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EDM

EUROPEAN DEFENCE MATTERS

On a mission

EDA's support to CSDP operations

› EXCLUSIVE

European Council President Charles Michel on EU Defence

› INTERVIEW

Pierre Éric Pommellet, CEO of Naval Group

› EDA'S CLAUDIA PROJECT

Modern computing for Armed Forces

CONTENTS

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Supporting Europe's security providers

Among the European Defence Agency's numerous 'Functions and Tasks' listed in EU Council Decision 2015/1835 (art.5), there is that of providing "support to CSDP operations". No little tasking because the 36 EU-flagged overseas missions and operations deployed since 2003 to Africa, the Balkans, the wider Eastern Neighbourhood, the Middle East and even Asia bear great responsibility as they are the most visible expression and tangible embodiment of Europe's security and defence clout in the world.

Together with its Member States and partners, the Agency has approached this role very pragmatically, developing over time a variety of tools and services that are now on offer to support the commanders of Member States' and/or EU CSDP missions and operations – ranging from commercially procured satellite communication solutions and the pooling and sharing of governmental Satcom services to geospatial information support, maritime surveillance, air medical evacuation, diplomatic clearances and the organisation of cyber awareness seminars for mission headquarters, to name only them.

In the following pages, we take a closer look at those support tools and services: how they came about, where and how they are currently used and how they could be further developed in the future. We also give the floor to the users, Member States and EU mission and operation commanders, to hear their views and recommendations for the future.

This magazine also includes an exclusive Opinion Editorial on defence and security by European Council President Charles Michel, a guest article by the new Director General of the European Space Agency, Josef Aschbacher, and much more. Our guest for the 'Industry Talk' interview is Pierre-Eric Pommelet, the CEO of Naval Group.

As always, we hope you will enjoy this magazine. Should you have comments or recommendations, please get in touch: info@eda.europa.eu

Elisabeth Schoeffmann
EDA Head of Media & Communication

Helmut Brüls
Chief Editor

"We must take more responsibility for our own security"

To translate its democratic and economic weight into global power and influence as a security provider, Europe needs to step up its defence cooperation and work towards enhancing its capacity to act autonomously, says European Council President **Charles Michel** in the following exclusive Opinion Editorial for *European Defence Matters*.

The world we live in is completely different from the one that the founding fathers of the European Union knew. The fragmentation of today's geopolitics and the multiplication of frozen conflicts at our doorstep – coupled with global phenomena like climate change, migration and pandemics – generate instability. This compels us to consider Europe's place in the world order and how best to stand up for our interests and values.

As I stressed on a previous occasion: Europe is a major player, but doesn't yet know that it is. The time is ripe to change this. The EU now wants to be able to take its fate firmly in its hands and reach its objectives.

European leaders have realised that it is essential to translate the EU's leading role as a democratic and economic power into strength and influence. In order to do that we have to enhance our security and defence. We have to take more responsibility for our own security.

In February 2021, members of the European Council clearly affirmed their commitment to pursue a more strategic course of action and to increase the EU's capacity to act autonomously, while investing in strong partnerships. This means more resilience, less dependence, more influence, and greater unity.

Setting a Strategic Compass

The first step towards achieving these ambitious goals is to provide the EU with a clear vision for the future. The EU is working towards equipping itself with a far-reaching Strategic Compass that will set our direction and level of ambition on security and defence for the years to come.

The Strategic Compass, to be approved in March 2022, will help develop a common European security and defence culture, in full respect of the specificities of Member States' policies.

While working on a grand vision, the EU also needs to achieve concrete results in further deepening security and defence cooperation among Member States. It is vital to enhance the effectiveness of Common Security and Defence Policy (CSDP) missions and operations around the world. They need to be equipped with adequate civilian and military capabilities, including when a rapid response is required, if we want them to help us reach our political objectives on the ground.

The newly established European Peace Facility will give the EU the capability to support its partners on a case-by-case basis, by providing them with military equipment where appropriate. It needs to be swiftly operationalised and implemented. Together with improved force generation and more efficient EU planning →

and command, it will indeed enhance the Union's civil and military operational engagement.

European leaders confirmed their commitment to provide for European access to the global commons (including space, cyberspace and the high seas), as well as improved military mobility across the Union, and to strengthen the EU's cyber resilience and responsiveness. They also called for greater cooperation and coordination to prevent and respond to cyber threats. Progress is being made towards these aims in terms of capability planning and development, in particular through the Civilian CSDP Compact – the civilian branch of the Common Security and Defence Policy that will be fully implemented by early Summer 2023, the Coordinated Annual Review on Defence (CARD), and the ongoing Permanent Structured Cooperation projects (PESCO).

All these developments need to go hand in hand with a strengthened European defence technological and industrial base. The recently adopted European Defence Fund (EDF) will support collaborative actions and cross-border cooperation throughout the EU, ensuring the participation of defence companies of all sizes, including SMEs and mid-caps. The European Commission Action Plan on synergies between civil, defence and space industries, as well as its forthcoming roadmap on key technologies for security and defence, will help support a more competitive strategic industrial and technological base in the EU's interest.

In these joint endeavours, all EU institutions and Member States have a key role to play. The Council and its members have recently called for a reinforced role of the European Defence Agency (EDA) to foster defence innovation, including on critical and disruptive technologies. It is now time to move to the concrete implementation of the over one hundred collaborative opportunities identified in the CARD report, and to work to improve the complementarity between the EDA's work and the EDF.

Towards closer EU-NATO cooperation

A stronger Europe that takes on more responsibility for its security and defence and that acts more autonomously will benefit multilateral security cooperation. The EU is now, more than ever, committed to cooperating closely with its partners, including NATO, the UN and regional partners.

Significant progress has been achieved on EU-NATO cooperation since the signature of the Warsaw and Brussels joint declarations. This cooperation has and continues to promote and protect our shared values and common security interests. A strong NATO and a strong European defence are indeed complementary.

The EU and its Member States now need to work on the implementation of the common set of proposals, foster EU-NATO operational cooperation in areas of common deployments and renew joint efforts in areas such as military mobility, to counter hybrid threats and to support partner capability building.

We have a unique window of opportunity to increase synergies between the two organisations, with the two parallel

> "A strong NATO and a strong European defence are complementary"

processes of the EU's Strategic Compass and NATO's 2030 agenda to be finalised in early 2022.

In the framework of NATO and beyond it, the special relationship that binds the EU and the US, and our close cooperation in security and defence, remains vital to our common security, stability and prosperity. Our work together to promote peace, security, freedom, and the respect for human rights is based on three fundamental building blocks: values, prosperity and influence. Our work is underpinned by an enduring security and defence alliance through NATO and vibrant economic cooperation, all the more important at a time when we are all confronted with unprecedented global challenges. This is why the European Council reaffirmed the strategic importance of the European Union's partnership with the United States. We have our differences, but we share values, interests, cultural and historical ties, and a geopolitical reality. Together with the new US administration, we are committed to reinvigorating our relationship and to further developing our strategic and operational partnership on an equal footing.

The momentum is here

It is my firm conviction that the steps we have taken so far and that we will take in the future will strengthen Europe's ability to effectively tackle security threats and thus reinforce our role as a global actor. EDA has an essential role to play in this regard.

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Tool for security

The EU's Common Security and Defence Policy (CSDP) provides the EU with an operational capacity to deploy civilian and military missions and operations abroad. Their taskings are set out in the EU Treaties, ranging from conflict prevention and peace-keeping to crisis management, joint disarmament operations, military advice, assistance tasks to humanitarian, rescue and post-conflict stabilisation tasks.

Missions and operations are a key pillar of European security and defence and arguably the CSDP's most visible expression.

The 5,000-plus military and civilian staff currently deployed on three continents in 17 ongoing CSDP missions and operations – 11 civilian missions and 6 military operations – are in a way the 'faces' of the Union's security and defence policy, working for a more stable world and contributing to a safer Europe. Their work on the ground and across continents is the most tangible example of the EU's action for global security. Since the first CSDP missions and operations were launched back in 2003, the EU has undertaken so far a total of 36 overseas operations in several countries in Europe, Africa and Asia. The most recent missions and operations set up under the EU banner are supporting security in the Central African Republic and enforcing the United Nations arms embargo on Libya in the Mediterranean Sea.

Planning and conduct procedures

CSDP missions and operations are planned and conducted on the basis of well-defined processes:

Decision making: Decisions to establish and to launch missions and operations require the approval of all Member States through a Council decision;

Force Generation: The majority of assets and personnel required for military as well as civilian missions and operations are provided by Member States;

Command and Control Structures: During the conduct phase, the Political and Security Committee (where all EU Member States are represented) exercises political control and strategic direction of both civilian and military missions and operations, under the authority of the Council and the High Representative. Each mission and operation has a single and identifiable chain of command for its safe and efficient conduct:

- for military operations with an executive mandate (e.g. EUNAVFOR MED IRINI in the Mediterranean), an operational headquarters is usually provided by a Member State acting as a framework nation;
- alternatively, the EU can also have recourse to NATO command structures under the Berlin-Plus agreements (e.g. EUFOR Althea in Bosnia-Herzegovina) or activate the EU Operations Centre;
- the military training missions in the Central African Republic, Mali and Somalia operate under one command located within the Military Staff of the EEAS in Brussels – the Military Planning and Conduct Capability (MPCC) – which ensures a better coordination and cooperation between military and civilian actors;
- all civilian missions and operations are commanded by the Civilian Planning and Conduct Capability (CPCC) of the EEAS.

Financing Mechanism: Civilian missions are financed through the Common Foreign and Security Policy (CFSP) budget. The common costs of military operations cannot be funded by the EU budget and are instead covered by Member States through the newly established European Peace Facility which has replaced the previous ATHENA mechanism.

European Peace Facility

Since 22 March 2021, the EU is equipped with a new financial instrument that will cover all its external actions that have military or defence implications under the CFSP: the European Peace Facility (EPF), an off-budget fund worth approximately €5 billion for the period 2021-2027, to be financed through contributions from EU Member States.

The ultimate aim of the EPF is to enhance the EU's ability to prevent conflict, preserve peace and strengthen international stability and security.

It will do so by allowing the EU to better help partner countries, either by supporting their peace-keeping operations or by helping increase the capability of their armed forces to ensure peace and security on their national territory, as well as through broader actions of a military/defence nature in support of CFSP objectives. The facility will allow the EU, for the first time, to complement the activities of its CSDP missions and operations in host countries with assistance measures. These measures may include supplying military and defence related equipment, infrastructure or assistance, at the request of third countries or regional or international organisations.

Since 2004, the EU's involvement in CSDP military missions and operations has been funded through the ATHENA mechanism. This is now replaced by the EPF, which will enhance the scope of common costs, thereby allowing for more rapid deployment and improved flexibility and predictability. The operational part of the EPF will remain embedded in the Council.

> **"Our missions and operations are an invaluable pillar of European security and defence. Their work on the ground and across continents is the tangible example of the EU's action for global security."**
>
> Josep Borrell, High Representative/Vice-President of the European Commission & Head of EDA

Serving a mission

Since its creation in 2004, one of the key tasks of the European Defence Agency (EDA) has been to provide practical support to civilian and military missions and operations launched under the EU's Common Security and Defence Policy (CSDP).

Following an internal restructuring in 2014, the Agency has developed an even more comprehensive and structured approach to supporting EU missions and operations as part of its mandate. This has led to a number of EDA initiatives that today make a direct and tangible contribution to ongoing missions and/or operations.

The Agency's practical support in this domain is provided in two different ways: either by offering access to existing EDA projects and activities which can be directly used by mission commanders, or by providing contractual support to mission commanders.

In the following pages, we put the spotlight on those EDA services which range from commercially procured Satcom solutions and the pooling and sharing of governmental satellite communications to geospatial information support, maritime surveillance, air medical evacuation, diplomatic clearances and the organisation of cyber awareness seminars for mission headquarters, to name only them.

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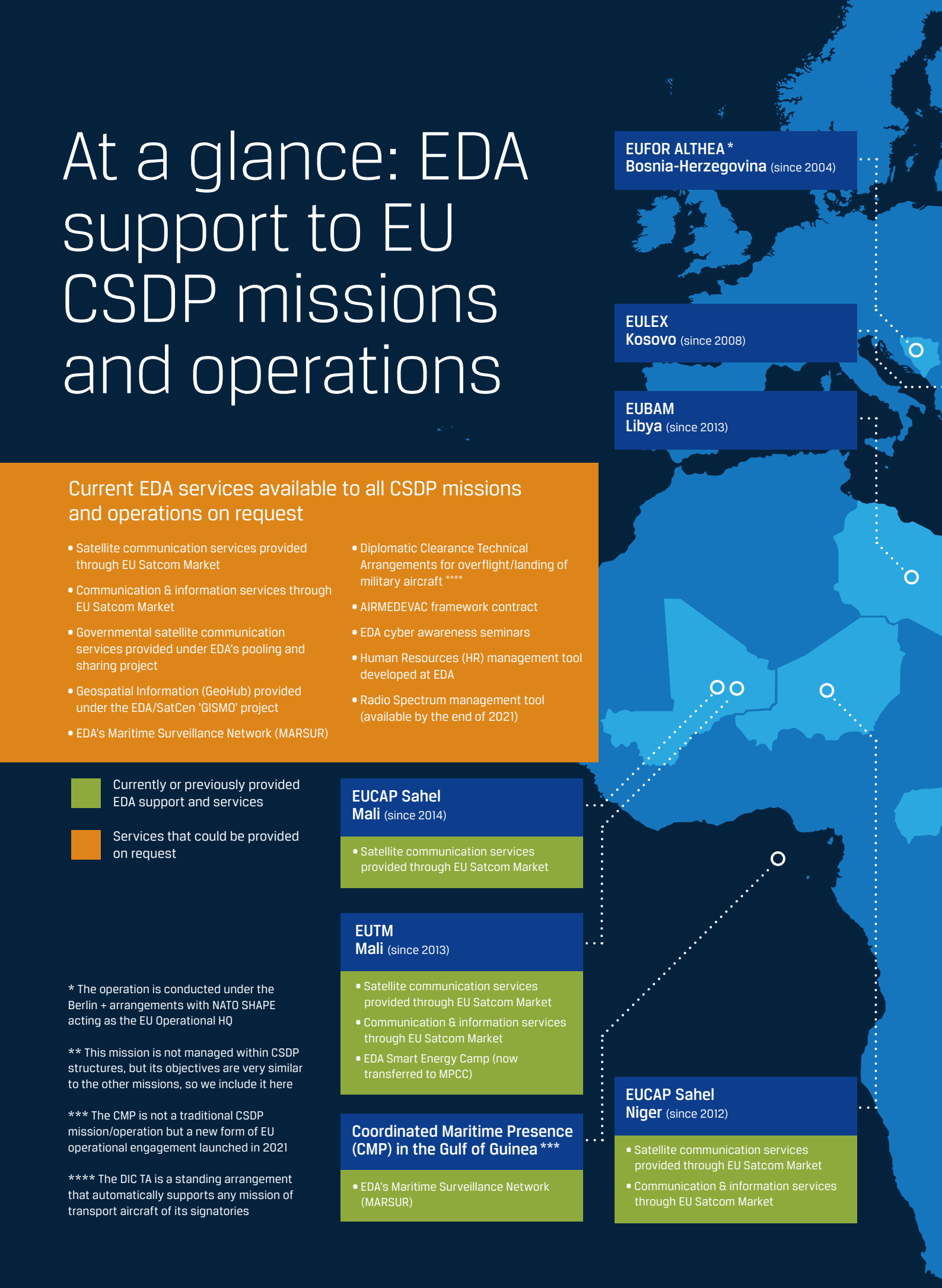
At a glance: EDA support to EU CSDP missions and operations



Current EDA services available to all CSDP missions and operations on request

- Satellite communication services provided through EU Satcom Market
- Communication & information services through EU Satcom Market
- Governmental satellite communication services provided under EDA's pooling and sharing project
- Geospatial Information (GeoHub) provided under the EDA/SatCen 'GISMO' project
- EDA's Maritime Surveillance Network (MARSUR)
- Diplomatic Clearance Technical Arrangements for overflight/landing of military aircraft ****
- AIRMEDEVAC framework contract
- EDA cyber awareness seminars
- Human Resources (HR) management tool developed at EDA
- Radio Spectrum management tool (available by the end of 2021)

Currently or previously provided EDA support and services

Services that could be provided on request

EUFOR ALTHEA *
Bosnia-Herzegovina (since 2004)

EULEX
Kosovo (since 2008)

EUBAM
Libya (since 2013)

EUCAP Sahel
Mali (since 2014)

- Satellite communication services provided through EU Satcom Market

EUTM
Mali (since 2013)

- Satellite communication services provided through EU Satcom Market
- Communication & information services through EU Satcom Market
- EDA Smart Energy Camp (now transferred to MPCC)

Coordinated Maritime Presence (CMP) in the Gulf of Guinea ***

- EDA's Maritime Surveillance Network (MARSUR)

EUCAP Sahel
Niger (since 2012)

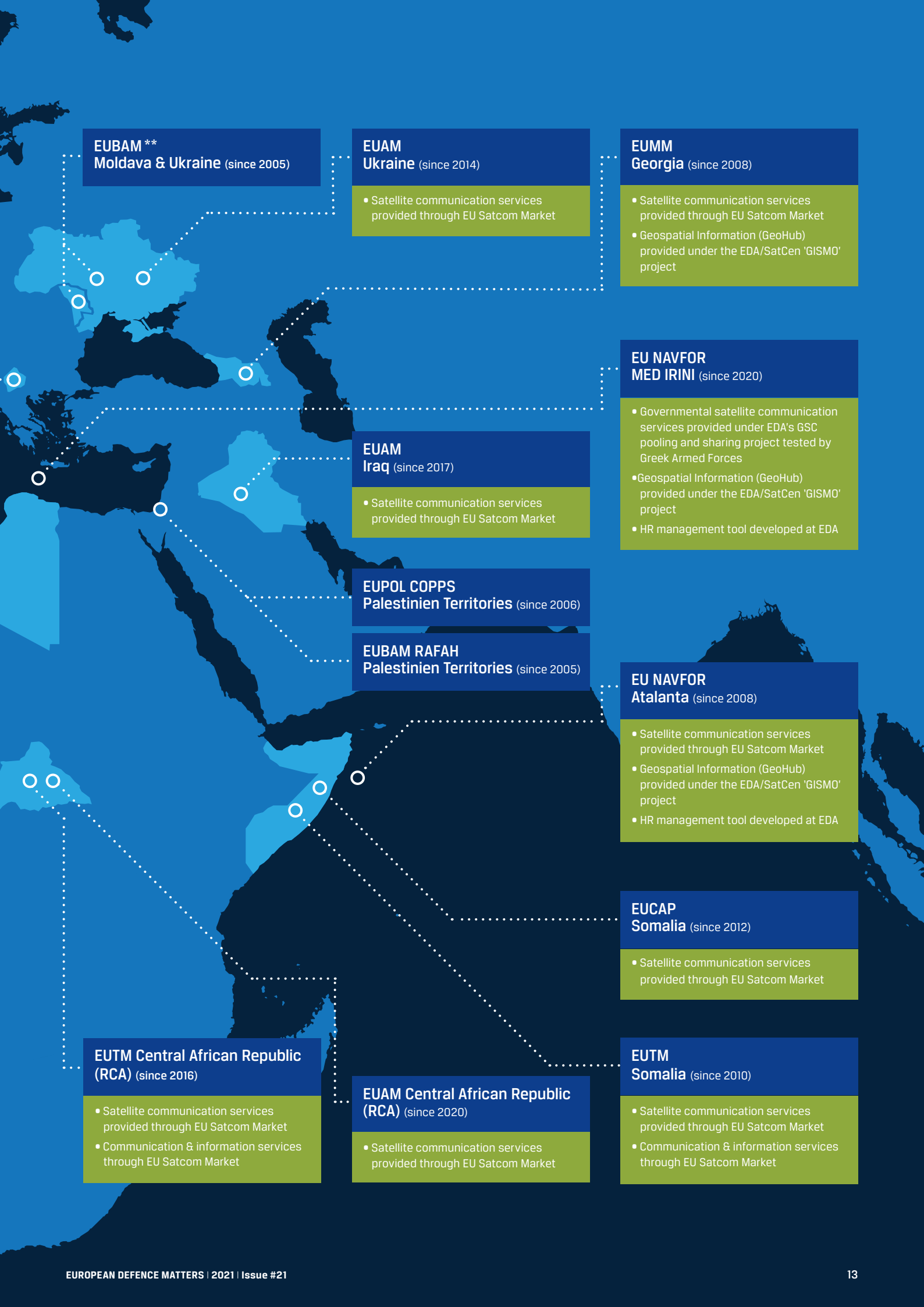
- Satellite communication services provided through EU Satcom Market
- Communication & information services through EU Satcom Market

* The operation is conducted under the Berlin + arrangements with NATO SHAPE acting as the EU Operational HQ

** This mission is not managed within CSDP structures, but its objectives are very similar to the other missions, so we include it here

*** The CMP is not a traditional CSDP mission/operation but a new form of EU operational engagement launched in 2021

**** The DIC TA is a standing arrangement that automatically supports any mission of transport aircraft of its signatories



EUBAM **
Moldava & Ukraine (since 2005)

EUAM
Ukraine (since 2014)

- Satellite communication services provided through EU Satcom Market

EUMM
Georgia (since 2008)

- Satellite communication services provided through EU Satcom Market
- Geospatial Information (GeoHub) provided under the EDA/SatCen 'GISMO' project

EU NAVFOR
MED IRINI (since 2020)

- Governmental satellite communication services provided under EDA's GSC pooling and sharing project tested by Greek Armed Forces
- Geospatial Information (GeoHub) provided under the EDA/SatCen 'GISMO' project
- HR management tool developed at EDA

EUAM
Iraq (since 2017)

- Satellite communication services provided through EU Satcom Market

EUPOL COPPS
Palestinien Territories (since 2006)

EUBAM RAFAH
Palestinien Territories (since 2005)

EU NAVFOR
Atalanta (since 2008)

- Satellite communication services provided through EU Satcom Market
- Geospatial Information (GeoHub) provided under the EDA/SatCen 'GISMO' project
- HR management tool developed at EDA

EUCAP
Somalia (since 2012)

- Satellite communication services provided through EU Satcom Market

EUTM Central African Republic (RCA) (since 2016)

- Satellite communication services provided through EU Satcom Market
- Communication & information services through EU Satcom Market

EUAM Central African Republic (RCA) (since 2020)

- Satellite communication services provided through EU Satcom Market

EUTM
Somalia (since 2010)

- Satellite communication services provided through EU Satcom Market
- Communication & information services through EU Satcom Market

No Satcom, no operation

Military operations today are virtually inseparable from the space domain, so vital has the latter become for the former to function and achieve its objectives. This is especially true when EU CSDP missions and operations are spread across geographically large or difficult operational areas such as the Sahel or the wide-open spaces of the Mediterranean or the Indian Ocean.

The European Defence Agency (EDA) helps its Member States as well as EU CSDP military and civilian operations and missions to fill communication gaps by managing on their behalf the provision of satellite communications (Satcom) services and also wider Communications and Information System (CIS) services including e.g. IT computer and radio networks.

Current military operations and missions are by definition information-centric whose chains of command, ability to react, soldier safety, and situational awareness depend on seamless streams of data combined with secure and reliable channels of communication. This implies in most cases a heavy reliance on satellite communication services and reliable terrestrial networks which also to a large extent applies to civilian missions as well. However, such services are complicated to source, nor does every EDA Member State have its own satellite capacity or the time, resources or expertise to find and manage what services it needs, when it needs them.

That's where the Agency's arrangements for the provision of satellite communication and wider CIS services enter the picture. Known as **EU Satcom Market** and **EDA GOVSATCOM pooling and sharing demonstration** projects, the former focuses on agglomerating participants' demand and providing commercially available Satcom and CIS services, while the latter offers a guaranteed access to governmentally-owned and controlled secure satellite communication services.

Both EDA projects have their own approach and dynamic; yet they are complementary and focused on one common objective: help to provide Member States and CSDP operations and missions with tailor-made, available, secure and efficient Satcom and CIS capabilities.

Hassle-free access to services, 24/7

Agglomerating Europe's military demand for commercial satellite services makes eminent sense. It not only assures good value for money but locks down the services' availability and planning, enabling efficient management of the array of auxiliary tasks that go hand-in-hand with them. That is exactly what the Agency's EU Satcom Market (ESM) service has been doing for years.

Military operations and missions are, by definition, heavily information-centric. Chains of command, ability to react, soldier safety, and situational awareness – all depend on seamless streams of data and secure, reliable channels of communication. This means a heavy reliance on satellite communication services and related terrestrial networks.

The EDA's ESM project fills this collective need. It offers its users Satcom end-to-end services with transmission links and Satcom terminals for all commercial bandwidths. It also provides Communications and Information System services (CIS), including the integration of telecommunications with radio and IT networks and the management, or purchase, as required of hardware and software. This diverse mix enables ESM users to access, store, transmit, receive, and manipulate information to meet their operational needs, whether at home or abroad.

"Demand for the ESM expands from year to year among the 33 members[1] that now participate," said Jan Floderstroem, EDA's Project Officer for Operations Support.

Widespread use

Indeed, the ESM links up European operations and missions from Ukraine to Georgia, and across the breadth of Africa. Its services are used by land, air and naval forces, be it complex full-range CIS networks for mission headquarters or simple geo-location devices to keep track of force deployments or vehicle movements.

For example, its supports the EU's Military Planning and Conduct Capability (MPCC) and all three of its military training missions in Mali, Central African Republic, and →

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Somalia where, since 2018 they are interconnected over a secure Wide Area Network. The CIS services provided include e.g. email, filesharing, Voice over IP (VoIP) and Video and Tele conferencing (VTC). The ESM has long had ties to EUTM Somalia where it set up its first Satcom link for the mission in 2015. For EUTM RCA, additional CIS services for all HQ staff provided since 2019 include email, VTC, VoIP, a terrestrial radio network, and 24/7 technical on-site support to the mission's headquarters' CIS staff.

ESM supplies several CSDP actors with push-to-talk radio solutions, which obviate the need for radio infrastructure. It's a powerful solution for missions with large areas of operation, enabling personnel to deploy safely to any location without losing vital communications. ESM also provides deployments of smaller two-way satellite ground stations with dish antennas to several EU missions e.g. in Mali, Niger, and Ukraine.

ESM's roots stretch back to 2009 when it was launched as an EDA ad hoc procurement cell to test the idea of pooling demand for commercial satellite services among a small handful of EDA militaries. Five years later more of the Agency's Member States had joined. It was then renamed and given a more formal footing as a service open to all EDA militaries, CSDP operations and missions (both military and civilian) as well as EU entities and, subject to the EDA Member States approval, third states which have an administrative arrangement signed with the Agency (currently Norway, Switzerland, Ukraine and Serbia).

Busy times

Since then, it has watched the volume of its activity grow steadily. "Every week we see the trend continue. Currently, on average, there is a new Satcom order coming in every 1.5 days, ranging from matters as small as shipping out a few SIM cards to the on-site deployment and assembly of a VSAT (Very Small Aperture Terminal) terminal," observed Floderstroem, adding that the ESM by mid-May 2021 has handled more than 440 Satcom orders since 2012.

Full service and efficiency guaranteed

Procuring and setting up such services is complex and requires specific skills and experience that not every EDA Member State enjoys. Using the ESM means individual users do not have to run their own bidding processes while taking advantage of an efficient pay-per-use solution where members pay only for the ESM services ordered.

The process is simple. After a customer defines its Satcom requirements with the ESM, these are communicated to the ESM contractor for a straightforward offer. If it requires CIS, this can lead to a 'mini competition' between the ESM's two CIS contractors to win the proposal. The ESM then checks and evaluates the order and it falls to the member to decide whether to accept it. Once an offer is approved, the ESM confirms the request for delivery.

Its support does not stop there, however. The ESM also offers:

- whole-of-project management, including governance;
- support and advice to members for defining technical requirements and options;
- synergies between civilian and military uses of secure satellite communication and CIS services;
- administration of ad hoc budgets composed of members' contributions for funding the services;
- invoice management and payment of services on behalf of the ESM members.

For example, if a Satcom problem occurs out in the field that local mission staff cannot resolve, then on-site interventions by contracted experts is part of services offered without additional costs, said Floderstroem, adding that services "can also cover a complete computer network, fully supported on site by the contractor's personnel, if requested."

Framework contract

ESM's services are provided via two framework contracts, one for the provision of Satcom services and one for the provision of CIS.

Once an order is firmed up, the ESM's team can usually get things up and running pretty fast after that. Flodedstroem commented "Normally, after we confirm a Satcom order for delivery it takes around 30 days for the service to start. In Africa e.g., building up satellite infrastructure it takes a bit longer". The time required from request for proposals to on-site provision of initial services is only three months. The ESM team's record for setting up a Satcom link – from request to actual uplink to the Member State – is 72 hours.

"For Satcom we process in the project a customised engineering study and provide a full offer in 11 working days. Conversely, we and the end user can always just pick and choose from the price catalogue and in such cases a firm offer can be delivered already in 5 working days".

Spike in demand as a result of Covid

Floderstroem said the Covid pandemic has led to an increase in demand from the CSDP missions. "They need more satellite capacity because their personnel are more spread out. As a result, we have supported them with an increase in Satcom capacities and mobile satellite services," he said.

1 Austria, Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxemburg, Poland, Portugal, Romania, Spain, Sweden, Slovenia, Republic of Serbia, European Peace Facility, EUCAP SAHEL Niger, EUCAP SAHEL Mali, EUAM Ukraine, EUCAP Somalia, EUMM Georgia, EUAM Iraq, EUBAM Libya, EUPOL COPPS, EUAM RCA, FRONTEX and the European External Action Service.

Three questions to...

LtCol Robert Kösling

Action Officer CJ6 Communications at the EU Military Planning and Conduct Capability (MPCC)

What added-value does the EU Satcom Market bring to the MPCC?

The EU Satcom Market project provides a huge scope of services to project members, inter alia MPCC, supporting them on CIS needs. This 'toolbox' consisting of framework contracts can deploy at short notice and deliver worldwide standard CIS solutions as well as solutions tailored to specific use requirements. This technical and logistical perspective complemented by the direct support by EDA personnel for drafting tender specifications, leading the tender process and providing the contract management authority afterwards is a highly valuable support to MPCC and its staff currently planning and conducting three EU Training Missions (EUTMs) in Africa.

And for the EU's Training Missions?

EUTMs usually conduct a turnover of personnel after six months of deployment. With the already mentioned advantages of setting up and managing CIS contracts by EDA on behalf of the end user, EUTMs benefit from easy, efficient and quick procurement timelines. This supports seamless planning and implementation of projects with the same personnel deployed into theatre. In addition, the contract management provided by EDA facilitates the retention of corporate knowledge in an environment with a high turnover of personnel. It is a huge benefit for EUTMs to be able to rely on a trustable partner when putting such contracts in place.

How do you see the EU Satcom Market evolve in the future?

CIS means and capabilities are a fundamental support to any Command and Control process – it does not matter whether they are civilian or military. Knowing this and seeing increasing CSDP activities worldwide, I think the EU Satcom Market project is already a very important and reliable partner for the conduct of EU missions and operations. I believe that the renewal of the framework contract for CIS and review of the services catalogue will add value. The renewal of the framework contract for satellite communications has already proven the ability of EDA to make good working things even more attractive.

FACTBOX: EU Satcom Market

- More than 440 Satcom orders handled (as of mid-May 2021)
- Total value of orders made to date: €58.6 million
- Average yearly growth of over €7 million since first order placed in 2013
- Customer base includes national defence ministries, four CSDP military operations/missions, EU's strategic headquarters in Brussels for all training missions, and seven civilian (CSDP) missions

"Pooling and sharing is based on the pay-per-use principle with no binding financial commitments upfront for the participants beyond the requested Govsatcm services"

From government to government

Europe's national capitals and EU institutions must have access to robust and secure satellite technology for the most crucial government functions, whether for military missions, intelligence analysis, diplomatic communications or as back-up redundancy for critical infrastructure such as the internet. Sharing this vital capacity among EU governments is not only logical but cost-effective, and has long been a focus of the European Defence Agency's (EDA) work – an endeavour that will reach important milestones in the next few years.

EDA's coordination of secure satellite capacities lies with its Governmental Satellite Communications (GOVSATCOM) project, whose roots stretch back to 2014 when the Agency's constituency of national Ministries of Defence gave the nod for this ground-breaking work to begin. After several years of planning and coordination, during which the Agency garnered the GOVSATCOM operational needs of military and civilian actors for national and CSDP operations, EDA and its participating Member States in 2017 mapped out 'EDA GOVSATCOM' as a demonstration project. Known as 'GSC Demo', it got off the ground with its initial three-year execution phase, starting in January 2019.

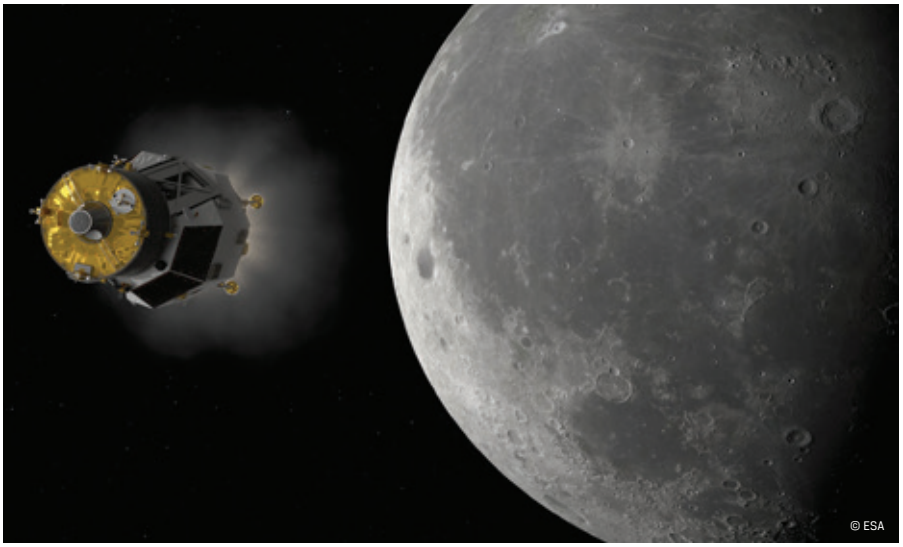
Ultimate example of pooling and sharing

EDA GOVSATCOM is the ultimate example of pooling and sharing between national capitals – hard to find a larger scale of ambition than space! Basically, it involves a small core of EDA countries pooling their national military or other government-owned satellite infrastructure to provide the secure use by a larger number of Member States and institutional stakeholders. "Pooling and sharing is based on the pay-per-use principle with no binding financial commitments upfront for the participants beyond the requested Govsatcm services. Contributing Member States also benefit from extensive EDA support throughout the service", said Heinrich Krispler, EDA's Project Officer GOVSATCOM.

"The benefit for our Member States is that we do most of the preparatory work, making it much easier and faster for them to get the satellite support they need. It means they don't have to deal on their own with heavy or slow procurement arrangements," added Holger Lueschow, Programme Manager for EDA's Satellite Communication activities. "That radically simplifies the process of gaining access to satellite capacities for a military. Obviously, those who have signed up to each [activity] get easy access to both commercial and Govsatcom services."

Seven suppliers, many beneficiaries

GSC Demo is currently composed of 17 Member States, of which seven →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(Luxembourg, France, Germany, Spain, Portugal, Greece, Italy) belong to the suppliers of the pooled governmental satellite communication services. Services include space capacity leasing, anchoring, backhauling, satellite ground terminals (terrestrial, airborne, seaborne) lease services and associated services such as technical support, engineering support, transport, logistic and training. They cover Continental Europe, Africa, Middle East, the Indian Ocean, the Mediterranean Sea as well as the Atlantic Ocean partially.

Its membership also includes the European Peace Facility, the EU's new €5 billion fund to help shore up the security of weak or failed states, particularly in Africa where more than half a dozen CSDP missions now operate. Secure and robust satellite communication services are essential in such parts of the world for mission headquarters, VSAT ground terminals, satellite-based phones and geo-location devices that track the whereabouts of forces and equipment, for example.

So far, the GSC Demo has generated orders worth well in excess of €1 million. These included two years of national support to establish communication lines within a Member State (wich started in 2019) and a service request in September 2020 to test the readiness and interoperability of the Satcom assets of another Member State's navy prior to deployment under Operation IRINI, the EU's CSDP mission in the Mediterranean to enforce the UN arms embargo against Libya.

More recently, in March 2021, yet another Member State (*see interview in text box*) initiated a long-term service request for the project to support its national training and military exercises, and help prepare and train personnel for CSDP missions.

Huge potential

Indeed, such requests show that confidence at national level in the GSC Demo to provide reliable, secure, and cost-effective pooled capabilities is growing. When it comes to governmental Satcom resources, "this should be the preferred option for getting the full range of secure and guaranteed Satellite Communication services, whether for national, CSDP or EU initiatives in a wider international context," observed Lueschow. "It can really mitigate communications shortfalls for such missions."

As for the future, EDA is already coordinating with its Member States to extend the project's life for four more years until 2025. Moreover, it is working to enhance GOVSATCOM's portfolio of services to even better respond to its participants' needs and expectations.

Supporting EU GOVSATCOM

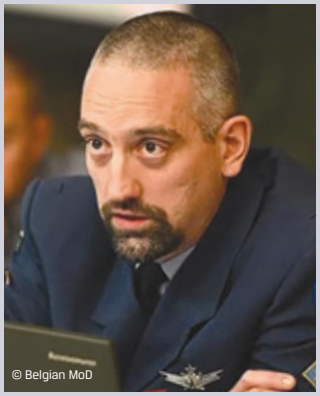
As EDA's member countries gain experience in pooling and sharing their satellite capacities, this can complement – and could be folded into – the EU's parallel project known as EU GOVSATCOM. Here the European Commission is working with national capitals to get the platform of public-owned satellite generated services up and running in the coming years.

EDA GOVSATCOM prefigures that effort. As Lueschow explained, "we agreed with the Commission to set up EDA's version of GOVSATCOM in 2016 so that, among other things, it would produce lessons learned for it and the Member States. Today we are working on how to prepare for EU GOVSATCOM's arrival, but that won't happen for another few years. Thus, we still have some time to further improve our GSC Demo. After 2024, national defence ministries will have to decide what to do with EDA's project."

Two questions to...

Nicolas Gérôme

Air Force Commandant, Head of Space Office at Belgian Ministry of Defence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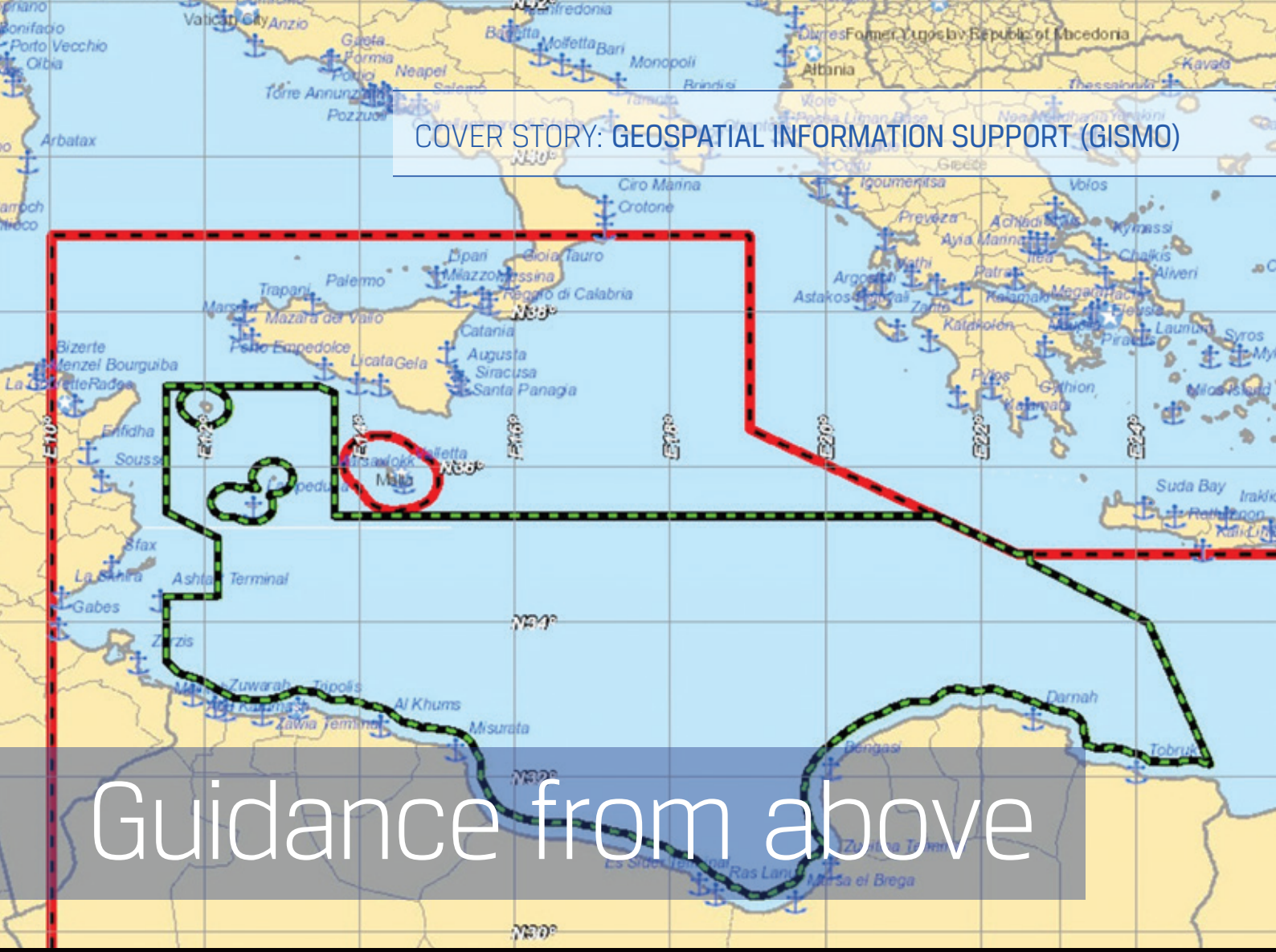
Which were the main reasons for Belgium's decision to use the GSC Demo project?
Belgium has no national military Satcom programme and therefore needs to fill its growing needs in bandwidth through collaborative engagements with Allies' programmes, institutional projects or financing of hosted payloads. The consequence of this is a strong dependence on these other nations' programmes. EDA's GOVSATCOM pooling and sharing demo project is the most adequate tool to cover such capability gaps. Due to their inherent characteristics, military missions sometimes imply quite heterogeneous user demands that our portfolio cannot always absorb. The contractual tool provided by EDA's GOVSATCOM project allows us to fill our peak demands perfectly while improving the partner nation's return on investment.

What are your experiences so far as a beneficiary of shared GOVSATCOM capabilities?
Belgium is fully satisfied with the services delivered so far, namely gap-filling bandwidth in X and Mil-Ka band provided by Luxembourg on GOVSAT-1 together with temporary additional anchoring services as we are building-up our new anchoring station in Marche-en-Famenne. Up till now, Belgium remains only a user nation in the agreement but might also become a supplier once our structural Satcom capabilities will be fully operational.



Guidance from above

Global satellite navigation services have long made geo-spatial awareness a commonplace in our world today. Every Google map user, for example, is a geo-spatial surfer. For military missions and operations, however, the necessary exploitation of this capability goes far beyond simply knowing where something is or how to reach it. Geospatial information is critical for battlefield awareness, event analysis and decision-making, all of whose elements need to be integrated as much as possible for mission-planning and quick reaction. The GISMO initiative, a joint venture between the European Defence Agency (EDA) and the EU Satellite Centre (SatCen), is helping Europe's militaries do this.

Ideally, military commanders and their headquarters need historical and real-time situational awareness for maximal operational effectiveness, that is: the ability to know what has happened and where, and the ability to retrieve it quickly to anticipate, or plan, for what happens next. That is where GISMO – EDA-SatCen's 'Geospatial Information to Support decision-Making in Operations' initiative – enters the picture.

The idea for GISMO germinated back in 2013, following an EDA workshop on capability issues related to ISR, or intelligence, surveillance and reconnaissance. With the backing of the EU Military Staff (EUMS) and working closely with SatCen, EDA sponsored a year-long landscaping study to identify the gaps and the options for filling them. That, in turn, led to a set of recommendations and initial project work in 2014 to begin developing a user-friendly platform to integrate diverse layers of data into an operationally flexible geospatial picture. The activity became a joint initiative between EDA and SatCen and it took advantage of the long-standing experience of SatCen, who managed the technical development of the project, including the access to geospatial information.

Italy volunteered as the first EDA Member State to host the nascent technology at its operational headquarters (EU OHQ) in Rome where, at the time, Operation SOPHIA, the EU's naval mission in the Mediterranean, was overseen. "We used that on-site time to gather valuable input from the OHQ's various specialised personnel – those involved in logistics, intelligence, medical and so on – to get a clear view of their user needs and how that could fit into wider geospatial representation," said Alessandro Vivoli, EDA's current Project Officer Space (previously responsible for ISR Collection).

GeohuB

That effort's result is today's 'GeohuB' (Geospatial hub), a software application that enables a headquarters' operational units to share and display geospatial information in a user-friendly fashion contributing to perform situation analyses. →

GeohuB has proved its operational added value several times over. Aside from its deployment to Rome to support Operation SOPHIA, it was used during the EU Crisis Management Military Exercise (MILEX) in 2017 to access geospatial information by the EU's OHQ at the time in Northwood, UK, as well as in 2018 during PACE 18, the EU's civil-military counter-hybrid threat exercise. Since then, it has supported EU exercises every year.

Currently, GeohuB supports the EU's border monitoring mission in Georgia where, with SatCen's help, personnel in the field function as mobile 'sentinels' by observing events on the ground and feeding data into the GeohuB system to support decision-making. Moreover, at the EUMS's initiative, GeohuB is now being explored as the application for sharing geospatial information among network users in an operational context. Recently, it has been used to augment the Multinational GeoSpatial Support Group, led by the German Bundeswehr, for the benefit of NATO and the EU. Finally, the GeohuB has just been deployed in the EU OHQ of Operation ATALANTA in Rota, Spain.

Standard tool for all CSDP missions

GeohuB's added value is that it functions as a standardised viewer and content-manager enabling information sharing. "The general aim is to provide a tool common to all EU HQs. These normally lie dormant until activated when the EU starts an operation, and then personnel are called upon following a manning agreement among Member States", explains Salvador Llopis Sanchez, EDA's Project Officer Communications and Information Systems. "The main advantage of GeohuB is that a geospatial officer called in from elsewhere to operate in an EU HQ in Spain or Italy will find a standard tool he can use right away, even if the wider environment is unfamiliar to him. That is a great advantage for settling quickly into the position," he said.

Another advantage of GeohuB is that it helps overcome the fact that HQ personnel are always rotated every three to six months. Traceability of records and data could be easily lost since the information remains in silos, fragmented across personal directories. "Having one place where geo-referenced information is stored and centralised, along with a methodology for structuring and retrieving it, ensures it is available to new incoming personnel," said Llopis Sanchez. "You can easily imagine the benefit this offers to a headquarters by having all its situational awareness sources in one single platform, particularly since GeohuB allows it to combine unclassified (open source) layers of geographical information with the classified information generated by the mission itself."

Alexis Letulier, Head of IT Division at SatCen, added: "Working in classified environments is always a big challenge due to the security and network limitations. But GeohuB can be used in those environments having been developed within SatCen accredited network."

GeohuB does this in nuanced ways where information can be shared and cross-referenced with OHQ personnel executing different functions. For example, incident-monitoring with tactical or medical evacuation implications can be shared between those operational units.

Support to logistics

Logistics is another domain where geospatial awareness is crucial. "Many logistics officers use very complex software to create their logistic plans. Sometimes it is difficult to share this information with others, as the latter will not have access to that functional service. GeohuB is the common information environment bridging them," observed Vivoli. "The same goes for your J2 (Joint Staff Intelligence) unit. They need to show potential threats from enemy forces to the commander, but the information is based on dedicated software. GeohuB can integrate all that for common display."

Getting the full picture

Indeed, one of the biggest daily challenges for any HQ is marshalling the situational awareness information from its various operational cells into a readily understandable form for displaying to its commander – the well-known 'morning brief'. Those responsible for pulling that together to account for what happened in the previous 24 hours must bring together relevant data from all operational aspects: incidents, weather, enemy movements, logistics, deployment reports, etc.

"Doing that dynamically on-screen facilitates coordination between HQ cells, considering that each one can access the tool with their own user profile. Thus, a logistics user can create new content that links to other tasks, with all feeding into the wider morning update report," said Vivoli. "In other words, operational staff can adapt the hub's functionalities to their needs. And its operational advantage is that the more complex it becomes – the more information you feed into it – the more useful it becomes."

Easy training

As for training, this takes only a few days, according to Alessandra Ussorio, SatCen's Projects Coordinator in the Capability Development Division. "The system is very user-friendly and intuitive to use. GeohuB offers several modules as part of its self-guided training material, which is available through the application so users can see tutorials and application examples of its functionalities. In addition, advanced training for administrators is also delivered. Historically, this was done physically either at SatCen or among the EU's HQ sites, but under the current circumstances it has been switched to virtual training." she explained. "SatCen not only provides a tool, but a whole service, including training and a help desk in support of the user community."

Looking to the future, GISMO has a side project in the conceptual phase – 'GeonaW' (Positioning, Navigation and Timing – PNT – threats Geo-database to support mission planning and operations in Navigation Warfare scenarios) – to build on GeohuB's technology. The Agency's PNT Project Team began researching the idea in 2020 with SatCen and their resultant landscaping study, use cases, and recommendations are now under discussion.

When brought to fruition, GeonaW will help operational planners do their job in degraded environments when, for instance, satellite positioning and navigation signals are jammed. "That would be very useful when operating in urban canyons or other built environments", observed Vivoli.

Three questions to...

Soenke Fischhoefer

Senior Geospatial Officer at the EU Military Staff (EUMS)

What, in your view, is GeoHub's biggest added-value?

GeoHub is a geospatial information tool that is easy to use and for which staff can be easily trained. It enables EU HQs to have a system similar to 'Google Maps', adjusted to the military environment, but at the same time to be in control of the underlying geospatial information which contains geospatial data and quality controlled products such as maps or geospatial web services. In addition, it is optimised to make use of EU SatCen products.

The EUMS has been key in the initial phase of requirements collection. What are the next steps foreseen?

EUMS and the Military Planning and Conduct Capability (MPCC) intend to continue to use GeoHub during the MILEX and Multilayer Exercises such as Integrated Resolve 20. GeoHub is also considered to be integrated in the further development of the EU Operations Wide Area Network (OPSWAN) which will be further improved over time while maintaining interoperability with NATO's Federated Mission Network.

How does GeohuB fit into EUMS' wider geospatial activities?

GeoHub is expected to give HQs full control over all the geospatial information used in a mission or operation, meaning everybody plans and evaluates on the basis of the same geospatial information or, as we say, 'operates off the same map'. The designation of data is important: designated geospatial information is quality controlled and legally binding for executive operations when chosen by the OP Commander.

Europe's collective military eyes at sea

The promotion of maritime situational awareness has long been a goal of the European Defence Agency (EDA), and was among its earliest efforts after the Agency's creation in 2004. There has been steady progress among Europe's navies towards interoperable situational awareness at sea since then, along with growing interest from EU institutions for the crucial support that it could potentially lend to future CSDP missions and operations.

At the forefront of this effort is the Agency's 16-year old MARSUR ("Maritime Surveillance") project, which knits together 22 navies for the exchange of maritime surveillance information, and which has just entered its third phase of development.

"One of the most important things about MARSUR is that it was developed by the Member States for the Member States: that is, their navies working together to find the technical solutions they needed,"

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said Georgi Georgiev, EDA's Project Officer for Maritime Capabilities Support. "There was no formal common funding, and so it was a very low-cost endeavour. Their total investment (excluding investment in system integration at national level) over the past 15 years has only been about four million euros."

For what MARSUR navies have achieved in terms of capability, that is a very tidy return on investment, indeed. Launched in 2005 as a low-key network for exchanging open-source maritime information among a handful of national navies, MARSUR has since matured into a multi-faceted communications platform which is operational and fully supports the needs of the MARSUR navies when conducting their national operations. The system enables a wide scope of services ranging from email, instant messaging, secure voice over IP, alerts, notifications and white boarding, or on-screen file sharing, to video exchanges, information recovery, and data transfers of tracks.

MARSUR's projected membership comprises Germany, which leads the effort, plus the navies of 15 other EDA Member States (Belgium, Bulgaria, Cyprus, Finland, France, Greece, Ireland, Italy, Malta, the Netherlands, Norway, Poland, Portugal, Spain, Sweden), as well as the EU's Satellite Centre (SatCen), of which the latter brings unique added value to the project's activities. However, another six countries (Croatia, Latvia, Lithuania, Romania, Slovenia, and the UK) participate in the MARSUR multinational agreement – not restricted to the EU – called →

'Technical Arrangement' by which they commit to share maritime surveillance information on a voluntary basis.

Tested at Operation SOPHIA

The heart of the project's data exchange activity is its 'MARSUR Exchange System' (MEXS) software, whose operational utility was demonstrated in 2017 during the height of the EU's Operation SOPHIA to prevent people smuggling and loss of life at sea in the Mediterranean. MARSUR is also associated with the eight-nation PESCO project, UMS (Upgrade of Maritime Surveillance), which aims to integrate land-based surveillance systems and maritime and air platforms for real-time distribution of information.

Noteworthy, too, is the fact that MARSUR has been involved in OCEAN2020, the largest technology demonstration project funded by the EU under the European Commission's Preparatory Action on Defence Research (PADR) to build up a recognised maritime picture by integrating data from multiple naval sources and unmanned systems. MARSUR was one of three networks selected to create a simulated EU maritime operations centre for the project, for example.

Selected for the CMP pilot case

For the Coordinated Maritime Presences (CMP) project, MARSUR is established within the EU Military Staff's headquarters in Brussels, where its Maritime Area of Interest Coordination Cell (MAICC) is located. As an interim solution, France currently provides the MARSUR node within the EUMS. However, the ultimate goal is to establish a permanent MARSUR node within the EU Military Staff to facilitate better exploitation of MARSUR capabilities, with EDA coordinating the effort. "Hopefully, this will be accomplished very soon – in the coming weeks," observed Georgiev.

Among the MARSUR features that the EU Military Staff wants to use is file storage, "which will allow the Member States to share their deployment schedules during the CMP pilot phase," Georgiev said. "Another →

CMP: helping confront the Gulf of Guinea's security problems

The EU is now testing its new Coordinated Maritime Presences (CMP) concept, launched on 25 January 2021, in the Gulf of Guinea region. It will directly rely on MARSUR, which will thus be fully exploited operationally for the first time via a coordination cell within the EU Military Staff in Brussels.

A cooperative initiative for exchanging maritime picture data and analyses among national navies, CMP is a voluntary framework where participating Member States' naval and maritime assets remain under their national chain of command. The Gulf of Guinea will be their first – and highly demanding – operational test area.

The Gulf of Guinea region faces many security problems, from piracy and illegal fishing to arms and drugs trafficking. In 2020 alone, for example, it suffered 84 attacks on ships, with 135 seafarers kidnapped for ransom. According to the International Maritime Bureau, the region now accounts for 95% of all ransom kidnappings at sea across the globe.

Those challenges require the exchange of detailed maritime situational information, and lots of it – the kind that, precisely, MARSUR provides. Based on the CMP's evolution and a buy-in by the countries of the Gulf of Guinea, the eventual goal will be to establish EU liaison officers and proxy MARSUR nodes across the region that would exchange information with the EU Military Staff.

Three questions to...

Cdr Paolo Pezzola

Action Officer Foresight and Planning Branch at the EU Military Staff (EUMS)

How is MARSUR involved in the CMP?
MARSUR has been identified by the Council as the means to collect and share information and data gathered by Member States' assets deployed in Maritime Areas deemed of EU Interest (MAI). The information received is used to compile strategic reports to enhance EU bodies and Member States' Maritime Situational Awareness.

What makes MARSUR fit for the CMP concept?
MARSUR comprises a range of tools that are adequate to share all relevant information within the CMP community in a timely manner. The same tools enable the CMP capability to coordinate Member States' political and strategic commitments in a MAI and synergise them with EU programmes and activities, in order to avoid duplications and rationalise the overall EU effort in a MAI. Furthermore, the CMP is actively involved in the development of the next version of the system, and this will guarantee that the system will meet not only the current CMP requirements but also the future ones, once the CMP initiative will have reached its maturity.

How does MARSUR need to evolve to become a standard tool for EU maritime CSDP operations?
This is a tricky question. The future of MARSUR, as of any other EU project, depends on the Member States' will. The real challenge therefore is not to evolve in the perfect C2 system, but to mediate, accommodate and meet all MARSUR project participating Member States' requirements. Adaptability, flexibility and scalability would be the driving factors for MARSUR to implement in order to become a standard tool for EU maritime CSDP operations.

Three questions to...

Cpt Michail Pantouvakis

Director and UMS coordinator at the Hellenic Navy

How does MARSUR support the UMS project?
The Upgrade of Maritime Surveillance (UMS) is a PESCO project aimed at enhancing the maritime surveillance and situational awareness in all the seas surrounding the EU by taking advantage of existing capabilities and examining future developments against persistent threats and emerging risks. The UMS involves Greece, which leads the project, plus Bulgaria, Croatia, Cyprus, France, Ireland, Italy and Spain, while Portugal participates with observer status. All the involved parties have agreed to use MARSUR as the UMS' information-sharing network.

What are the mutual benefits for PESCO UMS from this cooperation?
The UMS avoids duplication of efforts or unnecessary costs by using MARSUR as the information-sharing network. As the UMS project aims at providing a near-real-time Recognised Maritime Picture, the network through which data are interchanged is very important. MARSUR was used by UMS in two test runs carried out in November 2020 and March 2021. During these tests, Hellenic warships were used to pass data through the MARSUR network to the rest of the participants and vice-versa, in an area stretching from North Aegean to the South-East of Kastelorizo Island and to the South of Crete.

How will both projects interact, or perhaps support each other, in the future?
We consider that the UMS and MARSUR have mutual benefits. First, the UMS will offer a reliable opportunity for the operational use of the MARSUR. Second, MARSUR can take advantage of the lessons learned from the two test runs. Also, from an UMS point of view, MARSUR constitutes a significant prerequisite, among others, for providing a near-real-time Recognised Maritime Picture.


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Three questions to...

Cdr. Francisco Javier Garrido García

CIS Plans & Policy Office at the Spanish Navy HQ

Spain is one of the most advanced users of MARSUR. What would you say is its biggest added value for national and CSDP missions?
MARSUR was selected by the EEAS as the network to be used for the pilot case of the EU Coordinated Maritime Presence concept in the Gulf of Guinea, under the CSDP framework.

The use of MARSUR to support this concept allows European navies to advance in the development of a tool to efficiently carry out our missions, taking advantage of the synergies provided by joint participation.

MARSUR not only provides a significant improvement to the maritime situational awareness but also allows the coordination at different levels (tactical, operational and strategic) and adequate decision-making.

Spain is currently bridging MARSUR and CISE. What does it mean in concrete terms?
The combined use of MARSUR and CISE (Common Information Sharing Environment) opens-up a whole spectrum of new possibilities in the field of maritime security. Information shared between various sectors improves the knowledge of the situation and the decision-making in each area of responsibility. The collaboration between CISE and MARSUR is a win-win solution in a globalised world where threats and interests are manifold.

Currently, the Spanish Navy has the ability to exchange tracks between these two systems and we hope that new common services will be established in the near future to build a wide community of information exchange.

What does MARSUR need to become a tool for EU maritime CSDP operations?
Of course, MARSUR's development must continue. Initially, MARSUR was just a commitment of a group of European navies which has gradually grown into a system. But there is still a long way to go.

We need a functional tool, with the necessary security layers, quickly deployable and with a high degree of automation to facilitate the work of the operators, scalable and interoperable. MARSUR has to be prepared to take advantage of new technological advances, emerging and disruptive technologies, artificial intelligence, edge computing...

We are on the right track and with the effort of the MARSUR community we will achieve the operational tool that European navies need.

practical feature will be the exchange of info packages about suspicious vessels or threats to vessels, as well as the use of MARSUR's chat function. Alerts could also be used to track piracy activity or for suspicious vessel-approach alerts."

As part of that plan, the MARSUR countries are upgrading their MEXS software to refresh its technology and position the system to work with other European maritime initiatives. This latest, third phase was launched in November 2020 and will last six years, with 16 participating Member States

There are plans to demonstrate the capabilities of MARSUR also to the staff of the Operational Headquarters of the EU counter-piracy operation ATALANTA.

Increasing MARSUR's operational clout
Noting that a central goal of the new phase is to transition MEXS to new state-of-the-art technologies Georgiev said "basically the services will stay relatively the same but the technology will change. We are investigating options for the exchange of classified information within the network, for example. MARSUR already has a certain level of security, but the obstacle to full classified information exchanges is the certification principles. That's always complex and time-consuming to coordinate between so many countries."

For the moment, the MARSUR nations are defining their upgrade requirements, after which EDA will launch open calls for industry to develop the new software. "There will be an overlap between the two software versions, with 80 percent of the new system expected to be in place by spring 2022," he said, adding that the technology refresh will be based on existing standards, "so it's really just a matter of stitching everything together."

As MARSUR upgrades its technology and capabilities, this will enhance the network's operational utility for purposes of supporting EU maritime engagements and CSDP missions and operations. And it

will facilitate MARSUR's connectivity with the EU framework for exchanging data and situational awareness among the Member States, known as the Common Information Sharing Environment (CISE) for the maritime domain.

CISE functions as a political, organisational and legal environment for sharing information across seven sectors and user communities (transport, environmental protection, fisheries control, border control, general law enforcement, customs and defense), based on existing and future surveillance systems/networks.

"MARSUR is seen as the defence layer of CISE – to connect our navies with civil security actors," said Georgiev. "Technically, the two systems are already linked by a so called bridging node currently established by the Spanish Navy. But what has not been decided is the kind of information that could flow from one side to the other. We are close to a decision regarding the volume and nature of information flowing from MARSUR to CISE. Once done, that will be a big step forward in civil-military information exchanges at EU level, and a boost to our collective security."


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Question to...

CDR Bernhard Wehner

Forces Policy Division, German Ministry of Defence

Germany is the lead nation for the MARSUR III project. What are your expectations, what should it achieve?
Safety and security at sea are important topics for Germany. For this reason, Germany has assumed the role of lead nation, after Finland (MARSUR I) and France (MARSUR II), to animate collaboration among Member States and to further develop the capabilities of the MARSUR system. The successful completion of MARSUR II, directed towards system stability and maintenance, provides the MARSUR community with an operational network whose fundamental technical parameters are in stable operating conditions.

In spring 2019, the MARSUR community ratified the MARSUR Roadmap, clearly defining the goals and ambitions for the future. MARSUR III is the vehicle to address first and foremost the short- and mid-term goals of this roadmap towards a more capable, better integrated, and technically advanced network architecture that makes MARSUR fit for the upcoming challenges.

Improving the stability and security of the MARSUR network will further enhance its operational use, and thus increase its contribution to national and European Maritime Situational Awareness (MAS) pictures. For Germany, the integration of MARSUR in the EU Common Information Sharing Environment (CISE) is a milestone for European cross-sectoral and civil-military cooperation, and therefore of high priority. MARSUR, born out of a similar vision and with already significant operational experience, can play an important role in the process towards operational maturity of CISE.

The realisation of the MARSUR III objectives will provide both national and European actors with a reliable tool for military maritime situational awareness, based on multi- stationary and mobile components. Towards the end of MARSUR III we will have an established, EU-wide, fully operational tool for MSA information exchange between European navies, well integrated in CISE, that contributes significantly to CSDP and other EU initiatives like the Coordinated Maritime Presence (CMP).

Ticking missions' MEDEVAC box

Ensuring air medical evacuation (AIRMEDEVAC) during military and civil operations, national or multinational, is a challenge. When this specific capability is limited in Member States, outsourcing to private companies is the only way forward. However, experience shows that contracting on the spot and under time pressure is not a cost-effective solution, nor a guarantee for success. Having in place ready-to-use arrangements, such as the ones provided by the European Defence Agency's (EDA) AIRMEDEVAC project, can help reduce the administrative burden and achieve economies of scale.

The overall purpose of the Agency's AIRMEDEVAC project is to provide its participating members – currently Austria, Belgium, Czech Republic, Germany and the Netherlands – with an efficient and cost-effective commercial option for in-theatre aeromedical evacuation services through EDA.

In concrete terms, the project offers a stand-by framework contract through which services can be arranged for airborne evacuation – in Europe and Africa – of injured personal from the point of injury to a field hospital by a fixed-wing aircraft and/or by helicopter. Equally the patient can be safely transported from the field hospital to more sophisticated care in larger hospitals nearby the theatre of operations. The services provided enable participating Member States to meet their essential operational needs which may also include transportation of cargo. Movement of patients between the theatre of operations and their home countries (STRATEVAC), however, is outside the scope of EDA's framework contract.

Efficient pay-per-use solution

The project, which was launched in 2017 and currently counts five members, is open to all EDA Member States, EU entities as well as third states having signed an administrative arrangement with EDA (Norway, Switzerland, Serbia, Ukraine). It offers participants an efficient pay-per-use solution that does not impose on them any binding financial commitments other than for the specific support requested. The 24/7 standby capacities covered under the EDA contract reduce the administrative burden for members who don't have to launch their own bidding processes since they can rely on EDA contracts. Contributing Member States have access to a full turn-key solution, which encompasses aircraft, flight crews, maintenance, infrastructure, medical equipment and staff. The fleet can include Super Puma, AW169, Bell 212/412/407, BK 117, AS365 Dolphin or other types of helicopters as required as well as Beechcraft King Air B200 or B1900C aircraft.

The Agency manages the project, supports Member States in defining the common requirements, negotiates and concludes the framework agreement (based on an open public procurement process) and sets up specific contracts to cover special needs. Participating Member States then order the services whenever there is a need, without any delay. Afterwards, EDA manages the payment of the services provided, after full verification. The commercial aircrews also provide training to the Member States they serve, to ensure interoperability and compliance.

Harmonising requirements

Through the framework contract, EDA also promotes the harmonisation of the participating Member States' operational needs and the development of a European defence capability; the contract can therefore be regarded as a key enabler for missions and operations deployed in remote and hostile environments where Member States cannot rely (or not sufficiently) on own AIRMEDEVAC capabilities. The project is designed around military technical requirements developed by the EU Military Staff (EUMS)

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The services provided enable participating Member States to meet their essential operational needs which may also include transportation of cargo

and Member States experts and endorsed by the EU Military Committee (EUMC).

Framework contracts and first deployments

In 2019, EDA concluded a multiple framework contract with Global Helicopter Service GMBH, Elitaliana S.R.L. and Starlite Aviation Operations Ltd. for the provision of fixed and rotary wings medical evacuation services in the context of the AIRMEDEVAC programme. The contracts will run until January 2023 for a maximum value of €120 million.

On 1 January 2020, EDA commenced its first deployment of civilian, fixed-wing AIRMEDEVAC services to support Belgian Armed Forces operations in Niger in Africa. Belgian forces are active in several areas throughout Africa, including Burkina Faso, Mali and Niger. In Niger, they are delivering training and operational advice to the Forces Armée Nigériennes (FANER) and operate in austere conditions with only limited medical support facilities.

To provide appropriate medical oversight, the deployment provides an aircraft based, primary life support capability, available 24/7 throughout the designated operational theatre, to move injured personnel from the main Damage Control Surgery Unit in the city of Maradi to definitive care facilities in neighbouring Gao, Chad.

Two more contracts have been added since then to support German operations: one in November 2020 (helicopter support to German operations in Mali under UN Mission MINUSMA for the in-theatre forward aeromedical evacuation and air transport services) and another one in January 2021 for fixed-wing tactical aeromedical evacuation support of German missions in the Sahel. The AIRMEDEVAC capability is available 24 hours a day, 7 days a week.


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Removing borders, also for missions

Deploying troops to remote missions and operations requires military mobility, i.e. the ability for Armed Forces to swiftly and smoothly cross foreign territories and airspaces. Diplomatic clearances and cross-border movement permissions between EU militaries – two domains in which the European Defence Agency (EDA) is active – directly contribute to facilitating and supporting CSDP missions and operations.

The European Air Transport Fleet (EATF) partnership signed by 19 EU Member States and Norway in 2011 under the auspices of EDA was aimed at improving the military airlift provision in the EU and developing concrete solutions to increase its efficiency and effectiveness.

The development of a Diplomatic Clearances Technical Arrangement (DIC TA) for airlift started immediately afterwards, under the EATF umbrella, and in 2012 the first signatures were achieved, followed by numerous accessions of additional participants over the years.

The arrangement set harmonised procedures for overflights and landings and enables Member States to operate without the need to submit diplomatic clearances requests for each flight. Since then, the DIC arrangement is used by Member States' Armed Forces countless times, day in day out. And it has, and still is, benefitting CSDP missions and operations as well, even though the DIC TA usage for national and international missions is difficult to trace back.

"It is not possible for us to track and record every DIC TA-enabled flight that a Member State has made as part of a national or international mission, including CSDP missions and operations, but one thing is for sure: among the thousands of military flights that have taken place in Europe utilising the DIC TA since 2012, many of them were carried out as part of a CSDP missions and/or operation",

said Gerd Schwiedessen, EDA's Project Officer Aviation. Such arrangements are important 'force multipliers' that help to make sure troops and military equipment can be moved across Europe with very short or even no lead time at all, he stresses.

EDA's work on military mobility has since then significantly expanded, with two new work strands underway, one of which is expected to lead, by the end of this year, to a set of two new Technical Arrangements between participating EDA Member States, namely on Cross-Border Movement Permissions (CBMP TA) for land and air military movements.

The CBMP TA will expand the diplomatic clearance process-harmonisation to non-airlift platforms, and also addresses the transport of dangerous goods by air, which is crucial for military operations. "Once in force, this new arrangement will make a significant difference as the lead time for overflights with dangerous goods will go down from 10-20 working days on average today, to just two days in the future!", explains Schwiedessen.

Both EDA-engineered arrangements – DIC & CBMP Air/Surface – are (or will shortly be) there with one overall objective: to facilitate Member States' military deployments and support the EU's CSDP missions and operations.

More info on diplomatic clearances: https://dic.eda.europa.eu/

"Among the thousands of military flights that have taken place in Europe utilising the DIC TA since 2012, many of them were carried out as part of a CSDP missions and/or operation"

Cyber defence starts with cyber awareness

Military missions and operations, especially when hastily deployed to remote and unknown territories, face particular threats from adversaries as their supporting logistic and communication infrastructure and related processes may become a prime target for cyber-attacks. Hence the European Defence Agency's (EDA) initiative, launched in 2014, to develop and offer 'Cyber Awareness Seminars' for CSDP missions and operations.

The aim is to provide a common and solid knowledge for the whole staff of Operational Headquarters (OHQs) regarding cyber threats, international rules applicable to cyberspace, best practices on IT security and the EU concept on cyber defence in EU-led military operations and missions. Cyber awareness seminars were provided several times a year to EUNAVFOR MED operation SOPHIA staffs at the Rome OHQ from 2015 until 2017.

Before that, similar training activities were provided to the staff of the EU military operation in the Central African Republic (EUFOR RCA) based in the Larissa OHQ (summer 2014). Today, EDA continues to offer one-day seminars to OHQ staff, be it for national or multinational missions and operations based on OHQ requests.

Currently, the Agency is also setting up a cyber awareness 'train-the-trainer' pilot course for cyber awareness professionals which is scheduled to be launched later this year under the lead of Germany. The idea of this course is to standardise education approaches in this domain and to set up a European network of equally trained and interoperable cyber awareness professionals in Member States' Armed Forces.

Smart energy for smart missions

Initiated in early 2015 as one of EDA's activities aimed to help Member States make their Armed Forces more energy-efficient and environmentally sustainable, the **Smart Energy Camps Technical Demonstrator (SECTD)** project was deployed to EU Training Mission Mali (EUTM) at Camp Koulikoro between October 2015 and March 2016 to test the practical implementation of an intelligent power management system (energy demand management, renewable production and storage) in a challenging military environment.

The demonstrator included fixed solar photovoltaic panels on a test building (16KWp), flexible soldier portable solar photovoltaic panels as well as monitoring and metering equipment for water and electricity. Over the six-month test period, the renewable energy systems were not only successfully integrated into the existing camp power architecture (requiring only minimal reconfigurations of the network) but it also led to substantial energy management improvements and cost savings.

Even though it was decided to keep the demonstrator at the camp after the test deployment and let it continue its services and renewable energy supplies to EUTM Mali, it was never the ambition of EDA to remain the owner and remote technical maintenance manager of the system in the long run. Hence the agreement reached early this year with the EU's Military Planning and Conduct Capability (MPCC), as the commander of EUTM Mali, to take over the full ownership rights of the demonstrator on behalf of ATHENA, the mechanism – since then replaced by the European Peace Facility (EPF) – which handled the financing of common costs relating to EU military operations under the EU's common security and defence policy.

This transfer arrangement, signed on 15 January 2021 by EDA Chief Executive Jiří Šedivý and Vice Admiral Hervé Bléjean of the MPCC), allows for the demonstrator to continue its services to EUTM Mali in the future under the best technical conditions.

Bespoke staff management support for military missions

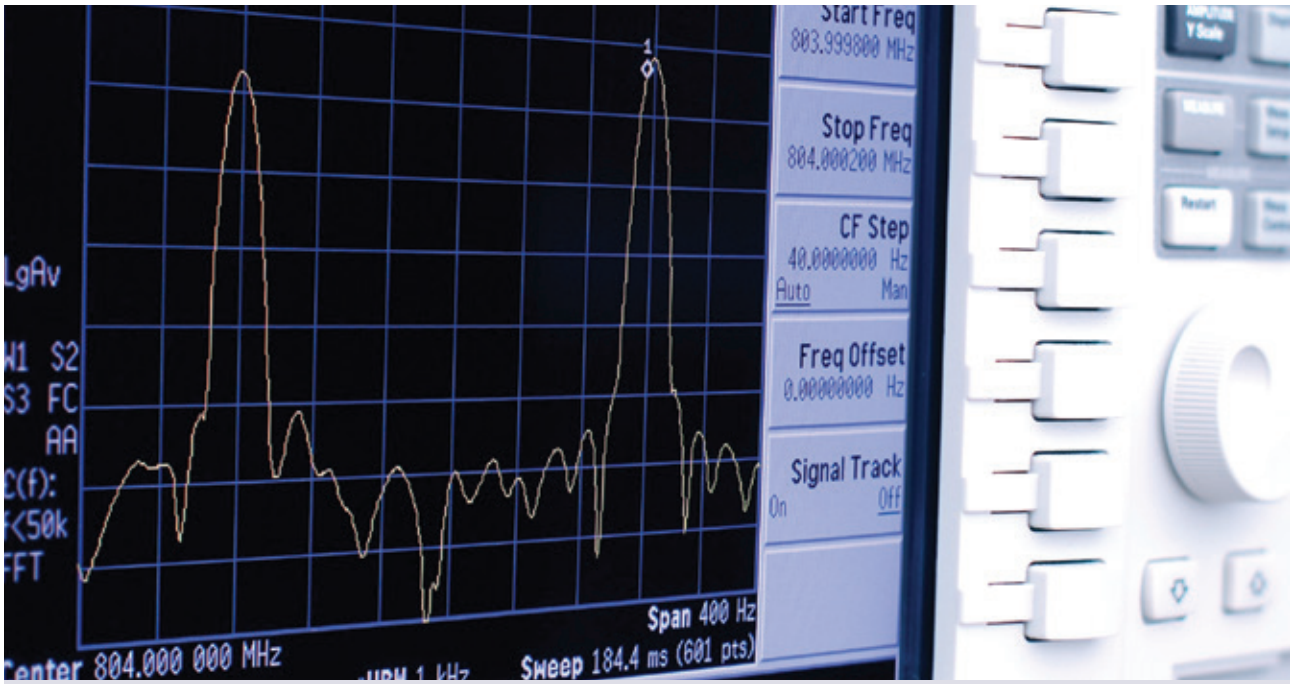
Commanders of military deployments, especially when encompassing multinational troops, are faced with many logistical and organisational challenges, one of them being personnel management.

Indeed, missions and operations have large volumes of personal data to track and process, including all movements of personnel in operational theatres. The indispensable digitalisation of HR data processes and flows is another hurdle many missions and operations tend to struggle with.

Against this backdrop, EDA has taken the initiative to develop J1 FAS (J1 Functional Area Service), a specialist software tool aimed at facilitating and supporting the management of human resources in national and international military missions, including EU CSDP operations.

To date, the tool has been successfully deployed in several Operational Headquarters (OHQ), including the Greek-led EUFOR RCA OHQ in Larissa in 2014, the Italian OHQ in Rome for EUNAVFOR MED operation SOPHIA in 2016 and several other exercises. After a comprehensive update of the software to address key lessons identified and to increase its functionality, a new more cyber-threat resistant version was developed recently to be implemented in the EU's Naval Force Mediterranean Operation IRINI (EUNAVFOR MED IRINI) which aims to enforce the United Nations arms embargo to Libya. Initial steps (including training) to prepare for the deployment started in April 2021.

Now that an upgraded more tailor-made J1 FAS version is available, the EDA framework contract for providing the service is ready to be used by different operations and missions as the workflows are adaptable and open-source software is used to avoid licencing fees. EDA is looking forward to deploying the software to more missions or operations to help Member States foster digital harmonised remote pre-processing, in-processing and out-processing of personnel.



Creating military space in the radio spectrum

Radio Spectrum (RS) management is a critical enabler for most systems used by Armed Forces for communication, positioning, navigation and timing, enhanced reconnaissance and surveillance as well as target acquisition. Freedom of manoeuvre within the RS is also a precondition for almost all defence capabilities and operational activities.

Meanwhile, competition between civil and military applications and users in an already congested RS is intensifying by the day. This puts increased pressure on the Armed Forces to use the finite resource of RS in the most efficient way.

Acknowledging that a more coherent, common European approach towards preserving and expanding the militaries' RS is essential, EDA Member States agreed to jointly acquire a RS management tool to support EU CSDP missions and operations as one important element of this approach.

EDA is currently supporting this acquisition process and has prepared the ground for making available the NATO HQ-owned RS management tool SMIROnline 2 (Spectrum Management Information Repository Online) to all EU Member States as well as to the entities in charge of CSDP missions and operations.

This tool, which is expected to be available by the end of 2021, is composed of a central database where all frequency assignments (e.g., within a CSDP mission or operation), interference reports as well as geographical and equipment technical details can be stored. In addition, the tool allows for an automated data exchange between users and provides an engineering capacity (based on the existing assignments, respecting frequency propagation as well as terrain path profiles) to ensure an efficient and interference-free use of the RS.

Thanks to this tool, CSDP mission and operation commanders will soon have the ability to collate all RS requirements and provide their troops in the field with the necessary interference-free access to the RS.

"We need to improve the efficiency of our defence investments"

If Europe wants to remain able to develop top-notch defence capabilities – in the naval and other domains – and play a leading role on the global defence market in the future, it must promote and support enhanced cooperation between big European players willing to pool their know-how and share resources, says **Pierre Éric Pommellet**, the CEO of Naval Group, in the following exclusive interview with *European Defence Matters*.

Together with Fincantieri, Naval Group has created the NAVIRIS joint venture, a strong European entity on the global shipbuilding market. What is the philosophy behind this cooperation and what can Europe's wider defence industry perhaps learn from them?
I believe in Franco-Italian cooperation in the naval sector. Following the announcement of our alliance project in October 2018, Fincantieri and Naval Group joined forces in January 2020 by creating Naviris with the support of the French and Italian governments. Both groups share the same objective to develop a new strategic naval defence capability to respond to our customers' needs in an innovative way.

This alliance is the natural evolution of the historical partnership that has existed for over 20 years. Naval Group and Fincantieri have been working together since the 1990s on the four Horizon air defence destroyers programme and the twenty FREMM multi-mission frigates programme launched in 2005 and ongoing.

We consider that Naviris represents a great opportunity for both groups and their eco-systems, first by enhancing our ability to better serve the Italian and French navies. Naviris is already in charge of the feasibility study for the mid-life modernisation of the Horizon frigates. In addition, Naviris can also develop joint export projects if the cooperation offers added value for our clients.

Naviris also aims to increase research funding. R&D projects can cover a wide range of topics as propulsion energy, data, cybersecurity and the weapons of the future. If we agree with Fincantieri to share a subject we feel is key to our positioning on the market, the two companies invest and the two States double the stake. Thanks to this principle of 1+1 = 4, Naviris will help increasing the long-term technological advantage of our vessels and, ultimately, improve the competitiveness of both French and Italian naval sectors.

Together, we're accelerating our technological advance and maintaining our key differentiators for the benefit of our customers.

To implement the European Patrol Corvette (EPC) programme, the biggest maritime project within PESCO, NAVIRIS has teamed up with another major player, NAVANTIA. Is bringing together big strategic competitors the way forward for Europe to develop top-notch defence assets that can compete globally?
Yes, bringing together large strategic players is the right way forward to ensure that the very best of the European naval industry and technology will be integrated within this new naval asset, while rolling out common standards and methods to keep it affordable.

Naviris, and Navantia have signed at the beginning of this year a Memorandum of Understanding (MoU) aiming at developing the European Patrol Corvette programme. These two players, who form the core team of this project have been joined so far by Italy (as coordinator), France, Spain and Greece. We have the ambition to expand the cooperation with other European partners.

Indeed, to develop top-notch defence assets capabilities, cooperation between European players is key in order to pool their know-how and share resources. This shall allow leveraging on innovation and R&D on new strategic projects by sharing experts and costs related to the development of new technologies, as it is increasingly difficult for a single country or for an industrial player to be in a position to fund and develop alone the whole range of technologies needed today for such a ship.

This is also why, in addition to national funds, EU funds are used. This funding strategy will allow increased R&D and standardisation efforts, leading to innovative solutions

and facilitating the co-development, the interoperability and the efficiency of the vessels in operations.

How strategic will the EPC be for Europe's defence in general, and EU CSDP missions and operations in particular? What will be its biggest added value?
The biggest added value of the EPC will be its versatility. This is why we are working collectively on modular solutions meeting all partners' requirements. The different countries in Europe have different capability requirements: they have to face a wide range of naval missions and threats, covering peace time (maritime surveillance, search & rescue operations, etc.), crisis time (maritime interdiction operations, personnel evacuation, etc.) and war time.

At the same time, working on a longer series integrating these blocks will help us to reduce the per unit cost of each EPC compared to a purely national version. The modular design of the EPC will allow it to fulfill the numerous missions and address multiple types of threats; its standardisation will generate cost savings and its interoperability will facilitate joint operations.

As such, the EPC's aim is to meet the different capability needs of the countries involved in the programme and provide an effective response to the world's maritime safety and security needs as the threat environment grows more complex.

For the EU industry, it is a unique opportunity to develop commonalities and strengthen its competitiveness. In general, each national industry develops its own solution, most of the time isolated from the other nations. This programme is an opportunity to bring together the technological know-how of several European industries.

The EPC project involves the four countries you mentioned plus Portugal as an observer, but many other coastal EU Member States are still missing. Do you see room for attracting additional members and involving industries from other countries?
In February 2021, Naviris and Navantia signed an MoU aimed at enlarging the industrial cooperation on the EPC program. Beyond that, there are partners from more than 10 countries already identified, and who have joined the project. And the door is open for more. Other Member States willing to acquire or renew their naval capability are welcome to join the project.

The EPC will give participants the opportunity to benefit from cost reductions linked with larger series while benefiting from extended capabilities as well as consolidating innovation efforts in Europe. This project is in the interest of all European naval players. In the end, the reduction in manufacturing costs is beneficial for navies, which can benefit from more ships for the same budget.

We also see a path for the industry of landlocked countries specialising in other maritime capabilities. With the support of their Member States, they could bring to the project their expertise in specific fields, to support the development of some technological blocks or elements of the EPC. →

Frigate FDI Belharra

Working together is important for developing European innovations and industries' autonomy and excellence.

The first CARD report proposes to replace ageing coastal and offshore patrol vessels within the next decade and recommends an EU-wide approach for the development of modular naval platforms. The EPC will do that to some extent, but do you see other cooperation opportunities in this area?

We're delighted that the first CARD report provides recommendations and options to create synergies. We need to improve the efficiency of defence investments. Europeans can no longer afford to duplicate the development of the same types of ships in parallel. We must maintain technological know-how and skills in Europe to ensure the strategic autonomy of our continent.

Thus, joint developments are key even if they are not easy to implement: Member States navies' capability needs do not always converge and do not allow us to propose common programmes at European level to develop identical classes of ship.

In order to limit these difficulties, as naval system of systems integrators, we must propose modular ships with common technological bricks that can be armed according to the operational needs of the navies. This modular approach allows for lower development and production costs, while respecting each nation's specific needs and interests.

The current programme of "Bâtiments Ravitailleurs de Force (BRF)" – replenishment vessels for France and Italy illustrates this industrial and capability approach. We can develop common architectures and specific equipment to meet the specific needs of each navy while reducing acquisition and ownership costs.

One other example of the resulting added-value is the ability to explore solutions in new areas. Naval Group and Fincantieri have been entrusted by OCCAR a study to propose new fuel of future and new energy production processes for low-carbon ship propulsion.

Unmanned systems are emerging everywhere. How important will Maritime Unmanned Systems (air, surface and subsurface) be in tomorrow's defence toolbox?

Obviously, when you look at major navies' investments, especially in regions where tension is growing, such as South China Sea or East Mediterranean Sea, maritime unmanned systems will be ever more important. And this will expand fast. It has largely begun in the air, Unmanned Surface Vehicles (USV) are next and Unmanned Underwater Vehicles (UUV) will follow as the underwater environment is the most challenging one. In that field, one major breakthrough took place in 2019 when the Belgian and Dutch navies united their strategies and awarded the replacement Mine Countermeasures (rMCM) contract to Naval Group. For the first time, intensive use of UUV, USV and Unmanned Aerial Vehicles

Nuclear attack submarine (SNA) Barracuda Suffren

(UAV) is implemented in an international programme. This programme has made the use of unmanned vehicles in counter-mining a reality as a lot of international navies have shown their interest in this programme as the standard for counter-mining activities.

More broadly, this movement is no surprise, because the US already opened the path years ago, and other navies are beginning to realise what force multipliers unmanned systems are. Although we don't know how much of a breakthrough they will be. This is why we must continue to develop the solid base on which a navy operates: aircraft carriers, submarines, combatant surface ships, while developing UAV and USV solutions that can interoperate with combatant ships.

What are the biggest challenges related to the integration of MUS into legacy systems?

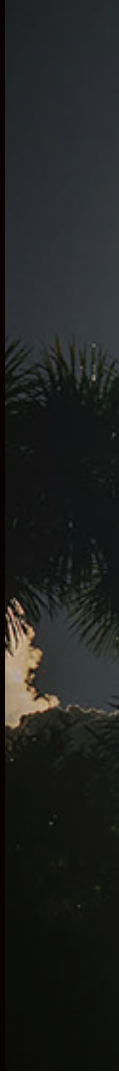
I see two big challenges. The first one is human and the other one is related to the interfaces.

First, navies are currently building their concept of UAV employment and doctrine. In fact, the integration of autonomous systems is taken into account in the design of ships, as for example in the studies of the future French aircraft carrier. The other part of this big challenge is also to train sailors so that they can take advantage of all the benefits of these new operational opportunities.

Second, the fragility of a system is always at the interfaces. And the maritime world is full of interfaces: between environments such as surface and underwater, between old ships and combat management systems and new unmanned systems with their command and control. To gain the full efficiency of such systems, the solution is a seamless physical and functional integration on board warships and even into naval forces. This implies a very large range of fields to master, ranging from robust launch and recovery systems to artificial intelligence to give drones as much autonomy as possible and minimise workload and risks for operators while keeping them in the loop. In this respect, Naval Group clients will benefit from its R&D on the Belgo-Dutch Mine Warfare System it won two years ago.

Pierre Éric Pommellet began his career at the French Procurement Agency (DGA), then at DCN (later DCNS and now Naval Group) before becoming Chief of Staff of Minister Jean-Pierre Raffarin (1995-1997). He then joined Thales where he held the position of Executive Vice President, Operations & Performance in charge of all military equipment activity of the aeronautics division before becoming the Managing Director. Pierre Eric Pommellet was appointed in March 2020 as Chief Executive Officer of Naval Group.

Developing cooperative space systems that contribute to Europe's strategic autonomy



The European Space Agency (ESA) is determined to play its role in helping Europe and its Member States respond to the challenges of the future, including on security and strategic autonomy, says **Josef Aschbacher**, the new ESA Director General in the following exclusive Opinion Editorial.

Since entering the new decade, we have undergone an unprecedented test of will and resilience with a COVID-19 pandemic that has shone a stark light on the fragility of the world's safety and security. In a still volatile context yet eager to move forward, ESA is determined to open a new chapter in Europe's efforts in space, a domain that directly services and fuels our economy, science, human interactions and above all, security.

ESA Agenda 2025, released to the public on 7 April 2021, provides a vision for ESA's future and contribution: strengthening the ESA–EU relationship, boosting green and digital commercialisation, developing space for safety and security, addressing critical programme challenges and pursuing the transformation of ESA itself. My goal, with the support of ESA Member States, is to increase the quality of cooperative space programmes and their contribution to the growth and success of Europe, including in its commitment to international peace and security.

ESA as a contributor to European security

Security has always been of concern to ESA, with the Agency committed to ensuring the resilience and safety of its own systems, but also to complement – not duplicate – national efforts in providing those space-based services that security communities require. While ESA's mandate, as set out in its Convention, is to "provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space", interpreted as "non-aggressive" as prescribed by international law, it has become a truism that space – dual use by nature regardless of the ownership of a particular asset – provides direct or indirect services to defence communities: weather satellites, Galileo, Earth observation, satellite communications, European launchers; all already serving dual use needs, and thus decision-makers at strategic level or security personnel in the field.

ESA's efforts in security are now embodied in its Safety and Security pillar, which tackles hazards and threats both in space – covering for example space traffic management, debris mitigation and removal, space weather, planetary defence, and space logistics – and on Earth. In doing so, ESA deploys support to all security users by planning to invest in new systems such as High Altitude Pseudo-Satellites (HAPS) and small satellites, secure satellite communications, or frequent, rapid response Earth observation.

Security as a pillar of ESA's future relationship with the EU

While ESA will remain first and foremost the Agency of its Member States, ESA's future is in many ways tied to that of the EU, both as a political entity and as a provider of critical services and public goods. As Commissioner Breton and I asserted in a joint letter to Member States on 17 March 2021, the "EU and ESA must and will work hand in hand to make sure we are responding to the challenges ahead of us". Among the challenges we have identified are Europe's security and strategic autonomy: ESA seeks to accompany all Europe in this endeavour and to that end will work with the EU and Member States alike as the default programmatic and technical partner for cooperative European space security purposes, in accordance with the ESA Convention.

If this position has been achieved, it is due to the substantial record of cooperation with the Commission but also the long-lasting bond that exists between ESA and the European Defence Agency (EDA). The success of that latter partnership stems from the substantial track record of tangible

projects in areas such as space-based Earth observation, cyber resilience, unmanned systems and critical space technologies for non-dependence. In addition, on 11 February 2021 we signed an agreement supporting the gradual evolution of next-generation secure satellite communication systems.

In recent years, the EU has made very substantial strides in reinforcing Europe's security apparatus and mechanisms. To maintain this momentum, I believe we need to continue leveraging ESA-EDA achievements in order to contribute to the overall strategic orientations of the EU but also those of Member States.

Political dialogue: better integrating space as a collective security capability

ESA's objective is very clear: to keep serving its Member States through its own programmes while continuing to efficiently serve as the EU's partner agency for space generally and in security-related space programmes in particular. ESA will thus work with Member States and the EU to be Europe's programmatic and technical partner for space and security purposes, while abiding by the provisions of the ESA Convention.

With ESA Agenda 2025, I have proposed that we in Europe begin a political dialogue on the future of space. I am convinced that the specific case of space and security should be tackled through the European Space Summit I have proposed for 2022, as a contribution to the Conference on the Future of Europe. With that aim in mind, I propose holding, by the end of 2021, a Space for Safety and Security Conference to explore EU and Member State security needs, and the means required to fill identified gaps. In this process, the concourse of EDA, our close, indeed essential space-for-security partner since 2011, and considering its wide-ranging achievements in capability development planning and implementation, as well as its organic ties to defence communities, would be of the greatest added value.

Conclusion

European security communities are well aware of ESA's achievements, its technological and scientific excellence, be it through our partnerships with EDA and the EU Satellite Centre, or in the context of the delivery of Galileo and Copernicus satellites and services that already provide security and defence communities with critical data. Today, as we envision the world of tomorrow, it is our collective duty to also imagine how space, as a frontier, cooperative endeavour, can serve Europe's security and strategic autonomy in a coherent, integrated and efficient manner. The ESA-EDA partnership has been and will remain absolutely pivotal to achieving that purpose.

Dr Josef Aschbacher has been ESA's Director General since 1 March 2021. The European Space Agency, dedicated to the peaceful exploration and use of space for the benefit of humankind, was established in 1975. ESA works together with its 22 Member States to push the frontiers of science and technology, and promote economic growth in Europe.

Reaching for the Cloud

Hybrid warfare – the blending of conventional military warfare, cyberattacks and disinformation campaigns – radiates in all directions, generating signals that have to be analysed and deflected or dismissed as early as possible. For the military, this means gathering, processing, analysing, and exploiting massive amounts of data. Cloud computing offers a formidable set of tools for doing this, not only to counter hybrid warfare but to augment decision-making in general, from tactical to headquarters to strategic levels. An ongoing European Defence Agency (EDA) project is helping its Member States' militaries do just that.

How to tie all those tasks together? Enter project CLAUDIA ("Cloud Intelligence for Decision Making Support and Analysis"). Launched in 2019 as a four-year project, it aims to exploit the cloud to enhance situational awareness, to deal with hybrid threats and support decision-making, among other goals.

"Hybrid warfare cuts across so many domains and layers of information, and there are so many possibilities for the use of the cloud that you have to start somewhere," said Jean-François Ripoche, EDA's Research, Technology & Innovation (RTI) Director. "So our initial goal with CLAUDIA was to develop and demonstrate a specific use case."

CLAUDIA is divided into specific work contracts for its consortium of researchers. Its first, year-long work contract ended in February 2021 with an analysis of EDA's Overarching Strategic Research Agenda and its so-called technology building blocks (TBBs). The latter are groups of technology that need to be matured for the purpose of developing specific military capabilities.

"We wanted CLAUDIA to support the four or five TBBs that lend themselves to the cloud such as information and communications or technology simulation efforts," said Ripoche. "The initial work was to analyse the TBBs' business cases and how they could be supported by the cloud's architecture and services."

Outsourcing IT services

The cloud concept may sound obscure but it simply means to outsource IT services – computing, data storage, software tools and applications – to (external) organisations, acting as service providers. This offers a number of advantages to militaries, including:

- the latest state-of-the-art IT technology
- strong knowledge-acquisition in distributed and collaborative environments
- ease of integration, scalability, and flexibility to structure services
- lower costs in terms of pay-per-use
- stronger security
- dense networking connectivity to distributed sources
- easier data backups and recovery.

Pilot project

The work phase centred around a pilot project and a prototype software tool called 'SWAN'. Its purpose and use case: demonstrate how artificial intelligence could exploit the cloud by analysing open-source data and generate intelligence about early signals regarding potential hybrid warfare activity.

Among the tasks SWAN demonstrated in February 2021 was the gathering of data from news sources to identify the fake news among them. "What this showed was that data from diverse sources could be processed and analysed, using natural language processing to establish the thresholds and warnings as indicators of possible hybrid disinformation campaigns," according to Ignacio Montiel-Sanchez, who until recently served as EDA's project officer for CLAUDIA and information technologies research.

As CLAUDIA builds out its capabilities, one future use of SWAN could be to supplement

common operational pictures by generating a map that pinpoints the locations of breaking news stories and the nature of the reported events. The system could then filter the various events to indicate possible cyber-attacks against military operations, critical infrastructure control rooms, energy and transport networks etc. "This could be expanded to include informational layers such as tactical planning, logistics, weather conditions, social media chatter, data from NGOs (non-governmental organisation) and so on," Montiel-Sanchez said.

Eventually, military intelligence could be folded into CLAUDIA's database as well, "but we would have to structure SWAN to share that kind of information. We choose not to do that at the beginning because it would have required a completely classified environment, and that would have taken up too many resources to get everything in place," observed Ripoche. "So we started with open sources, and will evolve the system from there."

Fog computing

For the time being CLAUDIA will tackle more do-able data domains such as the 'tactical cloud' – a broad concept where military platforms are linked via the cloud to command-and-control chains. A good example of tactical cloud functionality for the military is so-called fog computing.

Montiel-Sanchez explains: "Fog computing means getting the cloud as close to your tactical 'edge' as possible. It's the point where soldiers, sensors, and mission tasks take place. In most cases tactical data processing is carried out in one of two ways. Either the soldier's personal radar or sensor or nearby UAV (Unmanned Aerial Vehicle) does the processing locally or you transfer the data for bulk processing in the cloud. The problem is that, with so many local sensors or platforms surrounding a soldier it may not be possible, in terms of capacity or connectivity to send all the data to the cloud. Thus you need an intervening layer of computing nodes to do that – an intermediary structure of software and computing, processing, and memory storage capabilities."

Way forward

Indeed, Ripoche said CLAUDIA's next steps will focus on the tactical cloud by analysing how computing should be structured and how the information would flow from sensors to fog nodes and then to the cloud. "We will do a limited demonstration involving a tactical radio and a UAV by linking the radio signal to a fog node and then to cloud. This would be useful either for those Member States who have no advanced tactical fog capabilities or who need to work together in the field. Everyone is moving to the cloud but how do you move to an interoperable multi-cloud?"

The project will also explore SWAN's applications for cloud-based modelling and simulation (M&S) as a service.

"Modelling and simulation enters the picture here", said Veronica Guidetti, EDA's project officer for Emerging Digital Technologies and moderator of CapTech Simulation. "Let's take Artificial Intelligence as an example. AI often suffers from a lack of data and developers need training environments. Here, simulation can generate synthetic data that we miss from the real objects. Dynamic simulation naturally provides training environments, and so-called 'digital twins' tell you the way a system will change over time and what its future is likely to be. CLAUDIA is seen as a seed project that explores the exploitation of several types of M&S, agent-based, AI-based, gaming-based, under hybrid warfare scenarios. CLAUDIA's outcome might be attractive enough for EDA Member States to lead a bigger effort towards operational wargaming capabilities in the near future", she explained.

Flying together again!

What a relief: whereas SWIFT BLADE 2020 had to be cancelled due to the COVID pandemic, this year's HOT BLADE 2021, the 15th helicopter exercise organised under EDA's Helicopter Exercise Programme (HEP), was able to be held from 16-30 June at Beja Airbase/Portugal in strict respect of all health and safety measures. 23 aircraft (15 helicopters and 8 fixed wing) and some 550 military personnel from Austria, Belgium, the Netherlands, Slovenia and Portugal participated in this exercise hosted by the Portuguese Air Force. Observers were sent by Italy, Slovakia, Switzerland, Serbia as well as several international organisations.

Flashback on a memorable exercise!

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