FEBRUARY 2025 - No.1

Naval Review

WE DELIVER POWER AT SEA

NAVAL GROUP

A FORMIDABLE FRIGATE
A first-class combat ship, the defence and intervention frigate (FDI) was designed to operate, alone or as part of a naval force, in all areas of combat (anti-ship, anti-aircraft, anti-submarine), against asymmetric threats and to be capable of deploying special forces. Bringing together the best of French naval technology on a compact platform, the FDI is powerful, innovative and scalable in order to adapt to new threats. Here, we take a look at the FDI *Amiral Ronarc'h* during its sea trials in October 2024 *(see page 19)*.

n.1 Naval Review

WE DELIVER POWER AT SEA

PIERRE ÉRIC POMMELLET

Chairman and Chief Executive Officer of Naval Group

Dear readers,

In a rapidly changing sector, characterised by new geopolitical and military balances that have reshuffled the cards of the world as we knew it, we, as naval defence professionals, need to take the time to decipher and analyse our current situation and our activity.

This is the mission of *Naval Review*, our new quarterly magazine: to give each member of our ecosystem the means to fully understand the issues and developments that impact us.

With our expert view of the naval defence industry, we will review the latest news on our programs (under the heading "Trends in action"), the innovations of today and tomorrow ('Technosphere') and the topics that drive our professional life ('Team spirit').

And because our teams, customers, partners and suppliers are working hand in hand to build the naval defence of tomorrow, we went to meet them to hear their views on our joint activities.

Naval Review aims to enrich our knowledge of our environment, but also to strengthen our ties.

We encourage you to share your copy with those around you, with your customers, suppliers, partners and colleagues.

We hope you enjoy reading this first issue and we will be back this summer for the second edition!]

Trends in action

THE PROGRAM TO REPLACE THE DUTCH SUBMARINE FLEET HAS BEEN GIVEN THE GO-AHEAD. FIND OUT MORE ON PAGE 6. HOW CAN WE ANALYSE AND RESPOND TO THE NEED FOR DRONE CAPACITY, PARTICULARLY NAVAL DRONES? OUR ANSWERS ON PAGE 12. THE INITIAL SEA TRIALS OF THE FIRST DEFENCE AND INTERVENTION FRIGATE (FDI) FOR THE FRENCH NAVY, AS IF YOU WERE THERE: IT'S ON PAGE 19. HOW ARE THE TEAMS FROM THE SERVICES DEPARTMENT PREPARING TO MAINTAIN THE FIRST FDI? WE EXPLAIN ON PAGE 23.

BARRACUDA

Moving ahead together!

THE RELATIONSHIP BETWEEN NAVAL GROUP AND THE NETHERLANDS MINISTRY OF DEFENCE HAS FURTHER PROGRESSED WITH THE SELECTION OF NAVAL GROUP FOR THE REPLACEMENT OF THE WALRUS-CLASS SUBMARINES BY FOUR CONVENTIONAL BARRACUDA SUBMARINES. THIS AMBITIOUS PROGRAM IS KNOWN AS THE REPLACEMENT NETHERLANDS SUBMARINE CAPABILITY (RNSC).

How the Replacement Netherlands Submarine Capability (RNSC) will foster the existing ties between Naval Group and the Netherlands MOD, and more largely between the Netherlands and France ?

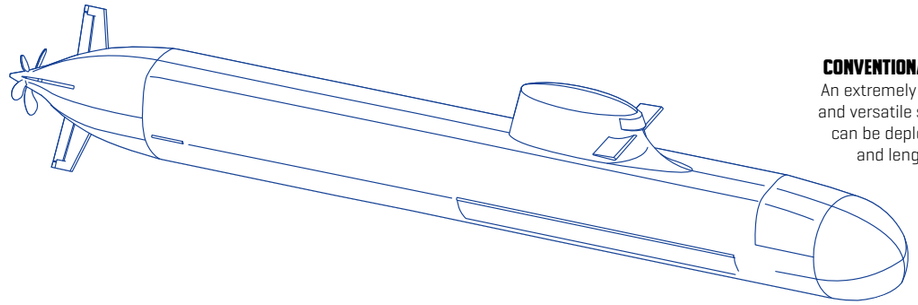
A discussion orchestrated by the *Naval Review*'s team.

Danny van den Bosch,
Deputy Head of the program for the Dutch Ministry of Defence and representative of COMMIT (Materiel and IT Command) in Cherbourg

Sylvain Perrier,
RNSC Program Director for Naval Group

What kick-started the RNSC program?

Sylvain Perrier: On September 30, 2024, Pierre Éric Pommellet, Chairman and Chief executive officer (CEO) of Naval Group, and Gijs Tuinman, the Dutch State Secretary for Defence, signed the delivery agreement of the future Orka-class submarines (Orka, Zwaardvis, Barracuda, and Tijgerhaai) that will replace the current Walrus-class submarines. The signing of this delivery agreement kick-started the RNSC program and paved the way for decades of collaboration between Naval Group and the Netherlands MOD. However, our preparatory efforts had begun well before the official start, during the pre-contract phase, namely by identifying key Dutch partners that will be involved in the program. About 10 companies have been involved so far, including Verebus and Van Halteren Technologies, with which contracts have already been signed. The company also enjoys a lively cooperation with the Netherlands knowledge institutes, some of which will become partners within the frame of the RNSC program, following their successful involvement on surface ship projects. For instance, a letter of intent has been signed with Marin last November. The signature of an Industrial Cooperation Agreement (ICA) on September 10 with the Dutch Ministry of Economic Affairs formalised this industrial cooperation strategy of Naval Group with the Netherlands defence and maritime sector.



CONVENTIONAL BARRACUDA
An extremely quiet, powerful and versatile submarine that can be deployed on distant and lengthy operations.

Danny van den Bosch: The process of finding the most suitable partner began several years ago. Before we launched the tender, we engaged in multiple discussions with key stakeholders to gauge the market landscape and determine what was feasible. We were not only looking for the industrial capability, that we knew we didn't have in the Netherlands anymore, to construct the finest submarines in their class but also for a partner with whom we could engage in an expert, productive and ongoing dialogue. The idea was to mutually enrich each other to enhance our collective expertise: sharing knowledge and resources, and being able to build and rely on each other today, tomorrow, and in the future.

In what context and with what objectives was the tender launched?

D. v. d. B.: The existing four diesel-electric attack submarines operated by the Royal Netherlands Navy that have been introduced in the early 1990s, have undergone various upgrades to extend their service lives, and they will have to be replaced. The signing of the agreement marks the final step in a rigorous selection process by the Netherlands to find the best industrial partner. Our decision was based on four key objectives for the Netherlands and its navy: to grow its strategic influence, enhance its maritime strike capability, improve its ability to gather, analyse, and share intelligence globally, and increase its capacity for special operations. As nations, France and the Netherlands share a long maritime and engineering history. Both rely on a strong submarine fleet for their defence policy and both are North Atlantic Treaty Organization (NATO) members. The Dutch submarines are a niche capacity within NATO, as they are expeditionary and suitable for brown and blue water operations. This will be true for the Orka-class as it is true for the Walrus-class, and this is something we want to emphasise from the start. We are a big part of NATO's submarine capability and will still be in 30 years' time. We have a responsibility towards the next generation and want to provide them with the best submarine available.

> **"The state-of-the-art Orka-class submarines must remain operationally relevant through 2070. They represent the future for the Netherlands Submarine Service, and by building them today, we are literally shaping the future of underwater warfare".**
>
> DANNY VAN DEN BOSCH

Why was Naval Group chosen?

D. v. d. B.: We launched the tender with very clear objectives, and Naval Group responded with a proposal that met the level of excellence we require to keep the Netherlands at the forefront of underwater warfare with a new fleet of four state-of-the-art diesel-electric submarines. Naval Group's extensive experience in ▸

> **“We’re already engaged, with a first common design review scheduled for February 2025 to validate the submarine’s technical requirements. Throughout the program, we will conduct several reviews, progressing from high-level design to a more and more precise definition of the submarine’s systems”.**
>
> SYLVAİN PERRİER

- submarine manufacturing and upkeeping, its ability to support Dutch strategic capabilities and autonomy, and its commitment to integrating the strong Dutch industrial base into the design, construction, and maintenance of the future submarine class made the French proposal the best choice for the Netherlands. The Orka-class is part of the Barracuda family. By leveraging the capabilities of the Suffren-class submarines, stemming from the French Barracuda program, and working on the Barracuda family design to adapt it to our specific requirements through meetings and discussions with Naval Group, the Orka-class submarines will give the Netherlands Submarine Service a head start in future battle. We’ve always wanted the ‘best of the best’ when it comes to submarines, we’ve always been aiming very high. With the Orka-class, we know we’ll remain on the top-end of underwater warfare.

S. P.: There are probably several reasons why Naval Group’s proposal was selected. Firstly, our extensive expertise in both conventional and advanced non-conventional submarines, particularly demonstrated through our Barracuda family, sets us apart. Secondly, our proposal was based on our understanding of COMMIT’s requirements, refined through a very fruitful dialogue phase. Thirdly, we also focused a lot on integrating an array of expertise available in the Netherlands as early as possible in the project. Agreements have actually been signed as soon as a month after the Delivery Agreement signature with some of our Netherlands partners! Lastly, our commitment to timely delivery has been highlighted during the tender process as we have guaranteed to meet the requirements within the specified timeline. This is critical because the timeline for designing, building, and delivering the future Orka-class submarines is of key importance to ensure the Netherlands Submarine Service operations continuity, with four ships to be delivered between 2033 and 2037 — 12 months apart for the first two and 18 months apart for the next two

What is the scope of Naval Group responsibility in this program?

S. P.: As the prime contractor for the RNSC program, Naval Group assumes comprehensive responsibility for designing, building, and delivering the submarines. This includes identifying and selecting new suppliers and establishing a robust framework to support them throughout their entire lifecycle. As such, Naval Group is actively cooperating with the Netherlands Defence Technological and Industrial Base (NL-DTIB), engaging its existing network of Dutch partners on critical systems and components and fostering the development and retention of expertise within the Netherlands’ ecosystem throughout the entire submarines’ lifecycle. This network of knowledge institutes, companies and small and medium-sized enterprises (SME) offers a vast array of technology and expertise. The selection of Naval Group for the RNSC program will set a new ambition to this relationship and is an opportunity of growth for both the NL-DTIB and the group, that will benefit from the niche expertise of the Dutch ecosystem.

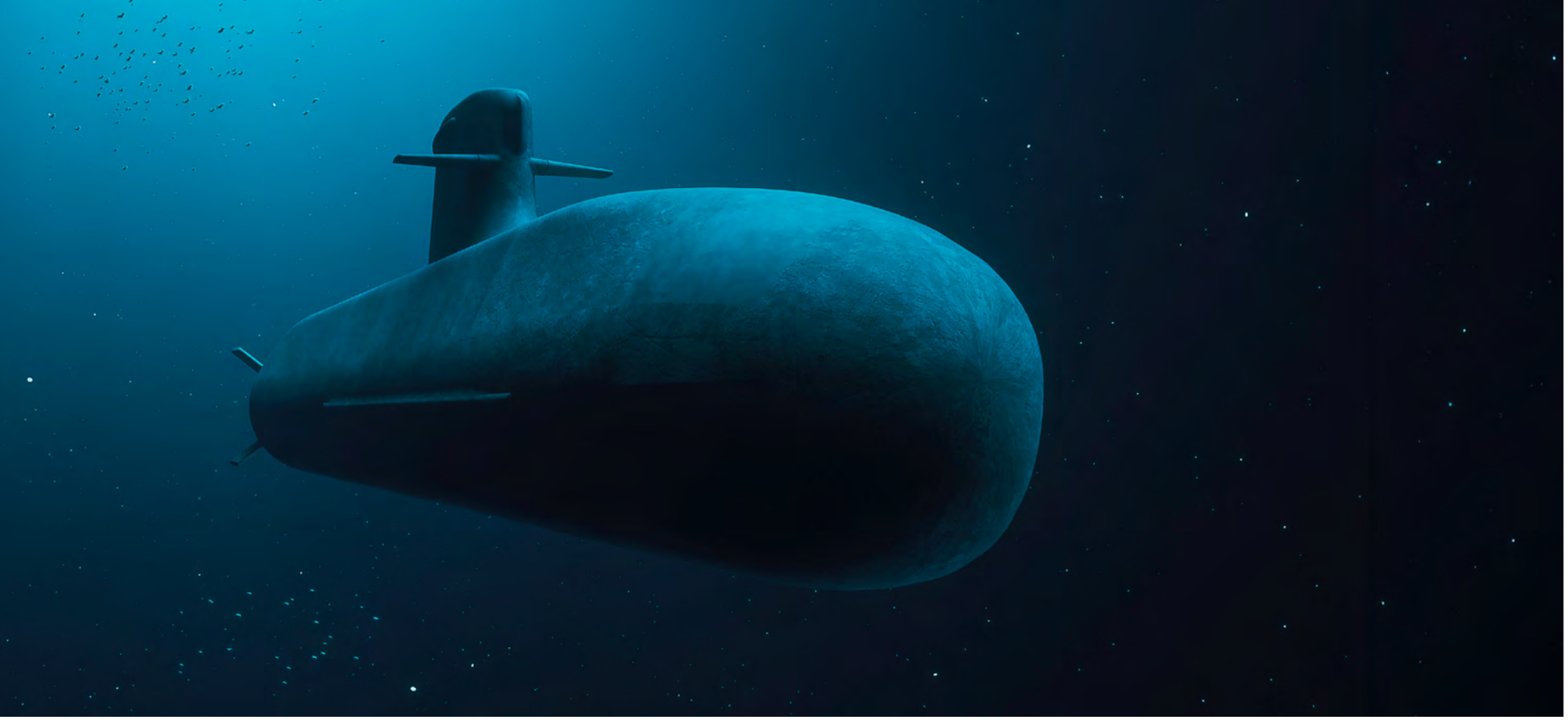
What is the industrial strategy for the program?

S. P.: Activities will extend across all Naval Group locations, not only in Cherbourg, which historically is the submarine manufacturing site of Naval Group. Each site is assigned specific roles based on its in-depth expertise. The NL-DTIB companies and knowledge centres, with which contracts have been or will soon be signed, will contribute in regard to their own expertise (Royal IHC for modules manufacturing, RH Marine for power and platform management systems, Van ▸

AGREEMENT SIGNED
On September 30, 2024, at a ceremony in Helder, in the north of the Netherlands, Gijs Tuinman, the Dutch State Secretary for Defence, and Pierre Éric Pommellet, Chairman and Chief executive officer (CEO) of Naval Group, signed the delivery agreement of the replacement of the Walrus-class submarines, currently operated by the Royal Netherlands Navy.

DECADES OF DUTCH-FRENCH NAVAL PARTNERSHIPS

A strong history of collaboration exists between France and the Netherlands in naval defence. Since three decades, Naval Group has qualified a large number of Dutch partners, suppliers and knowledge centres, for its different programs. The Dutch maritime cluster is an integral part of Naval Group’s ecosystem and Naval Group’s second international supplier. Naval Group has been present in the Netherlands since 2017. The Naval Group Netherlands subsidiary reflects the company’s commitment to establishing long-term industrial activities in the country. It aspires to establish contacts and manage relationships with all potential partners, whether small and medium-sized enterprises (SME), larger entities or even knowledge centres, while making the most of their technical excellence. Within the scope of the RNSC program, Naval Group Netherlands draws on the Dutch industrial and Research and Development (R&D) ecosystem; harnessing, building on and preserving knowledge on submarines in the Netherlands.



GLOSSARY

COMMIT: Materiel and IT Command.

ICA: Industrial Cooperation Agreement.

MOD: Ministry of Defence.

NL-DTIB: Netherlands Defence Technological and Industrial Base.

RNSC: Replacement Netherlands Submarine Capability.

BARRACUDA FAMILY: A TACTICAL POWERHOUSE

The Barracuda family submarines deliver exceptional military performance and underwater autonomy. Drawing on decades of French expertise, it excels in stealth and anti-submarine warfare (ASW), meeting stringent specifications from a highly skilled Dutch team. Its advanced sonar and stealth features reflect these exacting demands. With innovative energy systems and mature lithium-ion battery technology, the submarine achieves extended propulsion autonomy and enhanced underwater endurance, marking a breakthrough in operational capabilities.

- Halteren for hydraulic systems and refrigerating units, Bolidt for acoustic cladding, Optics 11 for towed array, Marin and TNO for performance studies…), to complement Naval Group's expertise. In that way we will answer the requirements of COMMIT, thought out to lead to the manufacturing of a submarine class that meets the high standards of the Netherlands Submarine Service.

How do you and COMMIT in general envision the next decades of cooperation?

D. v. d. B.: Moving ahead together is the principle behind our cooperation, and we want it to be more than words. This can only be achieved through a close cooperation, where each party benefits from the other, in terms of expertise but also of methodology, to run the program successfully and to create a state-of-the-art, niche submarine, that meets the needs of the generations to come. Because of this, a colleague and I have relocated to Cherbourg, to be as close to the Naval Group part of the team as possible, and others will join us soon. Together with the Naval Group team, we also very frequently travel back to Utrecht in the Netherlands, where the COMMIT headquarters are located, so we create a strong cohesion and a transparent work environment. Of course, it means that each of us has to make a step forward to adapt to the culture of the other! But we are driven by a common goal. I always say that these submarines are not for me: I am working for my children and other future generations, and together, we are creating submarines that will still be relevant in the 2070s.

In what state of mind are you now that the program has been launched?

S. P.: To meet our commitment under the RNSC program, we're putting all our strength into the battle. We have already onboarded all industrial Naval Group sites in France and some industrial partners in France and in the Netherlands, ensuring they are fully prepared to contribute to the success of the program. Actions have already been carried out and anticipation has been the key word over the months leading to the delivery agreement signature, as we wanted to make sure that we were in battle order, ready to tackle this exceptional challenge.

D. v. d. B.: We're ready to further cement our collaboration. Tangible milestones have already been reached and we are working hard to make this programme a success. We are looking for nothing less than excellence: we want to push the industries working on the program to go even further, to explore how they can do even better. We expect everyone involved in this cooperation to give their best and to go the extra mile.]

NAVAL DRONES
INDISPENSABLE ALLIES

DESIGNED FOR MISSIONS THAT CONTRIBUTE TO CONTROLLING THE MARITIME ENVIRONMENT, THE AUTONOMOUS SYSTEMS, WHETHER SURFACE, AIRBORNE OR UNDERWATER, COMPLEMENT THE WORK OF SHIPS AND AIRCRAFT BY CARRYING OUT A WIDE RANGE OF MISSIONS, FROM INTELLIGENCE AND SEA-FLOOR CONTROL TO PREVENTING ACCESS TO CERTAIN AREAS. BECAUSE TOMORROW'S COMBAT IS SET TO BE HIGHLY DRONE-BASED, CONNECTED AND COLLABORATIVE, NAVIES MUST EQUIP THEMSELVES WITH INNOVATIVE SOLUTIONS IN THE FIELD OF NAVAL DRONES AND AUTONOMOUS SYSTEMS: MULTI-MISSION, AUTONOMOUS OR REMOTELY OPERATED, AND EASILY INTEGRATED INTO FLEETS. HOW CAN WE ORGANISE OURSELVES TO MEET THIS NEED? A LOOK AT A MAJOR CHALLENGE.

At the heart of the transformation of naval combat

What specific and current threats require drone capacity, and more specifically naval drones?

Emmanuel Chiva: For several years now, we have been faced with a demanding geopolitical context. Crises are accumulating, threats are increasing and risks are overlapping. This unstable situation places particular constraints on our forces, which must adapt their strategies and capability requirements. For the French Navy, the scope of intervention is widening and the likelihood of naval forces being employed in a major engagement is increasing.

The war in Ukraine is a pivotal situation and its experience feedback illustrates the operational and capability transformations currently underway, including for the naval environment. The acts of war in the Black Sea and the hybrid coercion operations in the Baltic Sea demonstrate that the disputes and confrontations between nations are increasingly taking place in the maritime environment. This is particularly evident in the development of major underwater threats, in addition to surface threats. They confirm that the seabed is now a fully fledged field of conflict.

Naval drones are at the heart of this transformation of naval combat. Thanks to advances in robotics and on-board systems, the number of uses for drones is multiplying in all areas. The mobility, range and discretion of drones provide decisive new advantages for the control of air and sea space. They make it possible to automate certain missions such as environmental surveillance or intelligence missions, but also to conduct higher-risk missions and thus protect the crews. As a complement to human action at sea, drones enable deep-sea navies to build up forces that are indispensable for producing saturation effects on the adversary.

How does the French National Defence Procurement Agency (DGA) organise itself to meet the needs of the forces in this area? What is your roadmap for naval drones?

E. C.: Since its creation by General de Gaulle over 60 years ago, the DGA's priority has been to provide the French armed forces with the best weapons technologies. Operational urgency is not negotiable; results are what count. And fast. Today, the tense international context requires the DGA to provide our armed forces with unfailing capacity responses. A closer dialogue between the forces and our services makes it possible to identify new capacity needs. Analysing the value of the operational need, returned to centre stage by the forces and the DGA, makes it easier to identify and to speed up the responses we provide.

Massive efforts have been guaranteed by the 2024–2030 French military planning law (LPM). It includes a drone patch of 5 billion euro to finance initiatives in this area, a budget that has doubled compared to the previous LPM.

From the end of 2023, the DGA has led a working group that brought together French general staff and industrialists. Together, we have defined a roadmap that sets capability objectives and technological directions. In the short-term, priority is being given to defining a sovereign industrial strategy to consolidate the French production sector ▸

EMMANUEL CHIVA

A graduate of the École Normale Supérieure, holder of a doctorate in biomathematics, and a participant in the 49th national armament and defence economics session of the Institut des hautes études de Défense nationale (IHEDN — French institute of advanced national defence studies), since 2018, Emmanuel Chiva has been the Director of the Defence Innovation Agency (AID) and a member of the executive committee of the French National Defence Procurement Agency (DGA) of the Ministry of the Armed Forces. He has been the General Delegate for Armament since 31 July 2022.

Being a leader in the field of drones means reconciling technological innovation, operational robustness and system producibility.

for these systems. In pursuing the progress made, we will have autonomous navigation functions in the coming years, particularly in constrained environments. Interoperability between drone systems internationally is also a medium-term objective. The standard must be properly controlled. The objective to be achieved as quickly as possible is to have drones integrated into the naval combat system and carrying out operational missions in complete autonomy.

Long before the increase in conflict mentioned above, the DGA had already invested in the field, enabling France today to conduct real armament programs in which drones are at the centre of the capability response. The future naval mine countermeasures system (SLAMF) program, for example, allows autonomous drones to monitor maritime approaches in order to neutralise mines by means of remote-controlled drones. Similarly, thanks to the future hydrographic and oceanographic capability (CHOF) and seabed control (MFM) programs, the Navy will gain the capacity to explore, monitor and act.

To maintain our position, technological innovations must be equal to the challenges in the field. For this reason, the DGA wants to encourage experimentation, thus enabling the technological building blocks to mature. Innovative initiatives led by the Navy, the DGA and in particular the AID, such as Dronathlon (see opposite), are evidence of this approach. Moreover, in 2025, we will implement our project to create an experimentation zone for naval drones, led by the DGA Naval Techniques centre. The DGA's roadmap for naval drones therefore aims to accelerate technical and capability considerations and organise efforts. The naval drone sector is characterised by the wide variety of devices it comprises: Unmanned Underwater Vehicles (UUV), Unmanned Surface Vehicles (USV) and amphibious drones, from microdrones to XXL drones such as the Unmanned Combat Underwater Vehicle (UCUV). A comprehensive and effective response to the needs of the armed forces therefore requires a whole industrial fabric made up of startups, small and medium-sized enterprises (SMEs), mid-cap companies and major contractors. The hoped-for results will only be possible if the expectations of the armed forces and the production capacities of industry are coordinated. It is the role of the DGA to ensure this coherence.

DRONATHLON

Organised by the French Navy and the French Defence Procurement Agency (DGA), in collaboration with the Defence Innovation Agency (AID), the first Dronathlon took place from 7 to 11 October 2024. This unprecedented event brought together 35 companies to test drone solutions in realistic, multi-environment scenarios, allowing participants to assess drone performance and better understand operational needs in a complex environment.

What are the technological issues associated with these threats?

E. C.: Naval drones must be operational on the high seas, at very shallow depths and in sensitive areas, and therefore need to be robust and reliable. Aerodynamics, hydrodynamics, the type of propulsion and the choice of materials must all be studied to enable optimal drone performance. They must be designed to operate for extended periods of time, while being energy efficient. In addition, localisation and navigation capabilities, as well as data fusion systems, are crucial for producing military effects. The integration of artificial intelligence (AI) facilitates decision support and coordinated navigation for drone swarms. These technologies must also be designed to resist interference and jamming, by incorporating data protection systems. Naval drones are designed to be incorporated into traditional fleets. Within these complex environments, they must therefore be deployed and recovered from the platforms of the French Navy. Being a leader in the field of drones means reconciling technological innovation, operational robustness and system producibility. The war economy approach has demonstrated the importance of reclaiming a culture of production. One of the major challenges is to develop production chains that can be quickly adapted to the very rapid pace of drone transformation. Production processes must also be adaptable to incorporate new production techniques. The field of drones is also affected by more traditional issues. The in-service support (ISS) of this equipment is essential to maintain the reliability and credibility of the capabilities. Drones are generally deployed in remote areas that are difficult to access. It is therefore worth considering the development of dedicated maintenance infrastructures on board ships at sea.

What are the DGA's expectations of Naval Group?

E. C.: There are many challenges, whether operational, technological or industrial. We have a responsibility to adapt to meet the forces at work. To do this, we need to think incrementally and collaboratively.

Naval Group is a key partner of the DGA in the naval industry value chain. Its role must be that of a unifying force to capture innovations, integrate them into existing weapons systems and make them quickly available to the forces. However, the production of drones involves a plethora of challenges that cannot be solved by a single player. These types of projects involve all the players in the industrial landscape. The development of the drone sector does not just concern industrial prime contractors such as Naval Group. The skills and know-how of all are necessary for the growth of this sector. We need SMEs, mid-caps and startups: the DGA is therefore pursuing an active policy of integrating these companies into our industrial ecosystem. The DGA needs Naval Group to support this policy by maintaining a significant degree of openness to non-proprietary solutions. In the context of the war economy, and as a major contractor, Naval Group must support players throughout the production chain. You have the responsibility of being the driving force behind the structuring of the production chain, by helping subcontractors to anticipate orders and invest in their production factors.

Finally, in the field of drones as in others, the French industrial model, and therefore the future of the defence industrial and technological base (DITB), depends on our ability to export our military equipment. The DGA therefore also expects Naval Group to consider the exportability of these naval drones and their potential for the development of new industrial cooperation.

Naval Group must continue to be ready to carry out projects that will bring about a real breakthrough in the capabilities of the French Navy, and thus maintain its position as a world leader in the naval defence industry. The pioneering and innovative spirit that symbolises the historic cooperation of our two establishments must be reinforced. In 2025, we will continue to build the future of our forces with controlled risk, boldness and responsiveness.]

Our capacity to work as part of the French ecosystem is a strength

AURORE NEUSCHWANDER

A graduate of CentraleSupélec and Grenoble École de Management, and a participant at the Institut des hautes études de Défense nationale, Aurore Neuschwander has been head of the Drones, Autonomous Systems and Underwater Weapons (DSA) department at Naval Group since its creation in January 2023.

What do you see in the naval defence drone market today?
Aurore Neuschwander: Generally speaking, we are witnessing an accelerated "dronisation" of forces. The integration of drones is already underway or at the heart of discussions in a growing number of navies. All of them expect drones to increase their capabilities tenfold in order to fulfil the broader scope of their missions.
This acceleration is reflected in a proliferation of initiatives, with major sovereign programs in Australia, China and the United States, for example – including through experimental approaches such as Orka in the United States, which aims to develop a large, fully autonomous unmanned underwater drone capable of integrating numerous payloads. Today, drones are seen as a capacity supplement, but in the future they will form an essential part of the overall capacity plan and be an integral part of it.

What do we mean by the term "drones"?
A. N.: Drones have a wide range of uses, but they can be divided into two main categories: firstly, organic drones for ships, which provide added capacity to detect further, faster and at a controlled cost. This allows the ship to get a head start in developing the best tactics or the most appropriate response. The other category is autonomous systems. They have a force multiplier effect to enrich a tactical situation, for example extending area coverage or providing additional capacity when operators are too far away or the area is too dangerous. These are reliable, enduring systems that are resistant to attack, but also capable of reconfiguring themselves according to events.

What role does Naval Group play in this rapidly expanding market?
A. N.: Our aim is to support navies in the major transition to the use of drones by offering them cutting-edge underwater and surface drones. Beyond the capacity supplement, our added value lies in the communication between the drone and the ship or fleet, i.e. the mission system. In concrete terms, as far as the software's concerned, how does the drone interact with the combat system? How does it integrate with a naval force? The component implemented is equally decisive because the full benefit of drones can only be obtained if they are fully integrated into the ship. We have another mission, which is to support the entire life cycle of the drone – commissioning, training, simulation, reconfiguration and maintenance.

What are your most significant achievements in the field?
A. N.: In 2024, we structured and developed our range of drones and autonomous systems around four product lines: Seaquest® (surface drones), Seagent® (underwater drones), Steeris® (Steeris® MS mission systems and Steeris® Onboard autonomy) and Sealken® (physical integration of drones on board ships). In addition, we respond to requests from navies in the field of aerial drone integration.
In the same year, the alliance of our subsidiary Sirehna with the Couach shipyard resulted in the launch of the first surface drone, unveiled in 2024 at the Euronaval international defence exhibition. The partnership brings together Sirehna's expertise in drone technology, Naval Group's skills in naval defence systems and Couach's capabilities in the construction of high-performance platforms. In less than 18 months, we have gone from the green light to invest, to a drone that took part in the French Navy's Dronathlon, before carrying out integration tests on a multimission frigate (FREMM).
Another major area: with the DGA, we are making progress on the Unmanned Combat Underwater Vehicle (UCUV) program, a mini unmanned combat submarine. This is a large underwater drone, or XL UUV. For this program, we are integrating systems developed by partners. To test their performance, de-risk the technological building blocks and guide our choices, we are relying on a demonstrator built using our own funds. This allows us to carry out regular experiments and trials for the benefit of naval customers or for our own needs.
At the same time, we are structuring our export offer and continuing to roll out our product roadmaps, in particular by developing torpedo-shaped underwater drones, capitalising on our historic expertise in this field. In 2025, we will continue our work to develop a drone management system that is as agnostic as possible, capable of integrating with any drone and any vessel. The delivery of the drone mission system of the European mine countermeasures program, led by the Belgium Naval & Robotics consortium, is a major milestone.
All these developments are based on collaboration with our customers and partners. They require a lot of listening, agility and responsiveness, because the drone market will not wait. ▸

Find the video presentation of Seaquest® on our YouTube channel.

Drones will be omnipresent within naval forces and indispensable for collaborative combat.

What will the future centre of excellence contribute in terms of drones?

A. N.: At the end of 2027, the municipality of La Londe-les-Maures, near Toulon, will be home to the first centre of excellence for drones, autonomous systems and underwater weapons (see our article on page 34). Ideally located, the site is close to the French Navy and the DGA, but also to the Naval Group sites in Toulon and Ollioules and the very rich local ecosystem. Covering 17,000 m², the centre will carry out research and development, engineering, prototyping, assembly and integration of drones and underwater weapons, and will house a sea trials centre. When it opens, it will employ more than 550 people and attract numerous talents in fields such as naval systems design and architecture, software development and electronics. Finally, it will be open to the most innovative players in the field of drones.

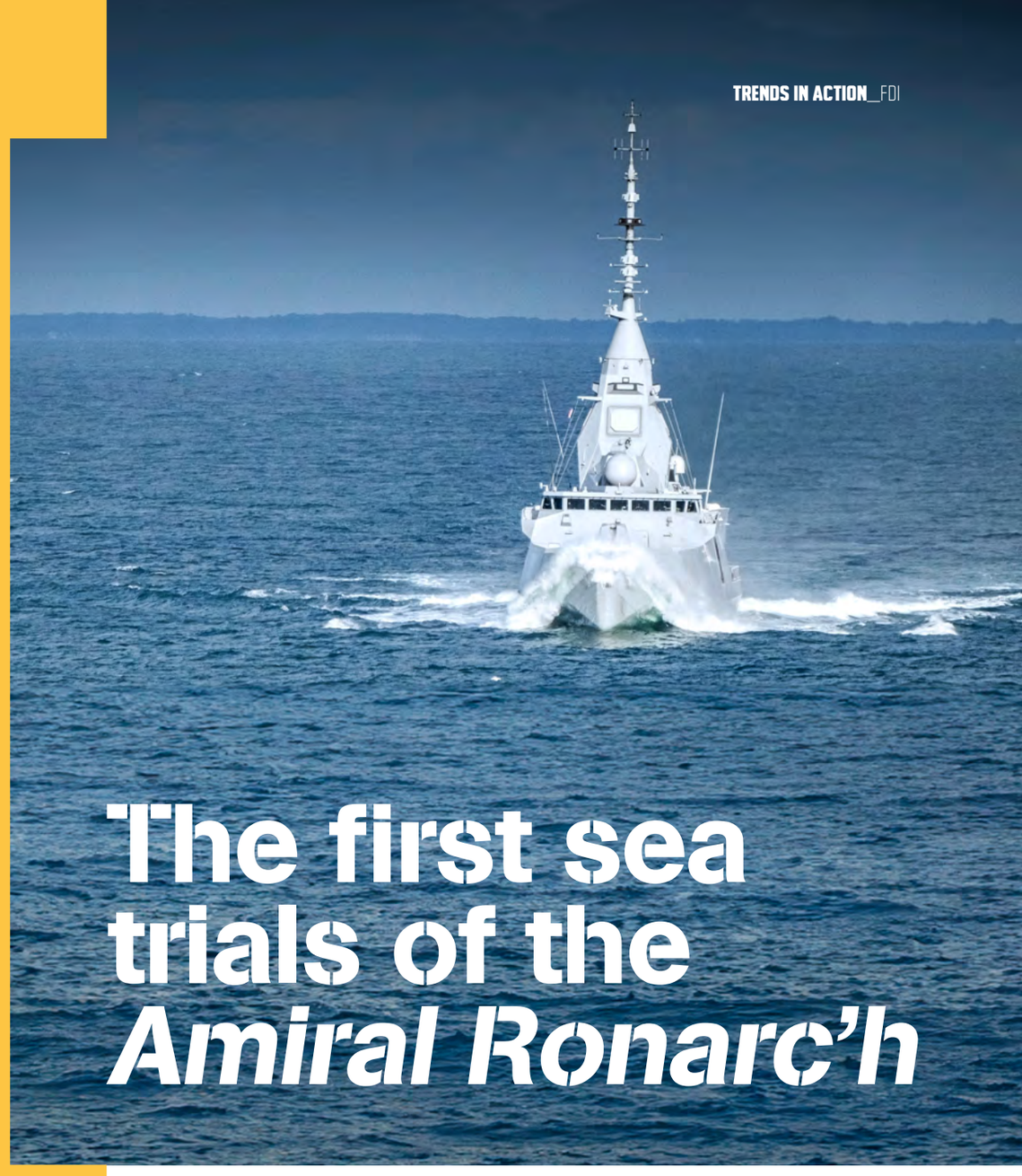
The drone industry is a whole ecosystem of innovation and development. What is your approach to partnerships?

A. N.: The naval drone market is extremely dynamic, with a host of complementary players. Some, from the civilian sector, are taking up positions and bringing a fresh perspective. One of our challenges is to help structure this landscape by setting up new methods of contracting and collaboration with these innovative companies. The ground is all the more fertile when sailors take ownership of the technological building blocks that we have developed together, as this generates new ideas. It is therefore a virtuous circle, a new way of innovating and a vector of transformation, because we are led to think differently and to push our limits.
Our ability to unite the French ecosystem is a strength. In addition to cooperating with players such as Thales and Exail, we work with innovative SMEs such as Marine Tech, which developed Manta, a new-generation hybrid drone, Photospace, which supplied the mast head for our XL UUV demonstrator, and Delfox, which works with us on the intelligence of our systems. These agile players help us de-risk our solutions and optimise our time to market and our costs. Thanks to them, we integrate technological building blocks that are outside our core business and can quickly offer competitive drone capabilities that make the difference.

What are the next major developments for naval defence?

A. N.: Drones will be omnipresent within naval forces and indispensable for collaborative combat. Sailors will be equipped with both simple tools for deception and camouflage, and complex systems with embedded intelligence. The contribution of artificial intelligence will be decisive, but the key point is that humans must remain in control of the decisions at all times.]

Find the video presentation of our line of drone products on our YouTube channel and on the poster attached to this issue of *Naval Review*.



The first sea trials of the *Amiral Ronarc'h*

FROM 7 TO 25 OCTOBER 2024, THE *AMIRAL RONARC'H*, THE LEAD SHIP OF THE DEFENCE AND INTERVENTION FRIGATES (FDI) ORDERED BY THE DGA FOR THE FRENCH NAVY, COMPLETED AN INITIAL THREE-WEEK SEA TRIAL PERIOD, INCLUDING THE USUAL NAVIGATION AND PROPULSION TESTS AND ALSO ALLOWING THE COMBAT SYSTEM TESTS TO BEGIN.

DEFENCE AND INTERVENTION FRIGATES

October 2024 was marked by a major milestone in the French defence and intervention frigate (FDI) program. *Amiral Ronarc'h*, the first in a series of ships intended for the French Navy, began its initial sea trials from the Naval Group site in Lorient, Brittany.

Our experts tell us more...

Jean-Marie Dorbon,
FDI Program Director

Nicolas Guiraud,
Commander of the *Amiral Ronarc'h*

"Traditionally, the first sea trial of a frigate lasts a week and its main objective is to test the general capabilities of the platform: propulsion, electricity, safety and anchoring," explains Jean-Marie Dorbon, director of FDI programs. "For this first FDI, the duration of the initial sea trials was extended to three weeks, which made it possible to extend the scope of the tests. From the first week, we were able to implement the radars and other sensors, in addition to carrying out the usual "platform" tests. A short stopover in Brest then allowed us to check the boat's adaptation to its home port, its connections and its fuel supply. During the following two weeks at sea, the tests mainly focused on the combat system. The sensors were first tested in stand-alone mode, then when connected to the ship's Combat Management System (CMS)." Captain Nicolas Guiraud, commander of the FDI *Amiral Ronarc'h*, continues: "During the initial sea trials of a first production vessel, the pressure is always higher because it serves as a reference for the subsequent units. However, it is not uncommon for unforeseen circumstances to require a return to port. With the aim of carrying out as many tests as possible during these initial sea trials, we were very pleased to have been able to sail for the three weeks planned, thanks to the ability of the sailors and the onboard industrial teams to deal with any hazards encountered at sea. During initial sea trials, the main challenge for the crew is to collectively obtain their qualification in the safe operation of the vessel, in firefighting and waterway management. It is a real hurdle to overcome, insofar as we have never sailed together before and only know the ship from visits and training sessions at the quayside during the months preceding the initial sea trials. This first familiarisation, supervised by the Naval Action Force (FAN) trainers, went very well and we validated our qualification on the third day at sea. With regard to the industrial challenge of the initial sea trials, which consists of testing all the ship's systems and equipment in situ to verify that they operate in accordance with the specifications, the *Amiral Ronarc'h* has generally kept its promises. The trials were conducted while the crew was manning the ship. We took part in some of them and were just observers for others. In any case, the discussions that we had initiated two years ago with the industrialists in Lorient continued on board with the other members of the state team – representatives of the DGA, the Navy's expert centres and the Maritime Safety Committee – in a constructive frame of mind. This dialogue, which allows for a mutual understanding of our respective constraints, is a guarantee of efficiency. It is essential to maintain it!"

"The bonds that we began to forge before the initial sea trials have allowed us to build a relationship of trust within a team that goes far beyond industry players," confirms Jean-Marie Dorbon. "During the initial sea trials, the chemistry worked well, because all stakeholders were transparent about their expectations and constraints. The outcome of these initial sea trials is positive: the program was followed and the ship performed well, even during a period of rough seas."

FEEDBACK THAT BENEFITS THE WHOLE SERIES

"These more intensive initial sea trials enabled us to gather a lot of information on the corrections and adjustments to be made, which we shared with our teams once we returned to Lorient," continues Jean-Marie Dorbon. "The five weeks spent at the dock afterwards were devoted to processing this information. The adjustments made to the *Amiral Ronarc'h* will be applied immediately to all units, whether French or Greek. The second three-week trial period, which began on 2 December 2024, was devoted to underwater combat and included acceptance trials on the sonar system. This alternating rhythm of long periods at sea and about a month at the dock will be applied to the *Amiral Ronarc'h* and to the entire FDI series, and only interrupted by necessary work to be carried out in dry dock before delivery."

A MEDIUM-SIZED SHIP

The FDI was born out of the discussions held by the French government and Naval Group on the follow-up to the multimission frigates (FREMM) program. The risk assessment studies conducted from 2015 onwards confirmed the possibility of offering a ship smaller than the FREMM (4,500 tonnes, compared to 6,000) but with improved capabilities and innovations with a high operational impact. Initially called a medium-sized frigate, it took the name defence and intervention frigate after the launch of the program in 2017 in order to highlight its on-board capabilities and the multiplicity of its missions.

After the validation of the general design review of the ship in 2019, production of the first of five units for the French Navy began at the Lorient site.

Following the signing of contracts for the delivery of three units to the Hellenic Navy and their in-service support (ISS) for three years, the FDI HN program was launched in March 2022.

The *Amiral Ronarc'h* was launched at the end of 2022, followed by the frigates *Kimon* (October 2023) and *Nearchos* (September 2024). By the end of 2024, six units – three French and three Greek – were in production in Lorient.

▸

TRENDS IN ACTION_FDI

POINT OF VIEW

CHARLOTTE CORMOULS-HOULÈS,
Functional Integrator, Radars

"I was lucky enough to be one of the first to use the new cutting-edge systems on this first ship. During its initial sea trials, we were able to use the radars at full power and at 360°. The informal discussions we then had with the crew were mutually enriching: the sailors shared their experience of the bugs encountered – which are common at this stage – and were able to ask us questions about the equipment. The sea trials also give us a better understanding of their work on board and an overview of the activities of other industrialists."

A DIGITAL SHIP

In terms of innovations, the most visible element is the SeaFire®four-fixed-panel radar developed by Thales, which offers hemispherical detection coverage to the FDI and gives it unprecedented capabilities in terms of detection performance, enabling it to respond to complex air threats with Aster missiles provided by MBDA.
The FDI also has cutting-edge intelligence capabilities thanks to the digital electronic warfare, with sensors in its masts and upper superstructure. In addition, it has a complete anti-submarine warfare system: hull sonar and towed sonar with proven performance on FREMM.
The less visible – but no less essential – innovations relate to the ship's combat system, in particular its mechanism for combating asymmetric threats, which provides operators with a very detailed view of their environment day and night to identify abnormal behaviour, as well as offering decision support.
In terms of design, the FDI is characterised by its inverted bow, chosen to facilitate navigation in rough seas.

A FIRST-CLASS SHIP

The FDI can navigate without restriction on all the world's seas and intervene in multiple theatres of operation (deployment of special forces, intelligence, crisis prevention or management missions etc.), either autonomously or as part of a naval force.]

POINT OF VIEW

PAULINE COLIN DE VERDIÈRE,
Cybersecurity Advisor on the Functional Integration Team

"From these initial sea trials, the CySS cybersecurity system could be tested with different combat system equipment to begin de-risking the interfaces between the systems."

Find our series of videos onthe FDI sea trials on our YouTube channel.

ISS

In-service support

How are the teams from the Services department preparing to maintain the first FDI? The insight of Nicolas Hanoire, director of the in-service support program for the FDI intended for the French Navy.

4 years

This is the duration of the first support offer to the Fleet Support Service [SSF] for the *Amiral Ronarc'h*, which is currently under negotiation. This contractual preparation is also taking place with our suppliers and service providers for the entire ISS environment [major equipment suppliers, medium-sized projects such as scaffolding, painting etc.].
"We will also have to manage any reservations regarding the acceptance of the ship, as well as the one-year warranty period," explains Nicolas Hanoire. "Finally, capacity upgrades are already planned and we are preparing to carry out the desired updates during the technical shutdowns. Ultimately, the objective is to be as well prepared and responsive as possible to ensure the operational availability and continuous adaptation of the ships."

A WHOLE SYNERGY

"The preparation for in-service support (ISS) primarily involves a handover from the initial crew to the ISS teams, while ensuring digital data continuity between these two phases of the ship's life cycle.
Links have begun to be forged between these teams thanks to the support provided at the Lorient shipyard by employees from the Services department. For the maintenance of the new systems and equipment, the upskilling of the ISS teams also involves dedicated training, both for the Brest teams that will be responsible for the first ship and for the Toulon teams that will be supporting the Hellenic ships. In addition to improving the skills of the Services department teams and ensuring data transfer, the preparation for ISS on the first FDI covers many other subjects: the industrialisation of theoretical maintenance documents to enable their immediate use by the ISS teams, study of the site resources necessary for the naval base in Brest, management of the storage and flow of materials, development of the ISS offer, preparation of the tooled environment [information systems], organising management of the ship's classified elements, and defining the industrial support strategy, in collaboration with the Naval Group entities involved in building the ships."

sphère

ADDITIVE MANUFACTURING HAS THE WIND IN ITS SAILS! FIND OUT HOW OUR TEAMS BENEFIT FROM ITS ADVANTAGES ON PAGE 26. A NEW CENTRE OF EXCELLENCE DEDICATED TO DRONE ACTIVITIES AND UNDERWATER WEAPONS WILL SOON BE OPENING IN THE VAR: PREVIEW GUIDED TOUR ON PAGE 34. IT IS POSSIBLE TO MOVE AWAY FROM THE "ONE LAUNCHER PER TYPE OF WEAPON" LOGIC, THANKS TO THE NAVAL GROUP'S MULTI-PURPOSE AND MODULAR LAUNCHING SYSTEM (MPLS). EXPLANATIONS ON PAGE 37. INTERVIEW WITH CAPTAIN NICOLAS, DIRECTOR OF THE NAVAL COMBAT EXPERTISE CENTRE OF THE NAVAL ACTION FORCE, PAGE 38.

ADDITIVE MANUFACTURING

WAAM IS A GAME CHANGER

THE ADVANTAGES OF METAL ADDITIVE MANUFACTURING, AND SPECIFICALLY THE WIRE ARC ADDITIVE MANUFACTURING (WAAM) PROCESS, WHICH OUR NANTES-INDRET SITE HAS BEEN WORKING ON SINCE 2016, ARE THE ABILITY TO RAPIDLY PRODUCE COMPLEX PARTS, QUICKLY MANUFACTURE SINGLE UNITS AND GIVE THE PART SPECIFIC MECHANICAL PROPERTIES LOCALLY. THIS IS A PROCESS THAT HAS NOT FINISHED DEMONSTRATING ITS POTENTIAL.

TECHNOSPHERE_ADDITIVE MANUFACTURING

The tremendous potential of WAAM technology

It has the wind in its sails in the industry: Additive manufacturing (AM), or 3D printing, has experienced tremendous growth over the past decade or so. The technology works by the successive addition of material: Based on a digital model, the part is manufactured layer by layer by a 3D printer. It has many advantages: It allows complex parts to be obtained quickly, and to be manufactured on demand with the right amount of material, thus reducing manufacturing costs and inventories. There are several families of manufacturing processes that differ in the way the layers are deposited and the materials used (metal, plastic, composites etc.). Among the metallic processes, WAAM uses an electric arc as a heat source and a metal wire as a material feed. "WAAM is a process suitable for the manufacture of large metal blanks with relatively complex geometry. It offers great freedom in the size and design of the parts," explains Anne-Sophie Thorr, Welding and Additive Manufacturing Engineer at Nantes-Indret

NANTES-INDRET GAINS MATURITY IN TECHNOLOGY

The Nantes-Indret site began studying the WAAM process in 2016 with the École Centrale de Nantes. From 2019, the site acquired machines and in October 2020, the first propeller made using additive manufacturing left the Nantes-Indret workshops to be mounted on a tripartite-class minehunter (CMT) of the French Navy, the *Andromède*, which it still equips today. "We have grown in maturity as regards the WAAM single-material process. The technology is particularly useful for in-service support (ISS): In addition to the speed of manufacture, it allows us to overcome supply constraints. We already have a catalogue of parts that can be made using WAAM. The challenge now is to integrate the technology from the design stage. This requires adapting the design of the parts during the design process, which is what we are working on with the design offices, "explains Floriane Rousé, Head of the Metallic Additive Manufacturing Program package at Nantes-Indret. In 2024, a new milestone was reached with the manufacture of a frigate blade using WAAM *(photo opposite)*.

At the same time, Naval Group is developing solutions to improve the productivity of the process in order to meet the expectations of the various programs in progress, in particular for the use of stainless steels and nickel alloys.

Another challenge is the mastery of multi-material WAAM, which makes it possible to give the part certain specific properties (anti-corrosion, anti-friction etc.) locally and thus obtain more functional parts at a lower cost. With this in mind, between 2020 and 2024, Naval Group participated in the European collaborative project Grade2XL aimed at developing multi-material WAAM *(see page 29)*.

Watch our video on WAAM technology on our YouTube channel.

GROWING IN MATURITY THANKS TO OPEN INNOVATION

GRADE2XL, A EUROPEAN PROJECT

Grade2XL is a collaborative development program that ran from March 2020 to August 2024. It brought together a consortium of 21 European partners with the aim of promoting the development of the WAAM multi-material process. As part of Grade2XL, Naval Group successfully produced two large demonstrators that meet industrial needs. The project has enabled Naval Group to increase its expertise in the manufacture of large functionalised WAAM parts.

MT ROBOTICS, THE MADE IN FRANCE PROJECT

The MT Robotics collaborative project, which began in 2024, aims to develop a 100% French WAAM machine. It also provides an opportunity to develop cross-disciplinary technological building blocks such as monitoring or in-process machining. Beyond the aspects of sovereignty, improving the competitiveness and quality of WAAM additive manufacturing are MT Robotics' key objectives.

TECHNOSPHERE_ADDITIVE MANUFACTURING

“We have grown in maturity as regards the technology, and now it’s up to us to demonstrate its full potential!”

FLORIANE ROUSÉ,
Head of the Metallic Additive Manufacturing Program package, Nantes-Indret

3D PRINTING

Additive manufacturing or 3D printing is a process that consists of manufacturing a part from a digital 3D model by successively adding material, layer after layer. There are several families of additive manufacturing processes. Wire Arc Additive Manufacturing (WAAM) is one of them.

15 M³

This is the volume of the blank that the largest machine in the Nantes-Indret workshops is capable of producing in five axes from 10 tonnes of molten material.

“We have made great progress in mastering certain grades of materials and have numerous projects in progress on stainless steel and nickel alloys.”

ANNE-SOPHIE THORR,
Welding and Additive Manufacturing Engineer, Nantes-Indret

LA LONDE-LES-MAURES

Guided tour of the new centre of excellence

HISTORICALLY LINKED TO THE ARGENTIÈRE MINE, THE BORMETTES SITE IN THE VAR DEPARTMENT WILL BE HOME TO A HIGH-TECH INDUSTRY OF A COMPLETELY DIFFERENT NATURE IN 2027. COMMITTED TO FRENCH SOVEREIGNTY, NAVAL GROUP HAS CHOSEN LA LONDE-LES-MAURES TO BUILD ITS CENTRE OF EXCELLENCE FOR DRONES, AUTONOMOUS SYSTEMS AND UNDERWATER WEAPONS.

In a sign of Naval Group's commitment to the environment, the Project Director, Jean-Marie Guérin, was previously in charge of decarbonisation and investments for the defence contractor. Ideally located, the future centre of excellence is close to the French Navy and the DGA, as well as the Naval Group sites in Toulon, Ollioules, Saint-Tropez and Lagoubran, which specialise in torpedo, drone and combat management systems. Covering no less than 17,000 m², the centre will deploy state-of-the-art facilities for research and development, engineering, prototyping, assembly and integration of drones and underwater weapons, not to mention a sea trials centre. However, the site will not be classified as a Seveso site. Les Bormettes will also attract many young talents in fields such as artificial intelligence and cybersecurity. When it opens, the site will employ 550 people.

A MODERN INDUSTRIAL TOOL

In addition to being a technological showcase, the site will be exemplary in environmental terms thanks to a constructive dialogue with all stakeholders, which began at a very early stage and has already resulted in numerous improvements. In the preparatory phase, this is taking the form externally of regular exchanges with the Town Hall, as well as with the Méditerranée-Porte des Maures community of municipalities, government departments and local associations; and internally with the setting up of dedicated working groups. Among the changes resulting from this consultation, the site plans have been adapted to limit noise pollution, and the number of housing units has been reduced.

Naval Group relies on High Quality Environmental (HQE) and Health, Safety at Work and Environment (HS&E) certified buildings. It will prioritise bioclimatic buildings, constructed with bio-based and very-low-energy-consumption materials, thanks in particular to photovoltaic panels intended to cover the site's energy needs. The buildings will also use as much renewable energy as possible, in particular heat pumps. In total, their carbon footprint will be reduced by 70% compared to the current situation of the sites working on drones, autonomous systems and underwater weapons (DSA).

PROTECTED BIODIVERSITY

The industrial facilities at Bormettes will be designed to minimise their impact on biodiversity. For example, the pontoon will be limited in length to avoid any impact on the posidonia, the renowned "Neptune grass" that constitutes a valuable ecosystem. As flora and fauna are a major focus of attention, three biodiversity zones containing animal and plant species will be protected. More than 400 trees will be planted, doubling their number in the area. The flora will be of Mediterranean origin, drought-resistant, with 70% of local origin. We have planned specific measures to preserve protected animal species, such as not destroying tertiary buildings, installing nesting boxes etc. ▸

KEY DATES

- **March 2024**
  Choice of architect.
- **Early 2025**
  Application for planning permission.
- **Early 2026**
  Start of construction work
- **2027**
  Completion of construction work.

UNDERSTATED AND STYLISH ARCHITECTURE

Naval Group wanted an architectural project that respected the current industrial footprint. The choice of materials such as white concrete, brass and wood blend in perfectly with the green spaces on the site and those developed by the community of municipalities, such as the seaside developments.
The Naval Group teams in charge of the project are considering integrating the historical dimension of this area, which has a century-old industrial tradition.

A BENCHMARK IN TERMS OF WATER MANAGEMENT OF THE AREA

The site will give pride of place to green spaces and permeable land to optimise water management. Naval Group plans to add to and widen the ditches that collect runoff water (the valleys) to six metres. The community of municipalities plans to build a canal parallel to the downstream bed of the Maravenne river. To this end, the industrialist will make a plot of land available to the municipality. We also wanted to maintain the soil permeability rate. Ambitious, exemplary, safe, respectful of the environment and biodiversity, the future Bormettes site will serve French sovereignty. The ambitions of Naval Group and the mayor of the municipality are aligned: to develop a centre of technological excellence to the highest standards, and to increase the attractiveness of La Londe-les-Maures and, more broadly, of the community of municipalities.]

THE PROJECT IN FIGURES

- **100 to 200 direct jobs** to be created by 2027.
- **More than 550 employees** at the opening of the site.
- **17,000 m²** of business premises.
- **12,000 m²** of floor space.
- **1,500 m²** of computer platforms.

MPLS

Multi-purpose and modular launching system

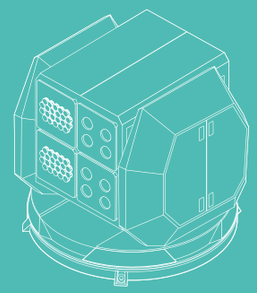
The MPLS is composed of a mobile turret on two axes, circular and elevation. It incorporates fire computers and a fire control system that enable it to hit moving targets. It can operate in autonomous mode or connected to the combat system.

One

single launcher for multiple means of self-defence. By moving away from the "one launcher per type of weapon" logic, the MPLS responds to the current context of asymmetric and protean threats. A true technological breakthrough, the MPLS is capable of implementing multiple vectors, while allowing for unprecedented payload capacity and simplified on-board integration. The MPLS has both a near-field self-defence capability of up to eight kilometres and the ability to easily integrate any type of capability thanks to its interchangeable ammunition module technology (rockets, missiles, grenades, underwater weapons, decoys, drones). In addition, the MPLS offers increased ammunition-carrying capacity, with a payload of approximately 1,000 kilos.

LAUNCHERS ARE REVOLUTIONISING

Capacity gains, time savings, increased weapon-carrying, reconfiguration possibilities, choice of means proportionate to the threats, optimised maintenance and logistics: The MPLS aims to respond to the new operational challenges of navies and their budgetary constraints.
The MPLS is also the result of a new partnership concept in product development and marketing. As the system is designed to be adaptable to different munitions, depending on the needs of the operational user, Naval Group is working with its partners on the integration of each munition module: Thales with 70 and 68 mm rockets, Lightweight Multirole Missiles (LMM), and KNDS with ts range of innovative munitions. Work has also been launched with MBDA to integrate the Mistral and Akeron missile families.



Watch the video presentation of the MPLS at the Euronaval 2024 trade fair.

INTERVIEW WITH **CAPTAIN NICOLAS,**
DIRECTOR OF THE CENTRE OF EXPERTISE FOR NAVAL PROGRAMS
OF THE NAVAL ACTION FORCE

INNOVATING TOGETHER

THE NAVAL ACTION FORCE (FAN) IS RESPONSIBLE FOR PREPARING CREWS AND ENSURING THE AVAILABILITY OF UNITS FOR OPERATIONAL USE. AS DIRECTOR OF THE FAN CENTRE OF EXPERTISE FOR NAVAL COMBAT, CAPTAIN NICOLAS OVERSEES DOCTRINE, INNOVATION, DIGITAL TRANSFORMATION AND THE INTEGRATION OF DRONES WITHIN THE FAN. IN THIS CAPACITY, HE ACTS AS A LINK BETWEEN THE FAN UNITS AND THE CAPABILITY PROJECTS THAT MAY BE PROPOSED AND LED BY INDUSTRIALISTS, THE FRENCH NATIONAL DEFENCE PROCUREMENT AGENCY (DGA) OR THE CENTRE OF EXPERTISE FOR NAVAL PROGRAMS (CEPN).

What have been the key stages of your career in the French Navy?
I have 27 years of experience, including 15 years on surface vessels, specialising in underwater combat, and three command positions – the last of which was on an anti-submarine frigate. During my time with the general staff in Paris, I also worked in the capabilities field, focusing on upstream studies of new equipment and ships, in close collaboration with the DGA and defence contractors.

What is the role of the centre of expertise that you run and what are your responsibilities?
I manage a group of experts on hand to intervene in all areas relating to the combat capabilities of surface vessels. The main fields are above-surface combat, underwater combat, mine warfare, platform safety and information and communication systems. I am also carrying out several additional missions. The first touches on innovation: I supervise the work of our innovation hubs, the FAN labs, which have tools to turn sailors' ideas into reality to improve combat capability. The second is related to digital transformation within the FAN. A team of experts is being trained to accelerate the digital transformation of the force, in close collaboration with the Marine Data and Artificial Intelligence Service Centre, under the auspices of the CEPN.
Finally, I am participating in discussions on the use of drones, especially surface drones, as well as on how to protect against them.

What are your links with the Naval Group teams?
We regularly discuss topics related to innovation and drones. When a product or system under development seems suitable for one of the FAN's needs, we can offer to test it on board one of our units. This is what happened when Naval Group presented its Seaquest® S surface drone to us. Another example: during the Wildfire anti-drone exercise, which we organised to strengthen our combat capabilities, some of Naval Group's anti-drone systems were tested on board one of our frigates.

What are our common challenges regarding innovation?
Drone technology is an important objective for strengthening the capacities of our units. Combined with the processing of mass data using artificial intelligence, it should enable us to achieve informational and tactical superiority in combat. To maintain the initiative over our competitors, the FAN must therefore master these technologies in the near future.

What do you expect from your collaboration with the Naval Group teams? What are its strengths and areas for improvement?
We expect them to provide innovative ideas, but also to be agile and responsive in their provision of solutions to our operational problems. Our industrial base has real assets with significant capacity for innovation. To meet our common challenges, we must maintain dialogue and understanding of the issues we encounter in operations. The changing international context forces us to be reactive. The innovation cycles of our competitors now take just a matter of months.]

WILDFIRE
From 23 to 26 September 2024, Naval Group took part in Wildfire, an exercise organised by the French Navy, on board the *Guépratte* La Fayette-class frigate, off the island of Levant in the Mediterranean.

Team spirit

THE OPERATIONAL RESERVE, A WIN-WIN ARRANGEMENT FOR BUSINESS AND NATIONAL DEFENCE? WE DISCUSS THIS ON PAGE 42. FOR NAVAL GROUP, PROMOTING DIVERSITY AND INCLUSION IS A FIRM COMMITMENT THAT IS BEING MADE OVER THE LONG-TERM. THREE EXPERTS EXPLAIN WHY AND HOW, PAGE 46. EVERYONE SHOULD RETURN HOME IN GOOD HEALTH AFTER THEIR WORKING DAY: THIS IS NAVAL GROUP'S NUMBER ONE PRIORITY. WE MAKE THE POINT ON PAGE 49. THE TRANSFORMATION: HOW, WHY? ANSWER ON PAGE 52.

PERSPECTIVES SHARED BY **GENERAL POISBEAU** AND **AURORE COUDERT,** RESERVIST.

THE OPERATIONAL RESERVE

WHY DOES EVERYONE WIN?

NAVAL GROUP HAS 108 EMPLOYEES WHO ARE ALSO OPERATIONAL RESERVISTS OF THE ARMED FORCES AND INTERNAL SECURITY FORCES*. TO UNDERSTAND THE REASONS FOR AND THE MUTUAL BENEFITS OF SUCH A COMMITMENT, NAVAL REVIEW INTERVIEWED DIVISIONAL GENERAL FRANÇOIS-XAVIER POISBEAU, SECRETARY GENERAL OF THE NATIONAL GUARD, ON THE ISSUES AT STAKE FOR NATIONAL DEFENCE IN THE OPERATIONAL RESERVE, AND AURORE COUDERT, PROJECT MANAGER IN THE ELECTROMECHANICAL SYSTEMS ENGINEERING DEPARTMENT AT THE NAVAL GROUP SITE IN SAINT-TROPEZ, ON HER EXPERIENCE AS A RESERVIST.

* Army General Staff, Army, Air and Space Force, Navy, National Gendarmerie, Armed Forces Medical Service.

What is the operational reserve? What purpose does it serve?

General Poisbeau: The abolition of compulsory military service in 1997 put an end to the "automatic" creation of a military reserve made up of civilians who could be mobilised in the event of conflict. Following the attacks on national soil in 2015 and 2016, some of our fellow citizens expressed a desire to enlist and thus promote national security. So the National Guard was created as a unifying crucible for this commitment through operational reserves. It encourages volunteers aged 17 to 72 to serve in the armed forces or internal security forces. Today, 84,000 volunteers carry out a wide variety of missions, both short-term and long-term. For example, during the Olympic Games in Paris, more than 10,000 volunteers were mobilised alongside the active forces to patrol, secure, observe and protect this major event, thus ensuring its complete success.

On 23 April 2024, Naval Group renewed its partnership agreement with the National Guard, together with measures to facilitate employee engagement. What are the mutual benefits?

General Poisbeau: The agreement provides for 20 days of paid activities during working hours. This should facilitate availability and employability in order to properly fulfil the missions entrusted. The notice period for departure on mission is thus reduced from one month to 15 days. Securing the career path of reservists offers a company like Naval Group the opportunity to value and recognise those who make a commitment, a criterion of corporate social responsibility (CSR) par excellence. More and more civilian employers are keen to recognise the value of these unique employees. The aim is to enable them to reconcile their professional careers with defence missions, but also to capitalise on the new skills and expertise ▸

20 DAYS per year paid by Naval Group to fulfil their reservist duties.

The reservists truly form the link between the military and civilian worlds.

THE DGA LAUNCHES THE INDUSTRIAL DEFENCE RESERVE

Overseen by the French National Defence Procurement Agency (DGA), the aim of the industrial defence reserve (RID) is to strengthen the production chains and maintain the operational condition of the arms industry in the event of a crisis or war. The ambition is to have some 3,000 reservists deployed with industrial companies in the defence industrial and technological base (DITB) or with state-owned industrial companies by 2030. On 5 November 2024, during the Euronaval international defence exhibition, Admiral Nicolas Vaujour, Chief of Staff of the Navy, Emmanuel Chiva, General Delegate for Armament *(see his interview on page 13)*, and Pierre Éric Pommellet, Chairman and CEO of Naval Group, signed a partnership agreement aimed at strengthening the RID system *(photo above)*.

▸ acquired. These can be complementary and transferable for both the forces and the company. The reservists truly form the link between the military and civilian worlds. They foster ties with society and thus contribute to greater national cohesion, which we would need if a difficult period were to arise tomorrow.

Aurore Coudert: A former commissioned officer, I have now been a reservist for more than four years, serving in the Defence Base Support Groups (GSBdD) of Cherbourg, then Toulon. I have expertise in the fields of logistics and operational performance. In this capacity, I have been involved on several occasions in projects to ensure the flow of food, equipment and clothing, as a consulting firm might have proposed. This is a specific aspect of the reserve that illustrates one of the many possibilities for getting involved, particularly as an expert in a particular field.

What does this commitment bring you personally and professionally ?

Aurore Coudert: I feel that I am contributing to the sovereignty of my country, if not to its defence. I attach great importance to supporting the military personnel who ensure our defence and security, sometimes at a very high price. Making a commitment is meaningful for me. On a professional level, I have been acquiring new skills in my field over several years, leading to Lean Black Belt certification. My mission as a reservist commissioner has been a fantastic field of exploration for cultivating these skills. It was like a practical internship. Today, I feel more active or proactive in resolving problems and conflicts and in the collective performance of Naval Group. I would add that it's important for the group to have employees who are familiar with the Army, and the Navy in particular. Understanding the challenges facing our customers, starting with the operator at their console steering a ship, seems to me to be essential. Finally, boarding a warship is a very interesting experience, whether you work in naval defence or not.

Naval Group is also stepping up its support for the operational reserve in order to help achieve the target of doubling the number of reservists in France by 2030. What should you prepare for?

General Poisbeau: We must prepare collectively for a changing world. It is important to face up to this by learning from the shortcomings of past crises and anticipating future crises. Defence has to be comprehensive, and reservists are the first ambassadors of mobilisation. Reservists are no longer an option but an obligation to provide the forces with the essential volume and civilian skills. This is one aspect of the national resilience strategy. There are certainly many challenges to be met in the doubling of numbers, but fortunately awareness is growing. It is up to the forces to coordinate and channel reservists so as to engage them where they will be most effective. Their commitment and their loyalty depend in part on the favourable position of the civilian employer and on military employment forecasts.]

More information on defense.gouv.fr

+ 71%

This is the increase in the number of reservist employees between 2022 and 2024 within Naval Group.

JNR

Created in 2016, on the initiative of the National Guard, the National Reservists' Days [JNR] were established to honour the women and men who serve their country on a part-time basis in the military, operational or citizen reserve.

DIVERSITY AND INCLUSION

In the interest of overall performance

For Naval Group, promoting diversity and inclusion is a firm commitment, one that is being made over the long-term.

Three experts explain why and how.

SOME WANT MORE, OTHERS SAY THEY ARE OVERLOADED.
ARE THE DIVISIONS AROUND ISSUES OF DIVERSITY AND INCLUSION
A REFLECTION OF THE PIVOTAL ERA IN WHICH WE FIND OURSELVES?
FIFTEEN YEARS AFTER NAVAL GROUP FIRST TOOK A STAND,
WHY IT IS URGENT TO CONTINUE TO TAKE ACTION.

Marilyne Abieta,
Diversity and Inclusion Manager
at Naval Group

Catherine Tripon,
National spokesperson
and Co-manager of the Employers
division of *L'Autre Cercle*

Valérie Brusseau,
President of the association
Elles bougent

One doesn't go without the other. While recruiting people with different profiles (training/education, culture, sexual orientation, gender, disability, opinions etc.) fosters diversity within the company, creating the conditions for everyone to feel comfortable, respected, independent and in the right place is all about inclusion. The two go hand in hand, of course. But is this always well understood? "No," observes Marilyne Abieta, Diversity and Inclusion Manager at Naval Group. "It is often seen as a 'fashionable' concept, whereas these issues have a deeper and more intimate impact on us than we think."

Wanting society to evolve positively means first and foremost accepting to change oneself. Naval Group initiated this movement in 2010, signing an initial agreement mainly focused on the professional integration of people with disabilities *(see page 48)*. The diversity and inclusion agreement, signed in September 2021, sets a more ambitious course in terms of recruitment, career management, awareness-raising, training and relations with our ecosystem. Combined with the Naval 2025 transformation program (see our article on page 52), it thus endorses diversity and inclusion as key levers in the company's transformation dynamic. The aim is to enable everyone to develop by combating all forms of discrimination. Corporate social responsibility (CSR), team spirit and cohesion, collective intelligence, solidarity, commitment, pride, loyalty, attractiveness...

A whole range of actions have been deployed at Naval Group sites to enhance and cultivate living together. Over 1000 employees, mainly managers, have benefited from the '*J'ai des stéréotypes mais je me soigne*' (I have stereotypes but I'm working on it) training course over the past three years, familiarising themselves with the subject and understanding the impact of cognitive bias in our decision-making patterns.

In December 2022, the Chairman and CEO of Naval Group, Pierre Éric Pommellet, signed a charter with L'Autre Cercle, the leading association for LGBT+ inclusion in the workplace, founded almost three decades ago.

"This charter of commitment is always signed at the highest level of the employer organisations and after a series of interviews designed to gauge their maturity in terms of diversity and inclusion," emphasises Catherine Tripon, national spokesperson and Co-manager of the Employers division of L'Autre Cercle. "In order to sign the charter, support and an action plan are defined in advance for the following three years. LGBT+ issues, which are still far from being unanimously accepted in France, are more naturally accepted in companies with an Anglo-Saxon culture. However, it is essential that all employees share the same rights and are treated equally. These rights to parenthood and conjugality must undergo the process of 'coming out' in order to be activated. But how can I be sure that my career won't stall afterwards? Or that my work colleague won't change their behaviour towards me? It's up to the employer to establish a framework of trust."

The same dynamic is at work in the feminisation of jobs. In January 2025, Pierre Éric Pommellet became honorary President of the association Elles bougent, which has been working for 20 years to strengthen gender diversity in companies in the industrial and technological sectors. "This appointment reflects the fact that Naval Group's corporate policy is committed to breaking down stereotypes and increasing the proportion of women in the company," says Valérie Brusseau, its President. "The bond that unites us with Naval Group, a partner from the very beginning, will be further strengthened during this anniversary year, which will also see a more packed calendar of events!" Proof that stereotypes die hard, according to an Opinion Way survey – Elles bougent on gender orientation in France (September 2024) – 63% of girls from scientific backgrounds consider the industry unattractive and do not see themselves working there. While 73% of working women say that their company does not do enough in terms of women's inclusion policies, 63% of these same women recognise that progress has been made in this direction over the last five years, particularly following the example of the Rixain Law.

In 2022, Naval Group joined the #StOpE initiative, launched in 2018 by Accor, EY and L'Oréal France. It is the first inter-company initiative aimed at combating so-called 'ordinary' sexism at work. We should also mention the equal mentoring program, launched by Naval Group to encourage mentor-mentee exchanges and, ultimately, progression to positions of responsibility. As part of this program launched in 2021, we have tripled the number of pairs in three years, from 20 pairs to 64.

Finally, in Toulon, the Indus & Elles think tank was launched last October, also focusing on the development of women's careers. The objective here is to discuss the supposed or real obstacles in order to free up courses of action that open up the field of possibilities for women in industry. ▸

LGBT+

The acronym LGBT includes lesbian, gay, bisexual and trans people. The + symbol is often added to this acronym to include people whose identity does not correspond to this conventional classification, or who choose other categories to describe their gender identity or sexuality.

SPEAKUP

An alert system called SpeakUp is available 24/7 for witnesses or victims to report situations or behaviour that contravene the group's rules or legislation: speakup.naval-group.com

DIVERSITY AND INCLUSION

DISABILITY: EARLY ENGAGEMENT

Since 2010, Naval Group has been committed to employing people with disabilities, having signed three successive agreements with social partners. On 25 June 2024, Jean-Luc France, Human Resources Director at Naval Group, and Hugues Defoy, Business Director in charge of global economic and social mobilisation at Agefiph (photo), signed a service agreement for a period of one year, renewable twice. This agreement demonstrates Agefiph's confidence in the actions already developed by Naval Group. Its objective is to support companies in developing and implementing their disability policy. It is reserved for those who respect the 6% employment rate for disabled people set by the 2011 law. This is fulfilled by Naval Group, which has a 6.7% employment rate, a figure that reflects the presence of around a thousand employees recognised as disabled within its workforce. The objective is obviously not 'only' an accounting one, but aims to support employment through recruitment, training, job retention, communication and subcontracting with the protected and adapted sectors. Naval Group has committed to increasing the proportion of annual purchases from establishments or services providing support through work (Esat) and from adapted companies (EA). For example, its partnership with APF France Handicap (see below) has led it to subcontract the manufacture of ammunition cabinets and stores, fire control consoles and cases to the Vannes site. A long-term contract that provides year-round employment for five skilled workers!

PERFORMANCE GAINS

45%
(versus 26%)
Inclusive companies generate higher revenues from innovation than other companies.
Source: BCG.

25%
Gender diversity allows for a 25% higher yield.
Source: McKinsey.

36%
The diversity of ethnic origin allows for a higher yield of up to 36%.
Source: McKinsey.

POINT OF VIEW

OLIVIER LEBRETON,
Director of the adapted company APF Entreprises 56, at the Vannes site

Naval Group has committed to increasing the share of purchases from the protected and adapted sectors every year, particularly for industrial services. Our long-standing partnership with APF France Handicap is a perfect illustration of this ambition.

How has APF France Handicap managed to expand its activities?
Our history is one of adaptability. We started out with cheque capture and electromechanical cabling, then we expanded our skills to meet a growing demand. Today, we are able to carry out sheet metal work, welding and custom assembly, using CNC machines and press brakes. We work mainly with Chantiers de l'Atlantique, for whom we manufacture sub-assemblies for cruise ship cabins. We also work with around 60 other regular customers. Naval Group is our second biggest customer. We make ammunition cabinets and stores, fire control consoles and cases. The profile of our service staff is adapted to the needs expressed by the customer.

What makes your collaboration with Naval Group special?
Our relationship is based on mutual trust. Over the past 16 years, we have built a solid relationship based on the quality and reliability of our products. We are proud to have expanded our collaboration over time, first with one-off orders and now with a framework contract. In 2024, we delivered 96 cabinets and 40 ammunition stores to Naval Group, providing employment for five people throughout the year.

WE CATCH UP WITH STÉPHANE SIGRIST, DIRECTOR OF HEALTH, SAFETY AT WORK AND ENVIRONMENT (HS&E), AND ALAIN LAMOUILLE, HS&E OFFICER RESPONSIBLE FOR SUPPLIERS.

Towards zero accidents

HEALTH, SAFETY AT WORK AND ENVIRONMENT (HS&E): THESE THREE FUNDAMENTALS ARE AN INTEGRAL PART OF NAVAL GROUP'S CORPORATE CULTURE AND ARE INSEPARABLE FROM THE CONDUCT OF ACTIVITIES AT OUR SITES, IN FRANCE AND INTERNATIONALLY. A PROGRESS DYNAMIC HAS BEEN SET IN MOTION, BRINGING EMPLOYEES AND PARTNERS ALONG WITH IT.

Ensuring that every employee and every partner returns home in good health after their working day at a Naval Group site, in France or abroad: this is the number one priority of the Naval Group Executive Committee, which has decided to place HS&E at the heart of the new transformation program *(see page 52)*. "We are at a turning point, as the level of the company's overall safety culture is being questioned. HS&E is not always the priority in the field, and managerial requirements in this area need to be improved. The progress approach adopted is based on a strong collective awareness of these difficulties and on the necessary mobilisation of the entire company, from the design of our programs, to being proactive on accident prevention. In this context, sharing internal and external best practices is key. We cooperate with the partner companies that work on our sites to share and define the most effective prevention measures in order to limit the risks faced by our employees in the field," explains Stéphane Sigrist, HS&E Director of Naval Group.

SECURITY, A COLLECTIVE EXERCISE

"Every day, between 6,000 and 7,000 external stakeholders pass through the doors of Naval Group. Our philosophy is to consider all of our sites as an extended enterprise where everyone who works there is focused on the goal of zero accidents," says Alain Lamouille, HS&E Officer responsible for suppliers. Under the impetus of the HS&E teams at each site, best practices are shared within the 'prevention clubs' set up at local level, and actions are carried out to define common standards. "Some of our partners are very advanced in terms of workplace safety and help us to progress: SPIE has shared its mobile safety box with our electricians at the Brest Site and Barillec has set out its effective process for on-the-job training," says Alain. ▸

LET'S CONTINUE OUR EFFORTS!

The number of lost-time accidents (LTAs) involving our partners on our sites was **194** in 2021, **172** in 2022, **171** in 2023 and **148** in 2024. The decrease in LTAs is therefore **24%** in **three years.**

Find our awareness campaign on the golden rules of Health, Safety at Work and Environment (HS&E) on our YouTube channel.

[Towards zero accidents]

Focus on shared best practices

HS&E PASSPORTS: ANCHORING COLLECTIVE HS&E PERFORMANCE

Green, orange or red? The HS&E passport, issued annually to partners, assesses the results achieved and their commitment to action plans for the prevention of HS&E risks. Introduced in 2022, the system is now in general use and managed jointly by the Purchasing and HS&E departments. It involves our partners in a real process of improving their practices.
With 58 HS&E passports already issued to the main partners working on our sites, the common foundation and the management of health and safety risks at work are being strengthened within the extended enterprise, which includes all our partners.

A 'STOP PARTNER ACCIDENTS' CARD

The 'Stop partner accidents' card, launched in June 2024 at the Naval Group site in Lorient, clearly informs our partners that they have the right to stop work in progress whenever they perceive a risk situation. Co-signed by the site director and the local manager of the partner company, it is based on the principle of 'the partners daring to speak up and Naval Group knowing how to listen' and helps to smooth out the relationship between client and contractor on the priority subject of HS&E. "This practice is the result of external benchmarks, and the initial feedback we have on its use is positive," says Alain Lamouille, Naval Group's HS&E Officer responsible for suppliers.

POINT OF VIEW

STÉPHANE TOMINE,
General Manager of Naviplast, a partner company of Naval Group and signatory of the 'Stop partner accidents' card

"The prevention card initiative is excellent. It gives employees the authority to intervene in case of danger, which is a duty, not just a right. The ability to stop a risky activity puts safety above operational priorities, even in an emergency. We have already used this card on the defence and intervention frigate (FDI) construction site. It was used to modify scaffolding to ensure safe working conditions. Like any change, this system will take time to be fully accepted. The teams participating in the managerial safety visits have already received their cards, and an awareness-raising session for our permanent and temporary staff took place in October during our quarterly safety meeting."

AN HS&E CLUB FOR NAVAL DEFENCE PLAYERS

In March 2024, Naval Group and its partners signed a charter of commitment at the Cherbourg site and formalised the creation of the HS&E club. It lays the foundations for a community of naval defence players, united by the desire to achieve common objectives on safety and environmental preservation. Its members meet every two months to exchange views, share best practices and decide on preventive measures such as cross-security visits.

THE SAFETY BOX, A DIFFERENT APPROACH TO HS&E

The first safety box opened its doors on the Cherbourg site in 2022, in the heart of the construction site.
A space dedicated to prevention and run by HS&E preventionists, the safety box provides an educational and fun experience aimed at developing a culture of safety. In groups of around 10 people, participants move from one room ('box') to another, taking part in a range of educational and fun modules led by HS&E health and safety officers. It has been made available to the partners of the HS&E club in order to train all those involved on the site. The safety boxes in Lorient, Angoulême-Ruelle and Brest were opened last November, and those in Toulon and Nantes-Indret will open in the first half of 2025.

TRANS-FORMATION

Launched in 2020, Naval Group's Naval 2025 transformation program set our five-year ambition to reach the level of excellence expected by our customers. Naval 2025 was based on four pillars (growth, performance, innovation, talent) that guided our roadmaps and action plans.

NAVAL 2025

This program has enabled us to carry out several major projects: the digital transformation of our workshops, construction sites, products and services, the transformation of our processes to simplify them and make us more competitive, and finally the transformation of our management.
We have also made significant industrial investments to transform the Cherbourg and Nantes-Indret sites in preparation for our major programs such as the third-generation nuclear-powered ballistic missile submarines (3G SSBN) and the new-generation aircraft carrier (PA-NG).
And now we are creating a "combat systems" skills centre in the Var, with the extension of the Ollioules site and the reindustrialisation of our La Londe-les-Maures site *[see article on page 34]* to accommodate drone, autonomous systems and underwater weapons activities.

CAP 30

Our previous transformation program has given us some valuable assets. Whether technical or cultural, the transformations launched by Naval 2025 are ongoing and contribute directly to strengthening our operational excellence.
By capitalising on these achievements, we are now entering a resolutely operational phase of our transformation with our new Cap 30 program.
Designed to be deployed by everyone at their own level, whether they are workers, technicians or managers, this new program is structured around three priorities: the health and safety of our employees as a prerequisite for our performance, customer focus at the heart of our actions, and operational excellence as standard, with enhanced collaboration with our partners.

To learn more, don't miss the next issue of *Naval Review*!

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As an international naval defence player, Naval Group is a partner for countries seeking to maintain control of their maritime sovereignty. Naval Group uses its extraordinary know-how, unique industrial resources and ability to establish transfers of technology and strategic partnerships. The group designs, builds, integrates, provides in-service support, deconstructs and dismantles submarines and surface ships. As an industrial prime contractor, equipment supplier, designer and integrator of whole warships and combat systems, Naval Group is innovating in the domains of autonomous systems, underwater weapons and drones. The group also proposes services for naval shipyards and bases. Ever mindful of the issues of corporate social responsibility, Naval Group is a signatory to the United Nations Global Compact.

For more information
NAVAL-GROUP.COM