

THE MILITARY
KEY PARTNER IN
THE SINGLE EUROPEAN SKY
#EuropeForAviation





FACTS & FIGURES

SES / SESAR PROJECTS IMPLEMENTED BY MILITARY STAKEHOLDERS

Airspace is a shared and scarce resource, vital to the security and prosperity of Europe. Over the last two years, EDA assisted Member States to obtain EU co-funding to upgrade and modernise the Air Traffic Management system and increase civil-military interoperability in Europe.



213 M€
**PLANNED MILITARY
INVESTMENT**



7
**INVOLVED
MEMBER STATES**



93 M€
**INEA
CO-FUNDING**



29
**IMPLEMENTATION
PROJECTS**



UNITED KINGDOM
 › Advanced Controller Tools
 › VHF Radio Ground Infrastructure
 › Short Term Conflict Alert (STCA) at 20 airports
19.1 M€



NETHERLANDS
 › Civil/Military Enroute Collocation
5 M€



BELGIUM
 › Civil/Military Enroute Collocation
5.5 M€



NAPMA
 › Avionics Upgrade - E3 AWACS
17.3 M€



FRANCE
 › Advanced Controller Tool
 › Civil-Military Secure Interface
 › Upgrade of Military Control Centre
 › SWIM Governance (multi-stakeholder project)
 › Gateway Upgrade for 4Flight compliance
 › SWIM Common PKI (multi-stakeholder project)
20.5 M€



PORTUGAL
 › Aeronautical Data Exchange
 › Avionics Upgrade - C130H (2 projects)
 › Avionics Upgrade - Falcon 50
 › SWIM Backbone Infrastructure
15.1 M€



SPAIN
 › Navigation Procedure Design
 › Navigation Procedure Implementation
 › Advanced Flexible Use of Airspace Tools
 › Avionics Upgrade - Falcon 900 (2 projects)
 › Avionics Upgrade - A310
 › SWIM Common PKI (multi-stakeholder project)
5 M€



ITALY
 › SWIM Backbone Infrastructure
 › i4D interface
 › LARA enhancement implementation
 › Automatic Tactical Controller Tool implementation
 › AERONET/ENET2 Interoperability
 › Italian Air Force Integrated Briefing
5.6 M€



ONE SKY FOR ALL

THE MILITARY HAS 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



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

© Austrian Armed Forces



Around 7000 military aircraft are stationed in Europe.

© Austrian Armed Forces



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

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The Single European Sky (SES) initiative aims at achieving improved efficiency, increased capacity, enhanced aviation safety, diminished environmental impact of flights and reduced costs of air navigation services. It is of crucial importance in order to cope with sustained air traffic growth while at the same time ensuring safe operations. Although SES does not apply to military operations and training, in a shared airspace, civil and military aviation activities are tightly interlinked and civil and military aviation activities are mutually supportive. Indeed, effective security and defence in Europe contributes to a sustainable European civil aviation sector and to preserving passenger confidence. On the contrary, the ATM system is an enabler for security and defence missions in a security environment which is becoming extremely complex and for which an appropriate daily training is needed.

In 2010, the European Defence Agency (EDA) was tasked by Member States to work on the implications of SES and the Single European Sky ATM Research programme (SESAR) for the European air forces. Specifically, together with the Member States the Agency concentrated all efforts on avoiding adverse impact on national and collective defence capabilities. At the same time, it is our intention to seize possible benefits for the military by improving the collaboration with civil aviation stakeholders to make the Single European Sky a success for all airspace users. In doing so, we have moved from a reactive to a proactive approach over the last years. Such an approach has also been agreed at ICAO level as the objective is to gradually move from civil-military cooperation to more collaboration.

We have put the right instruments in place, such as the EDA Single European Sky Military Aviation Board (ESMAB), to ensure there is solid consultation with Member States and all stakeholders. At the same time, the Board ensures that the strategic long-term vision of SES for the military is set and maintained.

By doing so, we have achieved tangible results over the last three years. The "Military Aviation Strategy in the context of SES" was approved by both the EDA Steering Board and the North Atlantic Council; € 93 million of EU co-funding have been awarded to military projects in the framework of SESAR Deployment in the 2016-2018 timeframe; through EDA, military are involved in SES-related initiatives from the outset and are able to provide common valuable inputs in the regulatory, technical and operational domains aiming to enhance the security and defence dimension in Single European Sky while contributing to its success; a common civil-military roadmap for Remotely Piloted Aircraft Systems (RPAS) Air Traffic Insertion has been developed to enable seamless integration of certified RPAS alongside manned aviation from 2025; among the eleven EU capability development priorities approved in June 2018 by EDA, the priority "Integration of military air capabilities in a changing aviation sector" is linked to SES. It will contribute to foster civil-military synergies notably through digital solutions benefiting from connectivity, automation and artificial intelligence in support of European industries.

These examples are illustrating that the military community is ready to pro-actively contribute to the success of a Single European Sky by overcoming together the challenges ahead to effectively accommodate the needs of civil and military stakeholders, all types of platforms, manned and unmanned, and all types of missions, roles and applications, in a balanced and proportioned way, in peace time and in crisis situations. Security and defence is indeed a shared responsibility.

Jorge DOMEcq
Chief Executive, European Defence Agency

THE MILITARY AND THE SINGLE EUROPEAN SKY

SINGLE EUROPEAN SKY

The SES initiative was launched in 2000 on the basis of the EU's objective 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.

EDA has been given a key role, to facilitate the coordination of military views regarding SES-related issues and to act as the Military Interface with EU Institutions. The goal of the EDA is to ensure that the States' interests related to security and defence are given full consideration, while maintaining the right level of interoperability between civil and military systems.

EDA has been supporting Member States in SES and SESAR since 2010, working closely with all relevant EU bodies.

SINGLE EUROPEAN SKY ATM RESEARCH (SESAR)

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

The main objective of SESAR is to coordinate ATM research and development in the EU and to help establish a new generation of ATM infrastructure.

In the current deployment phase, the concepts and technologies developed through the SESAR JU are introduced into operation across Europe. The SESAR 2020 Research and Innovation Programme will demonstrate the viability of the technological and operational solutions previously (2008-2016) developed in larger and more operationally-integrated environments.





HOW DOES THE SINGLE EUROPEAN SKY AFFECT THE MILITARY?

Aviation is a strong driver of economic growth, jobs, trade and mobility, but also a key asset to enable the military to ensure security and defence, as mandated by national laws and international agreements. A modernized aviation/ATM system accommodating the military needs will contribute to improve security and defence in Europe.

This is of the utmost importance as, even though civil and military objectives may differ, both live in the same world, share the same airspace and are therefore subject to the same upheavals. Safety and security are shared objectives and responsibilities.

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 and trusted partner for the successful implementation of the Single European Sky.

The SESAR project is committed to shaping the future towards a performance-driven European sky. And while the SES Regulations do not apply to military operations and training, 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. It is thus 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, for example to obtain EU co-funding to enhance their ATM technology.



A MILITARY AVIATION STRATEGY

The EDA SES Military Aviation Board (ESMAB) is a framework for coordination with Member States and relevant international organisations. Its objective is to agree on priorities about upcoming milestones for the Single European Sky, in the wider context of military aviation, and to ensure necessary national involvement at the appropriate decision-making level. The EDA Steering Board adopted in 2017 a Military Aviation Strategy in the context of SES, which reflects shared high-level principles on military aviation.

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

The strategy includes key 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 EDA, in close coordination with Member States, together with the EU Military Staff, the EU Military Committee and NATO. Its implementation will ensure that the military are recognised as credible and reliable partners in SES and SESAR but moreover, it will enable to preserve a safe, secure and efficient SES for the benefit of all relevant stakeholders.



FUNDING OPPORTUNITIES FOR THE MILITARY

In the current phase of SESAR, EDA is supporting Member States in identifying military projects and in preparing bids to obtain EU co-funding. In 2016, 17 projects submitted by Member States were awarded funds, adding up to a total of €69 Mio of co-funding from the Innovation and Networks Executive Agency (INEA). In 2017, 10 military projects were co-funded, with over €19 Mio awarded. In 2018 5 military projects were co-funded, with over 5 Mio€ awarded to the States.

EDA continues to support Member States in developing bids concerning military projects for the potential future EU CEF¹ Transport calls. Furthermore, EDA is exploring the potential use of other EU funding mechanisms for SESAR related collaborative military projects and developing its cooperation with the European Investment Bank. Further information regarding INEA and other funding opportunities, including the defence fund, can be found on EDA's website.

In addition, EDA also supports Member States by developing the Capability Development Plan (CDP) which is the 'driver' and the 'overall strategic tool' for future EU capability needs. The CDP is a tool to assist Member States in their national defence planning and programmes and, therefore, is an important element in a comprehensive capability development process. Among the 11 EU capability development priorities agreed in 2018, the "Integration of military air capabilities in a changing aviation sector" one is linked to the implementation of Single European Sky. It addresses effective and safe access to airspace for existing and future military assets, including unmanned systems, the ability to protect confidentiality of mission critical information and to ensure an appropriate level of interoperability and coordination with civilian aviation structures. The CDP is the key tool to set up future research, innovation, implementation or acquisition collaborative grant opportunities including the European Defence Fund (EDF).

EDA PRIORITIES FOR SES AND SESAR ARE:

- Ensuring participating Member States (pMS) early awareness of SES-related activities;
 - Supporting European armed forces in implementing the Military Aviation Strategy in a SES context;
 - Ensuring an appropriate military involvement from the outset in relevant SES-related activities;
 - Obtaining EU co-funding for military projects;
 - Further developing cooperation with key civil and military stakeholders
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1. CEF = Connecting Europe Facility.



COOPERATION WITH KEY STAKEHOLDERS

EDA cooperates with several other entities in order to progress and influence SES and SESAR:

- › **The European Commission, notably the Directorate-General for Mobility and Transport (DG MOVE).** In order to be involved from the outset in SES-related legislative initiatives, EDA supports the military in the preparation of the related meetings and has an observer status within the Single Sky Committee, the EASA Committee and related Expert Groups in which EDA is also participating.
- › **SESAR Joint Undertaking (SJU)** – A Memorandum of Cooperation between EDA and SJU sets the framework for collaboration on SESAR 2020. This ensures that, pursuant to the EDA's role, military views will be taken into consideration in the context of Single European Sky ATM Research and Development. The overall objective is to accommodate technical solutions developed in the framework of SESAR related to military equipment programmes,
- › **SESAR Deployment Manager (SDM)** – EDA and SDM work closely together on the basis of a renewed Memorandum of Understanding in order to take military considerations into account for the successful deployment of SESAR and to assist the military in accessing EU funding.
- › **European Aviation Safety Agency (EASA)** – Based on an exchange of letters, EDA and EASA are developing their cooperation to ensure early awareness for the military regarding forthcoming regulation and addressing subjects of common interest such as RPAS air traffic insertion and cyber security in aviation.
- › **EUROCONTROL** – EDA and EUROCONTROL have a joint work programme updated every two years developing their partnership on research, standardisation and deployment activities. EUROCONTROL's technical ATM expertise is provided to EDA in support of its role to facilitate the coordination of military views and to act as interface with EU institutions.
- › **NATO** – EDA and NATO have an effective staff-to-staff coordination process, which has been given an additional impetus through the common set of proposals for the implementation of the EU-NATO Joint Declaration which allows closer cooperation between NATO and EU/EDA experts on military aviation in general and SES/SESAR in particular.
- › **EUROCAE** – EDA is participating in certain working groups to influence EUROCAE and European Standardisation Organisations through effective military involvement.
- › **NEASCOG** – EDA enhanced its cooperation with the NATO EUROCONTROL ATM Security Coordination Group based on a longstanding relationship. The works carried-out by the NEASCOG aim to address ATM Security challenges in a civil – military context considering current and future developments and technological advances including those emerging from SES/SESAR.





KEY TECHNOLOGICAL PRIORITIES FOR THE MILITARY IN SESAR

EUROPEAN AIR TRAFFIC MANAGEMENT MASTER PLAN

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&D and deployment of new technologies and procedures.

The SJU is entrusted as the owner and the executor of the ATM Master Plan. A Master Plan update campaign was launched in November 2017 and will be completed by mid-2019. EDA plays an active role in the context of the Master Planning Committee and Master Planning Group established by the SJU, by coordinating the military views of Member States, with EUROCONTROL and NATO, and providing relevant input into the Committee's work.

REMOTELY PILOTED AIRCRAFT SYSTEMS

RPAS are becoming important assets in military operations. Enabling their operations and training in non-segregated airspace over European territory remains a key objective of EDA.

An RPAS Regulatory Framework Working Group was established in EDA in 2014 to develop a harmonised set of airworthiness requirements, so that military RPAS can be fully integrated into the future European aviation system. EDA's intention is to have common military airworthiness and certification requirements for military RPAS by 2020.

EDA, on behalf of its Member States, has a major role in the development of the required enabling technologies in the domain of RPAS Air Traffic Integration. The Agency 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 Defence Research) and SATCOM Command and Control links. Furthermore, the Agency is supporting EDA's Member States regarding other important R&D initiatives on Detect and Avoid (MIDCAS) and RPAS automation (ERA).

In 2016, the European Commission, EDA, EASA and the SESAR Joint Undertaking signed an agreement to establish a technical coordination mechanism 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 certified RPAS in non-segregated areas in a safe, secured and cost-efficient manner. The aim is to integrate large/certified RPAS in non-segregated airspace by 2025.

In addition, an Industry Exchange platform on RPAS ATI was settled in 2017 to promote an information exchange on current R&D initiatives and strategies between Member States, EDA and Industry.

In order to enable the seamless integration of RPAS alongside manned aviation, an initial phase of "RPAS Accommodation", in which RPAS will operate with limited restrictions, has been identified as a key stepping stone ("quick wins" in the 2019-2025 timeframe). In this context, EDA launched a study on possible scenarios and corresponding safety case for the accommodation of MALE-type RPAS. The report was published in January 2019.

In 2018, the EASA Executive Director and the EDA Chief Executive decided to launch a joint task force to produce "Guidelines for the accommodation of Military IFR RPAS under GAT Airspace classes A-C". It includes experts from the SESAR Joint Undertaking, EUROCONTROL, military representatives from EDA participating Member States and European Industry through the Aerospace and Defence Industries association of Europe. The Guidelines will be published in March 2019.

STANDARDISATION

As a critical enabler for cooperation in Europe, European defence standardisation is an integral element for any defence project, notably in view of translating results from Research & Technology and/or cooperative programmes into standards.

Based on the Rolling Development Plan produced within the European ATM Standardisation Coordination Group (EASCG), the European UAS Standardisation Coordination Group (EUSCG) and the European Cyber Standardisation Coordination Group (ECSCG), EDA is building a list of best practices and standards (military and civil) in the areas of Air Traffic Management and RPAS to be inserted in the European Defence Standard Reference System.

CYBER

EDA supports Member States to help improve cyber security in the air domain. Advances in and increased adoption of Information Technology is seen as key enabler for the overall improvement of the Aviation System (Digitalisation). These developments, emerging in part also out of the SES initiative, may for the time

being, primarily consider civil aviation; however, they also have a significant impact on military aviation and the vital civil – military coordination. In addition, new generations of manned and unmanned platforms, the increased reliance on satellite based PNT (Position, Navigation and Timing) aids, the modernisation of the CNS (Communication, Navigation and Surveillance) infrastructures and the exploitation of sensor-fusion capabilities that rely on multiple data sources to create a degree of situational awareness not seen before, must be appropriately considered to ensure the highest possible degree of cyber resilience.

To support our Member States, EDA developed an ambitious work programme in 2017 through "The Military Aviation Cyber Engagement plan" which aims to follow a holistic approach in cyber security. In 2018 EDA organised the Aviation Cyber Security Seminar that provided civil and military stakeholders with a broad overview of current and future cyber security challenges.

Information Sharing, Education, Training and Exercise, Regulatory and standardisation activities were amongst the identified priorities for further engagement.

Based on the findings, EDA, together with other organisations at EU and international level, will further pursue to address the topics identified, to provide its Member States with the best support possible.

TOWARD A 'TOTAL SYSTEM APPROACH TO MILITARY AVIATION'

Based on inputs from and after consultation with Member States, EDA Steering Board on 28 February 2018 agreed to the progressive introduction of a 'Total System Approach to Military Aviation' (TSAMA) through two pilot cases (transport aircraft and large/certified RPAS) and tasked EDA to revert to the Steering Board in the second semester of 2018 with the findings and recommendations concerning the way ahead for both pilot cases.

Following a Benefit & Impact Analysis on the potential project scope, which included a survey among Member States and a consultation with military aviation experts of EDA and external parties like the European Air Transport Command and the Multi Role Transport Tanker Implementation Team, the EDA has developed a Project Brief on the Introduction of a Total System Approach to Military Aviation, encompassing both pilot cases.

ARMED FORCES: THE BIGGEST AIRLINE IN EUROPE



3000 (46 TYPES)
HELICOPTERS



1315 (67 TYPES)
LIGHT AIRCRAFT



425 (35 TYPES)
LARGE AIRCRAFT



2200 (23 TYPES)
COMBAT AIRCRAFT



428 (26 TYPES)
UNMANNED AERIAL SYSTEMS



225
MILITARY AIR BASES



67
AIR DEFENCE SYSTEMS AND
MILITARY AREA CONTROL CENTERS

Source EDA data base



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