DAILY'S BEST

Special edition - December 2024

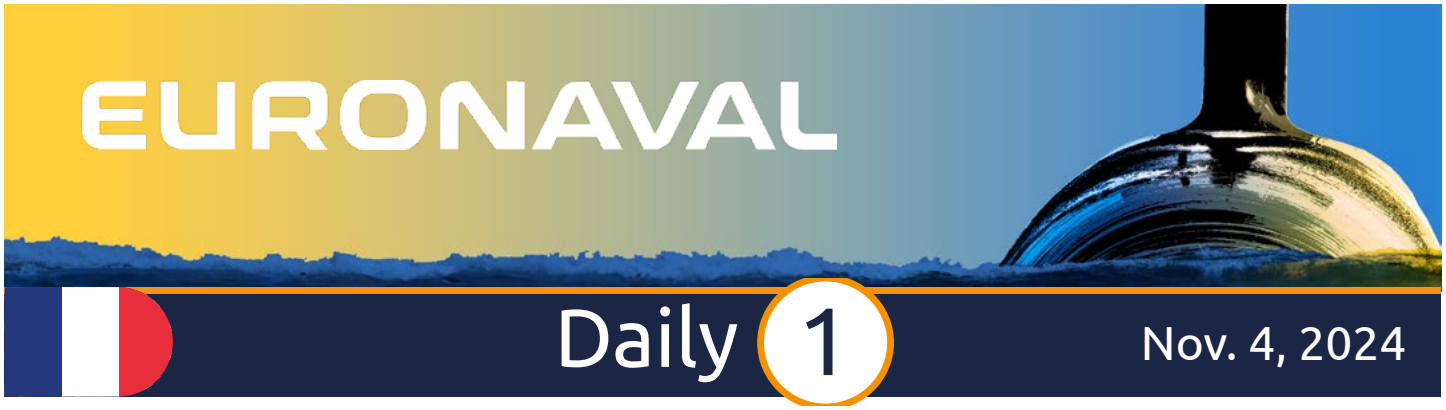
Relive the highlights

EURONAVAL

Paris Nord Villepinte | 4 › 7 nov 2024

The world naval defence exhibition

Français



Interview of the day

**Pierre Éric POMMELLET,
President of GICAN**

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Pierre Éric POMMELLET, President of GICAN

What is your outlook as we enter this 2024 edition?

The shipbuilding industry is evolving; it is faced with an ever-increasing number of war zones and the fact that innovation in military technology is picking up speed.

Since the last edition of Euronaval in 2022, international tensions have continued to grow, particularly in Europe, both on land and at sea. Every country needs to take this geopolitical reality into account if they are to have the means to defend their sovereignty.
In terms of technology, certain systems that were still only blossoming ten years ago, such as artificial intelligence and drones, now constitute the cutting edge of innovation.

In November 2024, Euronaval is set to be the naval industry's most important international meeting for countries wishing to ensure their security, as well as for manufacturers with the technological means to fulfil these requirements.

What are the priorities, or key points for the industry?

The reality of modern battlefields shapes the market and sets out development priorities for the shipbuilding industry. In this respect, I can identify four key points for our industry.

The first is increasing the autonomy of ships, submarines, unmanned aerial and surface vehicles, all of which require ever more advanced, precise and flexible technology. In times of conflict – as we are witnessing in the Black Sea and the Mediterranean – and to face rising tensions – e.g. in the South China Sea and the Taiwan Strait – more efficient and autonomous technology is required for reconnaissance, surveillance and mine-clearing operations. This helps to continuously reduce the risks for our crews.

The second priority is to modernize naval fleets, particularly submarines. The key lies in stealth and anticipation capabilities. Today's technological quickening requires us to design ships that can host the tools of tomorrow. This drive is dubbed "cyber by design", which reflects our sheer determination to always remain at the cutting edge of innovation.

This second point leads us to our third priority, which involves communication system networks and manufacturers' ability to offer effective, autonomous and reliable cybersecurity solutions in the context of electronic warfare. We can't afford to produce high-tech ships without ensuring that their CMSs are fully secure and reliable! Smooth, dependable systems are essential to ensure that information flows properly during operations at sea.

Last but not least, the naval industry can no longer avoid investing in renewable energies – as part of the ecological

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transition as well as a means of asserting its sovereignty. Much like the civilian domain, the world's navies are exploring more environmentally-friendly propulsion technologies, not only to reduce their ships' carbon footprints, but also to reduce energy consumption costs, to limit dependence on foreign suppliers and to ensure that our ships use less fuel while moving more efficiently.

Yet, these four priorities do not exclude other major issues, such as securing investments – from the banking industry in particular – for companies in the naval industry, as well as giving our ships the ability to intercept new hypersonic missiles, which have become a major threat.

As the President of GICAN, what outcomes are you expecting from the many exchanges and meetings that will take place during the four-day event?

As a trade association, GICAN represents over 80% of the French naval, maritime and defence industry. Our organisation champions, promotes and defends the interests of companies across the industry.
As President of the association, it is my duty to go out and

meet our members at Euronaval in order to understand their expectations and economic challenges. This in-depth knowledge of the market – from large corporations to the smallest SMEs, all of which are essential to our supply chain and help drive innovation – is the sine qua non for defending the industry's vital interests.
Finally, Euronaval is – first and foremost – the world's leading naval defence exhibition. As the President of GICAN, I am also tasked with promoting our industry's excellence vis-à-vis foreign delegations. After all, supporting exports is essential in order to help drive our industry forwards.

These four days constitute an exceptional opportunity to promote our members, to make their voices heard at the highest political and institutional levels, as well as to strengthen cooperative ties with those around the world who wish to benefit from the expertise of the French naval industry.

What role do the civilian and military maritime industries play in the world today?

Since 90% of the world's goods are shipped by sea, the slightest strain or breach in the system can have dire consequences.
These consequences are economic, of course, as we saw when the Ever Given container ship blocked the Suez Canal for seven days in 2021. Let us remember its impact on the global economy, given that 12% of international maritime freight passes through the canal.
On a military level, a state's sovereignty depends on its ability to project its power, to guarantee ascendency over its own territory, to control its exclusive economic zones (EEZs) and to defend the maritime routes that feed its economy.

In the current context, the war in Ukraine has largely disrupted shipping routes in the Black Sea. This has had obvious consequences for international grain and food exports (I'm thinking of the African continent in particular), increased sea freight and disrupted the world's energy supply. Yet, the war has also revealed which areas require us to adapt to new forms of conflict, to the "war of attrition" mentioned by the French Navy's Chief of Staff – one that calls for both flexibility and technological innovation.

As naval conflict enters the era of drones, and with the emergence of laser technology, it is clear that the maritime world is a place of permanent adaptation and tactical innovation, one that requires extreme agility to avoid losing the battle.
In some cases, the maritime world can give rise to technologies that will be deployed on land further down the line.

I used the war in Ukraine as an example because it's right on our doorstep. It speaks volumes for us in France, particularly given our place within NATO.
Generally speaking, the militarization of the seas is indicative of growing international tensions. Given that 70% of our planet is covered in water, the seas and oceans are likely to be the place where most tensions – and even confrontations – are played out. To understand what's going to happen on land, you often need to look at what's happening at sea. Ensuring security on the seas and oceans means guaranteeing safety on the mainland.

Today, with the technologies featured at Euronaval, we can look forward to the end of the "no blood, no fowl" logic. The solutions presented here will enable states to assert their sovereignty, show their competitors and adversaries that they are keeping a close eye on their territory and demonstrate that maritime cooperation is preferable to direct confrontation.

How do French manufacturers view the changing global geostrategic context?

Many countries, as well as the world's traditional great powers, are investing heavily in the modernization and expansion of their national navies. For French manufacturers, whose expertise and excellence are recognized globally, this means being able to meet the demands and orders of potential customers, while remaining assured that they have government support.

I see a triple opportunity for the French naval industry and, more broadly, for our national sovereignty. The first, of course, involves careers. Let me remind you that in 2023, the French shipbuilding industry represented 56,100 direct jobs and 37,400 indirect jobs. Orders are still pouring in, which means new jobs will be created. This is, first and foremost, thanks to France's military programming law (or LPM), which led the French Navy to order seven offshore patrol vessels (OPVs). Secondly, this increase is owed to exports. These include the contracts that Naval Group signed with Indonesia, who ordered two Scorpène-class submarines and, more recently, with the Netherlands, who requested four Barracuda-class submarines. These contracts will support employment in the naval industry for the next ten to fifteen years.

Thus, the second obvious opportunity for France is an increase in sales driven by exports. GICAN, which I have the pleasure of chairing, represents an industry that is set to reach €15 billion in sales by 2023 – 58% of which will boil down to exports. The shipbuilding industry is a driving economic force in France, with a knock-on effect on many sectors of our economy. In a political context geared towards reindustrialization, our industry is highly significant.

The final opportunity, which is more akin to an imperative, is to fulfil the French State's request to increase production rates as the world returns to war. In view of the recent acceleration in world history, the innovative power and agility of French naval manufacturers is being mobilized. In the face of changing geopolitical circumstances, our companies are demonstrating their ability for adaptation, innovation and flexibility once again.

The budget of France's armed forces has been "safeguarded". How do GICAN members feel about this? Are they optimistic?

GICAN can only support the continued ambitions of the 2024-2030 military programming law, which aims to modernize and renew a significant part of the French fleet.
With a budget of €50.54 billion, i.e. a €3.3 billion increase compared to 2024, the roadmap set out in the LPM – which was voted in during the previous presidential mandate – remains a go. In this fragile geopolitical context, every Frenchman, every citizen, whether they represent military or

civilian industries, must grasp the importance of keeping the armed forces' budget intact.

Therefore, our members enjoy a great deal of visibility, as orders are continuously coming in, partly thanks to the LPM. Nevertheless, we must remain vigilant. Suppliers must be able to meet orders, while accounting for the risks inherent to any international value chain. Shipyards must also be able to deliver vessels on time, which entails efficient management of human resources and production capacities. Training and ensuring that naval-related professions remain attractive are key levers in meeting the ambitions set out in the LPM.

Finally, if we are to guarantee the effectiveness of France's budgetary effort, it is essential to preserve the competitiveness of the defence industry on a European scale. This requires strong, united responses to unfair competition. In this respect, we can only encourage the European Commission to take concrete measures within the framework of the European Defence Industry Program (EDIP) to protect and promote Europe's defence industry.

Euronaval must remain an opportunity to showcase the sheer excellence of France's naval industry, to promote our sector's interests and to forge new partnerships and cooperative ventures geared towards ensuring international security.

Aude Leroy

TV Studio

What do current wars teach us about future naval warfare?

Daily Exclusive: Exojet - the thruster designed for and with the Special Forces

They may only be 30 cm high and less than 20 cm long, but they are packed with innovation: attached to both thighs, Alseamar thrusters offer divers a «magnetic coupling motor: no friction, hence lower energy consumption», explains Rémi Lecomte, sales and development manager for Special Forces for Exojet, which is being presented to the public for the first time.

Another advantage: should a fishing line or algae become stuck in the propeller, the protective grille can be removed by simply turning it 90 degrees – a simple manoeuvre requiring no special tools. The propeller can be clipped on and removed from the motor just like a magnet.

©Alseamar

The motor is powered by a single battery, which can be coupled to two others. The diver has 1 hour and 10 minutes of autonomy per battery at a speed of two knots, or twice the speed of a trained combat swimmer. Custom-made for the Exojet, the lithium battery is reliable and can be safely transported on board an aircraft or a nuclear submarine. The manufacturer guarantees a minimum lifespan of five years, based on a hundred battery charges annually. When the battery is drained or fails, the diver can cut the power feed from one battery and connect a second unit, rapidly and while submerged.

A remote control box worn on the left forearm completes the unit, allowing speed settings, real-time remaining operating time based on the selected speed, or breakdown warnings.

The result of the full-time work of five engineers and technicians over a two-year period, the Exojet has been designed with and for the Special Forces. The DGA's sole aim: a lower price than the US competitor and optimised maintenance costs. The prototype has undergone testing since last February by French combat swimmers. It enables them to descend to a depth of 50 metres, in temperatures ranging from -2 to 35°C.

A first delivery of 20 Exojets is scheduled in September 2025. The Armed Forces are expected to order a total of approximately fifty units.

Aude Leroy

©Alseamar

Key figures:

Harness + battery + remote control + 2 thrusters: 20 km on land, 4 kg under water

Surveillance: a future multi-domain satellite constellation

A few months ago, Rennes-based start-up Unseenlabs announced plans to launch a satellite constellation in 2026, featuring innovations in maritime, land and space surveillance.

It will be a future world first. In 2026, Unseenlabs will deploy a constellation of satellites for maritime, land and space surveillance. The technology — developed in-house — is described as «a payload onboard the satellites» capable of detecting radio frequency (RF) signals.

©Unseenlabs

Developed since 2015, when the start-up was created, this technology became operational in 2019 with the launch of the first satellite, followed by a constellation of 13 nanosatellites weighing 10 kg. For maritime surveillance, this set of satellites is located in low Earth orbit (LEO), at an altitude of 500 km, offering a revisit time of 4 to 6 hours. The data is then delivered to the various customers.

«*We send them maps showing the positions of all the ships. We show them the maritime activity in their area of interest. It's up to them to decide whether or not to intervene within this perimeter*», explains Cannelle Gaucher, communications manager at Unseenlabs.

Initially, only the position of ships that had activated their automatic identification system (AIS) was detected: «*Even if the AIS is mandatory, some ships avoid activating it to carry out illegal activities such as piracy, illegal fishing, fuel dumping... But in other cases, the AIS becomes unintentionally invisible*», observes Cannelle Gaucher, who underlines the considerable lack of data in terms of maritime surveillance.
The satellites developed by Unseenlabs are a solution to this problem, since they are not based on the RF signals emitted by the AIS, but on the emissions of the electronic systems on board the ships.

With the next constellation of 150-kg satellites, the company will be able to extend this surveillance system to land, air and space. According to Cannelle Gaucher, this promises to be a major challenge: «T*he number of signals is going to be enormous, so our engineers are working on processing all the signals picked up simultaneously. This is the issue we face with the next generation*»..

S. Rose Joannis

SM40 launch!

Unveiled at the show, the SM40 submarine-launched anti-ship missile is displayed in model form because although it is already being marketed, development according to MBDA's customers' specifications is still in the final stages.

The SM39 is reaching the end of its life, and the SM40 will succeed it: a "mini" MM40B3C, it is shortened to fit into the SM39 Underwater Vehicle (which reduces cost), installed on board all Naval Group submarines.

©MDBA

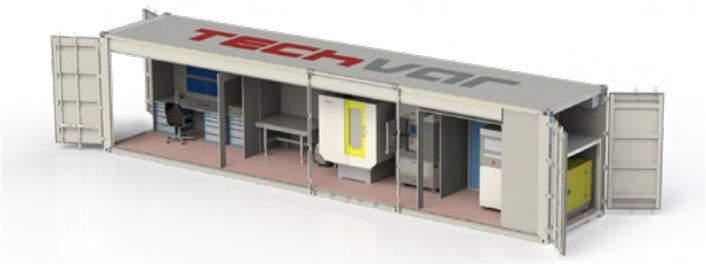
Developed with own funds, the engineers have redesigned its wings so that it can be perfectly housed in the vehicle. But, above all, this latest addition to the Exocet family has 2.5 times the range of its predecessor: 120 km instead of 50 km. "This is because surface vessel sonars can now detect targets at very long distances, such as the Captas 4", explains Stefano Bertuzzi, Director of Naval Systems, who points out: "Firing from so far away also allows an attack by stealth on a ship."

Fitted with a new self-guidance system, the thruster has also been upgraded to ensure the SM40's resilience in an electronic battlefield.

MBDA prides itself on the 4,000 Exocet missiles (MM38, MM40, SM39, AM39) it has sold to 36 customers around the world. The 4,000th unit is intended for the French Navy.

Aude Leroy

TechVar, a small but high-performance and innovative company



©TechVar

With ten employees, TechVar is a quiet leader in the field of mechatronic systems. Founded in 2007 in the Var département, in the south of France, the company manufactured the entire electrical structure and internal electronics of the first oceanic drone demonstrator DDO (Démonstrateur de Drone Océanique), designed and developed privately by Naval Group in a mere two years.

This prototype will form the basis on which the company will design the extra-large uncrewed underwater vehicle (XL UUV) following the inking of the framework agreement with the French Defence Procurement & Technology Agency (DGA) in December 2023. This innovative project enabled TechVar to rapidly build new expertise, says its CEO, Raphaël Lauzier: "*We had to find a way to produce a circuit-breaker that can reset itself, automatically. We drew on our technological building blocks. We are not simply a design office; we go the entire way through to the delivery of the functional product.*"

Another strength of the French SME is its ability to reverse-engineer and counter obsolescence: "*On a ship, everything becomes obsolete after 20 years, whereas the ship is designed to last*", explains Raphaël Lauzier, "*so we either integrate new components onto the electronics boards, or we recreate them so that the new components function, or we design complete new systems by integrating communication, new data, etc.*" To modernise SSNs, TechVar created interface boxes to launch torpedoes, enabling the legacy systems to 'talk' to the new ones, for several types of torpedo. This very specific task led the company to invent new tools.

Mobile MRO Centre

Hence the TechVar Embedded Workshop (TEW): a mobile, modular, multi-technology maintenance and production station. Integrated inside a shipping container, this kind of mobile workshop was the outcome of a discussion with a customer about MRO issues. It is not uncommon in the military world to see an aircraft bring one or more spare parts to an external site in the event of a breakdown.

To fill this gap, the TEW comes with the production facilities of a state-of-the-art factory to produce complex parts to high requirements. This laser component manufacturing bench works like a 3D printer, but with metal (steel, stainless steel, titanium, aluminium, etc). The technology can be used aboard ship within certain sea states: no excessive heeling or impacts, and no rough seas. While the container can be installed on the deck of a supply ship or an amphibious assault ship, it can also be installed in a port area, as it is autonomous in power and communications.

A satellite video platform allows workers in the TEW to receive help from experts anywhere on the planet.

TechVar's CEO is in the midst of arranging financing for the demonstrator, which will be provided for testing in military (Navy, Army) or civilian applications (offshore, such as on oil rigs or isolated industrial sites). More cost-effective than a machining centre, the TEW should cost approximately 1 million Euros.

As proof of its interest, the French Navy's Fleet Support Service awarded the unit its Innovation prize last June in Toulon.

Aude Leroy

Aude Leroy

Daily Exclusive: Beware of the Black Bird

The idea behind the Black Bird system is to combine deep water and the air, with the aim of operating from the ocean depths.

The system comprises a small unmanned aerial vehicle (UAV) contained in a watertight vehicle (called autonomous underwater vehicle, or AUV), a remote control relay buoy (X-SUB) and a remote control system (called the Ground Control System, or GCS).

In use, the AUV, which looks like a large capsule, emerges from the hull of the submerged submarine. Once it reaches the surface, the UAV is ejected and deployed towards its operational target, while remaining connected to the submarine, deep

©Alseamar

underwater.

To ensure communication between the UAV and the subma rine, the releasable radio-communication buoy (X-SUB) is used as a remote antenna. It allows the discreet transfer of data on electro-magnetic signals (converted into RF signals) between the UAV and the submarine: "*This antenna, which is immobile on the sea surface, significantly reduces surface give-aways*", explains Olivier Jacques, the underwater expert at Alseamar. "*No trace, no wake: it is undetectable in calm sea conditions*."

The buoy is connected to the submarine by means of a fibre-optic cable as thin as a fishing line. It is 7 km long and unreels as the submarine continues its journey. Finally, the UAV is remotely operated from the submarine, enabling various parameters to be modified during the course of the mission.

Capable of flight at different heights, the intelligence UAV weighs between 1 and 2 kg. It can fly several kilometres away while remaining connected. It is ideal for coastal overflights, monitoring drug trafficking or illegal fishing, or even observing commercial shipping, which can prove strategically important and of interest in wartime. Its small size (60 cm) allows several units to be carried on the submarine. It is a single-use system, and drops into the water and sinks at the end of the mission.

The economic aspect was taken into account at a very early stage, and the Black Bird system will cost much less than an hour's flight using a recce aircraft or satellite service.
Five Black Bird systems have already been produced. In the event of a major order, the systems will be produced "*in the form of a puzzle, to prevent copying of our know-how.*"

Aude Leroy

©Alseamar

©Alseamar

Facts and figures:

- Between 40 and 45 minutes of UAV flight autonomy
- 4 inches - that's the diameter of the buoy antenna
- Above the buoy, a balloon automatically inflates with CO2. A copper mesh on its surface boosts high-frequency sensitivity.
- The balloon deflates and is automatically isolated thanks to a smart mechanical system.
- Sea trials expected in Q4 2025
- Only presentation: 14 July, in the Cour des Invalides, in Paris

SeaQuest-S: from deterrence to interposition

©Naval Group

Focus on SeaQuest-S, one of Naval Group's new uncrewed surface vehicles (USVs)

It's called SeaQuest-S (for Small), is 9.30 metres long and comes with a folding 4-metre mast. The mast, called Panoramic Sensor Integrated Module (PSIM), is the pride of the engineers who designed it: this single unit can support "*an entire set of navigation, information (for the first production unit), and security sensors, the complete Control Command section as well as on-board intelligence and its computers*", explains Alexandre Humeau, sales director at Sirehna, a Naval Group subsidiary; "*the customer installs the payloads that they want, in stages, based on their needs: the mast is one of the major value-adds of this uncrewed surface vehicle*."

The two other modules of SeaQuest-S are the front section, which can accommodate a swarm of drones, additional fuel or even weapons: "*We are not saying that it is armed*", adds Pierre-Antoine Fliche, of Naval Group's Drones, Autonomous Systems and Submarine Weapons (DSA) Department, "*but that it is ready for combat and can carry a certain range of options*." The rear compartment houses communications, but everything is interchangeable, depending on the needs of the customer, be they governmental or civilian.

The other significant innovation is that the system is specifically designed to be stowed on a front-line vessel, in the space originally intended for a commando raiding craft (CRC), for example, aboard a frigate, a logistics or transport ship, or even a minesweeper. The advantage is that no changes are required to the ship's structure, nor modifications to the lifting equipment. Deployed from on board ship or land, alone or as a swarm, SeaQuest-S can withstand up to sea state 5 even though the mission profile is generally up to sea state 3.

Its main means of defence is escape, thanks to its 350 hp (Diesel) inboard «waterjet» thrust motor, which gives it excellent speed and manoeuvrability. It travels at 35 knots/hour on missions lasting approximately five hours. It has a range of over 200 nautical miles. This allows it to cover sensitive areas, to act as a remote sensor for a frigate – to which it supplies the information it gathers directly, or to detect an intruder or presence.

Fitted with a composite, carbon-reinforced hull, the first production unit was launched in July 2024.

Aude Leroy

Facts & figures:
- Created on only 18 months
- 9.30 m long
- Approx. 5 tonnes (more than a CRC)

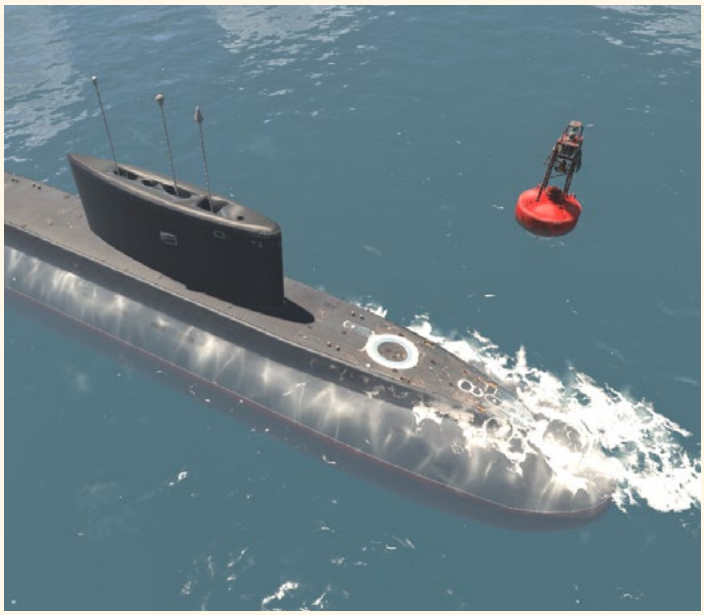
The Tracus System, a drone swarm for naval training

SeaOwl Technology sets a new benchmark in counter-drone systems with Tracus, a fleet of autonomous surface vehicles (ASVs) for naval forces.

The Red Sea, the Persian Gulf, the Black Sea: increased threats in various maritime operational theatres against commercial shipping has driven the French Navy to boost its counter-drone capabilities: "*These are small vessels, mostly remotely operated, which deliver explosives to a target. To counter them, it must be possible to detect, identify and destroy them*", explains Matthieu Glade, CEO of SeaOwl Technology.
A subsidiary of the SeaOwl group, the company is responsible for the development of high-technology systems in the field of defence and energies associated with the maritime sector.

The Tracus system was designed in collaboration with the French Navy as a training tool, and was developed over a four-month period. It comprises an autonomous fleet made up of 5 to 20 vehicles capable of simulating multiple usage scenarios: "*Some are easy to detect, while others are much less so. We can make identification very easy, or almost impossible. As for destruction, we ensure that it is very difficult*."

The equipment consists of small watercraft fitted with autopilots manufactured by the subsidiary, with onboard systems that make them navigation-capable: "*The unit navigates autonomously following the orders it has been assigned*", says the CEO. "*We have created several types of mission, using single or multiple drones. We sell a multi-purpose system capable of providing several levels of training based on basic, complex and extremely complex training scenarios.*"
The Tracus system was tested for the first time in the Mediterranean, as part of Exercise Wildfire: "*The operation was a great success for the French Navy, and a technological accomplishment that is driving us forward*", says Matthieu Glade.



©SeaOwl

At the end of September, the French Navy launched a large-scale live-fire training exercise involving several front-line ships and frigates.

The Tracus system was used to simulate attacks on the Navy frigates. It will be used again in future exercises in 2025, and the CEO has already received "*strong expressions of interest in the system from several leading naval forces. Its performance is therefore set to go much further.*"

S. Rose Joannis

SEAMOS MR-5K: Optronic solution to protect ships against drones

Launched at Euronaval 2022, Exavision's SEAMOS MR-5K optronic solution is offering new maritime surveillance features addressing the needs of counter-drone warfare.

To ensure that yesterday's innovations do not become out of date today, Exavision is keeping pace with navy requirements. And counter-drone warfare is one of the emerging priorities.

This year, the 100% French-owned company — acquired by Ineo Defense at the end of 2021, becoming part of the Equans group — is presenting an upgraded version of its SEAMOS MR-5K optronic solution, a multi-sensor camera system (optical, thermal IR and laser) combining optics and electronics.

©Seamos

Exavision is targeting its technology at Offshore Patrol Vessels (OPVs), i.e. vessels such as coastguard fleets, corvettes or uncrewed surface vehicles (USVs).

To achieve this, the company, which specialises in medium- and long-range optronic solutions (between 5 and 30 km) has integrated AI to recognise and track air and sea targets.

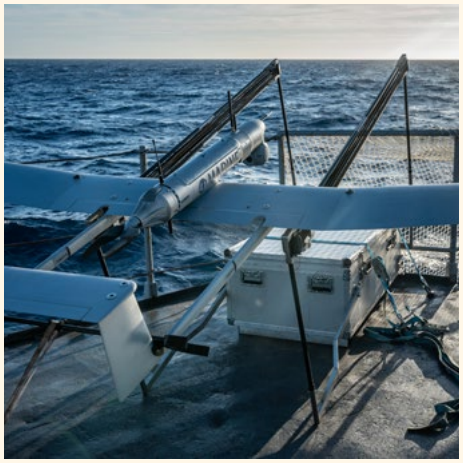
This optronic system, mounted on a gyro-stabilised turret on patrol boats, can monitor the surrounding area over a range of 5 to 6 km.

SEAMOS MR-5K has opted for uncooled thermal technology, which is less expensive and has a shorter range, but does not require compulsory preventive maintenance, i.e. a return to the factory every 3 to 4 years, which is necessary for all thermal IR cameras with cooled sensors.

For infrastructures such as large commercial ports or maritime bases, Exavision offers a similar land-based solution, called NEMOSYS, with a range of up to 30 km, also suitable for counter-drone operations.

Paul Laquière

The SMDM / Aliaca light tactical UAV heads to sea



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The Aliaca range of light tactical unmanned aerial vehicles (TUAVs) has found a berth on French Navy patrol vessels and other ships too.

The Aliaca range of light tactical unmanned aerial vehicles (TUAVs) has found a berth on French Navy patrol vessels and other ships too.

A lightweight and discreet TUAV with a low logistical footprint is just what the French Navy needed for its ocean patrol vessels (OPV).

Since 2020, SurveyCopter, an Airbus Defence and Space subsidiary with 30 years' experience in the design, production and operational support of light tactical unmanned aerial systems (TUAS), has equipped 19 French patrol vessels with its Aliaca system. Each system comprises two UAVs, a catapult, a net and two antennas.

The Aliaca system has been certified and qualified by the French Defence procurement and technology agency DGA and has been in operation with the French Navy since 2022, as part of the Navy's SMDM mini-drone programme. It is available in land-based or naval versions, with thermal or electric propulsion.

These 16-kg UAVs are mainly used for intelligence, surveillance and reconnaissance (ISR) missions in the Mediterranean, the Gulf of Guinea and French overseas territories.

The electrically-powered Aliaca UAV can travel up to 50 km around the ship and offers an endurance of 3 hours. The electric version is extremely stealthy, allowing the vehicle to fly into close proximity with suspect vessels, such as pirate ships, illegal fishing vessels, go-fast vessels and smugglers.

Its daylight and IR cameras enable it to detect boats sailing without AIS, the VHF radio automatic identification system used to identify ships.

For now, the main customer for SurveyCopter's Aliaca family is the French Ministry for the Armed Forces. In December 2023, the French Navy signed an order for 15 additional Aliaca systems. SurveyCopter's light UAV system is of particular interest to patrol boats that cannot carry helicopters. However, the systems are also finding a home on frigates, as flying a drone is still much cheaper than using a helicopter.

This year, two French F732 surveillance frigates, the Nivôse in Réunion and the Germinal in the French West Indies, have adopted the Aliaca system to complement their helicopters.
Following these encouraging developments with the French

Navy, SurveyCopter has made no secret of its ambitions to offer its system to other European navies.

Paul Laquière

Daily 2

Nov. 5, 2024

Interview of the day

**General Thierry Burkhard,
Chief of the Defence Staff**

Industry – Cybersecurity

The defence and intervention frigate (FDI) is 100% digital, a first for the French Navy.

Innovation

Seeing through the FOG

The first Dronathlon

From 7 to 11 October, 40 groups of companies that replied to the call for tenders to take part, only ten were selected to demonstrate the performance of their multi-domain drones.

Industry – UAV-based In-Service Support

UAV-based In-Service Support

Special reports - Environment

- **ABB leading the way in marine energy savings**
- **Navy electrification under way**
- **Hull Vane: an underwater wing to reduce fuel consumption**

General Thierry Burkhard, Chief of the Defence Staff

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Euronaval is an international exhibition; what makes it an important event for you, General, in your position?

Like all major defence exhibitions, Euronaval is a forum, where we meet and talk. It's an opportunity for users of equipment to directly meet the people who design it. And for naval manufacturers, it's an opportunity to truly identify the needs of their customers.

To me, as Chief of the Defence Staff, the discussions we have are vital, because they allow us to make headway and understand each other better. We need to grasp the constraints weighing on manufacturers and they need to know what we have to deal with and how we see warfare. This mutual understanding is the key to efficiency which, today, maybe even more than before, is vital given the pace of technical developments, the multiplication of conflicts and therefore the sustainability of our commitments.
Lastly, it's an opportunity to capture innovations. It provides a snapshot of all the new developments underway, which therefore fuels reflection and design.

As Chief of the Defence Staff, how important are maritime issues to you?

In general, our policy framework is closely connected to the specific features of the French nation. In particular, France's overseas territories give us anchor points all over the world, which naturally means that maritime issues are strategic.

Our country has the second-largest exclusive economic zone (EEZ) in the world, and we have territories in all three oceans. We must protect these areas and their coastlines. This specific feature therefore influences our defence model.

It also means that we are in contact with the rest of the world, with a greater need for cooperation. Interoperability with our allies is therefore a key factor, and it is reflected in our operational engagements, for example, in Operation ASPIDES in the Red Sea.

Lastly, being a shared space, the maritime domain has some specific issues. This situation gives rise to two opposing

views: on the one hand, that it belongs to everyone; on the other, that it belongs to no one and is therefore a space to be conquered. It is important to defend our view that it belongs to everyone, which implies protecting and managing the deep seabed, defending the principle of freedom of navigation, and monitoring economic sea routes.

The seas and oceans are indeed and more than ever an environment where all forms of conflict are increasingly evident, from competition and controversy to actual confrontation.

So, what are the main challenges for France in the world's seas and oceans?

First of all, our planet has not been nicknamed the blue planet by accident. The name clearly reflects the considerable amount of water on Earth and its importance. So, climate change is no doubt the first challenge, because beyond its direct impact on seas and oceans, it also causes chaos. Rising sea levels, competition for access to fish and migration are all issues of major concern for our allies that are already affecting us too.

Regarding our Navy more specifically, it needs to adapt in order to continue to be effective on and beneath the sea, towards land, in the air, and at the right level, but with resources that are necessarily limited. We must therefore continue to renew our Navy and ensure that we integrate all new developments, both current and future, including unmanned and autonomous systems, stealth, long-distance strike capabilities, and artificial intelligence.

Finally, we also need to study ways to respond to the multiplication of access-denial strategies in the air, at sea and beneath the sea. The maritime environment includes these three spaces, so it is relatively open. In this specific context, the hierarchy of power relationships can be challenged through the combined and synchronous use of adapted or derivative equipment. The conflicts currently taking place are showing us the avenues we need to explore in order take and keep the lead.

Do you have any particular message for naval industry players?

My message to them is the same as for all manufacturers in the defence industry. We need them to be strong in order to meet our demands and to win over the increasingly fierce competition.

To be strong, they need to be responsive and fully aware of the realities in the strategic environment. This is probably a bigger challenge for manufacturers in the naval industry who are used to working on major long-term programmes. Today, they must also be able to respond to short-term needs and produce small, short-life systems while keeping pace with developments in technology. One last challenge is the ability to natively design large-scale equipment so that it can easily integrate new developments, without the need for long and complicated periods of downtime.

I know I can count on our manufacturers to be as daring and agile as our sailors!

I wish everyone a very successful Euronaval!

Aude Leroy

FDI, the first «natively cyber-secure» ship

The defence and intervention frigate (FDI) is 100% digital, a first for the French Navy.

Naval Group's latest French frigate has a specific digital architecture, including two cyber-secure data centres, one in the bow, the second in the stern. They feature the same computer cores, unlike those used for other ships, and host, virtually, the IT applications needed to operate the ship and its combat system.

Among the equipment guaranteeing cyber security, the Netans navigation data distribution system from Exail has been adapted to the FDI to meet its specific requirements. It focuses in particular on protecting the flow of navigation data, its integrity and reliability, and acting as a barrier against any cyber attack. Between the sensors and data recipients, Netans manages several dozen different interfaces, while protecting the data from interception or manipulation. Advanced functions constantly monitor potential anomalies such as jamming or GNSS decoys. The system can trigger alarms or reject certain data if necessary to ensure real-time, cyber-secure transit.

© Naval Group

The list of cyber requirements formulated by the French Defence procurement and technology, DGA, and Naval Group is very complex, but «we have met them», explains Jean Lagaillarde, Product Manager at Exail, «and the Netans version has been adapted to meet these very specific needs, but I can't tell you any more than that.»

These new ships, which are resilient in the face of cyber threats, should help to set the standard for future innovations. And Exail intends to be part of it.

Aude Leroy

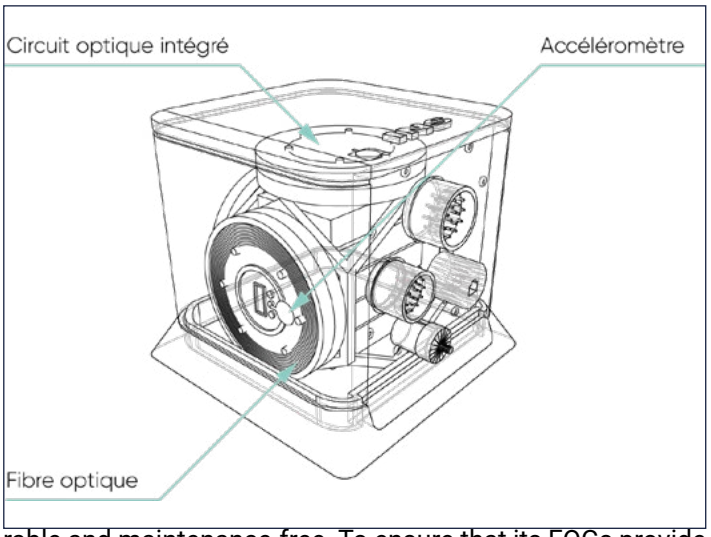
Seeing through the FOG

No mechanical movement, highly reliable, resistant to extreme environmental conditions, the fibre-optic gyroscope (FOG) has already been selected by more than 50 navies around the world.

In a small room at Exail's Lannion site in Brittany, two winding machines whirr away under the watchful eye of operators. Like a spinning frame, these machines spin an optical fibre thinner than a human hair. This thread is the result of a complex, specialised process that involves transforming a silica glass tube, 3 cm in diameter and 70 cm long, into... an optical fibre more than 50 km long!

Installed in a gyroscope, it is through this fibre that information is transmitted, via the reflection of photons forming a beam of light. FOGs use these light beams to measure rotation speeds. The absence of mechanical movement and vibration means no noise, no wear (no moving parts) and a mean time between failures (MTBF) of around 500,000 hours.

FOGs can withstand extreme environmental conditions (from the depths of the ocean to the farthest reaches of space) and are qualified to resist magnetic interference, extreme temperatures and violent shocks.
All this technology is the result of 30 years of R&D to guarantee maximum reliability and increased resilience, all at a relatively low cost to users because the equipment is durable and maintenance-free. To ensure that its FOGs provide high accuracy for navigation, cutting-edge algorithms have been developed in-house by Exail and optimised by AI.



The system, which is integrated into the company's inertial navigation systems, has already been selected by more than 50 navies around the world.

Aude Leroy

TV Studio

How does industry support NATO maritime cooperation & interoperability?

The first

From 7 to 11 October, the French Navy organised the first Dronathlon, in partnership with the French Defence procurement and technology agency, DGA, and the defence innovation agency, AID. Of the 40 groups of companies that replied to the call for tenders to take part, only ten were selected to demonstrate the performance of their multi-domain drones. They were tested on realistic scenarios developed by the Naval Combat Centre. The event took place at Saint-Mandrier, near Toulon, in the Mediterranean.

On the morning of Friday 11 October, a group of companies comprising Thales, Marine Tech, Drone-Act and PILGRIM Technology, was given two hours of operations to prove what it could do. No rehearsals were allowed. The group carried out its demonstration in two parts, one from land and the other at sea.

The objectives were to detect, identify, characterise and precisely geolocate a weapon system, radar emissions, enemy patrols and underwater and surface contacts. Four types of drones were used.

For the first part, a land/surface tactical situation was established, and the points of interest (POIs) were identified by a Drone-Act UAV, carrying the Curco RESM (Radar Electronics Support Measures) payload from Thales, allowing it to listen to radar emissions, in radio frequency, over a wide electromagnetic band (electronic warfare).

©THALES

The NX-70 Spy'C drone then took over to identify and confirm these POIs. A VTOL design, like the Drone-Act UAV, it provides imagery intelligence (IMINT) via an EO/IR camera, capable of detecting personnel at 100 metres, a vehicle at 300 metres or an AIDS module at 300 metres. These images were sent to a remote operator (industrial) for analysis.

The second part of the demonstration involved the dropping of a Thales acoustic buoy (Sonoflash-type mockup) by a Horus UAV from PILGRIM Technology. The buoy landed on the water after a parachute drop and started listening to establish a tactical submarine/surface situation.

The Navy is due to receive the Sonoflash buoy from 2025. Sonoflash is capable of interfacing with any type of aerial platform: maritime patrol aircraft, helicopter or UAV. Thales' FLASH IG dipping sonar then came into play, in this case a recoverable prototype. Its mission is to listen for and detect submarines. Aboard an RSV (Remote Survey Vehicle) AUV from Marine Tech, it can change position to track a potential target.

All the information and analyses were transmitted to a joint industry/Navy C2 centre for real-time monitoring of position, contacts of interest, etc.
«We achieved our demonstration objectives», declared Josepha Glorget, UAV project manager at Thales. Especially since on that Friday morning, the weather conditions were particularly severe, with winds up to 100 km/h and a 2-metre swell.

The results of this first Dronathlon are intended solely for the French Navy. The winners will be announced this Tuesday afternoon at 4 pm, in the Brest Room, by Admiral Vaujour, the Chief of Staff of the French Navy, and Thierry Carlier, the deputy director general of the DGA.

Aude Leroy

Athanor demos smart AIS on drones

Athanor Engineering, a maritime safety and security expert, deployed its smart AIS at the first edition of the Dronathlon in October.

With three decades of experience in the French Navy under his belt, Henri de Foucauld, CEO of Athanor Engineering, is familiar with the obstacles posed by Automatic Identification Systems (AIS): «*The International Maritime Organisation does not require military vessels to carry an AIS in order to avoid having to broadcast their position and identity at all times. But not having one is also significant because it raises suspicions that the ship has something to hide.*»

In 2016, he founded Athanor Engineering, the only French manufacturer to have developed a smart AIS, capable of broadcasting false positions, generating false identities and false boats and identifying deception by other parties. During the first edition of the Dronathlon, organised by the French Navy from 7 to 11 October in partnership with the

French Defence procurement and technology agency, DGA, and the defence innovation agency, AID, Athanor installed its identification equipment on board three uncrewed surface vehicles (USVs), through its participation in three consortiums. «*The AIS made it possible both to pick up the maritime traffic around the USV and to transmit a slightly offset position of the latter, so that it would be difficult to spot*», explains de Foucauld. The equipment took part in several scenarios close to the coast and in the open sea.

«*During the exercise, our AIS functioned well, with no surprises. We generated around thirty fake vessels to saturate traffic. The maritime patrol aircraft, which was there to identify our drones, had to go to each of the positions to check them.*» Although it was not the first time that the system had been tested, Henri de Foucauld was enthusiastic about the event: «*It was very interesting to work with several partners and to develop an operational solution that we could test in fairly realistic conditions. The weather also added some extra interest, enabling us to check the functionality of the equipment in rough sea and wind*», he remarks.

S. Rose Joannis

Industry – UAV-based In-Service Support

UAV-based In-Service Support

Unmanned aerial vehicle manufacturer Delair is co-developing a drone with Naval Group and the French Navy's Fleet Support Service (SSF) to carry out In-Service Support (ISS) of surface vessels. A first in France.

It's still a prototype, but it's showing great promise. In fact, two of them are due to be delivered in July — one to Naval Group and another to the SSF. Designated P.A Drone until now, it will be called the «Shipdrone» when it goes onto the market.

Its purpose is to carry out different types of mission to optimise the ISS of French warships. «This is the first sovereign French solution», explains Stephan Guérin, Head of Sales Navy Defence & Civil Market at Delair. «Equipped with LIDAR and photogrammetry technology, this drone is capable of creating one digital twin with a point cloud and a second with a set of photos. And it will be possible to work on both at the same time thanks to SEEBYL, a software package specially developed to support warship ISS. Shipdrone therefore combines hard and digital data: one tool to capture data, another for 'data-visualisation' and AI to optimise it.»
In continuous development, the UAV can automatically recalculate its flight plan to avoid passing too close to personnel working on board at the same time.

«Delair will not become an ISS operator in the military naval sector. But it will be the first building block enabling ISS specialists to optimise data analysis and help the experts to save time», explains Stephan Guérin. «Structural algorithms will detect, for example, whether there is corrosion. If so, what type? If there is deformation, what type? In the future, if we want to upgrade the boat's structures, we will be able to simulate them on orthofaçade drawings: it will be easier to integrate a new gun turret into the digital twin, for example.»

It will be possible to optimise all the ship's optronic systems. For example, the three DALAS laser landing aid systems for the Rafale were tested and qualified for the first time in a single day by the Shipdrone. Stephan Guérin explains that the sea

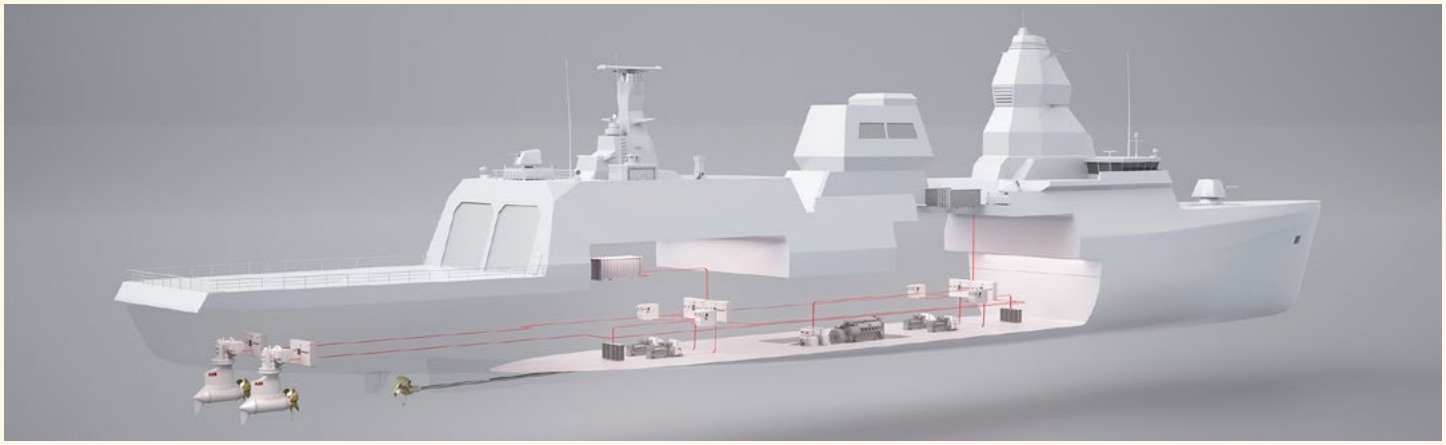
trials will continue, «but with the certainty that the DALAS units work, there are no nasty surprises for the final tests with the Rafales.» This would mean much higher cost and a lot more time. UAV-based ISS can also be used to look at the radiation pattern of an onboard radar, to check that it has no weak points along the antenna axis or that it still meets its initial commissioning specifications.

«It's a real Swiss Army knife in support of the boat's performance», and inspections can be carried out at the quayside, in dry dock or at sea. It can also be used for verifications.
The Shipdrone will ultimately be equipped with eight motors and will be able to carry payloads of between 5 and 10 kg. These payloads will be both passive and active (camera, LIDAR, etc.). The camera payload is covered by a specific development, undertaken by SONY, to optimise geo-triangulation of the photos to the nearest centimetre, and eventually with millimetre accuracy.
This UAV does not yet feature in Delair's catalogue. Once in production, the solution could be exported as a service, marketed either by Delair or by Naval Group, but still operated by Delair.

In addition to the Shipdrone, Delair also offers the SeaSam Hullscan, a remotely-operated vehicle (ROV) that inspects the hull to check for buildup of foreign matter and the condition of paintwork. This system also offers a high degree of precision, so it saves fuel and considerably reduces costs. Equipped with a lithium battery, available in several sizes, the Hullscan can perform a detailed inspection of the hull in 4 or 5 hours. Already on the market, notably in the commercial maritime sector, its success story continues. Around forty units will be sold in 2024, with around sixty expected next year. Unlike the Shipdrone, this ROV was originally a civil product included in the company's catalogue. It has also enjoyed success on the export market.

Aude Leroy

ABB leading the way in marine energy savings



©ABB

ABB is making inroads into the marine sector with its modular power system, Onboard DC Grid™, which delivers significant energy savings.
Eleven years after it was installed for the first time, ABB's modular power system, Onboard DC Grid™, has established itself as a must-have energy-saving feature for commercial vessels. Over the past two years, the system has begun to make inroads into the Navy and Coast Guard sector.

Recent breakthroughs in this demanding market include ABB's first contract in May 2022 with Damen Naval to supply Onboard DC Grid™ for four frigates under construction as part of the German Navy's F126 programme.

Following this agreement, the Swedish-Swiss company secured a second order to supply its system for four new anti-submarine warfare (ASW) frigates.

The ships — two of which will be built for the Royal Netherlands Navy and two for the Belgian Navy — are scheduled for delivery between 2028 and 2031, with the first ship entering service in 2029. «ABB's Onboard DC Grid™ is expected to reduce emissions, increase operational range, enhance safety and save weight and space», said Sindre Saetre, Senior Vice President at ABB Coast Guard & Navy.
Specifically, Onboard DC Grid™ is part of ABB's proposed modular power system platform that can reduce a vessel's fuel consumption by up to 59%. Onboard DC Grid™'s contribution to this reduction can be up to 27%. The same platform including Onboard DC Grid™, offers a space saving of 44% and a weight saving of 31%.

With this technology, ABB has opted for a direct current (DC) power system. As a result, the frigates' Diesel generators will be able to operate at variable speeds, making it possible to use as few Diesel generators as possible without any risk of power outage. The aim is to reduce the overall operating time and therefore the fuel consumption of the power generation systems.

This summer, two additional ships for the German Navy's F126 programme currently under construction were added to the contract with ABB.

Paul Laquière

Navy electrification under way

An electric propulsion system designed by Swedish-Swiss company ABB is the first step towards reducing CO2 emissions in the navy.

In 2025, a ship belonging to a national navy, which does not wish to be identified, will be equipped with an ABB electric propulsion system offering 20% fuel savings. «This project is the first of its kind on a navy ship», said Sindre Saetre, Senior Vice President at ABB Coast Guard & Navy. The technology is called Azipod®, a gearless steerable propulsion system in which the electric motor is housed in a pod on the outside of the ship's hull. Azipod® units can rotate 360 degrees, increasing the vessel's manoeuvrability, while reducing fuel consumption by 1/5th compared to conventional shaftline systems.

With Azipod®, ABB intends to play its part in the major challenge of sustainable energy transition in naval fleets.
To win over this demanding market segment, ABB can count on the results of its technology in the global ferry industry, and 80% of cruise ships are equipped with this electric propulsion system.

An independent study by marine consultancy Deltamarin found that the Azipod® electric propulsion system for fer**ries** could save up to $1.7 million in annual fuel costs per vessel. A ferry powered by Azipod® would also reduce CO2 emissions by around 10,000 tonnes a year, according to the same study.

This is equivalent to the amount of carbon dioxide emitted by around 2,200 private cars each year. A promising result for the naval world.

ABB will be holding a workshop between 1.30 pm and 2 pm in Hall B6, in the Brest cluster. They will also showcase their solution for electric propulsion and energy storage during a presentation between 10.45 am and 11 am in the same hall in the Cherbourg cluster.

Paul Laquière

©ABB

Hull Vane: an underwater wing to reduce fuel consumption

To reduce CO2 emissions and improve performance, the Royal Netherlands Navy (RNLN) asked Hull Vane to retrofit its fleet. And after a year of operations, the results are in.

Hull Vane bv is a Dutch company offering hydrodynamic solutions to enhance ship performance. The Hull Vane technology consists of an underwater wing-shaped appendage attached to the ship's hull that converts the energy of the stern wave into forward thrust. The boat's hull rises and the friction surface is reduced, increasing speed and reducing fuel consumption.

Hull Vane tested its technology on a series of four 108-m offshore patrol vessels (OPVs) operated by the RNLN. After a year in service, the results of the test indicate a saving of between 10% and 16% in fuel consumption and CO2 emissions, depending on speed. Other analyses show improved manoeuvrability in waves. The vane can have a span of up to ten metres, depending on the size of the vessel.

The Dutch patrol vessel HNLMS Groningen was the first Holland-class vessel to be equipped with Hull Vane technology. Its top speed has increased by 21 knots, and fuel consumption savings of 10% have been recorded. At the same time, Hull Vane technology improves comfort on board and reduces the stern wave, making the ships less visible. These promising results from a company created just ten years ago have already caught the eye of other national navies.

©Hull Vane

Paul Laquière

DCI: an EU and NATO operator

Since receiving accreditation as an operator for both NATO and the European Union (EU) as part of the European Peace Facility (EPF) in July 2023, the DCI group now manages eight assistance measures for the EU and an equal number for NATO. The French company is now signing multilateral rather than bilateral agreements.

For example, Benin is the first country to benefit, via Défense Conseil International (DCI), from assistance under the EPF. Totalling EUR 11.7 million over two years, since September 2023, this intelligence, surveillance and reconnaissance (ISR) programme includes the supply of an observation aircraft – a second-hand Cessna, UAVs and operator training.

The DCI instructors provide training on simulators or on training flights. "*These are multi-domain projects*", explains Thibauld de La Haye Jousselin, DCI's Director for Europe, Africa, the EU and NATO, "*which last two to three years on average, with budgets ranging from 1 to 40 million Euros [for the Lake Chad Basin Commission's Multinational Joint Task Force (MNJTF) battling Boko Haram]: we provide support with equipment and training.*" In addition to ISR, DCI's services extend from naval MRO to front-line medicine, by rehabilitating medical facilities, or even organising control rooms.

For NATO, DCI is supporting Mauritania, particularly in the retraining of military personnel "*who step back from active service […] so as to ensure that they do not fall prey to criminal organisations*", explains Thibauld de La Haye Jousselin; in Moldavia, wedged between Romania and Ukraine, DCI is involved in the country's military recruitment campaign; in Bosnia, in addition to developing airborne surveillance capabilities using UAVs, the French company is contributing to improvements to air-ground communication equipment, in particular through an impact assessment for "*installing communication towers in valleys.*"

Aude Leroy

Facts and figures: over 14 months of implementation

EU assistance measures provided by DCI:	**NATO Defence capacity building initiatives provided by DCI:**
4 for Benin	2 in Mauritania
1 for the MNJTF of the countries bordering Lake Chad	2 in Jordan
1 for the Republic of Côte d'Ivoire (RCI)	2 in Bosnia
1 for Northern Macedonia	1 in Moldavia

A combat swimmer with his sights set on the next Vendée Globe

The former combat swimmer Philippe Hartz is at Euronaval to present his project to compete in the solo, round-the-world sailing race, Vendée Globe, in 2028, and promote the 'Spirit of Defence'.

Philippe Hartz is looking for sponsors, large or small, who are keen to promote the navy, the armed forces and Defence. He will be presenting his project at Euronaval this Tuesday at 10.15 a.m. in the **Cherbourg Area**.

©Alexis Courcoux

After serving for twenty years as a combat swimmer in the French naval commandos (Commandos Marines), Philippe Hartz is returning to his passion for sailing or, more precisely, ocean racing. This confirmed Figaro racer and Marine Nationale - GICAN skipper is scouring the jetties in search of sponsors and partners to help him follow his dream of contesting the 2028 Vendée Globe with a competitive project.

Following in the footsteps of Éric Tabarly, the former army instructor is keen to promote the navy and, more broadly, the 'spirit of defence'. "Today, the world has changed. We need a sovereign army. I want to convey my belief that defence is the key to sustaining world peace."

After the end of his field missions four years ago, the seaman stepped out of the shadows "for a good cause", with the blessing of his Staff. And while a former enlisted sailor racing in the Vendée Globe is nothing surprising, he would be one of the first to do it.

But before that, there is still a long way to go, starting with the Ocean Race Europe next spring. At his side, Hartz can count on his wife, who is managing his project, logistics and communications, and on the Naval Fusiliers base in Lorient which will host his shipyard, saving him an estimated €500,000 over four years.

Paul Laquière

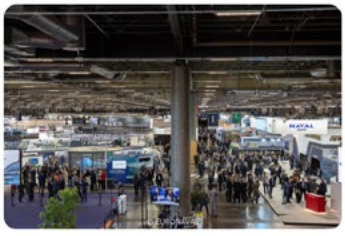
TV Studio

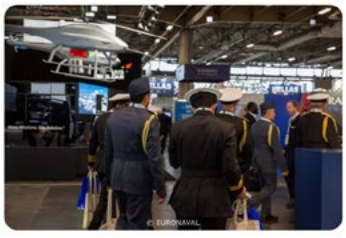
European cooperation – where are we and what's next

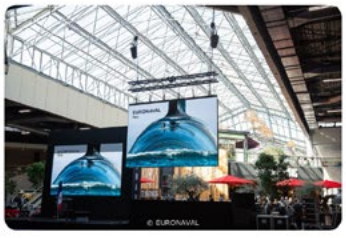
Day 1 in pictures







Daily 3

Nov. 6, 2024

Interview of the day

Foreign delegations

DGA

Here come the drones

Industry – Export

Industry – C-UAS

Skyjacker spoofs enemy drones

Innovation

After Sky Warden, MBDA now offers Sea Warden

Innovation - Mine warfare sensor

Elwave - CEDAR

The Euronaval 2024 Innovation Awards

Here are the five winners

Training – Mine Warfare

State-of-the-art training for mine clearance divers

Industry – Electronic warfare

Saab antenna at cutting edge of electronic warfare

Industy – Decoy launching systems

Sylena decoy launchers celebrate 10th birthday; more innovations ahead

Industry – Signage

ARTISSOUM, a new range of Submarine Signals

Industry - Radar

Spy-7, la technologie radar navale de nouvelle génération

Cybersecurity

Naval Drakon: New Communications System at Thales

Innovation - Medical

CHIMS: An innovative solution for emergency medicine in space… or at sea

Industry

Two new spring lines from Lachant group

Among the many foreign delegations that have already walked the aisles of Euronaval 2024, focus on two of them: Greece and Finland. These major players explain why they came.

Focus on two major European delegations, Greece and Finland, who tell us why they are at Euronaval this year.

Three Questions to the Greek Delegation

Tassos Rozolis, President of the Hellenic Manufacturers of Defence Material Association, SEKPY, the Greek national organisation representing high-tech companies in the air, naval and land defence, electronics and software sectors.

SEKPY has some 140 members and employs over 10,000 researchers and technicians.

What has brought you to Euronaval?

Euronaval is the most important naval defence event in the world. So it's the best place to promote the naval and defence interests of our country.

What are your expectations?

It's the ideal place to develop synergies and cooperation between Greek naval defence groups and leading international naval equipment manufacturers.

Which equipment is of most interest to Greece at Euronaval?

The plans for Naval Group to deliver a fourth defence and intervention frigate (FDI) to Greece is currently the most important project for our naval defence industry. The contract with Naval Group is due to be signed in March 2025.
And for the very first time, we hope to equip our frigates with 'Scalp naval' cruise missiles from MBDA, with a firing range of 1,000 kilometres.

Paul Laquière

Three questions to the Finnish Delegation

Tuija Karanko, Secretary General of PIA, Finnish Defence and Aerospace Industries, a trade association of 195 Finnish Aerospace and Defence companies.

Why is it important for your delegation to be here?

This is the event where European naval industries come to meet. The Finnish industry is playing an increasingly important role in the naval world, particularly in capabilities in Northern Europe.

What are your expectations for this year's exhibition?

We want to meet all our partners, of course, but we also hope to find new contracts with industries. As a trade association representing Finnish companies, we want to find global opportunities of which they can be a part.

How long have you been coming to Euronaval?

This is the fourth time we've represented the Finnish pavilion at Euronaval since 2018. And we'll be back in two years' time!

S. Rose Joannis

Here come the drones

hey're everywhere. Uncrewed surface vehicles (USVs), unmanned aerial vehicles (UAVs), uncrewed underwater vehicles (UUVs)... They are present in large numbers at Euronaval, but nowhere to be found onboard French warships. "Be patient,» says Emmanuel Chiva, who heads the French Defence procurement and technology agency DGA.

Feedback from the Ukrainian theatre and the Red Sea, where the Houthis are attacking every ship they can, has convinced observers of the seriousness of the drone threat within the space of just a few months. «It's been a very long time since we've had missiles launched from the sea», insists the head of the DGA, echoing the words of the French Minister for the Armed Forces: military ships are indeed weapons of war, they are not pleasure craft.

Except that in the Red Sea, the problem arises of characterising and identifying targets: how to neutralise them, what weapon systems to use...
To date, 22 Aster missiles (MBDA) have been fired by French Navy vessels. But at around €1 million each, there is an urgent need to find the right solution to match the level of threat. A very short operational feedback loop for ships returning from the zone has been set up between the DGA, the French Navy and manufacturers. This has led, for example, to Paseo systems (Safran) being fitted on the FREMM multi-purpose frigates.
With so many drone solutions on offer, Emmanuel Chiva feels that experimentation is still necessary: «You can't just put anything on a ship.» He won't give an exact date, but Emmanuel Chiva says that «things should come on board very shortly.»

Conversion to drones is under way in a number of programmes, such as mine warfare and the future hydrographic and oceanographic capability (CHOF).

Testing currently under way includes Naval Group's ocean drone demonstrator, which is a step towards the future unmanned combat underwater vehicle (UCUV) system. According to Emmanuel Chiva, the concept of operations has still to be defined: «Area denial? Anti-surface ship? Underwater detection? First and forcible entry?»

Launched by the French Navy, the first Dronathlon took place in October. The initial idea was to check that French organisations and structures were suitable. They are, according to Emmanuel Chiva, who says: «We are currently studying the creation of a state-run naval drone test centre and the conclusions of this study should be available before the end of the year.»

Other avenues under consideration include the use of drones at the entrance to the port of Brest or in the carrier battle group.

Aude Leroy

Les Temps Forts en vidéo

TV Studio

Day 3 in pictures
















Since the decommissioning of its two light frigates in 2019, Montenegro has been looking for a replacement. And it's to France, and in particular to Kership, that the country has turned. Founded and owned by Piriou and Naval Group, Kership will build the two 60-metre offshore patrol vessels (OPV) in France, at its shipyards in Concarneau and Lorient, in Brittany.
A victory for the manufacturer, but also for French diplomacy.

Three questions to Kership CEO, Pascal Le Roy.

Why did Montenegro select Kership to build these patrol vessels?

We had a product that had proven its worth and was already in service with a satisfied navy. At Kership, we don't sell our products like you would sell a car. Our products are tailored to our customer's needs. We held extensive talks with Montenegro to be sure to offer them the right product. We were the only French manufacturer in the running for the contract, but there were international competitors.

Did France help you to win the contract?

An agreement of this kind is only possible with political connections. We were greatly supported by the French camp on this contract, particularly by the French Defence procurement and technology agency, DGA, which established relations between the two countries' governments. The French government, through the Treasury, which is part of the Finance Ministry, also guaranteed the financing of the vessels, which was obviously a key factor of success.

Why did Montenegro turn to France?
`There were several reasons. Montenegro needs traditional patrol vessels to protect its coastlines from trafficking and illegal fishing. But there's another factor. Montenegro is keen to play an increasingly important role in NATO. Purchasing two vessels of this kind will enable it to take part in valuable operations within the Atlantic Alliance and will position it as a good partner.
So, there is a sovereign aspect, but also the ambition to contribute to international operations.
Finally, there is the diplomatic aspect linked to Montenegro's application to join the European Union. In this respect too, it made sense to supply sovereign vessels to a country that wishes to join the European Union.

Paul Laquière

Skyjacker spoofs enemy drones

©Safran

Presented last June and deployed during the 2024 Paris Olympic Games, this decoy system causes its targets to alter their trajectory in order to create a protective bubble around the ship.

Between now and the end of the year, three Skyjacker systems from Safran Electronics & Defense will be delivered to the French Navy. Tested by the FREMM Lorraine in the Red Sea, to counter the Houthis, the Skyjacker replaces the signals transmitted by navigation satellites (GNSS) to guide the UAVs, with other, modified signals: the drone alters its trajectory, deceived by this false information. And flies away from its target.
Coupled with radar detection and optronic identification, Skyjacker can defeat drone swarms in land and naval environments. It can also counter isolated, remotely-operated UAVs, and deliver effects at ranges from 1 to 10 km.

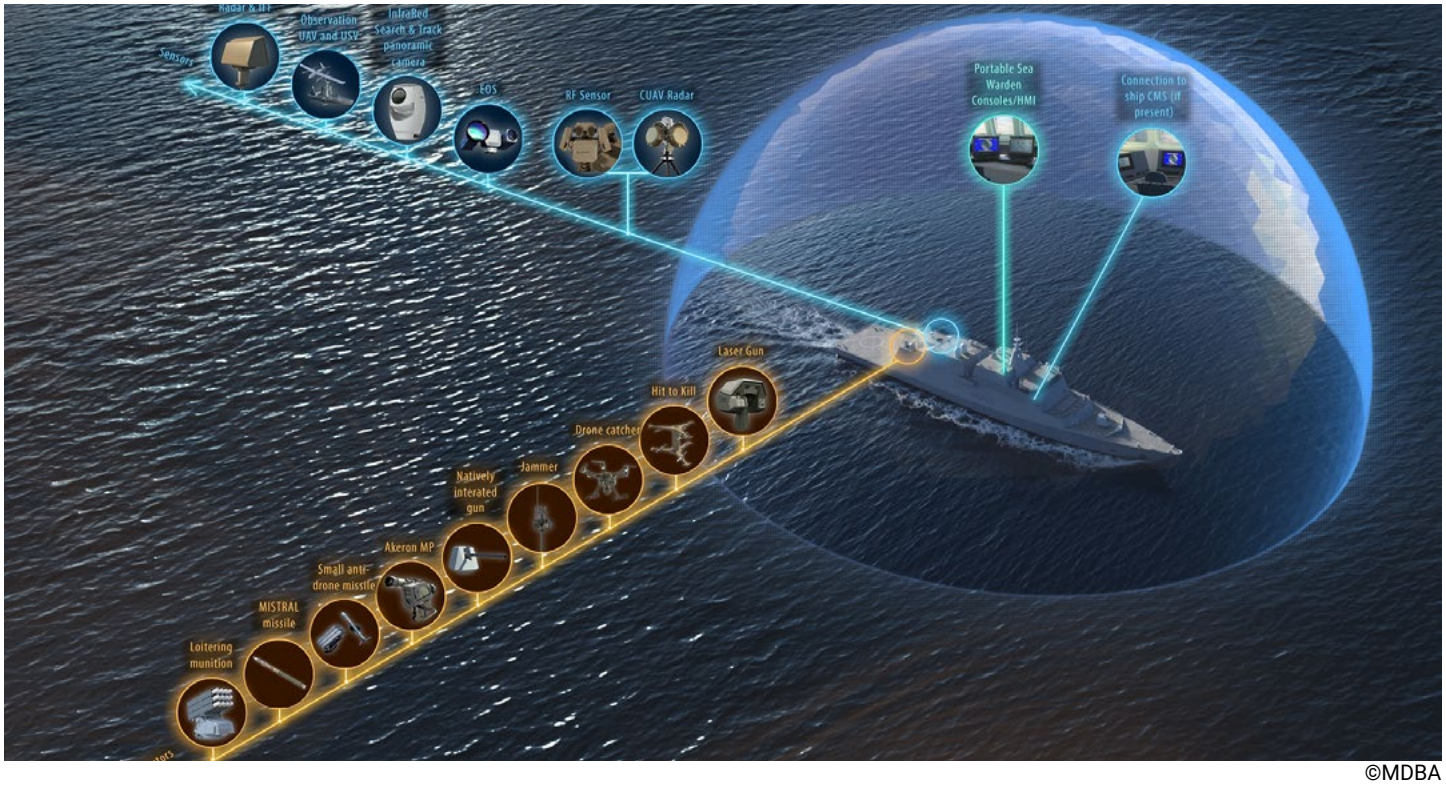
Disorientated, the drones are unaware of what has happened, fly off in the opposite direction and follow an oval-shaped holding pattern before either being destroyed or running out of battery. This makes it possible to erect a virtual protective wall, or bubble, around an infrastructure or point of interest (POI).

Aude Leroy

TV Studio

Seabed warfare – from observation and orientation to decision and action OODA

After Sky Warden, MBDA now offers Sea Warden



©MDBA

Why not develop variations of a successful product?

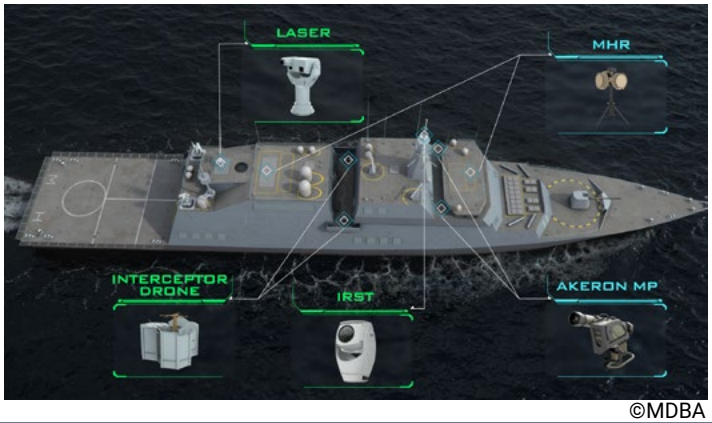
MBDA is using the technology building blocks from its "Sky Warden" product, which was designed for terrestrial environments, and navalising the system with a large panel of sensors and effectors to counter unmanned aerial and surface vehicles (like those used in the Red Sea and in Ukraine).

Modular options include laser, Mistral 3 missile, a "hit-to-kill" drone which intercepts using kinetic force alone, and jamming, selected according to the customer's needs.
Sea Warden provides both self-protection for ships at anchor or at berth, and defence for merchant shipping, for example on a frigate.

Depending on the effector used, an enemy UAV can be destroyed at a distance of 1 or 2 km from the frigate. If the ship is equipped with Mistral 3, which has a range of 8 km, the protection radius will be even wider.
The manufacturer is working on solutions integrated onto unmanned surface vehicles (USVs), to further increase the range, and onto camera-mounted uncrewed vehicles for example, to be able to view the target like a fast craft.

The aim is to have a multi-layered defence system, and to use the most appropriate effector for each type of unmanned threat. Sea Warden can supplement other air-defence systems on front-line frigates.
This will avoid firing an Aster missile to destroy a 'small' drone.

Aude Leroy



©MDBA

Elwave – CEDAR (Controlled Electric Detection And Ranging

A bio-inspired underwater sensor revolutionising identification beneath the waves

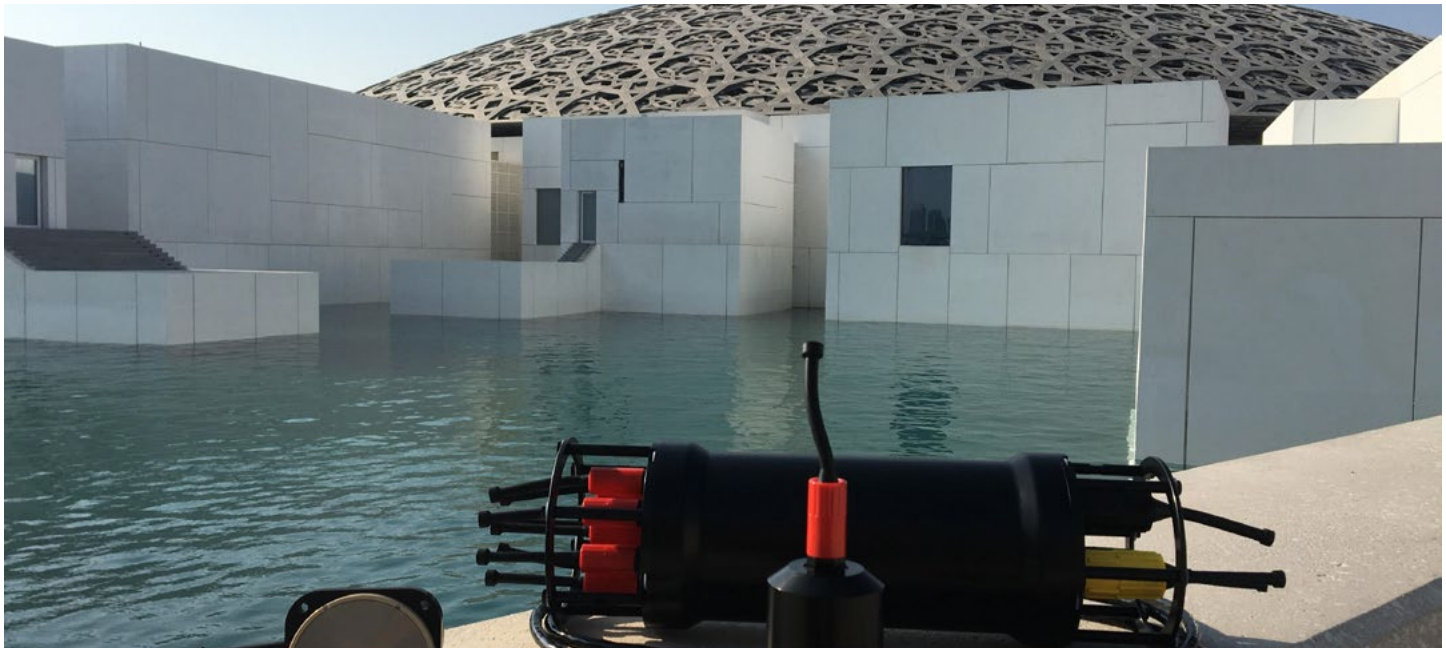
"Whether buried cables, mines or combat swimmers, to detect foreign bodies underwater, Elwave is launching a bio-inspired electromagnetic sensor, which is revolutionising identification beneath the waves and attracting both civilian and military interest."

The French company Elwave, winner of the Innovation Award at Euronaval 2022, is finally launching their CEDAR (Controlled Electric Detection And Ranging) underwater electromagnetic sensor. The system promises major advances in underwater detection and exploration. As the product goes to market, the company is rolling out a series of demonstrations to a number of different navies and to the civilian sector (Total, BP, Ocean Wings). These sensors could be particularly useful for clearing mined sea areas destined to become wind farms, such as the Gulf of Lion, in southern France. They could especially be used for naval surveillance or underwater exploration. Elwave have already signed the first sales contract for the CEDAR sensor with Abu Dhabi, UAE, for underwater archaeological research in the Persian Gulf.

©Elwave

When it came to creating the CEDAR technology, the researchers found inspiration in nature. They studied different species of fish that had evolved separately in South America and
Africa, and noticed that these creatures had developed a new
sense, called "magnetic sense". These species shared one thing in common, namely that they had evolved in very murky, cluttered underwater environments in which vision is extremely poor. To get their bearings underwater and to identify their maritime environment, the fish emit a magnetic field, which inspired CEDAR. One of these sensors, called Octopulse, resembles an octopus with a 40cm-long tube which contains all of its brain. "At the end of this tube, there are eight electrodes which we polarise to create an active electromagnetic field", explains Gary Bagot, Sales Director at Elwave. The more conductive the materials that enter this magnetic field, the stronger the electrical signal, and vice versa. "By interpreting the variations in this electrical signal, we can very precisely identify the shape of the foreign body, but also the materials it is made of – iron, plastic, sediment, human skin, etc. We can also find out if the body is alive, dead or inert."

This new sensor technology could therefore be very useful in mine countermeasures (MCM) and against unexploded ordnance (UXO). Elwave is the only French company selected by NATO to join the first group of innovators within DIANA (De-



fence Innovation Accelerator for the North Atlantic). In February 2024, Elwave's CEDAR technology was tested at the UXO base of NATO's Centre for Maritime Research and Experimentation (CMRE). The Octopulse sensor detected the 12 targets in the calibration area with a high degree of precision.
The CEDAR technology can also identify intruders, underwater cables or pipelines, in murky waters where an underwater camera would be of no use. Based on electromagnetic energy, the sensor could also be used to map the seabed or discover new species in deep ocean waters, without having to use disturbing lights.

The sensor is limited by the range of its electromagnetic field, the radius of which varies: a dozen metres or so in water and two metres when the target is buried. The sensor must therefore be brought to the site to be explored. While perfect technology doesn't exist, this one certainly complements other technologies. Elwave is already thinking about grafting its CEDAR sensors onto uncrewed underwater vehicles (UUVs).
This summer, the French company took part in the US Navy's ANTX CT24 (Advanced Naval Technology Exercise – Coastal Trident 2024). They demonstrated the capabilities of their CEDAR & TETRAPULSE sensor integrated into the Defender ROV (using Videoray) for MCM applications, in particular by taking over the identification of targets in murky waters, where a camera cannot penetrate. One thing is clear – with its new magnetic sense, CEDAR is opening up a whole new field of possibilities.

Paul Laquière

TV Studio

The data conundrum – collecting, analysing, sharing and protecting

Here are the five winners:

1 / GICAN Special Award, presented by Timothée Moulinier:
Marinetech for their solution «Manta X – Marine Garde»

2 / Special Start-up Award from our Seannovation space, presented by Bertrand GOUILLART:
TIDAV for their solution «T-H3»

3 / EURONAVAL Special ICT Innovation Award, presented by Alain Bovis:
Amphenol for their «HDMI AOC Extenders»

4 / EURONAVAL Special Defense Innovation Award presented by Thibaut Farineau:
MC2 Technologies their solution «SPART»

5 / EURONAVAL Special Artificial Intelligence Award, presented by Luca Peruzzi:
AILiveSim for their solution «Next Generation Simulation for Autonomous Development»

State-of-the-art training for mine clearance divers

In response to the use of drones in the naval world, training at DCI's military diving centre must now be adapted.

Fifteen modernised mechanical closed circuit rebreathers (diving apparatus) have just been received at the DCI Group's international military diving training centre (CIF-PM) in Saint-Mandrier, in the south of France. They are the same ones as the 250 sold and delivered over the past two years to the French

Navy by Aqualung, and available for export for the very first time at Euronaval 2024.

©DCI

These rebreathers will enable CIF-PM to provide cutting-edge diving training in complete independence. "We took part in the qualification testing of this equipment for the French Navy", explains Thierry Delacroix, head of the centre since 2020, "and we have trained 47 mine clearance divers in the past two years. We are now quite experienced, after some 1,500 dives using this apparatus."

The acquisition of this equipment had become a necessity following the return to the use of underwater mines since Russia's invasion of Ukraine. "And we have dropped the term 'mine warfare'", points out Hubert Dommartin, Military Business Developer for Aqualung, "which we now call 'seabed warfare'."
The arrival of drones is requiring major changes in training for military mine clearance divers: "We're at a crossroads", says Thierry Delacroix, "and adapting to the new underwater vehicles and intervention robots."

The CIF-PM is teaming up with industrial manufacturers to offer training for countries buying French equipment. But the centre can also provide training in equipment from overseas. Thierry Delacroix explains: "We ran a four-week course for divers from Slovenia, equipped with their own Aqualung Amphora rebreathers and sonar. They practised clearing a passage as part of an amphibious operation. They will be back in 2025, this time with their new AUVs [Autonomous Underwater Vehicles] from the French company RTSys [seabed warfare drones] and an SR8 ROV [remotely operated vehicle] from the American company Oceanbotics."

Although the CFI-PM does not yet have its own underwater vehicles as the market is still maturing, it nonetheless provides the type of training for which France is renowned: a mine clearance diver with decision autonomy, diving deeper (down to 100 m) and for longer (up to 6h) while interoperating with a drone.

Aude Leroy

Saab antenna at cutting edge of electronic warfare

Navies still regard ESM (Electronic Support Measures) systems as key sensors in "radio silent" tracking operations, as radars are becoming smarter and difficult to detect.

It is against this backdrop that Swedish company Saab is launching an update to its family of EW (Electronic Warfare) antennas for ships and submarines, called the U/SME-400. It is based on an antenna mounted on the mast of ships or submarines that can detect a wide range of signals, from 1 to 40 GHz, in extremely dense and crowded environments. It can now process signals much more easily, determining whether they are radar or communications signals.

ESM systems are particularly focused on radar signals from military vessels. The 25-kg antenna presented on booth i60 has above all gained in sensitivity and accuracy, being able to isolate up to 500 different frequencies simultaneously.

Paul Laquière

©Sabb

Sylena decoy launchers celebrate 10th birthday; more innovations ahead

Lacroix has launched production of its 100th system and is working on projects with UAV specialist Milton Innovation.

Only a decade after coming onto the market, Sylena decoy launching systems (DLSs) are fitted on more than 40 ships in eight navies, most of them non-French. Only the Sylena LW system (a launcher weighing less than 100 kg) has been delivered to France on the former OPV L'Adroit, sold to Argentina in 2018. However, discussions are under way with the French Navy to enable Lacroix to offer these Sylena systems on defence and intervention frigates (FDI), as is the case on Greek

FDIs. In the meantime, Lacroix says it started production of the 100th Sylena system in September.

The French countermeasures expert confirms the production of around 14,000 units of Seaclad ammunition (naval countermeasures). This range offers several cutting-edge technologies, including the Corner Reflector or CNR. Its particular geometric shape reflects the radar waves emitted by missiles and fools electromagnetic seekers. This technique is also used in conjunction with IR decoys to counter the latest generation of dual-mode missiles.

In addition, the Seamosc launcher and ammunition, unveiled in 2022, deploy an immense cloud of smoke to visually mask the ship from enemy missiles and prevent the precise aiming of laser-guided weapons.

In 2024, the Toulouse-based manufacturer will continue technology development efforts, with a particular focus on UAVs as a new deployment vector.

Following on from the Off Board Active Decoy (OBAD) project — which has been supported by France since 2020 and involves government bodies (defence innovation agency AID, defence procurement and technology agency DGA, Navy general staff, etc.) as well as a number of civil and DITB manufacturers, such as Thales — Lacroix is banking on synergies with its new Milton Innovation unit (specialising in UAVs and onboard systems integration).

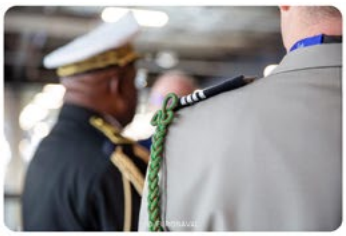
Applications currently being investigated include optimising tactical decoy sequences, jamming, counter-drone warfare, and deterrence and maritime protection training, particularly for anti-piracy missions.

Aude Leroy

TV Studio

Territorialization of maritime areas - the Indo-Pacific example

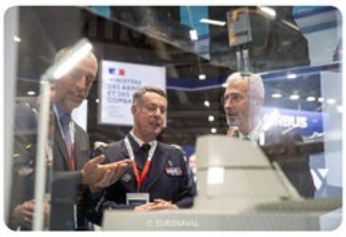
Day 3 in pictures














ARTISSOUM, a new range of Submarine Signals

©Lacroix

Lacroix's latest generation of submarine-launched signal-soffers improvements designed to expand the operating domain and increase safety during handling.

ARTISSOUM, the French acronym for artifice de signalisation pour sous-marin, is the name of the latest range of submarine signalling devices from Lacroix.

The original size of the products remains unchanged (around 47 cm long and 10 cm in diameter), as do the final effects (different possible payloads: coloured smoke, day/night marker or projected star).

In particular, the improvements will increase the depth at which the system can be used beneath the surface (no details given).
Personnel will also be better protected during handling, with a double safety system for pyrotechnic initiation. The addition of a safety cap ensures safety at every stage, from preparation to loading in the pyrotechnics workshop.

The systems have two functions: signalling or identification for aircraft or surface vessels. Depending on their colour, they can be used to transmit precise information using NATO codes, for example. A white smoke signal, a gas that ignites on contact with air, indicates the area where the submarine is due to surface. A rocket with a red star is a distress message, while one with a green star signals a simulated torpedo launch. Depending on the model, the effects can last from 10-15 seconds to more than ten minutes (smoke).
I
nitially developed by the French Arsenaux, these pyrotechnic products have been part of the Lacroix product portfolio for over 20 years.

Aude Leroy

Spy-7: Next Generation Naval Radar Technology

The U.S. firm Lookheed Martin, ranked by Defense News as the world's top defence company in 2024, is presenting a next generation radar at Euronaval called Spy-7.

This naval radar technology provides ships with the capability to make combat decisions more accurately and quickly. Spy-7 has the ability to detect, track and engage sophisticated ballistic missile and advanced air threats at sea or on land.

It engages multiple targets simultaneously with proven interceptors.
The special feature of this new radar is its ability to operate 24/7 without interruption.

For ships, the advantage of such an innovation is that they are never blind, for example during downtime for radar maintenance operations.

For the very first time, the system also features polarisation diversity, enabling it to detect complex threats that other radars cannot see.
The new technology has attracted several international partners. Spain's F-110 vessels will be fitted with the radar in 2028. Canada also plans to equip 15 surface combat ships with Spy-7 by 2030.

Paul Laquière

©Lockheed Martin

Naval Drakon:
New Communications System at Thales

Thales presents Naval Drakon, its new cyber-secure communications system designed to improve interoperability between different platforms during coalition operations.

©Thales

Olivier Ondet,
Directeur marketing et stratégie chez Thales

S. Rose Joannis

CHIMS: An innovative solution for emergency medicine in space… or at sea

When we think of space, there are certain inevitable analogies with the maritime world. CHIMS, an emergency medicine application, is bringing this connection to life after attracting the attention of the French Navy.

Developed by Axeal, a subsidiary of the technology and digital engineering specialist Hevrett Group, in collaboration with the European Space Agency (ESA) and the Institute for Space Medicine and Physiology (MEDES), the CHIMS (Crew Health Integrated Management System) application is an innovative digital solution for emergency medicine in space: “The aim is to understand medicine in a constrained environment, such as in space. Since the person ‘up there’ is not a doctor, we must be able to give them as much information as possible even when they don’t have a good-quality connection with the medical platform on Earth”, explains Fabien Neveu, Chief Digital Officer of the Hevrett Group.

In practical terms, the application starts by collecting the patient’s daily data before and during the mission, on all aspects of their everyday life: nutrition, sleep, physical activity, medical history, etc. CHIMS also has the advantage of integrating, processing and exploiting all this data with weak signals (factors that emerge over time) thanks to AI. In other words, information can be detected about the patient from the data collected and analysed. At the same time, the software guides the patient with a set of questions and answers, in order to reach a diagnosis and propose medical measures in line with their data.

This multi-year project has recently caught the eye of the French Navy: “There is a powerful analogy, because both populations are in a metal box, have difficulty communicating with doctors, and can understand the need for rigorous data capture”, Fabien Neveu underlines. But before being transposed to the marine environment, the idea would need adapting in terms of logistics and cost: “We couldn’t have an entire crew linked up to our sensors; it would make sense for some, but not others”, says the CDO. At the moment, the project remains under consideration.

S. Rose Joannis

TV Studio

Naval strategy

TWO NEW SPRING LINES FROM LACHANT GROUP

©Lachant Group

Lachant Group is presenting two new spring lines targeted at new equipment.

Springs are one of those overlooked components, yet they are essential to the operation of countless objects. This year, Lachant Group, a precision parts specialist, is presenting two types of spring lines that have been added to its product range.

The first is a large-diameter cold-formed wire spring line measuring up to 36 cm designed for aeronautical and naval equipment. Marc Guillemet, the company's general manager, explains that it will be used «for equipment that supports heavy weights: cannons, mooring springs and anchors.»

The difference lies in the way it is produced, which is «faster, more precise and more technical», he observes.
The second system is a wave spring line. It does not use a wire, but a flat length of material that is coiled and formed into waves, providing extra strength in environments that are highly constrained in terms of space. The structure incorporates a camera-based material control system to precisely measure the dimensions of the spring to ensure that it conforms to the customer's needs.

Thanks to these new, more complex and technical lines, Lachant Group is keen to extend the ability of vessels to remain at sea: «Whether in defence or civil applications, we need very high-performance equipment for large and small platforms. They have a much longer service life and require less maintenance», Guillemet explains. Orders are already coming in, and by January the company will reach 100% production capacity according to customer requirements.

S. Rose Joannis

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Daily 4

Nov. 7, 2024

Interview of the day

Lénaïc Segalen, General Delegate of CINAV talks about he challenges of recruitment in the naval.

Special reports - Training

- Focus on Acepp, a company with key human assets
- Forsim: a virtual instructor forthe french navy
- Equipment simulators in training

Industry

Simbad RC: MBDA doubles the capabilities of its self-protection systems

Industry - Deep sea

Underwater Acoustics: from Military to Civilian

Industry - Deep sea

DESPOT: The new Positioning System for AUV swarming

Innovation

Saab takes another steps towards autonomy of naval vessels

Sovereignty

Eurodrone: a step towards European sovereignty in drones

Interview of the day

Day in review

Focus on Acepp, a company with key human assets

With 40% of its workforce former sailors, Acepp draws on the experience of its personnel to pene-trate the training sector.

Although it is not its core business, Acepp, a member of the Hevrett Group, has turned its employees into a significant asset in the training sector. With 40% of its workforce former sailors, this SME, which specialises in MRO and construction-related work in the naval and nuclear sectors, has also made a name for itself in the training sector over the past two years or so.

“This activity originally stemmed from a customer need in rather confidential sectors, in environ-ments that were not always very accessible, such as the French nuclear submarine base at Île Longue, in Brittany”, says Thomas Guerry, a former SSN commander and now Key Account Manager at Acepp. “We provide training on the use and first-level maintenance of com-plex crane, rack and oth-er installations…”

With their human talent specifically comprising a dozen former submariners, each with 15 to 20 years of experience, Acepp is naturally positioning itself as a powerful solution against a critical re-cruitment landscape: “The population is ageing and a generation is heading off into retirement. Some specialists are in high demand within the industry and we are clear that, in the decade to come, with new nuclear technologies and the return to nuclear power, there will be a shortage of people trained in these professions.” Notably, a nuclear BTS (advanced technician’s certificate) was established two years ago in Cherbourg.

S. Rose Joannis

Forsim: a virtual instructor for the french navy

With its Virtuel Yves Instructor, Forsim is pushing back the boundaries in training. A new way of learning that could hold promises for meeting the needs of schools.

Frédéric Zitta is a former officer in the French Navy who, after a career of 27 years, has combined his expertise with another of his interests, developing simulators. His initiative gave rise to the company Forsim, founded in 2020. For two years, For-sim has been developing a virtual instructor that will be operational in summer 2025 at the School of Underwater Navigation in Toulon (ENSM / BNP), in the south of France. With this project, Zitta intends to make up for the shortage of available trainers. “*The French Navy needs self-training solutions because, given the constant needs on board ships, it is difficult to free up naval personnel for schools*”, explains Forsim’s CEO.

So self-training yes, but not just anyhow: “Today’s simulators incorporate small, extremely basic virtual instructors that are not satisfactory because they do not adapt to the learner”, says the former naval officer. But in a year’s time, the Virtuel Yves instructor will be able to meet this need. Not only will it monitor compliance with the rules of conduct, but it will also be capable of giving learners tips based on their mistakes and of adapting the training programme to their individual progress. The training tool will be embodied by a character who is still under study. It will be part of the programme and be positioned in a corner of the screen, “*maybe in the top right*”, says Zitta, “*so that it is present, but doesn’t block the field of vision*.”

The Virtuel Yves Instructor will consist of a generic part common to all the simulators and a part specific to the particular one. This specific part will contain the rules of conduct, learning tips and the training programme. It will be adaptable to other equipment of this kind but before that, a learner-focused adaption will be necessary, because the challenge lies in cap-turing their attention. “*AI is set to become part of our everyday lives, and I think we’ll succeed in getting students interested. The question is: will it work now or later?*” For the moment, Virtuel Yves still has everything to prove.

S. Rose Joannis

Equipment simulators in training

The growth of digital technology has not gone unnoticed by the Defence industry and it is keen to integrate digital solutions into its training programmes.

Combining operational and digital capabilities is the unique expertise of the Heverett Group, which has been supporting the industrial and digital transformation of its customers for 20 years. Building on this expertise, the company has quite naturally branched out into training, in connection with digital tools.

Over the past two decades, Fabien Neveu, Heverett's Chief Digital Officer (CDO), has seen digital technology evolve differently in traditional industry and in the Defence sector. "The issues differ between these two worlds. In industry, profit is the main concern, so the costs and lead-times are not the same. But the Defence sector, where the technologies adapted are quite mature, can benefit from the optimisation approach", he explains.

Among the digital solutions it develops, digital twins, i.e. the virtual model of a physical object, help to "facilitate training, among other things", explains Neveu. This technology has both economic and training benefits and is an opportunity to gather real-world data and transpose it in a digital environment. "Learners start with a virtual approach to the subject-matter before gradually moving into the real world. Training therefore requires fewer resources and less equipment, while still practising all the right safety measures", says the CDO.

This is the core business of Forsim, a company specialising in the development of training simulators. Its latest new product is a diving safety simulator (SIMSECPLO), designed for DCI – NAVFCO, which will be operational in 2025. "DCI wants a simulator for training in safe submarine diving, travel and surfacing, as well as the dangers involved and how to mitigate them", says Frédéric Zitta, CEO of Forsim.
The submarine equipment simulator, designed for three learners and an instructor, consists of four consoles each with four screens: "The workstations will be like a quite elaborate video game. There is one screen for the 3D view and three for controlling equipment such as pumps and valves", says Frédéric Zitta, who intends to stimulate the attention of learners with this modern simulation training game.

S. Rose Joannis

Simbad RC: MBDA doubles the capabilities of its self-protection systems

Until now, this short-range surface-to-air self-defence system was fitted with two Mistral 3 missiles… But, for 2027, MBDA will be offering the system with four missiles and, another new feature, with an automated turret 100% made in France. The new turret will be produced by the French Cegelec Défense group's Mechatronics Solutions division, according to the Mer et Marine online news portal, rather than by Rheinmetall in Germany.

Installed for the French Navy for the first time on board a replenishment vessel, the BRF Jacques Chevallier, Simbad RC in particular comes with an IR thermal camera which "captures" the target, and a remotely controlled automatic launcher, which is very easy to use by a single operator on board the vessel. There are only three control keys – activation, "lock on the missile" and "fire". Equipped with an IR homing system, the Mistral 3 missiles have a maximum range of 8 km and complement other weapons. They can be used against conventional and asymmetric threats such as anti-ship missiles, fast boats, helicopters, aircraft and of course Class 1 and 2 drones. Simbad RC is an effective solution, regardless of the weather conditions.

Aude Leroy

Facts and Figures

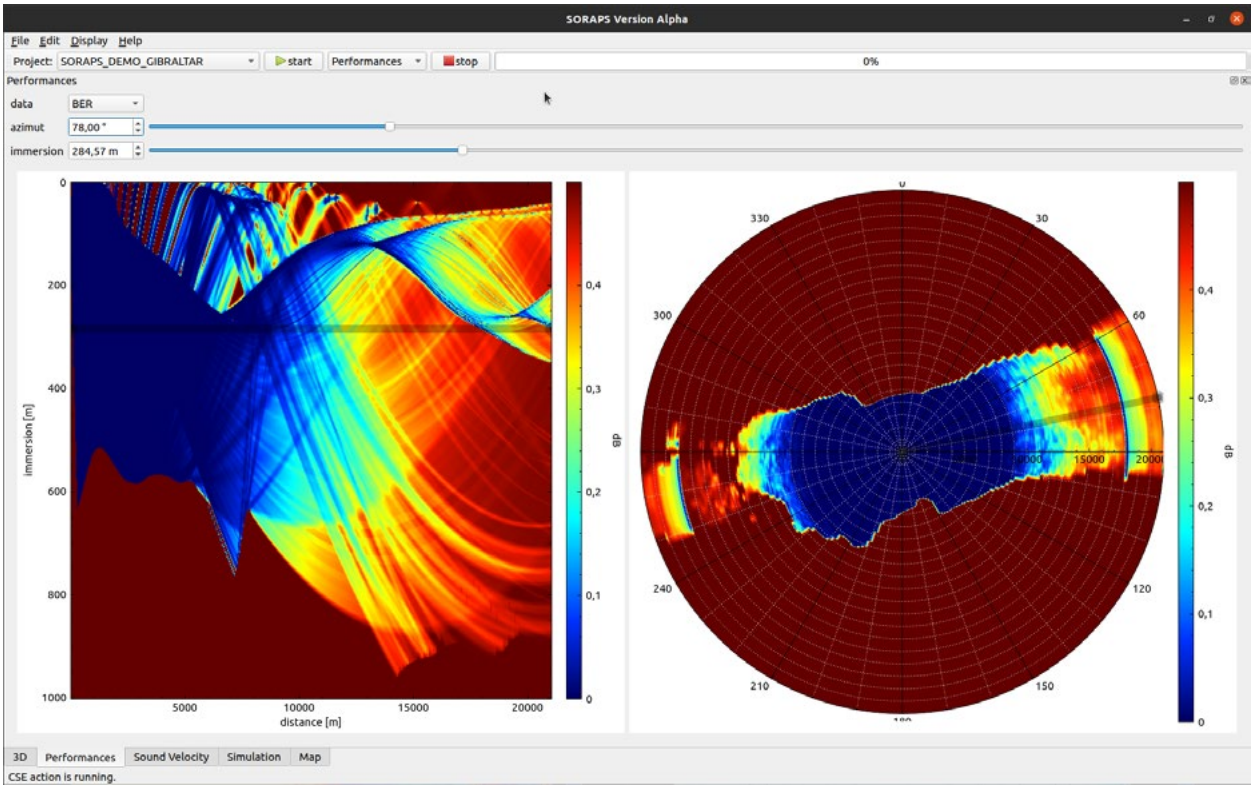
U system weight :	500 kg	Length:	1,86 m
Missile weight :	19,7 kg	Diameter:	90 mm

Retour en images

Underwater Acoustics: from Military to Civilian

Seagnal, a flagship company in underwater acoustics, is recognised for its expertise, but is too small to become a Defence equipment manufacturer and grow.

The company is therefore conquering civil markets to secure its future.



Seagnal may be a small company, but it is highly specialized. Based in Sophia Antipolis on the French Mediterranean coast, the dozen or so engineers it employs are all experts in analogue and digital electronics. In just twelve years, this team has produced six electronic demonstrators for the French Navy, which “have all met with satisfaction”, comments Jérôme Durif, Business Development Manager at Seagnal. Not only it is capable of designing customised electronic boards and entire systems for its customers, the company has also developed different types of active and passive sonars.

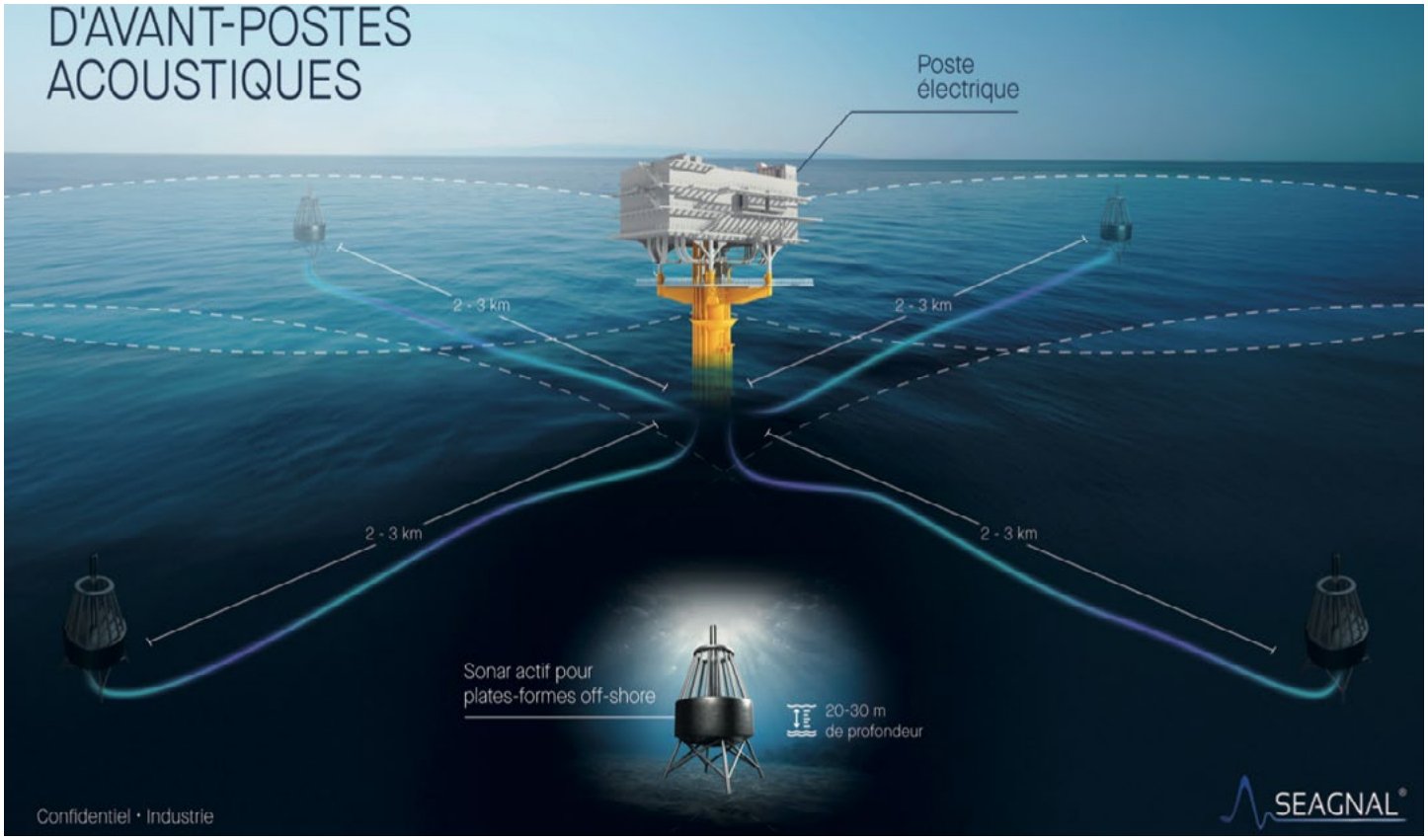
In particular, Seagnal has developed software capable of simulating sound propagation, called SORAPS. This programme is highly innovative in terms of computing power because “we use the same processors as those used to create animated images in computer video games”, explains Durif. “The 3D results are finer, more precise and more realistic because we take account of the features of the seabed, the salinity of the water, its temperature, and so on”, he says. In addition to 3D technology, SORAPS uses the time evolution of sound waves. Measuring the travel time of the different waves provides data on the behaviour of the acoustic channel between the transmitter and receiver. This technology is of particular interest to designers and users of sonar and underwater digital acoustic communication systems.

One promising area for Seagnal’s business development is underwater acoustic monitoring of offshore wind farms, both fixed and floating: “Each farm has a substation that receives the power output by the turbines. Substations are critical assets, and therefore potential targets for a terrorist attack, which would destroy the farm’s entire production. And they are difficult to secure. With our Acoustic Outpost Network (RAPA) comprising four to six active sonars (SAPOS) distanced from the substation, we can detect the presence of divers several kilometres away, in all directions”, explains Durif. Seagnal is working with Compagnie des Signaux (CS) group, which is proposing aerial, surface and underwater surveillance to operators of fixed offshore wind farms, pending the construction of floating farms, scheduled for 2028. France currently has only three experimental floating wind farms, each with three turbines, one in Brittany and two in the Mediterranean.

A 500-megawatt wind farm represents an investment of around €1.5 billion. The cost of the RAPA equipment is currently being determined, and should be in the region of a million euros per active sonar, which is a fair price to pay to protect the strategic core of such an offshore wind farm!

Un champ d'éoliennes de 500 mégawatts représente un investissement de l'ordre d' 1,5 milliards d'euros. Le coût des équipements du RAPA est en train d'être défini et devrait tourner autour du million d'euros par SONAR actif: pas très cher pour protéger le cœur stratégique d'un tel champ d'éoliennes en mer !

Aude Leroy

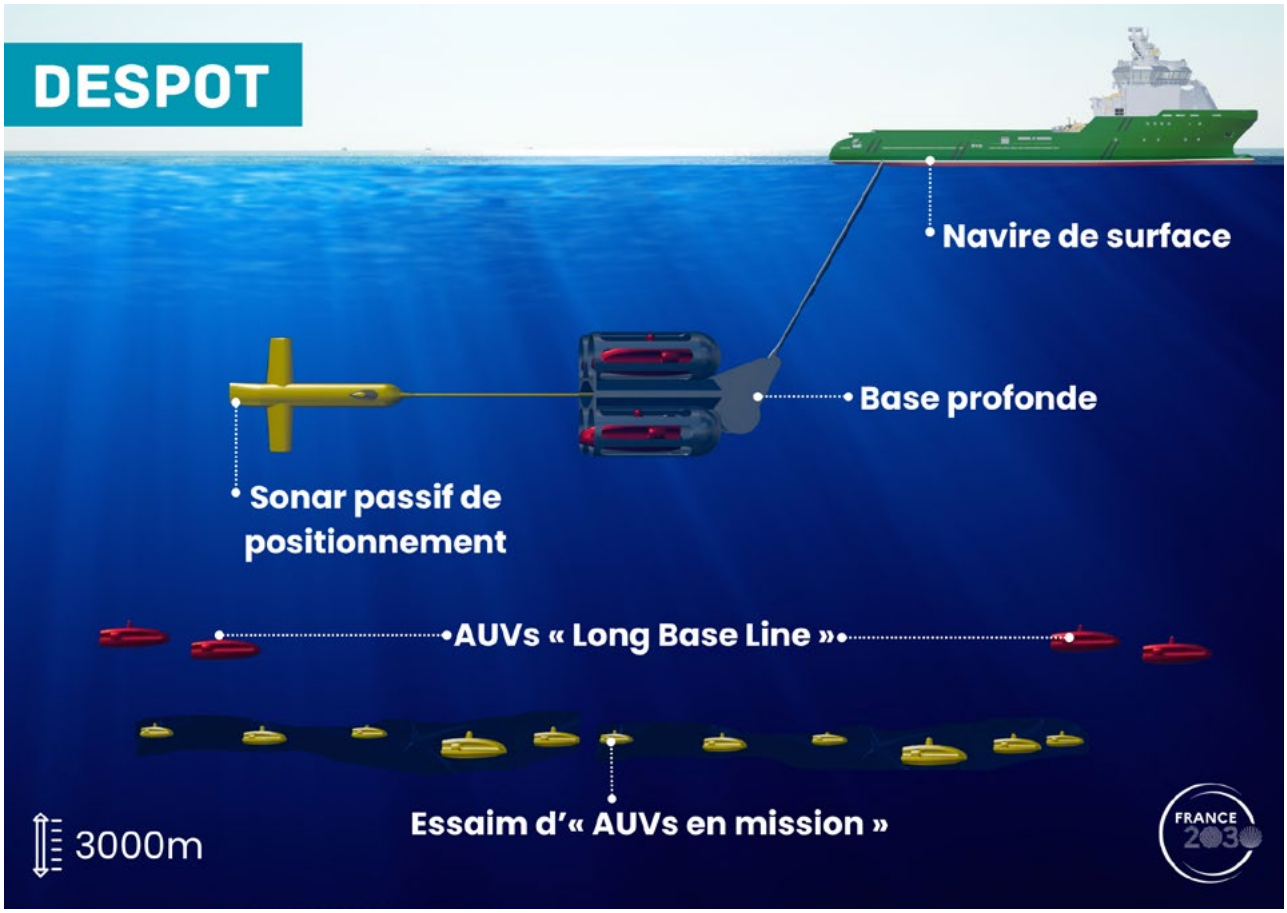


Facts and Figures

Seagnal's range : **3** km range of Seagnal's dive detection sonar (Compared with nearly 0,9 km for its competitors)

Floating Wind Turbine: **20** M€ / unit

DESPOT: The new Positioning System for AUV swarming



By joining forces, the flagship French companies Arkeocean, Seagnal and Bourbon Subsea Services have secured funding under the 'Deep Sea' call for projects component of the France 2030 investment plan.

DESPOT, which stands for "DEep Swarm POsiTioning", is a system for positioning a swarm of autonomous underwater vehicles (AUVs) navigating in the water column. In future, it will allow hundreds of these drones, swarming at depths of down to 3,000 metres, to be accurately positioned and guided to within five metres. This is totally revolutionary in the abyssal depths, which are still largely unknown to humankind.

The consortium leader, the family-owned business Arkeocean, is developing almost acoustically undetectable AUVs measuring less than a metre which will monitor the ocean depths or take GHOM (geography, hydrography, oceanography and meteorology) measurements. Seagnal is producing a sonar positioning system for these mini-AUVs so that they know their exact position underwater – a system that will also be more cost-effective than an inertial unit.

Between the surface vessel and the swarm, a Deep Base coupled with a Passive Positioning Sonar, and a 'Long Base Line' of four to six 'LBL' AUVs will enable each drone of the underwater swarm to know its position with a recurrence of less than ten seconds.

Launched in January 2024, the project will be developed over three years and funded by the French public sector investment bank BPI.

Aude Leroy

Saab takes another steps towards autonomy of naval vessels

On Wednesday, November 6, the Swedish company Saab presented its new autonomous ship, Autonomous Ocean Core, a 16-meter-long unmanned ship piloted live from the Euronaval stand, 1,800 kilometers from its location in Norway, around the port of Värns. This latest-generation surface drone, built by Saab at the Docksta shipyard, can self-pilot using artificial intelligence. Intended for military operations in hostile areas, it can be controlled from anywhere on earth thanks to the Starlink network.

Paul Laquière

Eurodrone: a step towards European sovereignty in drones

LThe European Union is organising itself to acquire a very large, 100% European, MALE (Medium Altitude Long Endurance) UAV. The aim is to break free from American dependence on UAVs by 2030.

At a time when threats at sea are becoming increasingly numerous and sophisticated, this 26-metre vehicle, capable of reaching altitudes of 10,000 metres, could be a veritable Swiss Army knife. Designed to carry missiles as well as the latest optronic, AIS and radar tracking technologies, the European UAV could be used both for maritime surveillance missions and in military operations. Eurodrone is a programme launched jointly by France, Germany, Spain and Italy. The contract — signed in 2019 between the four countries, Airbus and Europe's Organisation for Joint Armament Cooperation (Occar) — includes the supply of 20 Eurodrone systems by the end of the decade. Three contractors are involved in the programme: Airbus Defence and Space S.A.U in Spain, Leonardo in Italy and Dassault Aviation in France. They will have the ambitious responsibility of manufacturing the most advanced unmanned aerial system (UAS) in the sector, in other words an object of European sovereignty. Japan, which includes a large number of islands and therefore an extensive maritime surveillance zone, has already shown an interest in the European UAS. Powered by thermal engines, the MALE UAV will have an endurance of 22 hours and will be able to circumnavigate the Mediterranean in a single flight.

Paul Laquière

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Contracts signed or announced at Euronaval (via Press Releases)

Montenegro acquires two 60m OPVs from Kership

These two 60-metre Offshore Patrol Vessels (OPVs), designed and built by the French shipyard Kership based in Concarneau, Brittany, will enable the government to perform its missions at sea (policing, fight against trafficking, etc.).
The Navy of Montenegro also wanted to include capabilities for carrying and deploying special forces via autonomous craft and uncrewed systems to extend the ships' range of action and influence.

The French Defence procurement and technology agency (DGA) will provide government support on the commercial contract with Kership, for the Ministry of Defence of Montenegro, under a technical arrangement with the MoD's Logistics Directorate.

Lacroix to equip RABDAN FA-400 with SYLENA LW

©Lacroix

The SYLENA LW advanced decoy system from Lacroix will be integrated onto the FA-400 fast attack vessel recently launched by EDGE Group entity Abu Dhabi Ship Building (ADSB). The partnership agreement was signed by David Massey, CEO of ADSB, and François Moulinier, COO of LACROIX.

RABDAN FA-400 is a UAE 45-metre, purpose-built patrol vessel designed for speed and territorial and coastal missions.

Lacroix's technology is already operational on more than 30 vessels worldwide.

AID and GICAN step up their cooperation

The French Defence Innovation Agency (AID) and the French maritime industry association, GICAN, have renewed their partnership, after signing a first agreement in 2020.

AID and GICAN work together to promote the naval industry, particularly during innovation missions abroad and at French and international trade exhibitions such as Euronaval and the Defence Innovation Forum.

The two partners also come together within the Conseil d'Orientation de la Recherche et de l'Innovation des Industriels de la Mer (Maritime Industries Research and Innovation Guidance

Council - CORIMER), with the aim of identifying projects of interest for defence. CORIMER manages support for innovation in the maritime industry and acts as an interface between manufacturers and the government, in particular to optimise public aid for innovation and to direct projects towards government support schemes.

The signing of the agreement also comes as part of the designation of the seabed as a domain of strategic action for the French Ministry for the Armed Forces and Veterans. Innovation in seabed control and warfare is of crucial strategic importance, in order to strengthen offshore safety and the surveillance of naval and undersea infrastructure.

This partnership with GICAN will enable AID to further its relations with private-sector players driving initiatives to harness and support dual-use innovation.

United Arab Emirates Navy chooses Exail MCM system

The UAE Navy has chosen Exail to supply a UMIS 3rd generation unmanned integrated mine countermeasures system, which aims to provide advanced capabilities for remote mine clearance.

Singapore Navy opts for key Safran systems

Singapore's Defence Science and Technology Agency (DSTA) has chosen Safran Electronics & Defense to supply Electro-Optical (EO) observation systems and processing units for Gun Fire Control Systems (GFCS).

They will outfit the Singapore Navy's new Multi Role Combat Vessels (MRCVs) and Offshore Patrol Vessels (OPVs).
The sighting system comprises high-definition sensors and a multispectral telescope, for long-range identification of targets day or night and under poor weather conditions. The GFCS is a smart Command and Control (C2) system that processes information from various shipborne sensors to control the ship's weapons systems.

The new generation GFCS product line was also contracted as part of the modernisation of the Singapore Navy's Formidable-class frigates.

Thales partners with FEBUS Optics for the protection of critical undersea infrastructure

©Thales

A gem of technology in Distributed Fibre Optic Sensing (DFOS) systems, FEBUS Optics proposes DAS (Distributed Acoustic Sensing), which needs only one optical fibre for its connection. The system is designed to detect any acoustic signal generated on or near infrastructure being monitored and ensures early detection and precise geolocation of any anomalies. The signals will then be exploited using Thales' sonar arrays.

The two manufacturers' complementarity, which they are both keen to leverage, should enable permanent monitoring of the volume of water around sensitive installations and, therefore, a seamless surveillance system.

Advancing military training solutions

Défense Conseil International (DCI) and RTSYS - Underwater Acoustics & Drones are teaming up to integrate cutting-edge underwater robotic technologies into military training programmes with the aim of improving the operational readiness and effectiveness of international armed forces and security forces.

DCI's innovative training courses will leverage high-end equipment from RTSYS, in particular the SONADIVE portable sonar, the NEMOSENS and COMET-MCM light and man-portable AUVs for mine countermeasures (MCM) training, and the SEMA recoverable target for anti-submarine warfare (ASW) training.

Asterodyn, an ultra-fast defense drone piloted by AI

It is capable of following Formula 1 cars, goes from 0 to 200 km/h in two seconds and reaches a top speed of 400 km/h.

The Asterodyn drone was designed to be able to transport defense equipment between 300g and 2kg to aerial targets (drones, helicopters) or maritime targets, as part of military operations.

This remotely operated munition, presented last June at the Eurosatory show, has caught the attention of armed forces.Yesterday, Wednesday, November 6 at 1:45 p.m., in the Cherbourg space at the Euronaval show, the Asterodyn company announced its collaboration with Hawaii Tech for the design of a new version of the drone without human piloting based on AI, in order to make it autonomous in its trajectory to the target.

L'externalisation des vols en drone dans le cadre de la surveillance maritime

Avec l'augmentation de ses aires maritimes à protéger et ses 10,2 millions de kilomètres carrés d'espace maritime, la France conçoit plus que jamais le drone comme un outil de surveillance incontournable.

Mais face à l'usage complexe des UAS (systèmes d'aéronefs sans pilote), au coût financier de ce matériel et de sa maintenance, de nombreuses entités gouvernementales sont séduites par des offres d'externalisation de vols en drone. Assez inhabituel dans le cadre de la surveillance maritime, le marché du service de drone apparaît novateur. Et une société française, Extensee, qui expose à Euronaval, tire son épingle du jeu.

Depuis son lancement l'an dernier, l'entreprise est pour l'heure la seule titulaire d'un contrat UGAP (Union des groupements d'achats publics), lui permettant d'assurer des prestations de vols en drone auprès de différentes entités gouvernementales françaises comme les douanes, les préfectures maritimes ou encore la Direction générale de l'armement Essais de missile (DGA EM).

En parallèle, le besoin de formation de pilote de drone augmente. Là encore, la jeune entreprise se diversifie en proposant des formations au profit de la Marine nationale et d'entités militaires étrangères comme la Mauritanie, le Mozambique, le Tchad, le Niger, le Bénin ou encore le Cameroun.

The Egyptian Navy chooses Safran optronics and navigation systems

Ten Egyptian Offshore Patrol Vessels (OPVs), built by Alexandria Shipyard, will be equipped with advanced optronics and navigation systems from Safran.

The contract was signed with NVL Egypt, a joint venture between the Government of Egypt and the German shipbuilder Lürssen.

VIGY 4 is a compact, stabilised, long-range panoramic observation and sighting system that can detect, identify and track threats. It is particularly efficient for operations in reduced visibility, in the dark and in difficult weather conditions, through fog for example, thanks to a SWIR (Short Wave InfraRed) channel. The VIGY 4 sight can also drive and operate small and medium-calibre weapons. Based on the HRG Crystal gyroscope technology, an innovation patented by Safran, the Argonyx inertial system provides all the data essential for navigation. This advanced navigation system also offers a high level of performance in environments devoid of satellite navigation signals (GNSS-denied) and meets the most stringent requirements for weapon systems stabilisation.

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