



EUROPEAN  
DEFENCE  
AGENCY



# THE MILITARY IN SES / SESAR

Partnering for excellence  
in global aviation

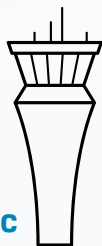
# PARTNERING FOR EXCELLENCE IN GLOBAL AVIATION

THE MILITARY OPERATE IN MULTIPLE ROLES AS AIR NAVIGATION SERVICE PROVIDER, AIRSPACE USER, AIRPORT OPERATOR AND REGULATOR UNDER STATE RESPONSIBILITY NOT ONLY IN TIMES OF CRISIS BUT EVERY DAY. THE IMPLICATIONS FOR THE MILITARY OF SINGLE EUROPEAN SKY (SES) INITIATIVE AND ITS TECHNOLOGICAL PILLAR, THE SINGLE EUROPEAN SKY AIR TRAFFIC MANAGEMENT RESEARCH (SESAR) PROGRAMME, ARE CONSIDERABLE.

MEMBER STATES HAVE ENTRUSTED THE EUROPEAN DEFENCE AGENCY (EDA) TO:

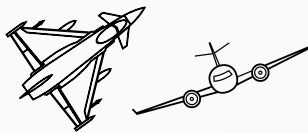
- › Connect the military with each other and the European Institutions
- › Develop ways to engage Europe's military in the SES initiative
- › Assist Member States in accessing EU funding for technological initiatives from the SESAR programme.

**365  
DAYS**

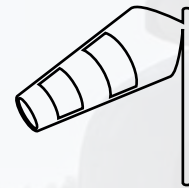


**Military air traffic controllers and airports operate 365 days of the year.**

**11 000**



**More than 11,000 military aircraft are stationed in Europe.**



**State air forces are the biggest fleet operators and airport owners in Europe.**

In the context of increased regional and global instability and given the evolving security challenges facing Europe, it is crucial for security and defence that any development in air traffic modernisation takes military requirements fully into account, in order to avoid any adverse impact on national and collective defence capabilities.

The implementation of the European Global Strategy (EUGS), the European Defence Action Plan (EDAP) and the EU/NATO Joint Declaration, offer a window of opportunity to address and contribute to strengthening European Security and Defence. Military aviation is a key part of this. The EDA facilitates the coordination of military views related to the challenges of SES facing Military Aviation and acts as an interface between the military community and the European Commission. In doing so, EDA ensures coherence and complementarity across the military community through staff-to-staff coordination with NATO and EUROCONTROL, while actively developing its cooperation with key civil stakeholders.

The Aviation Strategy for Europe defined by the European Commission and the revision of the EASA Basic Regulation provide opportunities for early involvement of the military.

Military aviation significantly contributes to ensuring the required secure environment in Europe. It is crucial for security and defence that any development in air traffic modernization takes military requirements fully into account, in order to avoid any adverse impact on national and collective defence capabilities. The changes brought about by technological solutions in terms of procedures, regulations, equipment and organisation need to be considered at the earliest possible stage and on the basis of a systemic approach, by relevant military organisations.

The Military Aviation Strategy in the context of Single European Sky reflects the shared view on military aviation as an integral part of the air traffic in Europe for the coming decades.

It establishes the strategic vision that European aviation will incorporate the security and defence dimension at a level that will ensure that Military Aviation continues to provide and further improve, effective security and defence in Europe in the changing context of the civil aviation sector, without prejudice to the safety of civil air traffic.

It includes fundamental principles related to safety, civil-military coordination and cooperation across the military community, as well as strategic objectives on security and defence, access to airspace and use of air navigation services, confidentiality, cyber security, and interoperability.

In supporting its implementation, the European Defence Agency contributes to ensuring that the military are recognised as credible and reliable partners for excellence in global aviation.

**Jorge Domecq**

*Chief Executive, European Defence Agency*

# ARMED FORCES: THE BIGGEST AIRLINE IN EUROPE

State aircraft fleet\* - ECAC

## One sky for all

The military recognise the crucial importance of the SES initiative in achieving improved efficiency, increased capacity, enhanced aviation safety, diminished environmental impact of flights and reduced costs of air navigation services.

SES does not apply to military operations and training, however civil and military aviation activities are tightly interlinked, as they share the same continuum of airspace. Consequently, SES needs to take account of the military, who in the European context are operating in many different roles, to include **airspace users, airport operators, regulators and service providers**.

The ultimate goal is to provide and further improve, effective security and defence in Europe in this changing environment, as it is crucial that any development in air traffic modernisation takes military requirements fully into account, in order to avoid any adverse impact on national and collective defence capabilities.

\*44 ECAC countries including 28 EU Member States



COMBAT  
AIRCRAFT



3365

LARGE  
AIRCRAFT



949

LIGHT  
AIRCRAFT



1390

HELICOPTER



3733

## The military and SES/SESAR

### SINGLE EUROPEAN SKY (SES)

The SES initiative was launched in 2000 by the European Commission following severe flight delays in Europe in 1999. A High Level Group was established and, building on the recommendations in its report, the Commission drafted a legislative package at the end of 2001. The package was adopted by the European Parliament and Council in March 2004 and entered into force one month later.

The EU's objective is to reform ATM in Europe in order to deal with continued air traffic growth in Europe and to ensure that aviation operates in a safe, cost efficient and environmentally friendly way. To support the legislation, a number of new bodies and projects have been created, including the establishment of the SESAR Joint Undertaking (SJU) for research & development, and a SESAR Deployment Manager (SDM) to manage and synchronise deployment. A Network Manager (NM) for the European ATM network has been created with the operations entrusted to EUROCONTROL, while an independent Performance Review Body (PRB) supports the Commission in the development and management of the SES performance scheme in which Functional Airspace Blocks (FABs) have a key role to play.

### SESAR

The SESAR project is the EU's air traffic management infrastructure modernisation programme. SESAR will develop the new generation air traffic management system capable of ensuring the safety and flexibility of air transport.

The main objective of the SESAR programme is to coordinate ATM research and development in the EU and help establish a new generation of ATM infrastructure capable of withstanding the foreseen continued growth of air traffic over the coming decades.

SESAR has now entered into its third and final phase - 'deployment' - whereby the concepts and technologies developed through the SESAR JU are introduced into operation across Europe. The European Commission appointed a SESAR Deployment Manager in December 2014 and the SJU has moved into its 2020 work programme.

The SESAR 2020 Research and Innovation (R&I) Programme will demonstrate the viability of the technological and operational solutions already developed within the SESAR R&I Programme (2008-2016) in larger and more operationally-integrated environments.





## How does SES/SESAR affect the military?

- SES and the SESAR programme have been pivotal for all European aviation stakeholders over the past 15 years, not least the military.
- Member States retain exclusive sovereignty in ATM matters relating to military operations and training, however, military engagement in SES is fundamental.
- The SES Regulations do not cover military operations and training, however the Military can be directly or indirectly affected due to regulatory constraints related to Flexible Use of Airspace and technical Implementing Rules such as Performance Based Navigation (PBN).
- The SESAR programme is committed to shape the future towards a performance driven European sky. In this perspective, it is key that SES answers both civil and military needs in bringing the procedures and the performance of ground and airborne systems used for ATM purposes up to SESAR standards.

The deployment phase of SESAR also offers opportunities for the military, to avail of EU funding to enhance their ATM technology.







## The Defence Community in SES and SESAR

### **Effectively developing a Single European Sky requires the buy-in of all relevant stakeholders.**

Considerable progress has been achieved over the past years regarding cooperation between civil and military stakeholders. Today, the defence community is seen as a key partner for the successful implementation of the SESAR programme.

Since 2010, EDA has supported Member States in the military implementation of SES and SESAR. A series of Council Decisions, complemented by EU Commission Implementing Regulation 409/2013 and EDA Steering Board Decisions, have assigned to EDA the role to facilitate the coordination of military views with regard to SES related issues and to act as Military Interface with EU Institutions. The overarching aim is to enable military contributions to be exploited and interests related to security and defence to be given full consideration.

The EDA SES Military Aviation Board (ESMAB) provides an effective framework for proactive coordination with States and relevant international organisations to agree on priorities with regard to the upcoming milestones for Single European Sky in the broader context of military aviation and to ensure the necessary national involvement up to the appropriate decision-making level.

## Cooperation with key stakeholders

For the deployment phase of SESAR, the EDA has signed a Memorandum of Understanding (MoU) with the SESAR Deployment Manager (SDM). In this phase of SESAR, the EDA is supporting its Member States and NATO in identifying military projects and preparing bids to obtain EU co-funding.

In addition, 3 other SESAR related military projects directly submitted to the Innovation and Networks Executive Agency (INEA) were awarded 15M€ of co-funding.

EDA continues to support States in developing bids concerning military projects for the current and future INEA calls.

EDA and EUROCONTROL have updated their joint work programme for the 2017-2018 period, further developing their partnership on research, standardisation and deployment activities, which is based on an exchange of letters from 2013, making EUROCONTROL's technical ATM expertise available to EDA in support of its role to facilitate the coordination of military views and acts as interface with EU institutions.

EDA and the SJU have signed a Memorandum of Cooperation (MoC) setting the framework for collaboration on SESAR 2020, the next phase of research and innovation in air traffic management. The MoC builds on existing working arrangements and ensures that, pursuant to EDA's role, military views will be taken into consideration in the context of SESAR ATM Research and Development.

EDA and EASA are also further developing their cooperation based on the original exchange of letters, in view of ensuring early awareness and insight of the military into upcoming regulation and addressing subjects of common interest such as RPAS air traffic insertion and cyber security in aviation.

The longstanding and very effective staff-to-staff coordination with NATO has been given an additional impulse through the common set of proposals for the implementation of the EU-NATO Joint Declaration, which notably addresses closer cooperation between NATO and EU/EDA experts on military aviation in general and SES/SESAR in particular takes a prominent place, with a view to complementarity of efforts.



In 2016, out of the 24 military projects submitted through EDA and the SDM, 14 have been awarded funds, adding up to a total of €53,5 million or roughly 10.5 % of total funds awarded.



# THE EDA'S PRIORITIES FOR SES AND SESAR

- › Ensure early awareness and insight of States regarding upcoming SES regulations
- › Support States in minimising adverse impact of SES and SESAR
- › Support States in obtaining EU co-funding for military projects
- › Introduce, in coordination with EUROCONTROL, military requirements in the SESAR Concept of Operations and Research and Innovation activities
- › Further develop the cooperation with key civil and military stakeholders for the benefit of States



## A Military Aviation Strategy

**To promote improved awareness on the need to pursue a coordinated civil-military approach in the context of Single European Sky, the EDA SES Military Aviation Board (ESMAB) has adopted a Military Aviation Strategy, which reflects the shared view on military aviation as an integral part of the air traffic in Europe for the coming decades.**

The strategic vision is that a sustainable European aviation will incorporate the security and defence dimension at a level that will ensure that Military Aviation, manned and unmanned, will continue to provide and further improve, effective security and defence in Europe in the changing context of Single European Sky and any other future developments in the civil rulemaking and oversight processes.

The strategy includes fundamental principles related to safety, civil-military coordination and cooperation across the military community, as well as strategic objectives on security and defence, access to airspace and use of air navigation services, confidentiality, cyber security, and interoperability.

Its development was facilitated by the EDA, in close coordination with Member States. Its implementation will contribute to ensuring that the military are recognised as credible and reliable partners in military aviation in general and SES in particular.



# KEY TECHNOLOGICAL PRIORITIES FOR THE MILITARY IN SESAR FROM DEVELOPMENT TO DEPLOYMENT

## MASTERPLAN

Within the Single European Sky initiative, the European ATM Master Plan is the main "non-binding" planning tool driving the modernisation of the Air Traffic Management system and connecting SESAR Research & Development (R&D) with deployment. It is the key tool for SESAR, providing the basis for timely, coordinated and efficient R&I and deployment of new technologies and procedures.

SJU is entrusted in accordance with the Council Regulation amending regulation 219/2007, as the owner and the executor of the ATM Master Plan.

**EDA plays an active role in the new SJU governance through its newly established Master Planning Committee** and will pursue the joint military approach involving EUROCONTROL and NATO, to provide input into the committees work.

One of the key focus for 2017 is the safe integration of drones into all classes of airspace to be reflected in a specific update of the Master Plan.

## REMOTELY PILOTED AIRCRAFT SYSTEMS

**Remotely Piloted Aircraft Systems (RPAS) are important assets in military operations and enabling their operations in non-segregated airspace over European territory remains a key objective of the EDA.**

An RPAS Regulatory Framework Working Group was established in EDA in 2014 with the purpose of developing a harmonised set of airworthiness requirements and common classification and certification processes, in order to ensure that military RPAS can easily integrate into the future European Aviation System. The EDA aims to have common military airworthiness and certification requirements for military RPAS by 2019.

In addition to that EDA, on behalf of its participating Member States, is playing a major role in the development of the required enabling technologies in the domain of RPAS Air Traffic Integration. In particular, EDA is managing several R&D projects in this area: Remote Pilot Stations Standardisation, Detect & Avoid Standardisation (a Pilot Project in the frame of the Preparatory Action on EU-funded Defence Research) and SATCOM Command and Control links. Furthermore, the Agency is supporting EDA's Member States regarding other important R&D initiatives: MIDCAS on Detect & Avoid and ERA on RPAS automation.

In 2016, the European Commission, EDA, EASA and SESAR Joint Undertaking signed an agreement to establish a "Technical Coordination Mechanism on RPAS ATI". This agreement aims to align the research activities for Air Traffic Insertion of certified drones with the European ATM Master Plan. The "Coordination Mechanism" ensures that all stakeholders, including the military are involved in the integration of RPAS in non-segregated areas in a safe, secured and cost efficient manner.

## CYBER

**EDA supports States on their way to improved cyber security in the aviation domain and reach a level of acceptable risk.** Military aviation, and civil aviation alike, is increasingly facing challenges in the cyber domain. Multiple parallel developments in the civil aviation sector have significant influence on military aviation. This ranges from the SES initiative over to an increased lifecycle speed for civil aviation systems to the fast growing UAS/UCAS market. Additionally, modern weapon systems that make use of and rely on all 5 warfare domains (Sea, Land, Space, Air, Cyber) are already widely in use. Cyber security in these Network Enabled Capabilities (NEC) must be an integral part from design, to deployment, to operations, and until decommission. A comprehensive and systemic approach that considers all elements of a system (people, processes, technology) delivers adequate solutions.

The nature of cyber security demands a certain degree of flexibility to enable promptly reaction to the fast-changing threat landscape and developments in this realm. An ambitious Work Programme is being developed in the EDA for 2017 which will incorporate the development of an Aviation Cyber Engagement Plan, identification of gaps and addressing the areas of awareness, education and training.

## STANDARDISATION

European defence standardisation is a strategic tool for improving armaments co-operation and enhancing the European Defence Technological and Industrial Base (EDTIB). It is also a key enabler of an effective European Defence Equipment Market (EDEM). It is the most cost effective way to reinforce and to perpetuate interoperability and is achieved by:

- › **managing and ensuring the coordination with key players and their actions;**
- › **supporting and monitoring European defence standardisation activities;**
- › **promoting common standardisation requirements;**
- › **providing a reference set of common standards for European armaments.**

EDA established the European Defence Standards Information System (EDSIS) in 2007 and introduced the European Defence Standards Reference System (EDSTAR) in 2011 to support harmonised standardisation for material. The EDA Material Standardisation Group (MSG) is a well-established network of standardisation managers, acting as a central gate for all defence standardisation initiatives with a cooperative aspect both for security and -defence related standardisation.

In accordance with the Implementation plan standardisation needs and opportunities from the EU Capability Development Plan, from the Collaborative Database CODABA, and from R&T and other projects. Mainstreaming the use of (EDSTAR and civilian/military standards is to enhance interoperability and efficiency and deepen defence cooperation, in coherence with NATO.

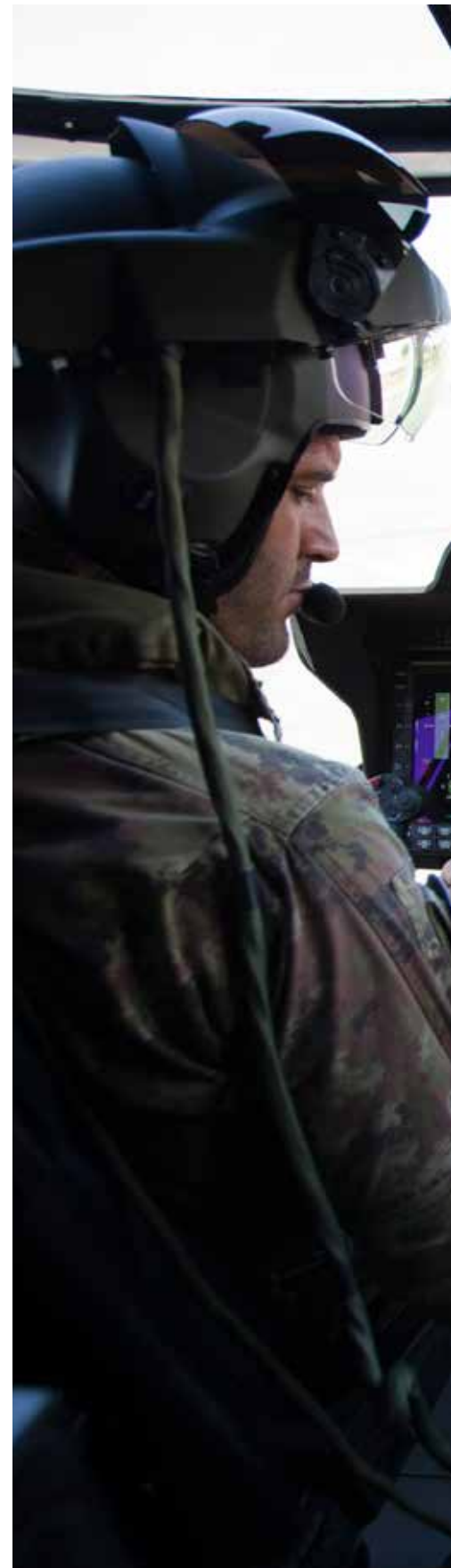
The EDA is member of the Defence Standardisation Coordination Group (DSCG), which includes representatives from the European Commission, the European Committee for Standardisation (CEN), the European Committee for Electrotechnical Standardisation (CENELEC), the European Telecommunication Standardisation Institute (ETSI), industry and NATO. The group is acting as the single interface in Europe between the military (procuring defence materiel) and industry (developing defence standards)

The EDA is member of the European Organisation for Civil Aviation Equipment (EUROCAE), which develops worldwide recognised industry standards for aviation, and of the European ATM Standards Coordination Group (EASCG), that is in charge of maintaining the Standardisation Work Programme resulting from SESAR Deployment.

## AIRWORTHINESS

Within European civil aviation, rules on airworthiness regulations are managed by the European Aviation Safety Agency (EASA). Member States have their own national-specific systems to ensure the airworthiness of their military aircraft. **In November 2008, Defence Ministers entrusted the EDA with the establishment of a Military Airworthiness Authorities (MAWA) Forum and approved the associated military airworthiness roadmap for achieving common harmonisation and certification processes. The MAWA Forum is chaired and supported by the EDA.**

The MAWA Forum has developed a suite of harmonised European Military Airworthiness Requirements (EMARs) which are based upon the EASA regulations. Member States are being encouraged to implement EMARs into national regulation as a step towards mutual recognition.







**MILITARY AND CIVIL AVIATION FACE  
SIMILAR CHALLENGES WHICH CAN BE MET  
MORE EFFECTIVELY THROUGH DIALOGUE  
AND COOPERATION, PARTNERING FOR  
EXCELLENCE IN GLOBAL AVIATION.**



**MILITARY FLIGHTS  
REPRESENT 25% OF ALL  
FLIGHTS OPERATING IN  
EUROPEAN AIRSPACE.**

## Conclusion

**A lot of progress has been achieved enabling the military to contribute to the goals set for SES.**

The military recognise and acknowledge the crucial importance of the Single European Sky initiative, bringing improved efficiency, increased capacity, enhanced aviation safety, diminished environmental impact of flights and reduced costs of Air Navigation Services. SES and SESAR will benefit to our economy and aviation as a whole, both civil and military.

The provision of air navigation services for civil and military aviation is driven by the need to ensure the highest level of safety. Military aviation significantly contributes to ensuring the required secure environment in Europe. It is crucial for security and defence that any development in air traffic modernization takes military requirements fully into account, in order to avoid any adverse impact on national and collective defence capabilities. The changes brought about by technological solutions in terms of procedures, regulations, equipment and organisation need to be considered at the earliest possible stage and on the basis of a systemic approach, by relevant military organisations.

### **THE MILITARY COMBINE SEVERAL ROLES IN SES:**

- > **REGULATORS/CERTIFICATION AUTHORITY**
- > **AIRCRAFT OPERATOR**
- > **AIRSPACE USER**
- > **ANS (ATS, AIS, SAR, MET) AND CNS PROVIDER**
- > **AIRPORT OPERATOR**

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