Editorial

"The SESAR Joint Undertaking was set-up as a Public-Private Partnership to fully engage ATM stakeholders in the development of future ATM systems, while having one single accountable entity to drive the programme forward. Our structure relies on the principles of partnership, economy, subsidiarity, effectiveness and efficiency. And efficient we are as the programme increases its deliverables.

Together with our partners, we made significant progress in 2012 and I am pleased to report that we have delivered a number of tangible results. These results can be witnessed through a number of validation successes, including: the world's first Initial 4D flight, remote towers, GBAS catII/III stations, a live demonstration of the SWIM infrastructure and the updated 2012 edition of the ATM Master Plan. The 2013 World ATM Congress served as an opportunity for SESAR to showcase these achievements, many of which are highlighted in this issue. Our results demonstrate how the SESAR programme has already made a substantial contribution to the high level goals of the Single European Sky.

But not only is SESAR achieving common European solutions, we have also secured interoperability and synchronisation with the US' FAA (NextGen programme) and ICAO's Aviation System Block Upgrades (ASBU). In effect, both ICAO's Global Air Navigation Capacity & Efficiency Plan and SESAR's European ATM Master Plan are performance-driven documents, sharing the same philosophy of modernising Air Traffic management through harmonised systems, procedures and regulations deployed in mirroring step changes (or "blocks").

With SESAR, we are progressively moving from an ATM system with somewhat independent components to a system of systems whereby the degree of interdependency, integration and the level of automation are much higher. The technical challenges ahead of us are enormous but we have the right partnership to face them successfully and achieve real impact. And we do. So much so that the European Commission, supported by the majority of the ATM community, intends to continue the SESAR Joint Undertaking under the next financial perspectives."

Patrick Ky, Executive Director,
SESAR Joint Undertaking

Content

EUROPEAN COMMISSION EUROCONTROL

Interview

Jacqueline Foster, Member of European Parliament

Jacqueline Foster is a Conservative MEP for the North West of England and is the Conservative Party's Spokesman on the Transport & Tourism Committee, a position she also held between 1999 and 2004. In addition, she is Vice President of the Sky & Space Parliamentary Intergroup. Prior to her being elected to the European Parliament in 1999, Mrs Foster worked in the Airline Industry for British Airways for more than 20 years and has also worked in the aerospace, space and defence sector.

In this interview, Mrs Foster discusses the implementation of the Single European Sky and in particular how SESAR can help contribute to its success. She also puts forward her own specific expectations for SESAR and looks at the issue of how Member States and Stakeholders can further support innovation in ATM.

Jacqueline Foster, Member of European Parliament

1. Mrs Foster, in your recent draft report on the Implementation of the Single European Sky Legislation you express concern about the timing of the SES implementation. What are the reasons for this concern?

The whole of Europe is desperately seeking economic growth. We cannot have economic growth without efficient, modern air traffic management. Europe's needs in the 21st Century are, at the moment, being met by 20th Century technology and processes. Delaying implementation means holding back growth. The defragmentation of airspace is still an area of huge concern. Only two of the nine FABs have been completed on schedule, all the others have missed the deadline. If we want to keep people across Europe moving efficiently, we need to implement The Single European Sky without delay.

2. In your view, how can SESAR contribute to the success of the SES implementation?

The Single European Sky needs SESAR. We cannot have one without the other. At the moment, each Member State has its own air navigation service provider, each following its own rules and procedures. To add to this, some providers have not benefited from regular investment. As a result, we have a complicated and expensive system. To improve efficiency, alongside better co-ordination with airlines, airports and meteorological centres, we must implement SESAR and the SES.

3. What do you expect from a timely deployment of SESAR or in turn what are the risks of a delayed deployment?

The GDP of the EU could be boosted by a massive Ð419 billion if SESAR is introduced according to plan. A study on the macro-economic benefits of SESAR also indicates that many thousands of new jobs will be created and, at the same time, some 50 million tons of CO2 could be saved.

The risks of delay, for example by 10 years, means a negative impact on growth and jobs. In short, this would be disastrous.

There are huge benefits for competition and importantly the consumer, shorter distances flown, meaning reduced fuel burn obviously will bring down the price of the ticket, creating a more competitive industry. This would certainly be in tune with the needs of the passenger and fit for the 21st century.

We also have to remember that Europe risks being left behind by delaying implementation. Other nations, not least our competitors in the Middle East and Asia, are also investing heavily in better air traffic management. In particular, projects such as the US NextGen system. Companies in Europe should not be at an economic disadvantage with their competitors elsewhere because we failed to act.

4. How can Member States and stakeholders support the implementation of SESAR and the SES?

Well, we need to appreciate the impact SESAR and the SES can have on our economies as I have said. Significant time and money has already been invested in getting us to this point. That means the first, tangible results from the investment must be widely shared and appreciated and that the next stages understood and agreed. All of us - Member States, politicians and industry - must maintain this support and also ensure that the technologies are interoperable allowing them to be used worldwide.

Finally, we cannot ignore the fact that we are woefully short of runway capacity in some Member States and it is imperative that we address this urgently. It is no use complaining about third countries having advantages over Europe when we are not doing enough!

It is clear, we must push hard now to reap the benefits of a full and timely introduction of the SES and SESAR.■

Focus on

SESAR at World ATM Congress 2013

SESAR is delivering

In February 2013, SESAR Joint Undertaking welcomed the world of ATM at the World ATM Congress 2013. The theme of this year "From Innovation to Solution", provided the backdrop for SESAR and its guests to present the progress achieved by the programme so far. During the course of the three day Congress, SESAR was pleased to host a Forum and three workshops, whereby 650 attendees were privy to SESAR's concrete deliverables to date, as well as the upcoming actions designed to reach the objective of developing a modernised air traffic management system for Europe.

"Yes.
Yes we did.
Yes we do.
Yes we will.
Yes to a programme that can no longer be ignored."

Patrick Ky, Executive Director SESAR Joint Undertaking

Patrick Ky, Executive Director SESAR Joint Undertaking opened the Forum, attended by 250 participants, with a direct question: "SESAR: did we deliver?"

The answer is a resounding "Yes. Yes we did. Yes we do. Yes we will.
Yes to a partnership of 3,000 persons.
Yes to the active involvement of all ATM stakeholders including airspace users, staff, NSAs, SMEs, universities, industries, ANSPs, supervisory authorities, the military, ...
Yes to over 10,000 SESAR-labelled flights.
Yes to 80% of SESAR projects' output tested in a real life environment.
Yes to the first System Wide Information Management (SWIM) live demonstration interconnecting several different systems.
Yes to the first remote tower ready for operation.
Yes to the demonstration of SESAR benefits in city pairs connecting over 8 European airports.
Yes to several World premieres: I-4D flights; SWIM interconnections; GBAS catII/III stations; etc.
And Yes to a programme that is driving the change

SESAR welcomed high-level endorsement of the SESAR Programme at the World ATM Congress. (From left to right) **Matthew Baldwin**, Director Air Aviation and International Transport Policy, DG Transport and Mobility (MOVE), European Commission, **Frank Brenner**, Director General of EUROCONTROL, **Patrick Goudou**, Executive Director European Aviation Safety Agency (EASA).

in the European ATM Community, as well as in the international arena."

"The bottom line is performance. It's all about performance!" summarised **Matthew Baldwin, Director Air Aviation and International Transport Policy, DG Transport and Mobility (MOVE), European Commission**, in his intervention.

Paying tribute to the work delivered by SESAR Joint Undertaking, Mr. Baldwin stated *"Since 2007, the SESAR Joint Undertaking has set up and managed a complex research, development and validation programme that has changed the way ATM R&D is done in Europe."*

Looking at SESAR's next phase - deployment - Mr. Baldwin announced *"We [the Commission] intend to set up a binding framework at EU level and within the Single Sky framework that will enable operational stakeholders and the Commission to organise, execute and monitor SESAR deployment. This binding framework will be built on the principles that we have agreed with the stakeholders: 1. SESAR deployment must be driven by performance. It must contribute to achieving the Single Sky performance objectives. 2. SESAR deployment can only be effective if it is timely, synchronised and coordinated through an effective governance, involving all the relevant stakeholders."*

Mr. Baldwin went on to describe SESAR deployment principles, based on the notion of Common Projects, aimed at identifying, with the consensus of stakeholders and Member States, and deploying the essential operational changes in the ATM Master Plan. The first Common Project is already being set up as a pilot case, under the responsibility of SESAR JU: *"The SESAR JU is selecting the potential operational and technological changes candidates and assessing their maturity and business case. The pilot common project will probably address around 10 of the 18 essential operational changes. We plan to consult stakeholders on this proposal in view of adopting the first common projects by the end of this year."*

This positive message supporting the tangible benefits delivered by SESAR was further reinforced by **Frank Brenner, Director General of EUROCONTROL**, who concluded his speech with *"Please believe me when I say that things are happening and we are moving from innovation to solutions. I think 2013 will see us take a big step in the direction of deployment forward."*

In his speech, Mr Brenner also put forth the proposal of consolidating centralised services to reduce the costs of parallel deployments amongst multiple ANSPs: *"It makes a lot of sense to see if there are opportunities for a more collaborative approach to deploying SESAR projects."* He later went on to add that *"Typically candidates to become centralised services are those involving data, for example flight plan data, 4D trajectory calculations or aeronautical information."*

Mr Brenner then addressed those involved with SESAR to *"give some thought on whether the very valuable results now being developed in SESAR should be best deployed at local/national/ANSP/centre level, or on a regional/FAB level or on a central or European level."* This notion was also echoed by **Richard Deakin, Chief Executive Officer, NATS,** who also stressed the importance of change management, as well as a focus on customers.

Speaking at from a wider ANSP perspective, **Krzysztof Banaszek, President of PANSA** demonstrated that the Central and Eastern European (CEE) ANSPs are clearly involved in the SESAR Programme. On speaking at the Forum, he also highlighted that the CEE is a central part of the Single European Sky and stressed the importance of a two way partnership with the purpose of both contributing to and benefiting from the Programme.

From a regulatory perspective, **Patrick Goudou, Executive Director European Aviation Safety Agency (EASA)**, reinforced EASA's commitment to SESAR: *"As a fundamental part of the foreseen technological development, we are committed towards the success of SESAR deployment. We are taking our due part of it, by continuously providing the contribution required from us."*

In his intervention, Mr Goudou reaffirmed the role of EASA in helping SESAR Solutions move to implementation, and eventually, for the Single European Sky to become a reality: *"Regulation should be there to support the implementation of systems and the use of new technologies. For this reason EASA proactively supports the efficient implementation of the Single European Sky initiative and is ready to broaden its support even further through extended competencies"*. He also took the opportunity to highlight that *"we do not regulate safety. We enable economic growth in the European region by supporting standards, maintaining trust and delivering effective ways to implement new technologies."*

SESAR welcomed high-level endorsement of the SESAR Programme at the World ATM Congress. (From left to right) **François Quentin**, Chairman of the Board of Directors of HUAWEI France, **Krzysztof Banaszek**, President, PANSA, **Richard Deakin**, Chief Executive Officer, NATS.

The notion of proper regulation to implement sustainable innovation was further stressed by **François Quentin, Chairman of the Board of Directors of HUAWEI France**, in his intervention on innovation: *"growth is not sustainable if things do not happen in a way to achieve objectives. This includes establishing standards and international agreements across the world to make it a seamless system when needed."*

Referring to examples of ruptured innovation in the communication technology domain, Mr Quentin proposed that *"Communication technology might bring some very good value to aviation."* In his view, communication technologies used by aviation are obsolete and *"there is a need for something new. And something new should be a worldwide communication system, connecting aircraft, flight operations and ATM controllers, connecting passengers to airline servers and to the Internet."*

The technology is already available, from satellites to networks, and its benefits must now be brought to passengers, airlines and every stakeholder of the aviation community. *"It's a massive challenge to convince every stakeholder to plan for a worldwide system and for the associated ground based networks which are needed to implement the system worldwide. But it will bring solutions to problems which have no solutions today. It will create new possibilities and new business"* emphasised Mr Quentin.

"SESAR has already delivered anywhere between 20 % and 75 % of SESAR high level goals"

Florian Guillermet, Deputy Executive Director Operations & Programme, SESAR Joint Undertaking
"SESAR is delivering today"

A glimpse at selected SESAR delivery to date

More particular results and benefits delivered to date by SESAR were shared in an address by **Florian Guillermet, Deputy Executive Director Operations & Programme, SESAR Joint Undertaking**, at the World ATM Congress.

Mr Guillermet shared figures of SESAR's contribution to Single European Sky's high level goals, secured through Validation and the Releases delivery approach: *"Depending on the strategic performance objective, SESAR has already delivered anywhere between 20% and 75% of Single European Sky's high level goals thanks to its performance-driven approach".*

For each of the 6 Key Performance Areas of (1) fuel efficiency, (2) cost effectiveness, (3) airspace capacity, (4) airport capacity, (5) predictability and (6) safety, Mr Guillermet gave a preview of corresponding results delivered within SESAR Release 2.

These early results were presented during an in-depth dedicated workshop on "How SESAR contributes to SES performance". Speakers from NATS, AENA, ENAV, DFS, DSNA, EUROCONTROL and NORACON provided concrete results of validated SESAR Solutions in front of an audience of over 100 captive listeners.

The **'Arrival Manager and Extended Arrival Manager Horizon'** SESAR Solution aims at answering constraints linked to TMA (Terminal Manoeuvring Area) overloading, sequence building at low altitudes and inefficient flight profiles. It produced results in fuel-efficiency and predictability with a 16% reduction of fuel burn per flight during descent and a 78% to 87% reduction in aircraft stack holding time, see figure 1.

The SESAR Solution **'Conflicting ATC clearances'** tackled safety and in particular the detection of conflicting situations; the timely resolution of detected situations and the rate of false alert. It resulted in a 5% reduction of runway conflict.

A SESAR solution on **'Advanced flexible use of airspace'** addressed the areas of airspace capacity and fuel-efficiency and in particular the design and integration of variable profile area. This solution can produce very positive effects on specific routes: a 75% reduction in extra nautical mile, leading to a 75% reduction in extra fuel burnt and emissions.

The **'Time based separation'** SESAR Solution impacted results in airport capacity, fuel efficiency and time efficiency & predictability. The outcome of the exercise was an increased aircraft landing rate of up to 5 additional aircrafts per hour and a reduction of holding time of maximum 9.4 min in strong headwind conditions, see figure 2.

Finally, the **'Remote Tower' SESAR Solution** provides a cost effective solution to deliver remotely tower information and separation services, with positive consideration of human performance, and whilst ensuring safety.

FIGURE 1: EXTENDED ARRIVAL MANAGEMENT

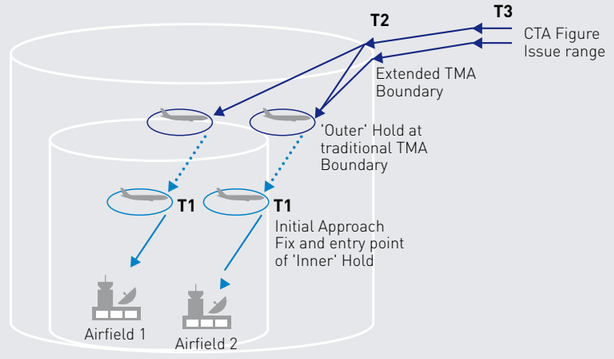
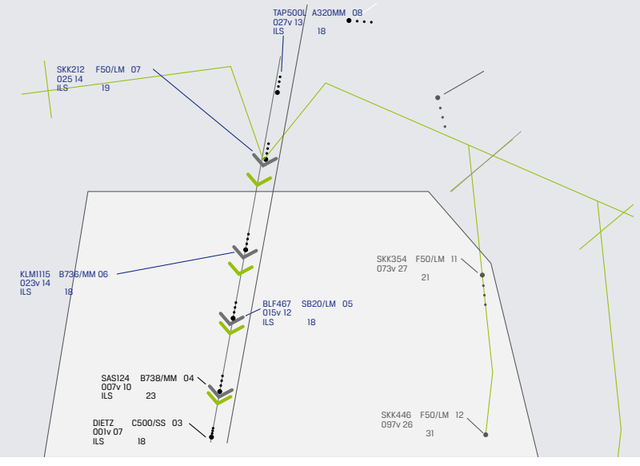


FIGURE 2: TIME BASED SEPARATION



Visit http://www.sesarju.eu/atc/sesar-workshops for the full overview of results.

SWIM: live success

During 3 packed demonstration sessions, gathering over 200 participants, 10 SESAR partners gave a live demonstration on the agility and flexibility of the System Wide Information Management (SWIM), the intranet of ATM.

Participants at the SESAR SWIM live demonstration, which featured 31 systems from 10 different partners: *"Now I understand what SWIM is all about"*; *"SWIM is becoming a reality"* said some of the participants.

SWIM consists of standards, infrastructure and governance enabling the management of ATM information and its exchange between qualified parties via interoperable services

For the live demonstration, a fictitious scenario involving 4 flights was created, two active and two planned flights. Key steps of the scenario involved:

- **Step 1** : the creation of the 4 flight plans
- **Step 2** : a volcanic eruption with an ash cloud entering the airspace leading to airspace closure and flight rerouting
- **Step 3** : a change in weather with significant amounts of snow reducing runway capacity
- **Step 4** : an obstacle on an airport's runway leading to flights diversion.

Figure 3 presents an overview of the scenario.

This was not intended to accurately represent of the target SESAR concept but it allowed for **demonstrating the use of various SWIM services and technical infrastructure developments**, as well as the use of formal definitions of information and services to support the interoperability.

This live demonstration shows that SWIM is moving closer and closer to deployment and becoming a reality. SWIM is a means to unleash the power of information. Now it is up to the ATM stakeholder community to start benefiting from such advances. ■

FIGURE 3: EXAMPLE PROVIDED DURING LIVE SESAR SWIM DEMONSTRATION

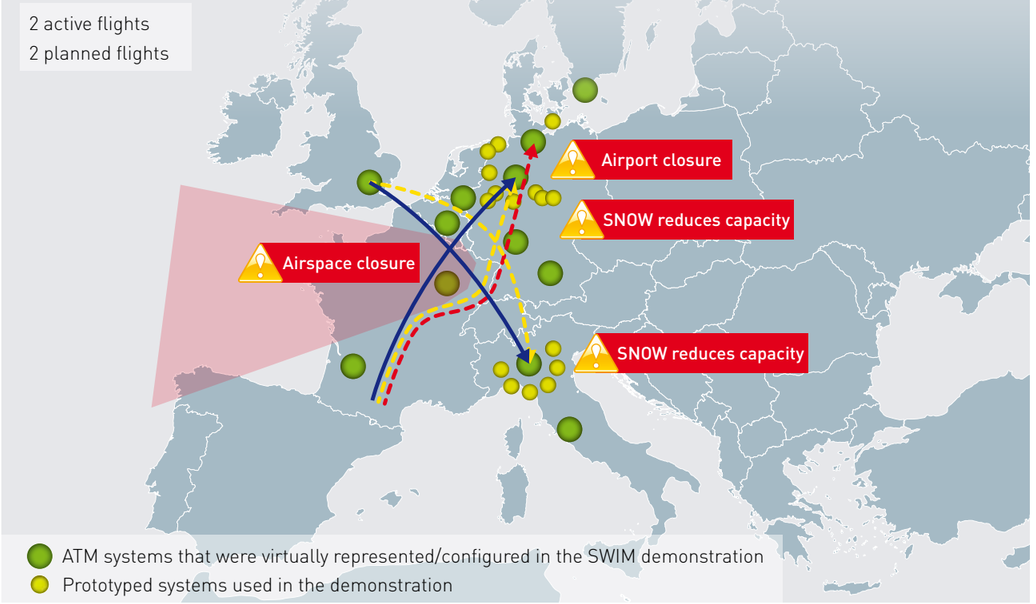
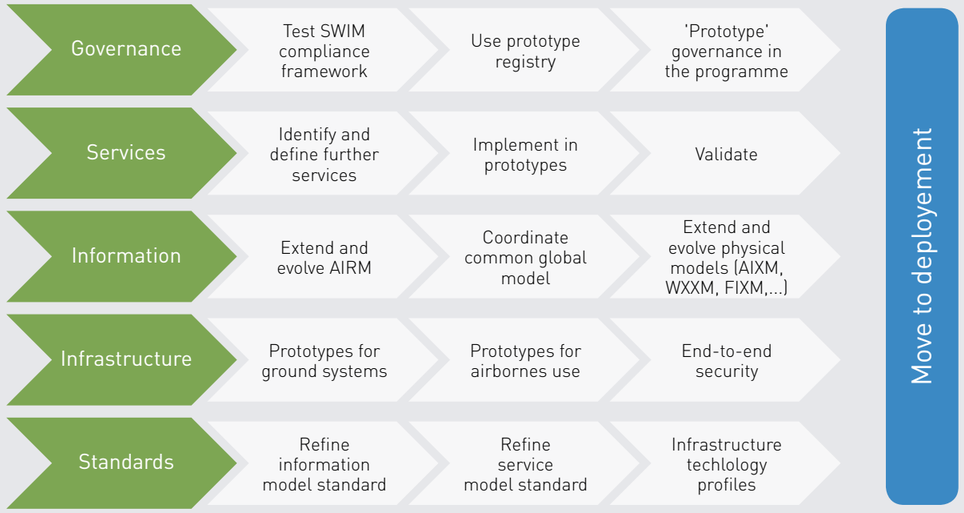


FIGURE 4: WHAT'S NEXT WITH SWIM IN SESAR?



Remotely Piloted Aircraft Systems integration in ATM

An impressive panel to discuss *"RPAS integration in non-segregated airspace and ATM environment: myth or reality?"* featuring representatives from the European Commission, French DGAC, LFV, IFATCA, the UK Royal Air Force, ASD, SESAR Joint Undertaking and EUROCONTROL.

For its final workshop, SESAR Joint Undertaking gathered experts from the civil and military fields, as well as representatives of the European Commission, to discuss integration of unmanned systems in ATM. Speakers were unanimous in confirming that synergies with the current SESAR work programme are crucial for successful RPAS development in the civil and military realms: *"The use of RPAS in civil aviation is growing and it is now a question of how, not whether, to integrate them into the existing air traffic. They must adapt to the ATM system; not the other way around,"* clarified **Patrick Ky, Executive Director SESAR Joint Undertaking**.

In this context, an R&D roadmap was developed that schedules their initial integration by 2016. This roadmap is aligned with the European ATM Master Plan (linked to the ICAO Global Plan and the Aviation System Block) and harvests potential opportunities for quicker integration. *"I can confirm that the 2013 SJU's Work Plan includes some demonstration activities which will allow gathering the first important information in terms of ATM integration in different operational scenarios,"* added **Matthew Baldwin, Director Air Aviation and International Transport Policy, DG Transport and Mobility (MOVE), European Commission.**

The roadmap identifies integration requirements and outlines operational and technological system gaps -and their enablers- to reach the 2016 integration objective. In addition, important issues such as privacy, insurance, liability, data protection and societal acceptance will have to be adequately addressed when developing regulations leading to a foreseeable proliferation of RPAS applications.

SESAR calls for Remotely Piloted Air System demonstration activities

The SJU has launched a Call for Proposals to select and co-finance around 10 projects offering SESAR integrated remotely piloted air system (RPAS) demonstration activities. The deadline for submitting proposals is the 31st of May 2013 at 15:00 CET.

The purpose of this Call for Proposals is to select a number of 'Demonstration Activities' Projects, including integrated pre-operational flight trials activities, (the "Demonstration Projects"), which shall aim at:

- demonstrating how to integrate RPAS into non-segregated airspace in a multi-aircraft and manned flight environment, in order to explore the feasibility of integration with the wider aviation community by 2016;
- focusing on concrete results filling the operational and technical gaps identified for RPAS integration into non-segregated airspace; and
- capitalising on the SESAR delivery approach by providing synergies, risk and opportunities, with the overall SESAR programme.

The Demonstration Activities shall:

- be relevant at European scale;
- be performed in European Union and/or EUROCONTROL member States;
- cover various types and sizes of RPAS, and
- be performed between the third quarter 2013 and first quarter 2015

For more, visit www.sesarju.eu/about/procurement#procurement-1210

SESAR and the Rotorcraft Community – ready, steady, GO!

2010/11, saw the involvement of a team of independent experts from the General Aviation (GA) and Rotorcraft (R) sector, tasked to review the Concept of Operations (ConOps) with the aim of ensuring that the document was inclusive of GA/R inputs at all levels. The outcome of the work done has resulted in the update of a fundamental summary document (SESAR ConOps at a Glance) with firm recommendations to the SESAR JU for follow-up activities based on a technical task list, ConOps updates and the SESAR Master Plan.

Following EUROCONTROL's invitation to provide AirSpace User (AU) expertise for the execution of the SESAR Programme, the new European Helicopter Association (EHA) tendered for and is now officially involved as AU providing rotorcraft expertise through the technical contribution of CHC, AgustaWestland and Eurocopter.

The EHA is representing the National Helicopter Associations Committee (NHAC) and the European Helicopter Operators Committee E.H.O.C. (Oil and Gas sector), with the technical support of Manufacturers. The EHA's goal is for the rotorcraft to be recognised as a safe and environmentally acceptable means of transportation. The EHA is actively engaged in many activities, rule-making tasks, committees and advisory boards within the European Aviation Safety Agency (EASA) and this important contribution is a great opportunity to make sure that all airspace users are taken fully into account under the future SESAR Air Traffic Management system. Rotorcrafts are covering a wide spectrum of air operations, from private flights to commercial passenger air transport (off-shore operations). SESAR's Concept of Operations (ConOps) encompasses rotorcraft operations, in particular those which are rotorcraft-specific

The mission of the EHA is to speak as THE voice for the European Rotorcraft industry at the European institutions and elsewhere, including to the general public; representing and promoting the best interests of all sectors as an economically important, safe and sustainable industry essential to the success of European and National economies.

like low level IFR, Point-in-Space IFR approaches/ departures to/from non IFR installations and Simultaneous Non Interfering (SNI) operations at airports.

Low Level IFR is aiming to improve the safety and reliability of helicopter operations, in particular at night and (or) adverse weather conditions. Helicopters are not pressurised and most have no de-icing capability. Medical flights should also preferably stay at altitudes not exceeding 3000 ft. above ground when a critical patient is on board. Therefore, IFR routes are required to be lower than those used by standard airplane traffic.

Most facilities used by rotorcraft for vertical landing (helipads, helidecks) are not certified as IFR installations, which prevents the use of direct IFR departure/approach procedures. The Point-in-Space (PinS) concept, supported by ICAO, it allows for visual flying in the initial and last phases of an IFR flight, thus providing flexibility for IFR access to facilities classified as VFR installations. Point-in-Space IFR approaches are variants of RNAV-GNSS approaches and can be implemented either with only GPS lateral guidance or preferably, with both lateral and vertical guidance thanks to SBAS (EGNOS).

IFR rotorcrafts operating at airports today, are using the same procedures designed for fixed wing aircrafts and are forced to use runways. This produce is a detriment to the specific features of rotorcraft flight characteristics (such as: low speed, steep slope capability, high manoeuvrability) and increases the workload of AT Controllers (R/C-A/C separation Issues). Rotorcraft-specific Simultaneous Non Interfering (SNI) procedures at airports are aiming to allow IFR rotorcraft to operate independently of fixed-wing traffic and to depart/arrive to/from helipad without using runways in service.

EHA Rotorcraft experts are now involved in a significant number of SESAR projects, both in the Operational and System threads. Participation in B4.2 and WPx.2 projects, addressing ConOps and Detailed Operation Descriptions (DOD), respectively allows a top-down introduction of rotorcraft operations into SESAR, whereas involvement in relevant specific projects (SWPs) ensures that rotorcraft aspects are considered for the development of the CNS (Communication, Navigation & Surveillance) technologies, necessary for an effective implementation of the SESAR ATM Master Plan.

The EHA is actively engaged in many activities, rulemaking tasks, committees and advisory boards within EASA.

Finally, it is also expected that the operational improvements proposed for rotorcrafts will significantly contribute to the achievement of SESAR's high level objectives in terms of safety, efficiency and environment. Availability of Low Level IFR routes and IFR access to helipads, thanks to Point-in-Space departure/approach procedures, should reduce VFR flights undertaken in marginal visibility conditions and make rotorcraft operations less dependent on the weather. Introduction of SNI procedures at airports, when compatible with local airspace constraints, will fully reserve runway capacity to fixed-wing traffic and will reduce the environmental impact of rotorcraft operations on account of shortened departure/arrival paths and low noise steep IFR approaches. ■

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