

YEAR BOOK

2023-2024

NAVAL
GROUP

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2023-2024

EDITORIAL

Naval Group has a precise and in-depth understanding of its clients' challenges, which it translates into operational objectives for its teams. An update on the company's mission and its challenges, both past and future, from its Chairman and CEO, Pierre Éric Pommellet.

Page 6

CONTEXT

Reconciling sustainability and urgency. Stanislas Gourlez de La Motte, Naval Adviser to Naval Group, has given us his analysis of this "new world disorder".

Page 11

GROUP PROFILE

Highlights, key figures, locations, life cycle, governance, products, business model and stakeholders of Naval Group.

Page 51

CONTENTS

NAVAL GROUP YEARBOOK 2023-2024

SERVICES

Naval Group's Services Department supports its naval clients throughout the entire life cycle of their ships and naval infrastructures. It has a dual objective: to guarantee the operational availability of surface ships and submarines, whilst maintaining them at the highest level.

Page 13

SURFACE SHIPS

2023 was marked in a number of advances, particularly through the production of defence and intervention frigates (FDI), the design of the new-generation aircraft carrier (PA-NG) and the production of Gowind® corvettes for export.

Page 21

SUBMARINES

Hearing without being heard, seeing without being seen. impressive, stealthy and progressive, Naval Group's submarines have truly earned their stellar reputation in the world's oceans. Focus on the major advances in our programs.

Page 31

SYSTEMS, EQUIPMENT AND PROPULSION

A new strategic focus for a new systems, equipment and propulsion department (SEP): Naval Group is preparing for the future of collaborative naval combat and reaffirming its commitment to working closely with naval forces to overcome future challenges.

Page 41

DRONES, AUTONOMOUS SYSTEMS AND UNDERWATER WEAPONS

Naval Group is increasing its expertise and know-how in the design and production of underwater weapons, drones and autonomous systems. The aim is to offer its naval clients a new, differentiating capability integrated into surface vessels and submarines.

Page 49



DELIVER POWER AT SEA

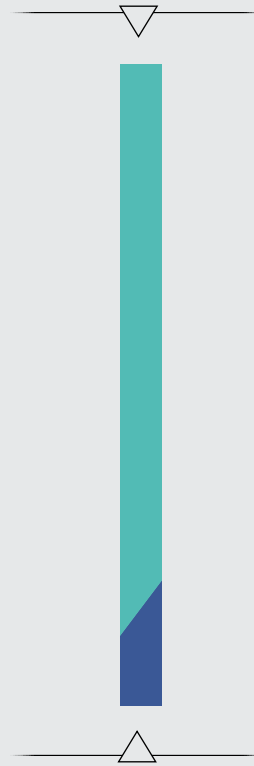


The sea brings us together: Naval Group, an industrial company for sovereignty, is dedicated to serving the sailors who protect their country, and plays an essential role in the French deterrence. Drawing on the diversity and engagement of its talents and its centuries-old industrial tradition, Naval Group designs, produces and maintains high-performance, sustainable and reliable ships, systems, equipment and services to ensure the superiority and availability of fleets. Through the excellence of its know-how and its passion for innovation, Naval Group is responsibly shaping tomorrow's naval industry.



IN THE FACE OF MOUNTING THREATS, OUR CLIENTS NEED US

Naval Group has a precise and in-depth understanding of its clients' challenges, which it translates into operational objectives for its teams. An update on the company's mission and its challenges, both past and future, from its Chairman and CEO, Pierre Éric Pommellet.



In an ever-changing naval defence sector, what are the strengths of your positioning?

Pierre Éric Pommellet: Our environment has certainly changed: we are witnessing new conflicts emerge, both conventional and asymmetric, as well as new geopolitical and military balances in the making. In the face of mounting threats, our clients' requirements and expectations are particularly high. They need a manufacturer capable of meeting their requirements both on time and at a competitive cost. Within this context, and following work carried out with our employees in 2022, we have established and drawn up our purpose: "We deliver power at sea".

This text reasserts our commitments to our clients, partners, suppliers and employees. To stand out in the highly competitive naval defence market, we rely on our unique position as prime contractor, designer and integrator of armed vessels throughout their life cycle, from design to dismantling. In our day-to-day work, we are guided by a common objective: to meet the operational needs of our clients, both in France and overseas.

Numerous milestones were achieved in 2023 for your clients. What were they?

P. E. P.: In France, there was the delivery of the *Duguay-Trouin*, the second Suffren-class nuclear attack submarine (SSN), the repair and return to the operational cycle of the SSN *Perle*, the maintenance of the aircraft carrier *Charles de Gaulle*, and drone testing during exercises with the French Navy. We have helped to ensure a high level of availability for the French fleet and to deploy innovations on board in an unprecedented operational context. In terms of new constructions, Naval Group is accelerating its cycle times and preparing the ships of the future: the defence and intervention frigates (FDI), the new-generation aircraft carrier (PA-NG), as well as the third generation of nuclear-powered ballistic missile submarines (3G SSBN), which will replace the current Triomphant-class SSBNs and form France's oceanic nuclear deterrence force in the future. Set to be the largest submarine ever built in France, the first 3G SSBN will be commissioned by 2035. In terms of our international milestones, we delivered our first Gowind® corvette to the United Arab Emirates (UAE) and a fifth Scorpène® submarine to India (INS *Vagir*, Kalvari class). In Brazil, the *Humaitá* was handed over to the Brazilian Navy, equipped with the new-generation F21 heavyweight torpedo developed by our teams. In both India and Brazil, our submarines have been ►



Pierre Éric Pommellet
Chairman and CEO
of Naval Group.



Teams from the Services Department in front of the FREMM Aquitaine at the dock in Brest.

built locally thanks to ambitious technology transfer programs. Closer to home, and still in 2023, we launched the first FDI for the Greek Navy and two minehunters for the Belgian and Dutch naval forces.

What assets do you have to support your clients and overcome their challenges?

P. E. P.: It's got to be our products and the skills that we use to produce them! Our clients are naval forces that come to us because they need to protect their nations, which is the whole reason of our work. Of course, we owe them nothing but the best ships. However, they also expect us to deliver them to the highest standards of quality, competitiveness and timeliness, to which we are committed. To achieve this, we have set up an organisation based on product lines (submarines, surface ships, systems, equipment and propulsion, UAVs, autonomous systems and underwater weapons, and services), accompanied by cross-cutting functions to ensure that we are constantly striving for optimal levels

of performance and efficiency from our industrial facilities. However, it is of course our skills, which are developed over a long period of time, that are the company's most important asset when it comes to meeting the challenges of our clients. When it comes to this, Naval Group is fully committed to the Ministry of Defence's war economy initiatives.

How do you innovate to anticipate your clients' needs?

P. E. P.: Openly and collaboratively: innovation is designed to focus our efforts on the areas that are critical for our clients and to rapidly bring our research and development projects to maturity — an absolute necessity

in a world dominated by urgency. When we innovate, we rely in particular on our ecosystem of scientific, academic and industrial partners. We also ensure that we capture and develop the ideas of our employees on the ground, thanks to our Innov' Factory Services network based at our sites. Yet, above all, innovation means looking to the future: to make sure that we stay one step ahead of the most transformative developments in naval defence, our Scientific Advisory Board is providing us with a forward-looking vision to 2040, based on high-level thinking that integrates science and technology, as well as sociology and anthropology.

WE ARE GUIDED BY A COMMON OBJECTIVE: TO MEET OUR CLIENTS' OPERATIONAL NEEDS.

OUR OPEN AND COLLABORATIVE INNOVATION GUARANTEES TECHNOLOGICAL SUPERIORITY FOR OUR CLIENTS AND ENHANCES OUR COMPETITIVE EDGE.

How do you ensure that your teams maintain their unique skills?

P. E. P.: Maintaining and developing our skills is critical to guaranteeing our long-term viability and competitiveness. Some are particularly critical, such as nuclear safety or welding. Our professions require long acquisition times to achieve the excellence we need. For example, we have set up a number of training schools, either on our own or in partnership with other manufacturers, in targeted industrial trades, and we also offer around ten joint metallurgy qualification certificates [CQPM]. We also offer group employees a wide range of professional development opportunities.

Finally, to recruit the best people, we are promoting the Naval Group brand, with a national "Naval Group is recruiting" campaign in 2023. We are proud to have been awarded the Top Employer certification for our human resources performance.

When you arrived in 2020, Naval Group integrated CSR into its strategic plan and created a dedicated department. What are Naval Group's commitments regarding these issues?

P. E. P.: Naval Group's roots are firmly planted in society, and corporate social responsibility is key to our strategy. That's why our CSR commitment is reflected in a broad range of actions and initiatives. The first of these initiatives concerns the health and safety of our employees and partners. By 2023, our efforts reduced the frequency and severity of work-related accidents, and we remain firmly committed to this goal through our "Working towards zero accidents together" program. In terms of diversity, we have signed the United Nations' Women's Empowerment Principles and the LGBT+ charter with L'Autre Cercle. In terms of environmental protection, we are working to reduce our impact over the entire life cycle of our ships. Since 2008, our environmental approach has been ISO 14001 certified, for both products and operations. We are examining alternatives to fossil fuels to significantly reduce the environmental



The Duguay-Trouin on its first sea voyage in Cherbourg, in March 2023.

280

PROFESSIONS HAVE BEEN IDENTIFIED AS CRITICAL WITHIN NAVAL GROUP.

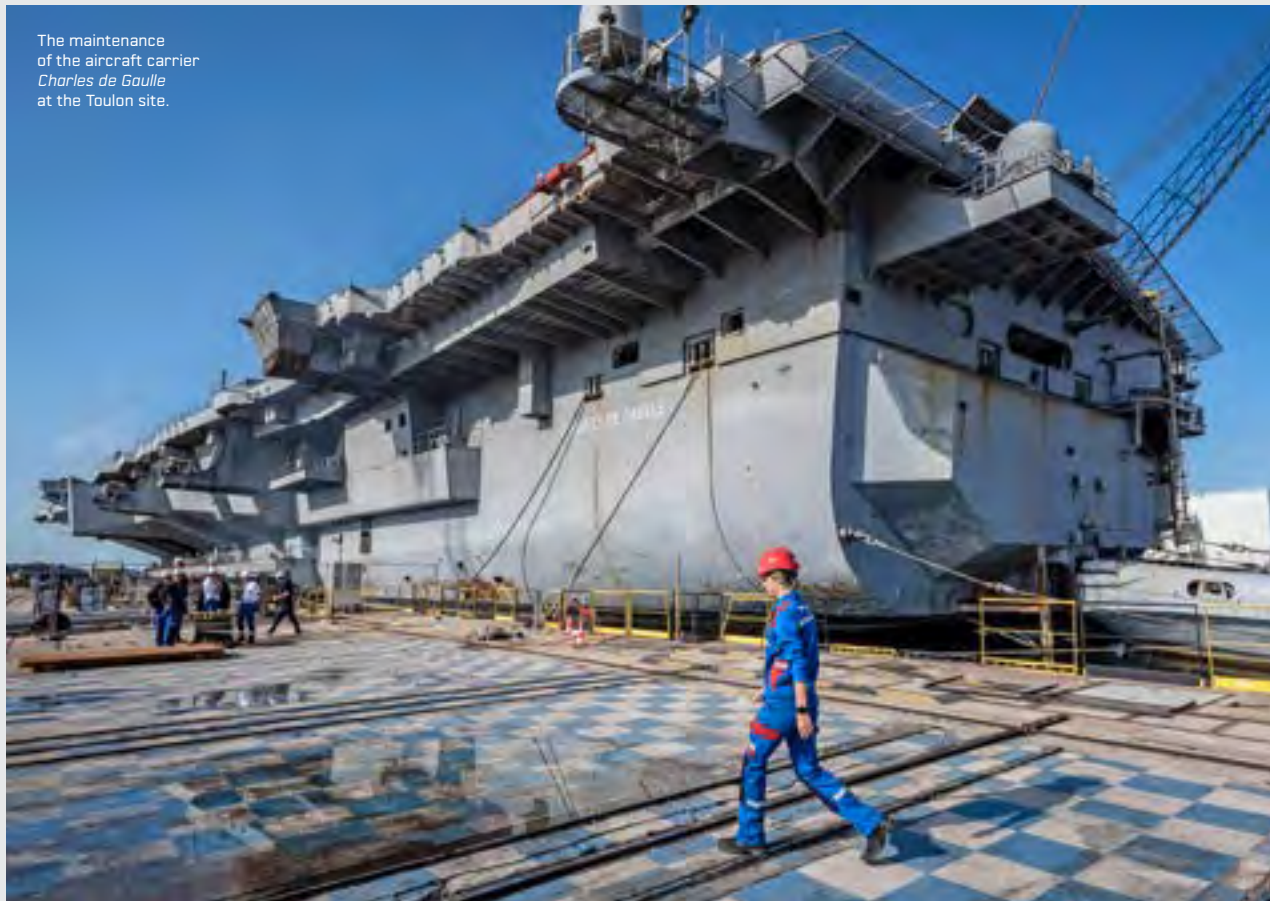
1,000

NEW EMPLOYEES JOIN THE NAVAL GROUP'S TEAMS EACH YEAR.

16,325

THE NUMBER OF GROUP EMPLOYEES AS OF DECEMBER 31, 2023*.

* average annual full-time equivalent workforce.



The maintenance of the aircraft carrier Charles de Gaulle at the Toulon site.

OUR COMPANY IS UNDERGOING PROFOUND CHANGES TO PREPARE FOR THE FUTURE.

footprint of our platforms. As part of this drive, in February 2024 we joined Pacte Alliance of small to medium-sized companies for Decarbonisation and Energy Transition, which aims at decarbonising 3,400 SMEs by mid-2026. Our responsibility also extends to the relationship between the military and the nation. As a defence industrial company, we are helping to restore and strengthen this link through a wide range of actions. We support La Fabrique Défense, an event created by the French Ministry of Defence for young people to encourage discussion and sharing around defence issues. We also contribute

to the work of the Armed Forces-Youth Commission of the Ministry of the Armed Forces and support the National Reservist Days. Through this, in 2023 we doubled the number of days allocated to our reservists.

What were your transformation priorities in 2023?

P. E. P.: In preparation for the entry into force of the new collective agreement for the metallurgy industry, we have worked on our human resources policies to adapt them to our challenges. We have supported our supply chain to consolidate it and meet the

demands of the war economy. With this in mind, we acquired shares in Jeumont Electric, a strategic supplier for the nuclear industry. We are also progressing our Naval 2025 transformation program, with a particular focus on the digital transformation of our workshops, shipyards, products and services, the transformation of our processes to simplify them and make us more competitive, and finally the transformation of our management. This transformation also concerns our sites and our industrial investments. We are upgrading the Cherbourg and Nantes-Indret sites in preparation for our major programs, and we're also creating a 'combat systems' skills centre in the Var region, with the extension of the Ollioules site and the reindustrialisation of our La Londe-les-Maures site to house our drones, autonomous systems and submarine weapons activities. This is how we're preparing for the future, as close to our clients as possible. •

RECONCILING SUSTAINABILITY AND URGENCY

How can we take the long view at a time when we are under fire from a strategic revolution and new conflicts that demand urgency? On the one hand, the long term is undeniably that of our clients, both in France and internationally. For more than 60 years, the French Navy has deployed naval air groups, for more than 50 years it has provided a permanent oceanic deterrent, for 45 years it has excelled in anti-submarine warfare and for 40 years it has deployed nuclear attack submarines. Entire generations of surface ships and submarines designed, built and maintained in service by Naval Group provide long-term support for our clients' sovereignty at sea. On the other hand, the strategic revolution that we are faced with is stirring up a host of new challenges to which governments, naval forces and industry must respond together, here and now. Stanislas Gourlez de La Motte, Naval Adviser to Naval Group, has given us his analysis of this "new world disorder".



STANISLAS GOURLEZ DE LA MOTTE

NAVAL ADVISER TO NAVAL GROUP

After 40 years in the French Navy, Stanislas Gourlez de La Motte joined Naval Group on July 1, 2023 as Naval Adviser to Pierre Éric Pommellet, Chairman and CEO of Naval Group. A former student at the French Naval Academy, this submariner and atomic scientist has served on the *Casabianca* and *Perle* nuclear attack submarines, the *Foudroyant* nuclear-powered ballistic missile submarine, and the *Charles de Gaulle* aircraft carrier. In 2017, he joined the French Naval Staff as a coordinating authority for nuclear affairs before being promoted to Admiral in late 2018. In 2022, he was appointed Inspector General of the Armed Forces with the rank of Admiral of the Fleet.

What forces are at work behind today's upheavals?

The strategic revolution we are experiencing is the result of a triple movement: geopolitical, operational and technological. Let's look at the geopolitics first, with the return of a world devoid of hierarchy. Somewhat bipolar during the five decades of the Cold War, then unipolar for two decades, over the last 15 years or so our environment has shaken off all ideologies and hierarchies, gradually imposing the law of the survival of the fittest. This geopolitical movement is accompanied by a strong deregulation affecting consultation structures, international law and common standards — basically, all our foundations — which has the effect of making our world both illegible and unpredictable.

What do you consider "operational change" to mean?

Operational change means moving from "chosen" wars to "imposed" wars. The last 30 years can be broken down into three ten-year periods. Between 1991 and 2001, there were few conflicts (in the former Yugoslavia and Somalia) and very little involvement from Western armies. Between 2001 and 2011, the American war on terrorism involved a lot of troop engagement, but it was deliberate and maintained. Since 2011, we have had less and less choice in "our" wars, and in any case they have taken their toll on us, as in Syria in 2011, Mali in 2013, Crimea in 2014, and Ukraine since 2022. What is really at work behind these military conflicts are new geopolitical balances. Conflict is now one of several tools used to influence the global or regional political scene, and strategic surprise is becoming the end-goal. In short, the aim is to create chaos and to destabilise.

What impact does technology have on these profound changes?

As a result of the democratisation of technologies, the weapons and resources that could only be deployed by Nation States in the past are now within the reach of a wide variety of players with very different

levels of industrial maturity. These weapons are also being deployed in a variety of new ways that depart from the traditional pattern. Here, I'm referring to technological innovations and innovations in use, particularly in missiles, drones (airborne and surface) and naval mines. What we need to remember is that access to technology is accelerating the proliferation of weapons of war, profoundly transforming not only their use but also the very nature of conflict.

How is this shaping strategies in the defence industry?

These three movements — the destabilisation of the political order that emerged from the Cold War, the use of violence to resolve disputes and the proliferation of the tools of war — are tidal waves that are crashing through our certainties. However, they also profoundly disrupt the whole "tactics-techniques-testing" cycle, speeding it up significantly. Traditionally, the '3T' cycle is broken down as follows: statement of need by military staff, response by industry, testing by operational staff. This cycle is now being considerably accelerated in a number of areas (digital, drones, drone warfare, etc.).

In concrete terms, what does this mean for Naval Group?

Today, Naval Group needs to juggle and reconcile several timeframes: the long-term processes of design and construction, the medium-term processes of capacity upgrades and the recurring timeframes for maintenance, and the short-term timeframe for new technologies. Synchronising these timescales is essential if we want to deliver on our promise to provide naval forces with the means to achieve their full potential, delivering power at sea. •

SERVICES

WITH MORE THAN 5,000 EMPLOYEES IN FRANCE AND OVERSEAS, NAVAL GROUP'S SERVICES DEPARTMENT SUPPORTS ITS NAVAL CLIENTS THROUGHOUT THE ENTIRE LIFE CYCLE OF THEIR SHIPS AND NAVAL INFRASTRUCTURES. IT HAS A DUAL OBJECTIVE: TO GUARANTEE THE OPERATIONAL AVAILABILITY OF SURFACE SHIPS AND SUBMARINES, WHILST MAINTAINING THEM AT THE HIGHEST LEVEL. SELECTED HIGHLIGHTS FROM 2023.



FREMM 23 ENSURING FRIGATE AVAILABILITY ON SEAS ALL AROUND THE WORLD

The Fleet Support Service (SSF) has reaffirmed its trust in Naval Group by awarding it the contract for in-service support (ISS) for the maintenance of the French Navy's eight multimission frigates (FREMMs) in operational condition. This contract came with one key requirement: guaranteeing the operational availability of FREMMs anywhere in the world.

In December 2022, the SSF and Naval Group signed an FREMM ISS contract. The contract, referred to as "FREMM 23", became effective in January and is based on a commitment to ensure the availability of the eight FREMMs based in Brest and Toulon. Service and performance are central to this agreement, which provides for 47 technical shutdowns (TS) over a seven-year period. It includes routine maintenance, the integration of new systems, and future upgrades for the frigates. As designer and builder of FREMMs — with the *Lorraine*, the eighth and latest frigate, commissioned in November 2022 — Naval Group was already overseeing their ISS under a previous contract. More than 250 employees are involved in the program, based in the frigates' home ports at the Brest and Toulon sites, as well as at Angoulême-Ruelle (for shaft line inspections), Nantes-Indret (for propulsion plant installations), Ollioules and Bagneux (for the combat system) and Lorient, the construction site.

THIS WORK IS NOT LIMITED TO ISS: IT INVOLVES CONTINUOUS INNOVATION AND MODERNISATION!

"Our decision to organise this work in dedicated shipyards in Brest and Toulon since 2016 has been a major asset: it's fostered synergy between the teams and enabled us to boost our efficiency. In 2023, we will have met the eight end-of-availability dates (EOA), which mark the end of the technical shutdowns, including three major shutdowns with docking for the *Aquitaine*, *Provence* and *Languedoc* FREMMs"

explains Franck Chardonnet, Program Director. The final TS of the year, for FREMM *Bretagne*, was completed on 15 December. In addition to routine maintenance and upgrades to frigate systems, developments have been made to the cyber system (CySS), and the latest version of the Combat Management System (CMS), with improved sonar performances, has been

integrated into the combat system. In line with the development schedule for the in-service technical support (ISTS) for the CMS, the frigates' TS will allow for the combat system to be upgraded. Starting in 2024, we'll make a significant technological advance with the progressive integration of Setis® 3.0 on the FREMMs.



**OUR MISSION:
TO GUARANTEE
THE OPERATIONAL
AVAILABILITY
OF FREMMs ALL
OVER THE WORLD.**

FRANCK CHARDONNET,
PROGRAM DIRECTOR

LIMITING THE VOLUME AND DURATION OF TECHNICAL SHUTDOWNS

To optimise the way they work, Naval Group and its partner Thales have set up an Integrated Expertise System (IES). Taking advantage of the complementary nature of their fields of expertise, the IES bolsters their diagnostic capacity and improves the speed with which any failures are dealt with. "In a broader sense, we are also working on improving the reliability of installations by using onboard data. We are capitalising on Naval Group's expertise in data and FREMM data mining to further its progress towards condition-based maintenance: through monitoring certain parameters via the Intelligence Maintenance System (IMS), we can determine whether it is necessary to

trigger a preventive maintenance task or not. This reduces the frequency of tasks being carried out and, in turn, also reduces the scope of each TS", adds Franck Chardonnet. These optimisation measures are working, and their success is demonstrated by the excellent results achieved in 2023 in terms of the handling of technical issues, the operational availability of frigates, and the quality of relations with clients, who have expressed their full satisfaction with the commitment and efficiency of our teams. "Our strength also lies in our ability to listen to the client's needs and to respond, whilst taking into account the constraints of the various stakeholders, whether they're operational, technical or financial," concludes the Program Director. •

**CONSTANT SUPPORT
AROUND THE WORLD**

Ensuring the availability of FREMMs around the world also means ensuring that constant support is available to ships on missions. The Services Department has therefore set up a dedicated organisation, in order to make sure that it can send resources to any of the ports where the FREMMs stopover. Naval Group is one of the few manufacturers in the sector to deliver such a rapid response capability on an international scale, and this is thanks to its network of subsidiaries and industrial partners. In late September, FREMM *Languedoc* left the Abu Dhabi naval base after nine days of servicing and preventive maintenance. Just a few weeks earlier, FREMM *Bretagne*, which had been on a North Sea operation, received parts for several repairs. Last spring, it was the FREMM *Lorraine*, which benefited from an intervention by the Services and Naval Group Far East teams during a stopover in Singapore. Thanks to this dedicated organisation, the multimission frigates get more regular maintenance: the duration and density of TSs conducted in France are therefore reduced, optimising the availability of the frigates.

REDUCING THE ENVIRONMENTAL IMPACT OF OUR ACTIVITIES



On the TS sites, trials are being conducted to reduce the impact of careening activities on the natural environment and to preserve marine biodiversity. When FREMM *Alsace* was under guard in the summer, an anti-UV tarpaulin was installed all around the hull to protect it from fouling. Microorganisms that grow and spread through photosynthesis eventually cause roughness in the hull's surface, impairing the vessel's speed performance and increasing her energy consumption. Thanks to the tarpaulin's protection,

the hull stays clean, avoiding energy-intensive and polluting hull cleaning processes. On FREMM *Provence*, a new range of paint was tested after the hull was stripped: silicone paint provides better protection for the surface covering and reduces the hull's friction in the water, as well as the noise emitted by the frigate. The trial proved to be conclusive, reducing the ship's fuel consumption and increasing her speed.

ON AVERAGE,

85%

OF TECHNICAL INCIDENTS
RESOLVED NINE DAYS AHEAD OF
THE CONTRACTUAL DEADLINE.

FRENCH SUBMARINES A YEAR OF IN-SUPPORT SERVICE

What a year! At the Brest naval base, 2023 marks the end of major maintenance work on nuclear-powered ballistic missile submarine (SSBN) *Le Terrible*, and the launch of major maintenance work on *Le Vigilant*. In Toulon, the Services Department's teams were called on to work on two generations of nuclear attack submarines (SSN).

In autumn, *Le Terrible*, which is one of the French Navy's four Triomphant-class SSBNs, was returned to her operational cycle after a 36-month assigned major overhaul and refurbishment period (including six months of trials) in Brest. With a particularly tight schedule and unprecedented operations specific to the first major overhaul and refurbishment period of an SSBN equipped with M51 missiles, this project represented a significant industrial challenge and a race against the clock to meet the timing requirements of the Cœlacanthe program, the oceanic component of nuclear

successful M51 acceptance launch validated *Le Terrible's* weapons system, before the sea trials in June demonstrated the performance capacities of its platform.

THE CHALLENGE OF UPSTREAM ENGINEERING WITH *LE VIGILANT*

At the beginning of October, it was *Le Vigilant's* turn to start a 36-month assigned major overhaul and refurbishment period. The submarine arrived in Dock 8 at the Brest naval base in January 2024. With 700 modification orders, *Le Vigilant's* assigned major overhaul and refurbishment period is on a particularly large scale given the unprecedented modernisations carried out for the SSBN: "The nature of the upgrades meant that we had to design new systems and prove that

ADAPTING INFRASTRUCTURES TO ACCOMMODATE THE NEW GENERATION OF SSN

At the Toulon naval base, renovation work continues on the Missiessy protected zone, which is dedicated to housing the SSNs. Launched over ten years ago now, the Barracuda Reception and Support (BRS) program aims at adapting the infrastructures dedicated to the maintenance of Suffren-class nuclear submarines, whilst allowing for the continuation of ISS activities for both classes of submarine. This challenge has been taken on by the group's infrastructure teams, experts in complex maritime infrastructures, taking into account the operational requirements as well as the regulatory and environmental constraints. Following the commissioning of Dock MY01 and Berth 505 in mid-2020, Berth 506 was commissioned in 2023. Work on Dock MY02 is ongoing, with completion scheduled for 2024. The third and final dock to be renovated, MY03 is intended for major maintenance operations, the next of which will be the assigned major overhaul and refurbishment period of the *Suffren* in 2030. Lastly, new workshops are being built and others are being renovated, and almost 1,000 specialist tools have already been installed.



EXACT COMPLIANCE WITH THE SCHEDULE FOR THE ASSIGNED MAJOR OVERHAUL AND REFURBISHMENT PERIOD MEANT THAT *LE TERRIBLE* WAS ABLE TO RETURN TO ITS OPERATIONAL CYCLE IN THE AUTUMN, GIVING THE FRENCH NAVY THE MEANS TO FULFIL ITS DETERRENCE MISSION.

LAURENT MOCARD, PROGRAM DIRECTOR

deterrance. No fewer than 60,000 lines of preventive work were carried out, involving partners and employees across all of the group's sites. With safety and quality as the cornerstones of this work, reinforced by a trusting relationship built day after day with the client, the magic of collective commitment came through: on April 19, the

integrating them on board would have no impact on the rest of the installations. It was a real challenge for upstream engineering, which our architect teams from our various sites really tackled with all their talent. Finally, as with *Le Terrible*, the race against time is on to deliver a fully operational SSBN to the French Navy on schedule.



MALGWENN MÉNÈS HULL WELDER

Based at the Naval Group site in Brest, Malgwenn Ménès is a member of the Hull Division within the Services Department.

QUICK INTEGRATION

Drawn to manual work and keen to dive right into the professional world as soon as she could, Malgwenn took a vocational agricultural course at college. Her brother told her about the various jobs available within the Naval Group's Hull Division, where he works a sheet metal worker. Malgwenn's interest was sparked and she started a six-month metal welding course given by the Union des industries et métiers de la métallurgie (UIMM) in Brest. Through two work placements completed at Naval Group's in-house welding

academy, Malgwenn confirmed her interest in this work and she applied to Naval Group as soon as she had completed her course, starting on an open-ended contract as a welder in September 2021. "My team was delighted to welcome me, which gave me a very positive start and made it easy for me to integrate into the team," Malgwenn explains.

in question: I'm qualified to weld steel, stainless steel, aluminium and high-strength steel," explains Malgwenn. "We sometimes work in the workshop, but more often than not, we're onsite, maintaining surface ships and nuclear-powered ballistic missile submarines [SSBNs]. We also weld blocks for the defence and intervention frigate (FDI) program, which are then shipped to the Lorient site. Lastly, we're sometimes assigned to missions on some of the group's other sites, or even overseas. I spent ten months on the FDI shipyard

possibility of progressing with experience: there's always room for improvement! I also love working as part of a team, helping each other out and sharing our experiences. This support is so important because our job requires perseverance and diligence in the face of difficulty and technicality. Although our work environment is demanding — we work in dust, smoke and high temperatures — the group does everything necessary to guarantee our health and safety. Plus, there are no signs of any shortage of work in the years ahead, which is really

reassuring, as is the possibility of being assigned to missions or moving up the career ladder through in-house training."

HELPING EACH OTHER AND SHARING EXPERIENCES
In the Hull Division, welders work alongside sheet metal workers, boilermakers, and painters. They also work with the handling teams, when they're working on massive parts, and with the inspectors in charge of verifying the quality of their welds. "What motivates me are the technical challenges and the

DIVERSE MISSIONS

The 17 welders in the Hull Division are supervised by two team leaders. "Our role is to fuse together the components that make up the hulls of the ships. We use different processes depending on the type of metal

I FIND IT VERY STIMULATING TO SHOW WHAT I'M CAPABLE OF BY CONTRIBUTING TO A MAJOR PROJECT.



- 40%

THIS IS THE DECREASE IN ACCIDENTS RECORDED DURING THE ASSIGNED MAJOR OVERHAUL AND REFURBISHMENT PERIODS OVER THE PAST 10 YEARS, WITH A 10% REDUCTION IN THE NUMBER OF ACCIDENTS DURING EACH OF THESE PERIODS INDIVIDUALLY.

45,000

LINES OF PREVENTATIVE WORK AND 34,000 EQUIPMENT INSPECTIONS FOR THE ASSIGNED MAJOR OVERHAUL AND REFURBISHMENT PERIOD OF SSBN LE VIGILANT.



January 2024. Nuclear-powered ballistic missile submarine (SSBN) *Le Vigilant* is returning to Dock 8 at the Brest naval base for the remainder of its assigned major overhaul and refurbishment period.

TWO GENERATIONS OF SSN UNDERGOING MAINTENANCE

Naval Group maintains the French Navy’s SSNs as soon as they’re commissioned. A fleet made up of old- and new-generation submarines, with Suffren-class SSNs gradually replacing Rubis-class SSNs. The teams are currently faced with the challenge of simultaneously carrying out maintenance operations on both classes currently commissioned, with their different technologies and requirements. The first half of 2023 was marked by the completion of the final assigned major overhaul and refurbishment period for a Rubis-class SSN: SSN *Perle*’s overhaul and refurbishment period was completed on 30 June, with the submarine restored to its full operational potential until 2033. In parallel, there was also the end of the assigned technical shutdown for the *Émeraude* and, most notably, the second technical shutdown (TS) for the *Suffren*. Launched in March, this involved a high level of activity on the nuclear boiler room and preparatory work for a future capacity increase on the dry deck shelter (DDS). At the beginning of October, the *Duguay-Trouin*,

AN EXEMPLARY PROJECT, AT DOCK 8

The keyword for the major overhaul and refurbishment period for *Le Terrible*: cleanliness. Continuous efforts to keep the site clean and tidy have helped reduce accidents and quality issues, whilst also improving working conditions and reducing the environmental impact of our activities. At Dock 8 of the Brest naval base, particular care is given to preventing accidental spills, and waste is sorted and recycled. With the support and guidance of the Fleet Support Service (SSF), safety is the guiding thread running through the assigned major overhaul and refurbishment period, from start to finish. The deployment of a new evacuation security system, the reinforcement of fire prevention and safety protocols, and an increase in the number of fire-fighting exercises: all measures possible are being taken to control fire hazards. The onboard presence of three quality controllers and their watchful eye over the progress of the work, in the aim of “getting it right the first time”, has helped to raise the site’s quality levels. These good practices are already delivering great results and are all being adopted for *Le Vigilant*’s overhaul and refurbishment.

which is the second SSN in the Barracuda series, docked for her first technical shutdown. In addition to the standard scope, this first TS also included the treatment of sea trial reserves. The project demonstrated that the teams in Toulon have deftly got to grips with the maintenance of Suffren-class SSNs — it was the shortest TS since the new generation of SSNs arrived in Toulon — especially as they

were also requested to work on the *Suffren* when it docked. The activity continued at a steady pace at the end of the year, with the *Améthyste* and then the *Émeraude* each going into TS. The *Duguay-Trouin* was commissioned in April 2024. •

MODERNISATION PROGRAMS
CONTINUOUS IMPROVEMENT OF OPERATIONAL CAPACITIES

Launched in 2017, the renovation and upgrade program (RU) involved three La Fayette-class frigates (FLF), which are ships that were commissioned between 1996 and 1999. This exceptional program was rounded off nicely by the acceptance of the *Aconit* by the French Defence Procurement Agency (OGA) at the end of 2023.



After the *Courbet* and the *La Fayette*, which were re-commissioned in 2021 and 2022 respectively, the *Aconit*, which is the third and final FLF in the RU program, made her debut at the Castigneanu Dock on February 8. As with the first two frigates, the work on the *Aconit* aims at modernising its equipment, increasing its resilience and autonomy, and also giving it new combat capacities. There’s anti-submarine warfare on the one hand, with the addition of a hull sonar and an anti-torpedo decoy system;

and anti-air warfare on the other hand, with the replacement of the *Crotale* system by two *Sadral* launchers and improved optronic surveillance capacities. The information system and platform control system have been modernised, and the Operations Room (OR) has been completely refitted to accommodate the new equipment.

FEEDBACK: A PRECIOUS ASSET

From bow to stern, every compartment of the frigate was involved. Alongside the crew, this major project will involve employees from all of the group’s sites over an eight-month period, as well as around 30 subcontractors. With often more than 250 people onboard

each day, the task of steering and managing co-activities is extremely important. The project is getting valuable feedback from the first two frigates, both in terms of team operations and technical issues. In design and production, modifications are made as work progresses to make interventions easier. This was particularly the case for work on the anti-air warfare system in March: the port locker, designed in a single block for the *Courbet*, was switched to being manufactured in two parts for subsequent frigates, facilitating adjustments during integration. All of these changes, based on feedback, save precious time and improve working conditions. ▶



The La Fayette-class frigate (FLF) *Aconit*.



WHAT I'LL ALWAYS REMEMBER ABOUT THIS PROGRAM IS THE EXCEPTIONAL HUMAN ASPECT OF THE ADVENTURE, AND THE FANTASTIC TEAMWORK ACHIEVED ALONGSIDE THE CREW, WITH THE SUPPORT OF THE DGA AND THE SFF.

CYRILLE ALENDA, DIRECTOR OF THE FLF RU PROGRAM

SIGNING OF THE MID-LIFE UPGRADE (MLU) CONTRACT FOR THE HORIZON-CLASS FRIGATES

On July 28, 2023, the Organisation for Joint Armament Cooperation (OCCAr) awarded Naviris — a joint venture between Naval Group and Fincantieri — and its co-contractor Eurosam — a consortium comprising MBDA and Thales — the Mid-Life Upgrade (MLU) Contract. This contract covers the modernisation of four Horizon-class air defence frigates: two Italian ships and two French ships. Naviris will take care of the frigate, while Eurosam will be responsible for modernising the anti-aircraft system. The aim of the program is to ensure that these ships, which were built between 2000 and 2010, retain their first-class capacities until they are decommissioned in 2040. Intervening on the front line in high-intensity combats, the four frigates [the *Forbin* and the *Chevalier Paul* for the French Navy] will be adapted in order to respond to new threats and, in particular, to combat hypersonic and ballistic missiles, supersonic sea-skimmer missiles and UAVs. The renovated ships will be delivered to the French and Italian navies between the end of 2027 and the end of 2030.

TEAMWORK AND SEAMLESS COORDINATION

The physical integration of sonar, the new flag-ship feature of the combat system, required major work on the hull in order to create an appropriate environment for it. To protect the antenna, it was placed inside a dome which was manufactured by the Composites team on the Lorient site. The equipment was slid under the hull, then lifted for coupling. From engineering to production, the Services teams have once again demonstrated their expertise through the integration of this complex new system into an existing environment. In April and May, the combat system equipment was integrated into the OR. This delicate stage of the project was successfully completed thanks to the high-quality coordination and flexibility of the teams: those from Toulon's Services Department for the physical integration of the equipment, who worked closely with the teams from Ollioules' Systems and Equipment Department, who oversaw the functional integration.

ONE BY ONE, MILESTONES ARE BEING SUCCESSFULLY TICKED OFF

On July 24, after more than five months of work, the *Aconit* undocked. The installations are being restarted on the quayside until the sea trial campaign in October. The frigate was accepted by the DGA at the end of 2023, and the keys to its new installations were handed over to the crew at the beginning of January 2024. Following trials to verify its military

capacities, the ship was back in the French Navy's operational cycle as of January 15, 2024. Rounding off this extraordinary program, the *Courbet* and the *La Fayette* FLFs will be retrofitted over the course of the year to give them the same hardware and software configuration as the *Aconit*. •

MORE THAN

50

MODIFICATION ORDERS AND 5,000 LINES OF WORK FOR EACH SHIP, COMPLETED WITHIN NINE MONTHS, INCLUDING TRIALS.

SURFACE SHIPS

NAVAL GROUP'S PURPOSE, "DELIVER POWER AT SEA", WAS REFLECTED IN A NUMBER OF ADVANCES

IN 2023, PARTICULARLY THROUGH THE PRODUCTION OF DEFENCE AND INTERVENTION FRIGATES (FDI), THE DESIGN OF THE NEW-GENERATION AIRCRAFT CARRIER (PA-NG) AND THE PRODUCTION OF GOWIND® CORVETTES FOR EXPORT.

FDI TWO PROGRAMS, ONE SERIES

Production of FDIs for the French Navy (FDI FR) and the Hellenic Navy (FDI HN) is in full swing at the Lorient site, with six units – three French and three Greek – already launched in the production cycle.

The FDI program, covering new first-class frigates ordered by France and Greece, made steady progress during 2023. The first ship in the series to be launched in November 2022, the *Amiral Ronarc'h* was fitted out. "The commissioning of the installations began in the first half of 2023, and the dock trials will be conducted up until the ship's maiden voyage in mid-2024. Delivery of the ship is scheduled for early 2025", explains Sylvain Perrier, Director of the FDI Program. Construction of *Kimon*, the first FDI HN, began in autumn 2021. The second unit in the

series reached two major milestones over the course of 2023. After the assembly of its hull blocks into construction form, the frigate was launched at the end of September 2023. The event was officially celebrated on October 4,

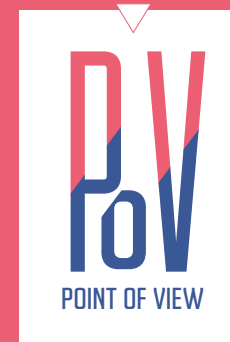
with the French Minister for the Armed Forces, Sébastien Lecornu, and his Greek counterpart, Nikolaos Dendias, both in attendance. At the end of August 2023, the ship's Combat Management System (CMS) was powered up

THE ORGANISATION ADOPTED FOR THE ENTIRE SERIES AIMS AT COMPLETING TASKS AT THE RIGHT TIME AND TO THE REQUIRED LEVEL OF COMPLETENESS. ALL OF THE CONSTRUCTION PHASES HAVE BEEN STREAMLINED.

PIERRE-LUC GUÉGUEN, ARMED SHIP MANAGER FOR THE FDI SERIES



The launching ceremony for FDI *Kimon* in Lorient in September 2023.



KILYANN BEVEN SHIPBOARD ELECTRICIAN

Kilyann Béven is working on the first FDI in the series to be built in Lorient: the *Amiral Ronarc'h*.

DISCOVERING A PROFESSION

"After taking a CAP (vocational qualification) followed by a vocational electrician course, I started as a temp worker. I learnt my trade as a shipboard electrician on a job with a Naval Group subcontractor. The working environment and the naval sector really appealed to me, so I decided to continue in that field. After an eight-month job with a naval manufacturer, I was recruited by Naval Group in 2020 on a permanent contract as an onboard electrician - what

mission at the Shore Integration Facility (SIF) in Saint-Mandrier in February 2021."

WHY NAVAL GROUP?

"My job is really interesting. It's exciting to work on such a large-scale project and to follow its progress. It's also satisfying to see a job well done and targets met, when a ship takes shape, for example. In terms of profile, the job of a shipboard electrician requires a good work ethic and diligence, particularly when it comes to complying with safety standards. You need to

speciality. I'm currently splitting my time between shipboard and preparation, which gives me a good insight into the work of the preparation technicians and launchers, whom we work with on a daily basis."

THERE'S NO SUCH THING AS ROUTINE OR BOREDOM IN MY JOB: I HANDLE A HUGE RANGE OF TASKS AND THERE ARE LOTS OF DEVELOPMENT OPPORTUNITIES.

we also call a fitter", says Kilyann. On board the ship, his main tasks are to lay cable trays, wire up equipment and installations, connect them to the ship's electrical network, and check the connections. "There are around 40 electricians of all ages working on the three FDIs currently in production at the Lorient site. We carry out this type of operation throughout the ship's construction process: the work begins in the form and then continues on the quayside and in the dock. From time to time, we are sent to support the teams on another group site. For example, I completed a

be able to work both as part of a team and independently, in conditions that can be noisy, crowded and sometimes cramped. Our working hours are adapted to the constraints of the site, so we sometimes work early in the morning, in the afternoon or in the evening. To progress in this job, the most important thing is to be curious and open to learning, to want to discover new things! We're fortunate in that we enjoy good working conditions, and we can progress in a variety of ways: as a supervisor or team leader, by joining a preparation or testing team, or by training in another



FDI *Kiman* at the launching ceremony in Lorient in September 2023.



LATE APRIL 2023

Start of dock trials for the *Amiral Ronarc'h*, first of the five FDI FR.

LATE SEPTEMBER 2023

Launch of *Kiman*, first of the three FDI HN.

INCREASED PRODUCTIVITY ACROSS THE SERIES



Work towards achieving the paperless target is continuing, with almost 650 digital tablets being used on the shipyard by the end of 2023, giving fitters access to digital blueprints of the ship and compliance reporting in real time. Increasing the pre-armament rate for the hull blocks and conducting upstream platform testing for the ship's equipment and software are the two key elements that enable time to be saved in the construction assembly and trial phases. The hull block pre-armament rate is increasing for each unit in the series: this rate has rapidly risen from 25% for the first unit in the series to 70% of the target for the third. The teams are aiming at achieving 100% for the fifth unit. "This increase should make it possible to smooth out the load during the construction of each ship, so as to limit co-activity and improve the

safety and working conditions of employees, whilst also boosting productivity", explains Pierre-Luc Guéguen.

THE CYBER SYSTEM (CYSS)

The FDI will have a "cyber shield", the CySS. This system will enable the crew to supervise all of the armed ship's computer network flows and its 1,800 onboard software programs, and also to receive alerts in the event of any anomalies. In 2023, the system was rolled out in two versions (France and Greece), which were deployed on on-shore platforms for testing. The aim is to qualify each version of the CySS for the first sea trials of the first FDI FR and HN, and then to implement the final versions of the system when the ships are delivered. In November 2023, the human-machine interface (HMI) of the Cyber Management System (CyMS) was presented to the French Defence Procurement Agency (DGA) and the staff of the French Navy, before the crew of the *Amiral Ronarc'h* was trained to use the system in 2024.

in its Panoramic Sensors and Intelligence Module (PSIM), which was then taken on board at the beginning of November, a few weeks after the floating unit was launched. The *Kiman* PSIM was powered up again at the end of December so that combat system trials could continue in early 2024. Following start-up of the installations and the dockside trials, the next stages have been scheduled for the second half of 2024, with the maiden voyage, followed by delivery of the ship in 2025. The third unit in the series is the second FDI HN, *Nearchos*", continues Pierre-Luc Guéguen, who is Armed Ship Manager for the FDI series. Machining of the hull began in mid-2022. During the first part of 2023, the blocks were manufactured, painted and pre-armed. The master ring was put on the slip at the beginning of October 2023, and assembly work for the floating unit will continue until spring 2024. By the end of 2023, 14 of the 27 blocks had been assembled or were in the process of being joined in construction form, while the frigate's PSIM was in the pre-arming phase before being sent to its test zone, where the dry dock tests will be conducted. *Nearchos* is due to be launched in autumn 2024 and delivered in late 2025. Machining

of the blocks for the fourth unit began in December 2022. Following completion of the "downgrading" work, the two machine blocks were painted in January 2024. After the pre-armament phase, the ship will be put onto the slip in mid-April for her final assembly. Completed in 2023, the elements forming the structure of the PSIM were painted in January 2024 before the module was pre-armed. It will then move to the dry dock test zone in autumn 2024, following after the PSIM of the *Nearchos*. Finally, the first sheet metal cut for the fifth FDI took place on July 12, 2023, and the hull blocks will be manufactured, before being painted and pre-armed, in 2024, at the same time as the sheet metal cut for the sixth French FDI, starting in April 2024. " With these projects, Naval Group is demonstrating its agility and ability to adapt, by alternating frigates for different naval forces on its production line and by adapting the ships produced to its clients' configurations and schedules. •

PA-NG PROGRAM

A NEW STUDY PHASE

After two years of preliminary design work, the PA-NG program entered the advanced design phase on April 27, 2023. The aim is to put together a de-risked development-construction proposal by early 2025.

The PA-NG program involves the development and construction of a new-generation nuclear aircraft carrier to replace the *Charles de Gaulle* aircraft carrier, which is currently in service, by 2038. Design work began in 2018, followed by the preliminary design brief (PDB) phase and risk assessment studies, which were conducted between April 2021 and February 2023. During this period, cooperation between the program's industrial stakeholders — Naval Group, Chantiers de l'Atlantique and TechnicAtome — was exemplary. The MO Porte-Avions joint venture (Naval Group-Chantiers de l'Atlantique), created at the start of the PDB, is responsible for overall project management, co-contracted with TechnicAtome, the prime contractor for the nuclear boiler rooms. "At the end of these two years of studies, the general architecture of the future aircraft carrier has been stabilised and the architectures for the main systems have been defined. By

exploring possible solutions and selecting the best alternatives, the PDB phase confirmed the feasibility of the future aircraft carrier in terms of overall coherence, performance, safety acceptability and the target budget", explains Vanessa Lehn, PA-NG Overall Engineering Program Package Manager (PPM). The final review took place at the end of February 2023: the client expressed their satisfaction with the response provided by the program partners to the requirements expressed by the DGA and the French Ministry of Defence.

THE CHALLENGES OF THE ADVANCED PRELIMINARY DESIGN (APD) PHASE

The preliminary design phase will last 32 months and will be completed by the end of 2025. This involves refining the definition of the ship and its systems, continuing work on the integration of the aviation and weapons systems in conjunction with the manufacturers in charge of the corresponding programs, preparing the industrial deployment of the program, and carrying out the preliminary nuclear safety studies essential

A WELL-ORGANISED INTER-SITE COLLABORATION

Internally, a multi-disciplinary team of around 300 people is hard at work, spread over several sites:

- **in Lorient:** overall engineering, studies of aviation and ammunition systems, the electrical plant and distributed digital systems;
- **in Brest:** studies of the support system and interfaces with host infrastructures;
- **in Nantes-Indret:** design and manufacturing of the energy-propulsion plant system and components for nuclear boilers;
- **in Ollioules:** design of combat and communication systems, cybersecurity studies and support systems;
- **in Cherbourg:** design of containment chambers;
- **in Angoulême-Ruelle:** aviation equipment studies.

"We have set up collaborative technical workshops, organised by research topic, to bring together multi-site and multi-industry teams", says Vanessa Lehn. They cover a diverse range of topics (propulsion plant energy, nuclear safety, naval architecture, fitting-out, ship-boiler room interfaces, etc.). These workshops are held regularly, ensuring effective collaboration and synergy between technical experts. The exchange of information is made seamless and team involvement is facilitated."

Vanessa Lehn, PA-NG Overall Engineering Program Package Manager

MAY 3, 2023 APD LAUNCH REVIEW

This review provided an opportunity to validate the contractual and industrial organisation and to ensure the availability of input data and the various technical frameworks required to start the studies.

OCTOBER 2, 2023 COMPLETION OF THE SYSTEM REQUIREMENTS REVIEW (SRR) FOR THE ARMED SHIP

This milestone confirmed that stakeholders' needs had been correctly understood and that the solution envisaged is aligned with these needs, thereby authorising the studies to go ahead without major risk.



Front view of the future PA-NG.

to its completion. During this phase, the main challenge for engineering activities is to lay the technical foundations, i.e. the design and planning of the development, to allow the ship's development to be launched with a controlled level of risk", summarises Vanessa Lehn. This work will enable us to put together a low-cost development-build proposal."

MULTIPLE MILESTONES TO REACH IN 2024

"We will need to mature our systems design in preparation for the design reviews scheduled for May and June 2024, followed by the submission of the development-build proposal in early 2025", continues Vanessa Lehn. "The interim review with the client, scheduled for July 2024, will validate an initial configuration of the ship and her systems. This configuration will serve as a reference for the proposal. In September 2024, we will finally have to complete the System Functional Review (SFR) for the armed ship and, at the same time, launch the studies for the early development of the energy-steam conversion system, in advance of the armed ship."

FOCUS ON THE PA-NG'S NUCLEAR PROPULSION PLANT

"The PA-NG will be the French Navy's first fully electric nuclear-powered ship: 100% of the energy generated by the two K22 nuclear boiler rooms will be converted into electricity, to meet the needs of the new electro-magnetic catapult system, amongst other elements", explains Cyril Robin, Propulsion Plant Energy Program Package Manager (PPM). This transformation will be implemented through four GT2A modules (for "dual-alternator turbine generator") for the energy-steam conversion system supplying the entire onboard ship via the electrical power plant. The main consumption element will be the ship's propulsion plant, driven by three electric motors capable of propelling the ship at speeds of up to 30 knots. "The overall operation of the energy-propulsion system is being handled by Naval Group, in close collaboration with TechnicAtome for the nuclear boilers and Chantiers de l'Atlantique for the propulsion plant system and part of the electrical distribution. The GT2A modules will be supplied by Naval Group, which also manufactures

the boiler room components for the French Atomic Energy and Alternative Energies Commission (CEA) and assembles them for TechnicAtome. "Alongside the aviation system and the nuclear boilers, the energy-steam conversion system is one of the aircraft carrier's largest systems. Moreover, it is on the critical construction path. That's why we need accelerate our research into this system", says Cyril Robin. We have very tight deadlines for the preliminary design phase, which began in April 2023 and will be completed in September 2024 for the energy-steam conversion aspect. We'll then move on to the advanced studies (which are part of the development phase). Production of the boiler room components will start in 2024 with our casting suppliers. The production of the first equipment elements to be integrated into the GT2A modules will begin in 2026, and the modules will be assembled in 2028."





GOWIND® FIRST DELIVERY FOR THE BANI YAS CORVETTE PROGRAM

The first of two Gowind® corvettes ordered from Naval Group by the United Arab Emirates (UAE), the *Bani Yas* corvette was delivered on October 21, 2023. Three days later, the second corvette, *Al Emarat*, made its maiden sea voyage.

Having first taken on the role of Proposal Manager up until the signing of the contract in 2019, Patrick Bianéis then stepped up to the position of Director of Operations for the Bani Yas program. “At the Euronaval trade show in November 2016, Naval Group presented a scale model of the Gowind® Égypte”, he recalls. The first unit, which was built in 38 months in Lorient for the Egyptian Navy, was then nearing completion and the Egyptians were very satisfied with their ship. Representatives of the UAE Navy were able

to board the Egyptian corvette during trials conducted in April 2017 to see the ship’s impressive performance for themselves. This further caught the Emiratis’ interest in this multimission ship, as they are looking to protect their seaboard on the Arabian Gulf and the Arabian Sea. They were particularly interested in the corvette’s projection capability and its extensive ASW component, which they didn’t have in their naval force. We therefore put together a proposal based on the Gowind® Égypte, which gradually evolved as the UAE Navy selected additional functions and equipment, particularly for its combat system.” The contract for the supply of two Gowind® corvettes to be produced by

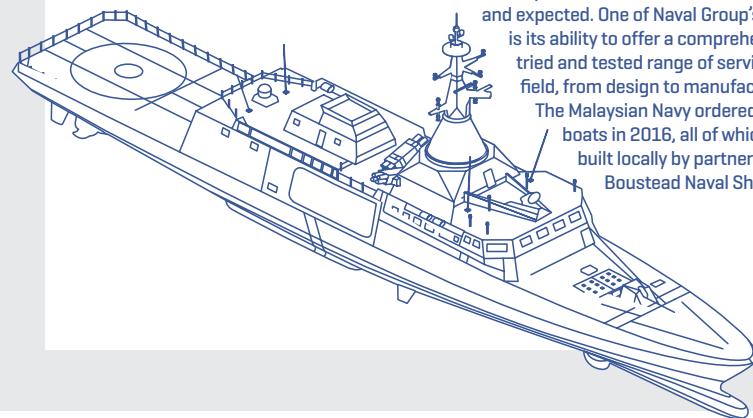
Naval Group on the Lorient site was signed with the UAE in March 2019, and came into force on May 9. Construction of the first unit, which the program has been named after, has started in Lorient. Despite the constraints imposed by the health crisis, the first block of the nine rings composing the corvette was placed on its keel blocks in January 2021, and *Bani Yas* was launched in December 2021.

THE GOWIND® CORVETTE: AN EXPORT SUCCESS

The Gowind® corvette has been a major commercial success, with more than ten units already ordered by three naval forces. Designed to perform the full range of naval defence and maritime security operations at high performance levels, it is a compact,

high-sea combat ship that is robust and well-equipped in terms of electronics, weaponry and projection capabilities, enabling it to take on air, surface and submarine threats. In addition to the assertion of military sovereignty sought by foreign naval forces, a transfer of technology to develop local industries is often required and expected. One of Naval Group’s strengths is its ability to offer a comprehensive, tried and tested range of services in this field, from design to manufacture. The Malaysian Navy ordered Gowind® boats in 2016, all of which were built locally by partner shipyard Boustead Naval Shipyard.

After a pause period, the program restarted in September 2023. For the Egyptian Navy, after Naval Group completed the first of four units ordered in 2014, and the Alexandria Naval Shipyard (ASY) successfully produced the next three units. The four corvettes are now in service in Egypt. Naval Group is therefore committed to forging long-term partnerships with its naval clients. Bearing this in mind, in 2023, the group submitted a proposal to the Hellenic Navy for four corvettes, three of which will be built locally.



The *Bani Yas* Gowind® corvette at sea.

WHERE DO WE STAND AT THE END OF 2023?

“Between April and October 2023, the acceptance trials for the first corvette were successfully completed with the client in attendance in Lorient, both on the dock and at sea. The delivery ceremony took place on October 21, with official representatives from the UAE Navy in attendance, led by the Commander of the UAE Naval Forces. *Bani Yas* left Lorient two days later, under the responsibility of its crew, and arrived in Abu Dhabi on November 27, completely autonomously and without any difficulties”, emphasises Patrick Bianéis. The second Emirati corvette is set to follow the same trajectory, just a few months later. *Al Emarat* made its maiden sea voyage on October 24, 2023, followed by another sea voyage in December. Her acceptance trials will continue until April 2024, and we are aiming for delivery in June so that the ship can reach the UAE in early August. In addition, our cooperation with the UAE was strengthened through the signing of several

additional contracts in 2023: one for the supply of Canto® torpedoes and chaffs, and another to work jointly with a local partner, and with a transfer of technology

from Naval Group, to develop the basis for a future National Combat Management System that will be deployed on other UAE Navy platforms.”



The crew of the *Bani Yas* corvette join the UAE authorities at the delivery ceremony on October 21, 2023.



TRAINING FOR UAE CREWS LED BY THE SERVICES DEPARTMENT

Crew training was included in the initial 2019 contract: Naval Group University plans all of the training courses, and then receives and supports the sailors from start to finish, both on the various sites and shipboard. "The training cycle is identical for the crews of the two UAE corvettes and comprises three components: equipment training, safe navigation training, and operational training", explains Jean-Baptiste Briche, Gowind® UAE Training Work Package Manager. The first crew's training began at the end of November 2022 and will be completed

in July 2024. The second crew started training in September 2023 and will finish in 2025. So, we're developing a close, long-term relationship with each of them." • **The "Use and maintenance of systems and equipment"** training course is a long phase of technical training courses. They are primarily given at Naval Group University in Lorient, for the theoretical part, and then the training is dispensed on board the corvettes or in training centres run by the manufacturers in France or abroad, for the practical part. "The crew of the *Bani Yas* corvette benefited from this component between September 2022 and April 2023. 100% of the equipment training has been completed and the results of the satisfaction survey have been positive, which has been a great initial success", reports Jean-Baptiste Briche with satisfaction. The crew of *Al Emarat* will complete this section in April 2024, having started it in October 2023.

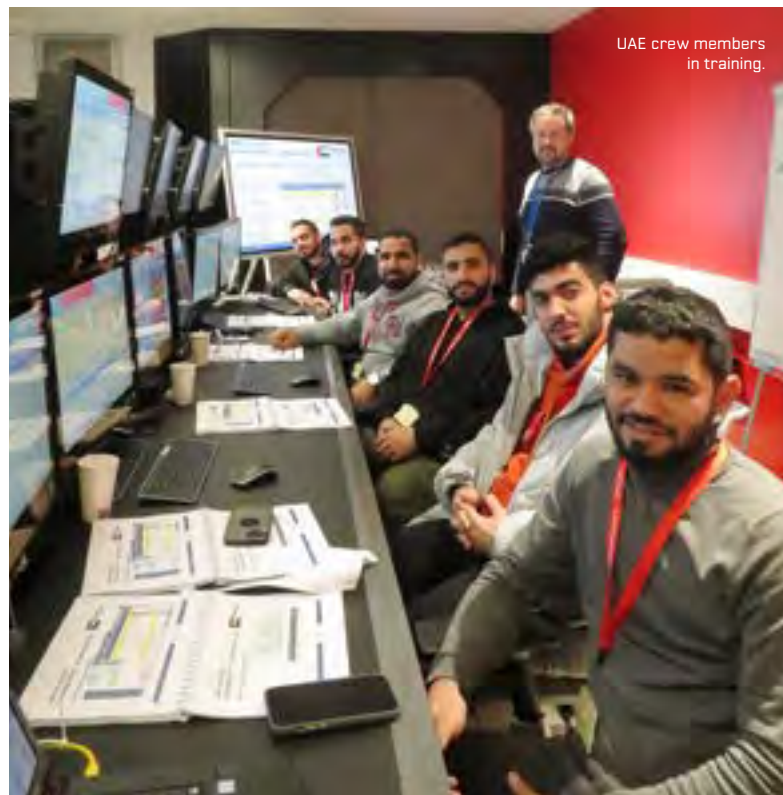
• **The "Safe sailing" and operational training** - the equivalent of a driving licence and a hunting licence, to put it simply, are issued by DCI-NAVFCO, a Naval Group subcontractor. Just like the installation training, the "Sailing safely" section is completed before the boat is delivered. It's a six-week course, two of these weeks being spent at sea with the full crew. • **As for the operational training** it aims at ensuring that the crew has mastered the ship's military function. It's a 20-week course and starts in France with theoretical training in anti-submarine warfare, and it ends in the UAE, after the ship's transit, with various UAE Navy exams. "The crew of *Al Emarat* will take navigation training in April and May 2024. For the crew of *Bani Yas*, the practical part of the operational training will be dispensed from January 2024 in Abu Dhabi", explains Jean-Baptiste Briche.

75
SAILORS HOSTED IN LORIENT

400
DAYS OF EQUIPMENT TRAINING

80
EQUIPMENT MANUFACTURERS

90%
SATISFACTION RATE



UAE crew members in training.

SUBMARINES

HEARING WITHOUT BEING HEARD. SEEING WITHOUT BEING SEEN.

IMPRESSIVE, STEALTHY AND PROGRESSIVE, NAVAL GROUP'S SUBMARINES HAVE TRULY EARNED THEIR STELLAR REPUTATION IN THE WORLD'S OCEANS.

FOCUS ON THE MAJOR ADVANCES IN OUR PROGRAMS.

BARRACUDA

A SYMBOL OF FRENCH INDUSTRIAL EXCELLENCE

Major advances in the Barracuda program mean that France is progressively establishing its capabilities of renewing its fleet of nuclear attack submarines (SSN), thereby considerably bolstering its strategic oceanic force (SOF).

Multiple milestones were reached over the course of 2023 with Barracuda, a program designed to ensure the successor to the Rubis-class SSNs, symbolising the excellence of the French naval industry! Naval Group is overseeing the design and construction the six new SSNs for the Barracuda program. Its scope includes the manufacture of the main components of the nuclear

boilers in partnership with TechnicAtome, the initial logistics for ship maintenance in Toulon after delivery of each SSN, and the design and construction of two dedicated dry deck shelters. The submarine construction program will come to an end in 2030 (the *Suffren* was delivered in November 2020 and commissioned in June 2022 and the *Duguay-Trouin* was delivered in July 2023), but Naval Group's commitment will continue well beyond this date.

NEW SSNS, NEW STANDARDS

To meet the current and future operational needs of the French Navy, the six new French naval nuclear attack submarines (SSN) will deliver a tenfold increase in performances. A concentrate of the most advanced technologies, the Suffren-class SSN boasts unrivalled operational capacities and invulnerability. Versatile and powerful in combat, it is capable of fulfilling all its missions, from the high seas to the coastline. Indispensable for the protection of nuclear-powered ballistic missile submarines (SSBN) and deployed aircraft carriers, the SSN has a broad field of action encompassing deep anti-submarine warfare (ASW), surveillance and intelligence.

INNOVATION AT EVERY LEVEL

One of the most discreet submarines in the world, the new French SSN is the result of a major technological advancement in all fields. The result? Longer mission durations, enhanced shipboard comfort, a central automated steering system that makes the vessels more manoeuvrable and agile, and an at-sea availability of 270 days compared with just 220 days for the Rubis class, three of which are still in service today (the *Perle*, the *Améthyste* and the *Émeraude* SSNs).

Optronic mast allows for enhanced visual information gathering and facilitates crew communications, which is a key asset for its intelligence missions. These innovations are the result of work put in by each and every Naval Group industrial sites in collaboration with leading industrial and technological partners. In total, 2,500 men and women can take pride in contributing to French sovereignty through the Barracuda program.

WITH DELIVERY OF THE *TOURVILLE* SCHEDULED FOR 2024, WE'LL START A NEW PHASE TO ACCELERATE THE DELIVERY OF THE *DE GRASSE*, *RUBIS* AND *CASABIANCA*, AND TO COMPLETE THE CONSTRUCTION PHASE OF THE BARRACUDA PROGRAM.

2024: THE ADVENTURE CONTINUES

In 2024, Barracuda's progress is set to continue. The French Navy crew's armament for the *Tourville* trials will lead to a first sea voyage (FSV) by reaching the milestone of boiler room qualification for trials. The FSV is a major milestone that marks the completion of a huge number of trials, tests and verifications, both in the production site and then on the quayside, all of which are essential prior to delivery. Ships 4, 5 and 6 in the series (*De Grasse*, *Rubis* and *Casabianca*) will then continue to put the expertise of Naval Group and its partners to use in order to deliver a complete class designed to the highest standards by 2030. ▶



The *Duguay-Trouin* was able to complete its first sea voyage and underwent final adjustments before returning to her home port of Toulon, where she will be delivered to the French Navy. The success of these stages is the result of the exceptional commitment and efforts of the completion and testing team, led by Philippe Mermet-Bijon, Armed Ship Manager (ASM).

PROMOTING EMPLOYEE ACCOUNTABILITY WITH THE SAFETY BOX

In early 2023, Naval Group launched the Safety Box in Cherbourg: an educational system dedicated to health and safety at work (HSW), providing role-play exercises to prevent risks for employees and subcontractors working on Naval Group sites.

The aim is to promote continuously enhancing individual and collective responsibility and responsible behaviour, enabling the sharing of best HSW practices and also fostering an

HSW-focused culture through exchanges with training leaders. Naval Group is committed to this field of its activity and it takes all measures within its power to protect those working on its sites. Based close to the workshops and worksites on the industrial site, the Cherbourg Safety Box, which has already proven its value on other industrial sites such as Airbus, Veolia and Toyota, has also been adopted by the Brest and Lorient sites.



2023, A YEAR FULL OF EVENTS

- **March:** start of sea trials for the second production vessel, the *Duguay-Trouin*. She made her first sea voyage and then undergo final adjustments before being delivered to the French Defence Procurement Agency (DGA) and the French Navy in the summer. She returned to Toulon, her home port. The weeks spent at sea allowed for critical equipment to be tested, such as the propulsion plant and navigation systems, as well as the ship's balancing.
- **May:** the last section of the last production ship in the series, the *Casabianca*, was welded at the Legris workshop in Cherbourg, where the hull and structures of the six SSNs were built.

- **July 20:** The *Tourville*, third in series, left the Laubeuf yard in Cherbourg, where she was built, to head for the launching facility (LF). She will be delivered in 2024 after completion work and dock trials, which will precede a phase of sea trials.
- **July 31:** The *De Grasse*, fourth in the series, takes the place of the *Tourville* in the Laubeuf yard, in order to continue with her integration, before being transferred to the LF.
- **November:** at Nantes-Indret, the end of production for the final component of the 26 stainless steel nuclear boiler from the Barracuda program was celebrated at a ceremony. The event marked the finalisation of the key capacities of the nuclear boilers in the Barracuda program.

10,000

PROFESSIONALS FROM ALL AREAS OF EXPERTISE HAVE LENT THEIR SKILLS TO THE BARRACUDA PROGRAM SINCE IT WAS LAUNCHED.

7,500,000

MAN-HOURS HAVE BEEN INVESTED IN THE BARRACUDA PROGRAM OVER THE LAST 13 YEARS.

700,000

PARTS HAVE BEEN INTEGRATED INTO THE NEW SUFFREN-CLASS SSN.

3G SSBN

BUILDING THE FUTURE OF FRENCH DETERRENCE

There is a gap of around 15 years between the announcement of the launch of France's third-generation nuclear-powered ballistic missile submarine program (3G SSBN) in February 2021 and the delivery of the series' lead vessel. This is hardly surprising for one of the most complex production and delivery missions in the world

The largest submarine ever built in France (approximately 150 metres), the first 3G SSBN will be commissioned by 2035. This will kick-start the progressive renewal of the oceanic component of France's nuclear deterrence, which is currently carried by the four Triomphant-class submarines. The final 3G SSBN is expected to be delivered to the French Navy by 2050, with Naval Group planning to deliver one ship every five years. The future generation of SSBNs is designed to navigate until the 2080s, which means that some of its future commanders haven't even been born yet! With the 3G SSBN program, the notion of "long-term" that characterises naval defence becomes particularly relevant.

and certain internal modules), its equipment and its integrated systems will be built and assembled. The Cherbourg site boasts unequalled expertise in this field, having built the first generation of French nuclear-powered ballistic missile submarines back in 1964. After the six Le Redoutable-class SSBNs, the *Le Triomphant* generation was commissioned in 1997. Still in service today, they will gradually be replaced by 3G SSBNs. This program, which aims at ensuring France's deterrence capabilities until the end of the 21st century, presents a major challenge for Naval Group and will be a great source of pride for the numerous employees and partners involved. At various stages, it will involve more than 200 companies, 400 skills, and 3,000 people across France!

WITH A NEW CLASS OF SSBN DESIGNED TO SAIL FOR 30 TO 40 YEARS, ONE OF NAVAL GROUP'S CHALLENGES IS TO ENSURE THAT THE SHIPS HAVE SUFFICIENT UPGRADE CAPACITY IN ORDER TO KEEP THEM ON THE CUTTING EDGE OF TECHNOLOGY THROUGHOUT THEIR ACTIVE SERVICE.

CHERBOURG, UNRIVALLED EXPERTISE

As part of this exceptional program, Naval Group is acting as the overall project manager under the supervision of the DGA and the French Atomic Energy and Alternative Energies Commission (CEA), with TechnicAtome in the role of co-contractor for the nuclear boiler room. Partners with renowned expertise (such as Thales and ArianeGroup) are also contributing to the capacities and performance of future ships. The program entered its implementation phase in 2021, starting with the design and manufacture of the first parts of the nuclear boiler room for the four submarines, which is a stage that needs to be prepared as far upstream as possible. In 2024, a very tangible phase will begin with the first sheet metal cut for the lead production in Cherbourg. This milestone is the starting point for the construction of the future SSBN in Cherbourg, where the submarine platform (hull, structure



With its hundreds of thousands of parts and because it contains a nuclear boiler room and three-stage rocket launch facilities, the SSBN is one of the most complex objects in the world.



VALENTIN REGNIER

HULL AND STRUCTURE
DESIGN AND TESTING
MANAGER

Since 2019, Valentin Regnier has been working at the Barracuda submarine shipyard.

MISSIONS THROUGHOUT
THE PROGRAM

In 2017, after completing a course to qualify as an industrial boilermaking technician, Valentin took a further qualification in industrial boilermaking design and production. During a two-year internship on the Cotentin Peninsula with a company specialising in boilermaking and pipework, he produced stainless steel and steel parts in the workshop. Valentin then applied for a job with Naval Group, where he was recruited to the Cherbourg site as a hull and structure design and testing manager.

useful for this — and then ensure that the proposed solutions are taken into account for units 4 through 6 of the Barracuda series by updating the manufacturing and assembly plans”, he explains. “My job requires me to be proactive in dealing with anomalies and to react quickly to validate the solutions proposed by the site”.

INTERACTION WITH A WIDE RANGE
OF PROFESSIONS

When he’s not on site or visiting subcontractors to accept delivery of materials with the buyers, Valentin works mainly in the office

preparation specialists, who then update the manufacturing ranges, as well as with the shell-welding trades, to communicate the updates to them”.

Valentin is also in contact with the Lorient site, which manufactures the Barracuda’s bridge-decks. In the event of an anomaly, he retrieves the 3D model and sends it back to Lorient, so that the changes can be taken into account on subsequent parts. Lastly, the teams tasked with in-service support for the *Suffren* and *Duguay-Trouin* at the Toulon site provide feedback on the corrections made during technical



I LOVE MY JOB BECAUSE IT REGULARLY PRESENTS ME WITH TECHNICAL CHALLENGES, AND I LOVE PROBLEM-SOLVING.

“Submarines are really emblematic in this region, so working here was an obvious choice for me, as I’m from Normandy”, he explains. Valentin was responsible for the acceptance of the watertight doors and panels on the third Barracuda submarine, and then supervised their installation on board before helping with their testing. “I also help resolve technical problems encountered in production — my previous experience as a boilermaker was

he shares with his two specialist colleagues, who are responsible for the hull and structure systems. “I work with a wide range of professions in production: the mechanics and carpenters who assemble the equipment, for which I then run functionality testing, the managers who coordinate these tests, and the quality engineers who check that they are all in order. To update the plans, I work with the people in charge of numerical calculations and layout, then with the industrial

shutdowns, as part of the continuous improvement of the series. “It’s important to be a team player”, says Valentin, who adds that he’s delighted to be working for such a major program, serving the interests of France. “There are countless possibilities for future development, from studies for another program, such as the 3rd generation nuclear-powered ballistic missile submarine (3G SSBN), to preparation teams or the shipyard.”



INNOVATION AND COMBAT POWER

To succeed, Naval Group relies on its intrinsic capacity to innovate, which particularly enables it to pool innovation across its various product lines. The Le Triomphant-class 2G SSBNs are evolving in parallel with the studies being conducted for the 3G SSBN, in particular with the Sycobs 3.0®

feature many other innovations: the hull will be coated with a specialist material (an acoustic coating) that can absorb the sound waves emitted by active sonars and reduce the noise emitted by the submarine, resulting in enhanced stealth. Other innovations of note: the sensors on the future 3G SSBN will be upgraded to the highest technological

100,000

THIS IS THE NUMBER OF SYSTEMS THAT WILL BE INTEGRATED INTO THE 3G SSBN.

90%

OF THE 3G SSBN PROGRAM’S ADDED VALUE WILL BE GENERATED IN FRANCE OVER SEVERAL DECADES, REPRESENTING AROUND 3,000 HIGHLY-SKILLED DIRECT JOBS.

CYBERSECURITY CHALLENGES, AN UNAVOIDABLE ASPECT IN TODAY’S DAY AND AGE, ARE TAKEN INTO ACCOUNT RIGHT FROM THE DESIGN STAGE OF THE 3G SSBN. FURTHER DOWN THE LINE, CYBERSECURITY WILL ALSO BE INTEGRATED INTO THE IN-SERVICE SUPPORT PHASES.

combat system. Similarly, the submarines feature new equipment (e.g. sonars) and benefit from upgraded solutions integrated into Suffren-class submarines (such as periscopes). The future French SSBN will

standards, environmental factors will be taken into account in the design, a new site for reprocessing the shipboard atmosphere will be developed, and modernised spaces will offer improved living conditions. •



The future 3G SSBN.

TRANSFORMED
PRODUCTION
STRUCTURES

To accommodate the production of the largest French submarine to date, Cherbourg and Nantes-Indret have begun their industrial transformation. A specialist in nuclear power and propulsion energy, Nantes-Indret will also be home to the teams working on the future French aircraft carrier. For this purpose, from 2022 onwards, the site will be equipped with a new building, Orion, which is a modern, modular and eco-friendly structure built with sustainable materials. It will eventually house more than 600 employees and partners over an area of 8,500 m². The Cherbourg transformation began as soon as the construction contract was launched, in mid-2021, with the upgrading of the infrastructures of the Legris workshop for the hull and the machining systems. In total, Naval Group will have invested several tens of millions of euros in each site to prepare them for the 3G SSBN program. Among the other Naval Group sites involved in the program, Angoulême-Ruelle, Ollioules, Paris, Bagneux (program management), Lorient and Brest will each play a part in the construction of the future SSBN, contributing their own area of expertise.



SCORPÈNE® WHEN CONVENTIONAL MEETS EXCEPTIONAL

Whether they are equipping themselves with submarines for the first time, like Malaysia, or already have a submarine force, like Chile, the world's naval forces have all expressed their high approval of the Scorpène®, particularly impressed by its extreme versatility and remarkable performance. In India and Brazil, the Scorpène® programs are making great strides.

Launched in Chile and Malaysia in the 2000s, the Scorpène® is still recognised today as a major tactical asset, as demonstrated by the significant progress made on the India (P75) and Brazil (Prosub) programs in 2023, not to mention the keen interest expressed by other navies, such as those of Indonesia and the Philippines, in Naval Group's conventional submarine. 14 Scorpène® submarines are already serving the sovereignty of four countries at sea (Chile, Malaysia, India and Brazil), and India has expressed its desire to acquire a further three submarines.

To share their feedback, naval forces using the vessel came together at the Club Scorpène® event, the 2023 edition being organised jointly by the Brazilian Navy and Naval Group and hosted in November in Rio de Janeiro, with foreign navies and representatives of the French Navy in attendance. On this occasion, Naval Group presented the technological innovations that enable Scorpène® to remain at the cutting edge of modernity.

SCORPÈNE®: RENOWNED ADVANTAGES

Naval forces are praising the Scorpène®'s acoustic superiority, combat capability and permanence at sea. Easy to operate, it outperforms competitor vessels in both high seas and shallower waters, effectively combating surface vessels and submarines while also being capable of gathering intelligence or engaging in special forces operations. Thanks to its acoustic discretion, Scorpène® is also exceptionally stealthy. A performance rarely matched by a conventional submarine!

A PRODUCT THAT CAN BE ADAPTED TO ALL NAVAL NEEDS
The Scorpène® is a conventional submarine at the forefront of innovation, whose design can be adapted to the needs expressed by client navies. To meet the demand from certain countries whose geographical features require an ocean-faring submarine with high submerged endurance, the group has proposed the acquisition of Scorpène® vessels fully equipped with lithium-ion batteries. With greater on-board capacity, this submarine offers greater submerged endurance and a reduced rate of indiscretion, giving it unique tactical mobility for a conventional submarine. Other advantages of this technology are reduced maintenance and the absence of hydrogen release, which is a major danger for the submarine and its crew.

ONE OF SCORPÈNE®'S STRENGTHS IS THAT IT CAN BE ADAPTED TO THE NEEDS OF EACH INDIVIDUAL NAVY BY INCORPORATING CONTINUOUS INNOVATION, AS DEMONSTRATED BY THE LITHIUM-ION BATTERY.



The organising members of Club Scorpène®.



The ceremony for the incorporation of the *Humaitá* into the Brazilian submarine forces on January 12, 2024 in Brazil.

14
SCORPÈNE® VESSELS ARE CURRENTLY IN SERVICE FOR BRAZIL, INDIA, CHILE AND MALAYSIA, AND THE INDIAN NAVY IS LOOKING TO ACQUIRE THREE MORE.

INDIA AND BRAZIL: MAJOR ADVANCES

In 2023, major milestones were reached by these two ambitious, flagship export programs. In Brazil, Naval Group has been involved since 2008 in Prosub (*Programa de Submarinos*), which is a program aimed in particular at building four Scorpène® vessels on the Brazilian Itaguaí site, a naval and industrial base developed specifically for this program. To meet the needs of the Brazilian navy, Naval Group has launched an unprecedented technology transfer program and is training a large number of Brazilian engineers and sailors. After the *Riachuelo*, which was delivered in 2020 [the first conventional submarine built entirely in Brazil], the *Humaitá* was delivered to the Brazilian Navy in December 2023, equipped with Naval Group's F21 torpedo, qualified following a successful trial launch. 2024 got off to a great start with the official ceremony to incorporate the *Humaitá*

into the Brazilian submarine forces and the launch of the third unit, the *Tonelero*. In India, the P75 program has also been productive, with the *Vagir*, the fifth Kalvari-class Scorpène® to be entirely built locally, due to be commissioned in early 2023. The *Vagir* is following in the footsteps of the *Kalvari*, the *Khanderi*, the *Karanj* and the *Vela*, which were commissioned between 2017 and 2021. The final Indian Scorpène®, the *Vagsheer*, will be delivered in 2024 after a sea trials phase. ▶



IN KARWAR, NAVAL GROUP UNDERLINES ITS COMMITMENT

On September 13, 2023, Naval Group inaugurated a technical workshop in the Karwar industrial zone in India. In concrete terms, the workshop will support the six Kalvari-class submarines throughout their life cycle. The workshop is strategically located close to the Karwar shipyard, which will be home to India's fleet of Kalvari-class submarines, aircraft carriers, and warships. Based on the Scorpène® model, they have been adapted to the Indian Navy's operational requirements and the environment in which its ships operate. The opening of the technical workshop makes Naval Group India, a subsidiary of Naval Group, the first subsidiary of an industrial designer (OEM) to physically base itself in Karwar, in line with the Indian government's Make in India policy. Naval Group's investment illustrates its long-term commitment to the Indian Navy and the local naval industrial ecosystem as part of the strategic bilateral cooperation between India and France.

NAVAL GROUP IS ONE OF THE FEW MANUFACTURERS CAPABLE OF DELIVERING A SUBMARINE WITH A FULLY TESTED COMBAT SYSTEM, LIKE BRAZIL'S RIACHUELO AND HUMAITÁ, WHICH INCORPORATE THE F21 TORPEDO.

PROSUB: ANOTHER STEP FORWARD WITH NUCLEP

As part of Prosub, Naval Group is involved in the construction of the future Brazilian conventionally armed nuclear-powered submarine (SCPN), except for the nuclear boiler room which is being developed independently by the Brazilian Navy. A major contract was signed on September 6, 2023 with Brazilian manufacturer Nuclebrás Equipamentos Pesados (Nuclep). The agreement is an important milestone, as it covers the manufacture of the qualification section of the Brazilian SCPN, which is a key step towards the manufacture of the submarine's hull. In addition, the ceremony for the cutting of the first sheet metal

of the SCPN qualification section took place on October 4, in Itaguaí. Prosub's end objective is to manufacture the SCPN, involving French and Brazilian teams, with a major technology transfer component and the training of a large number of Brazilian engineers at the design school at the Naval Group site in Lorient, and then in São Paulo.

Carlos Seixas (left), Chairman of Nuclep, and Renaud Poyet (right), Chairman and CEO of Itaguaí Construções Navais (ICN), at the signing of the Brazilian SCPN contract.



SYSTEMS, EQUIPMENT AND PROPULSION

A NEW STRATEGIC FOCUS FOR A NEW SYSTEMS, EQUIPMENT AND PROPULSION

DEPARTMENT (SEP): NAVAL GROUP IS PREPARING FOR THE FUTURE OF COLLABORATIVE

NAVAL COMBAT AND REAFFIRMING ITS COMMITMENT TO WORKING

CLOSELY WITH NAVAL FORCES TO OVERCOME FUTURE CHALLENGES.



SETIS® 3.0

CONFIRMED POTENTIAL FOR COLLABORATIVE COMBAT

The cornerstone of the combat management system for first-class surface ships, Setis® 3.0 has been significantly extended in the course of 2023, for the benefit of the French Navy, with the addition of one of its flagship modules dedicated to Naval Cooperative Surveillance (NCS).

In the systems family, the arrival of Setis® 3.0, a software package for steering the combat system of the first-class surface ships built by Naval Group, has continued to make a good impression. According to Franck Ferrer, Director of Combat and Mission Systems, Setis® 3.0 is like “a toolbox made up of Lego® bricks — each corresponding to a capability or technical function — which we can draw on to create the Combat Management System (CMS). Naval Group then pieces these separate

building blocks together for a target ship: this is all instantiation work”. Setis® 3.0 is the heir to Setis® F, the historic combat system for Naval Group’s multimission frigates (FREMM), for which the difficulties it encountered in in-service technical support (ISTS) for a large fleet of ships led to the end of its service. The next generation needed to be more agile. In any case, this was one of the requirements that guided the R&D work carried out by the Setis® 3.0 teams: developing a standardised product line for all of the French Navy’s Tier 1 surface ships, whose in-service support (ISS) will finally be pooled. So, when the client wants to upgrade their CMS, the development work

requested will benefit the whole fleet, not just one vessel. The same applies to sailor training platforms, where the training budget will be optimised because everyone will share the same user experience in terms of the operating concept.

NCS AND TACTICAL ADVANTAGE: LEADING BY EXAMPLE



FREMM Lorraine at sea.

The operational nature of the NCS has been proven during various trials conducted by Naval Group in collaboration with the French Navy. One of them, conducted as part of the FS23 exercise last June, saw a FREMM launch an Aster 30 to retaliate against an attacking missile, based on primary detection by the sensors of a Horizon frigate, also equipped with the NCS. In simple terms, the system enabled the FREMM to identify, locate and classify the runway as hostile much more quickly, and thus to launch the Aster firing sequence with a precious few seconds’ head start, to deal with high-spectrum missiles. It followed on from a NCS qualification trial conducted at the end of March, during which NCS networking between the FREMM air defence ship Lorraine, the Chevalier Paul air defence frigate and the Charles de Gaulle aircraft carrier was tested for the first time.



“BASE SYSTEM”

Reorganised and re-architected to facilitate any changes or corrections of technical aspects, the former Setis® F, now Setis® 3.0, has been enriched with a new module: NCS (see boxes). This year, 2023, the Setis® 3.0 teams have completed this “core system”, which means launching products online and developing the NCS. All of the building blocks required to implement Setis® 3.0 on FREMMs and FDI frigates have been completed. Deployment is already underway on FREMM anti-submarine warfare (ASM) frigates, and will soon begin on air defence (AD) frigates. It will be deployed on the Charles de Gaulle aircraft carrier and Horizon frigates during their next major overhaul and refurbishment period. The French Navy and the French Defence Procurement Agency (DGA) have decided to extend the scope of Setis® 3.0 to all first-class carriers. In 2023, two new contracts were signed to define the scope of these new developments over the next three years. They will contribute to the essential missions assigned to the French surface fleet, namely anti-aircraft,

anti-surface and anti-submarine warfare, the projection of special forces and the fight against cyber-attacks and “asymmetrical” threats.

THREE TO FIVE TYPES OF SHIP

Setis® 3.0 is a major transformation operation in which the teams are fully committed to equipping themselves with an organisation and industrial facilities that are equal to the challenges of the next decade: more competitive, more attractive products tailored to clients’ multi-program capacity requirements.

EXPORT

On the export market, Setis® 3.0 is designed for the market of heavily armed frigates. The Setis® 3.0 offer will soon be extended to include a technology transfer capability. •

NAVAL COOPERATIVE SURVEILLANCE (NCS): STRENGTH THROUGH UNITY (OF DATA)

NCS is a new operational capability, developed as part of the Setis® 3.0 product line. It is deployed on FREMMs, Horizon frigates and the Charles de Gaulle aircraft carrier, and will be deployed FDIIs in the future. It enables a ship’s CMS to access raw sensor data from the force’s other ships, which are also equipped with NCS. The fusion of data from onboard sensors and ships connected to this NCS increases the resilience and clarity of the tactical situation, as well as the advance warning time required for decision-making: speed of development and updating of manoeuvring tracks, improved precision, resistance to jamming or to a deficiency in a force sensor, etc. It constitutes the first fundamental building block of the tools that Naval Group is designing for collaborative naval combat in a high-intensity and high-threat context.

CYBERSECURITY A PRIORITY

This year, Naval Group is proud to confirm its excellent progress in terms of image and appeal to the cybersecurity community. What's more, it has bolstered its position of trust with clients, demonstrating its expertise in this latest battleground.

Cybersecurity is doubly cross-functional, involving both Naval Group employees and systems, from architects to support roles. To tackle a growing and offensive threat, the group needs to raise its cyber performance to the highest level, both in its products and within its own organisation. It's no longer a question of simply complying with standards or managing risks, but rather a matter of being able to withstand aggressive scenarios. The operational superiority of our client naval forces depends on it.

employees from various departments have been identified and tasked with spreading the word amongst their peers. It's an environment that encourages and fosters sharing knowledge and experience, along with feedback on challenges observed in the field. Raising awareness of cyber issues doesn't just concern employees, it also affects Naval Group's supply chain. At the request of the French Ministry of Defence, Naval Group's Cybersecurity Department led a round table discussion at the end of October to discuss the strategic and vital importance of embracing cybersecurity with the French Defence Technological and Industrial Base (DTIB) – some of whom are also our suppliers.

NAVAL GROUP ORGANISES "GIRLS CAN CODE!" COURSES

Grace Hopper, Margaret Hamilton: don't these names ring a bell? Maybe they don't, but they should – these women left a lasting mark on the history of software development in the 1950s and 1960s, before the field became increasingly male-dominated. Yet Cécile Léon, Human Resources Business Partner (HRBP), and Maxime Debert, Cybersecurity Team Manager, at Naval Group, can confirm: "The skills required to work in software development and cybersecurity are not gender-specific. Women have their rightful place here. In mid-April and July, they organised two "Girls can code!" courses in Toulon and Bagnaux, with the aim of giving young girls at secondary school the chance to get involved and discover the career opportunities available to them." These IT courses, created by the Prologin association, aim at encouraging girls to try their hand at IT, and they also invite female IT specialists such as Alexandrine Hahn, a submarine software developer, to talk about their experience in a way that tackles die-hard stereotypes head-on.



ARCHITECTS, REVERSERS, PENETRATION TESTERS, INTEGRATORS, DEVELOPERS... RECRUITMENT TARGETS HAVE BEEN ACHIEVED! THIS IS ALL THE MORE IMPRESSIVE GIVEN THE EXTREMELY CHALLENGING AND COMPETITIVE MARKET: NAVAL GROUP'S ATTRACTIVENESS IS NOW VERY MUCH CONFIRMED IN THE CYBER WORLD.

PATRICK RADJA, DIRECTOR OF CYBERSECURITY AT NAVAL GROUP

To ensure that cybersecurity is integrated into its core activities as early and as effectively as possible, Naval Group has decided to set up a "Cyber Champion" program in 2023, following the example of other industrial groups. Its aim is to train and lead a network of cybersecurity ambassadors to establish a lasting by design culture. An initial dozen

SEANERGY

Another highlight of the year was the approval by Naval Group's Executive Committee of the plan for a cyber by design information system to reinforce the security of software development whilst improving user experience. This program, called Seanergy, unites the energies of three areas of expertise:

450

THAT'S THE NUMBER OF "ETHICAL HACKING" EXPERTS WHO GATHERED IN TOULON AT THE END OF AUGUST FOR BARBHACK EVENT: A HACKING CONFERENCE SPONSORED BY NAVAL GROUP.

6%

THIS IS THE RATE OF STAFF TURNOVER WITHIN NAVAL GROUP'S CYBERSECURITY DEPARTMENT, COMPARED WITH A SECTOR AVERAGE OF 20-25%



cyber, digital and information systems, and combat and mission systems. It was the subject of a proof of concept and convincing demonstrations this year. The first operational systems will be integrated in 2024.

TORTUGA

The Cybersecurity Department is also delivering great successes to its clients. It has achieved 100% satisfaction and success in meeting the milestones linked to the Tortuga framework contract, and ultimately in consolidating a trusting relationship with it. Signed in 2020 for a seven-year term, "Tortuga determines the progress of cyber capabilities in the naval defence sector in relation to its specific challenges", explains Patrick Radja, the group's Director of Cybersecurity. Working groups have been set up to accelerate projects based on innovation solutions proposed by Naval Group to overcome these challenges. It received its tenth purchase order this year.

CYBER LAB AND CYMS

On the export front, Naval Group has reached an important milestone in Belgium, with the launch of its new Cyber Lab. Based within its Belgian subsidiary, this centre of excellence specialises in implementing cybersecurity technologies developed for the rMCM minehunter program. Launched and fully operational, the Cyber

Lab will study the operation of the Cyber Management System (CyMS), the beating heart of the cyber strategy of armed vessels [implemented in the Belgian-Dutch rMCM program] and CyASAP, from a security operations centre (SOC) for the Belgian Navy. They will spearhead the international business development of the group's cybersecurity offering from 2024. •

COOPERATIVE MODE ACTIVATED

As an expert in cyber defence, Commander Alain Dréano spent several years advising the French Navy on cyber defence, before taking over as Head of the Cyber Defence Support Centre (CSC) in Toulon on September 1, 2023. «We are working with Naval Group to develop complex and realistic cyber scenarios for the French Navy's cyber training missions. We are also in talks regarding the industrialisation of cyber-surveillance capabilities. The aim is to optimise our existing detection (probes, systems) and supervision capabilities, while ensuring that they remain consistent with current infrastructures. Lastly, we need to continue our exchanges with Naval Group's Computer Emergency Response Team (CERT), using our detection capabilities [rules, compromise indicators], in order to move forward.»



BRUNO MAUGIN UPSTREAM INDUSTRIALISATION PREPARER

At the Nantes-Indret site, Bruno Maugin is involved in the Nuward™ small modular reactor (SMR) project, currently in R&D.

FROM INDUSTRY TO CIVIL NUCLEAR POWER

With a professional degree in industrial production-performance management, Bruno began his career at a small to medium-sized mechanical-welding company before joining the MAN Energy Solutions production site in Saint-Nazaire, where he worked for nine years as a methods technician. He then went on to become a methods manager in the piping sector, where he played a key role in re-industrialisation. "Following on from this position, I was recruited by Naval Group in August 2021 to participate in the Nuward™ project, so that I could contribute

A GROWING WORK SCOPE

"My role in the team is to test different innovative welding processes on a small scale on the component designed by TechnicAtome and then to analyse them. The aim is to determine which parameters to implement so that they can be applied during the demonstrator testing, before the component is manufactured to scale 1", explains Bruno. "During the preliminary design brief (PDM) phase, working alongside an industrialisation manager, I conducted a large number of welding tests following the acquisition of a uniaxial diffusion welding furnace.

site, which will receive a hot isostatic compaction furnace in July 2024. "This will enable us to carry out the second phase of component welding, which has been outsourced up until now. The machining of sheet metal sections has also been brought in-house to the site's workshop."

AN INNOVATIVE PROJECT

"It's very exciting to be working with EDF and the project partners. Naval Group has grown considerably in the field of uniaxial diffusion titanium welding. Furthermore, the level of expectation has risen since the APD phase: the component that will be integrated into the reactor

IT'S EXCITING TO BE INVOLVED IN AN INNOVATIVE PROJECT WORKING TO PRODUCE CARBON-FREE ELECTRICITY.

my knowledge to this exciting R&D project", explains Bruno. Nuward™ is a small modular nuclear reactor project aimed in particular at replacing coal-fired power stations in Europe. TechnicAtome and Framatome are the reactor designers, while the Commissariat à l'énergie atomique et aux énergies alternatives (CEA) is in charge of R&D studies and testing, and Naval Group is responsible for developing and industrialising certain equipment, including the steam generator.

These were used to determine the weldability parameters, which were then implemented on two demonstrators representative of the scale 1 part. To do this, I worked with the Centre d'expertise des structures et matériaux navals (CESMAN), which conducted the characterisation of the section I had welded". The advanced design brief phase began in April 2023. Bruno is now in charge of the dedicated resources manufacturing division for a vessel at the Nantes-Indret

is eagerly awaited, as it will determine the power output of the nuclear power plant. The SMR is also enabling us to develop technologies that will be implemented on future generations of nuclear propulsion. I like the dynamic, adaptable and agile way in which our team has grown, expanding from three to 13 employees. We are continuing our tests with autonomy, rigour and responsiveness to adhere to the timetable set by EDF."



BRUNO MAUGIN

EQUIPMENT GROWTH DRIVERS FOR THE GROUP

Expanding the client portfolio, refining the product policy and strengthening partnerships have been the SEP Department's guiding principles since 2023.

One of the major projects of the SEP Department, launched in 2023, has been to define its new business strategy, based on continuity and expansion with existing and emerging clients. Shaft lines, vertical launchers, masts, landing grids, propellers, heat exchangers, gearboxes, weapon-launching tubes... The vast range of references in the Naval Group catalogue testifies to its extraordinary expertise throughout the product life cycle, from design to maintenance. This activity is based primarily on the complementary skills and know-how of the Naval Group sites at Angoulême-Ruelle, Nantes-Indret, and Lorient. Historically, it has been deployed (and continues to be deployed) for the construction of French and foreign surface ships and submarines.

BUSINESS-TO-BUSINESS

Another part of this activity involves direct stand-alone sales to external shipyards, which are strategic partners. Naval Group's ambition is to accelerate its development by moving towards an equipment manufacturer model driven by production and management of product lines. "Our aim is to double and even triple the current business-to-business volume of €40 million in annual turnover over the next ten years", says Élisabeth Raynaud, Director of Programs and Systems and Equipment Development. Various drivers are envisaged to meet this ambition. This year also saw the development of meetings to exchange views and ideas with partners such as BAE Systems. The aim was to get to know each other better and to identify market opportunities where one company could be the other's client. A contract was signed in 2023 with representatives of BAE Systems Australia for the supply of shaft lines [see box]. ▶

OUR AIM IS ALWAYS TO BE ONE STEP AHEAD WITH THE PRODUCTS THAT WILL BE OF INTEREST TO NAVAL FORCES.

VINCENT VIMONT, DIRECTOR OF THE ANGOULÊME-RUELLE SITE AND OF THE NAVAL EQUIPMENT DEPARTMENT



DOUBLE SUCCESS WITH SYLVER®

On November, 21 2023, Naval Group celebrated the sale of the 200th Sylver®. A ceremony was organised to mark the event, with the client and partner MBDA France in attendance. Used by 11 naval forces around the world to deploy high-intensity naval operations, the vertical launching system has established itself as a leader in its field since its initial integration on board the *Charles de Gaulle* aircraft carrier in 1999. The technological excellence demonstrated by the teams at Naval Group's Angoulême-Ruelle site in the production of cutting-edge naval equipment, and the versatility created by its

designers, are undoubtedly the two key factors in its success. The Sylver® allows a diverse range of missiles to be launched, on board, making a crucial contribution to the anti-air warfare defence and deep strike capabilities of warships. Another major success in 2023 was the signing, again with MBDA, of a five-year support and maintenance contract for 170 Sylver® vessels.



INNOVATION

Innovation is another of its drivers for expansion, whether it's in equipment, industrial production or manufacturing processes. At the end of the year, there were strong signs of interest from various naval forces in the new modular multi-purpose launcher that Naval Group presented at the Naval Innovation Days (NID) event in the autumn. More compact and easier to integrate, this all-in-one equipment can be fitted with different types of effectors for defence against different types of threat. Designing new products that are perfectly aligned with client requirements is in Naval Group's DNA. For Élisabeth Raynaud, "being in contact with different naval forces from around the world strengthens our ability to listen and understand needs and requirements, and guides our innovation efforts towards appropriate and competitive responses". To date, Naval Group equipment is sold in over 20 countries in Europe (including the United Kingdom, Italy, Greece, Belgium and the Netherlands), the United States, Asia (India, Japan, Thailand), Africa (Morocco and Egypt) and Australia. This international presence is both an open door to the rest of the world and a gateway to new construction contracts.

BRINGING TALENTS TOGETHER

For the SEP Department, stand-alone activity supplements the major programs. It smooths out the workload, which can be irregular between two vessel programs. It also enables skills to be maintained and developed, not to mention the industrial resources, whose operating and upgrading costs are therefore more cost-effective. Lastly, as a last strategic driver, an equipment and systems service offering, combined with that of the Services Department, is currently being studied. The key idea is to bring together skills and feedback from clients, with the aim of optimising the entire product lifecycle, thus fuelling innovation and future developments. •



The shaft lines for the programs are manufactured at the Angoulême-Ruelle site.



NAVAL GROUP WINS A SHAFT LINE CONTRACT IN AUSTRALIA

In April, Naval Group won the contract to supply the shaft lines for Australia's nine future T26 frigates (Hunter Class). It is a major order, and promises a substantial flow of business over the next few years. A few weeks earlier, an Australian delegation, including representatives from the BAE Systems Australia and Commonwealth of Australia (CoA) programs and procurement teams, had visited the Nantes-Indret and Angoulême-Ruelle sites, which are involved in the design and production of this equipment. The first contract concerns the first three ships. This is part of the BAE T26 program, through which Naval Group is already supplying eight frigates to the British Royal Navy.

DRONES, AUTONOMOUS SYSTEMS AND UNDERWATER WEAPONS

BECAUSE TOMORROW'S BATTLES ARE LIKELY TO BE HIGHLY DRONE-BASED, AS WELL AS BEING CONNECTED AND COLLABORATIVE, NAVAL GROUP IS INCREASING ITS EXPERTISE AND KNOW-HOW IN THE DESIGN AND PRODUCTION OF UNDERWATER WEAPONS, DRONES AND AUTONOMOUS SYSTEMS. THE AIM IS TO OFFER ITS NAVAL CLIENTS A NEW, DIFFERENTIATING CAPABILITY INTEGRATED INTO SURFACE VESSELS AND SUBMARINES. FURTHER INFORMATION.





CONTRACTS

THEN THERE WERE THE ARMED DRONES

In December 2023, the French Defence Procurement Agency (DGA) awarded Naval Group the master contract and its first subsequent contract to study, build and test an initial demonstrator for an unmanned mini-submarine combat craft. What is it called, you ask? The Unmanned Combat Underwater Vehicle (UCUV).

The pace of activity in Naval Group's Drones, Autonomous Systems and Submarine Weapons (DSA) Department sharply accelerated in 2023. Driven by an initial contract awarded in April 2023, representatives from the DGA, the French Navy and Naval Group have together laid the foundations for the future demonstrator of a combat submarine drone. Six priority use cases have been defined, along with an initial high-level architecture file for the future vector. This momentum opens up interesting development prospects for Naval Group, as it can now back up its work with concrete operational jobs.

INITIAL EXPERIMENTS

In parallel with these initial studies and the implementation of the UCUV framework agreement, in May Naval Group launched its extra-large unmanned underwater vehicle (XL UUV) demonstrator, previously known as the DDO (*see box*). After successful initial surface trials in June and an immersion test phase at the end of September, it showed off its prowess in the autumn during client trials in Toulon harbour. Two of these trials were part of the Mine Risk Clearance For Europe (Miracle) mine warfare project and the anti-submarine warfare European Autonomous Networked Innovative and Collaborative Environment (Seanice) submarine warfare project. The third was commissioned by the French Navy itself. This fruitful collaborative trial demonstrated the value of these new capabilities and their high added value.

SHARED AMBITION

Encouraged by these positive results, the Ministry of the Armed Forces wanted to go even further. This gave rise to the UCUV framework agreement, which was awarded to Naval Group in December 2023. Its ambition is to carry out all of the studies and developments of the main technological building blocks that make up the future Navy demonstrator of an unmanned mini-submarine combat craft. Its notification was combined with that of a first subsequent contract (MS1), the aim of which is to study and validate secure autonomous navigation based on Naval Group's DDO demonstrator (which has since been renamed XL UUV), and then to develop the first version of the controlled decision-making autonomy (ADC)[®] of the future UCUV (*see box*). Future subcontracts will also include studies and the validation of technological building blocks for long

EXTRA-LARGE UNMANNED UNDERWATER VEHICLE: CALL ME XL UUV!



DDO is the name of the first demonstrator of a large-scale underwater drone (XL UUV) developed by Naval Group. In 2016, the group began investing its own funds to design and build an unmanned vehicle capable of carrying out fully autonomous intelligence missions. A new version of the demonstrator was launched in 2023 to respond to these challenges. Featuring new carrying capacities and enhanced safety principles (including cyber), it also benefits from a new hydrodynamic shape, the design of which significantly enhances navigation performance. A total

of 5,000 new parts were redesigned and manufactured for this V2. Tested and qualified in September, this optimised XL UUV demonstrator will be at the heart of the trials associated with the UCUV master contract.

APRIL 2023

Announcement of the contract to study the practical cases and high-level architecture of an unmanned mini-submarine.

DECEMBER 2023

Announcement of the seven-year UCUV framework agreement and the first MS1 subsequent contract.



WHAT IS CONTROLLED DECISION-MAKING AUTONOMY (CDA[®])?

"At Naval Group, we believe that tomorrow's naval combat will involve a mix of manned and unmanned units. If drones and autonomous systems are to be an integral part of the naval force system, they need to be autonomous and resilient to the hazards that arise in the theatre of operations, otherwise they risk becoming unnecessary burdens. ADC[®] is the innovative solution that Naval Group has developed to overcome this challenge. It combines two areas of expertise: mission systems and onboard intelligence, namely developed for the F21 heavyweight torpedo. Its great strength also lies in the coupling of a digital twin to the operator's workstation, which is a replica of the intelligence on board the drone and synchronises with it. The twin continues to display the mission, while the drone conducts the mission within the initial framework, even if the communication link is temporarily broken, until the vector reconnects and updates its data. The operator is never left in the dark."

Raphaël Goletto, ADC[®] Project Manager

endurance, implementation of resources and weapons, followed by production of the UCUV demonstrator and, finally, its first trials by the French Navy. At the same time, Naval Group has deployed its other demonstrators, torpedo UAVs and small and medium surface UAVs, to increase its maturity and to test new applications. Cyril Lévy, Director of Drones and Autonomous and Collaborative Systems, confirms it: "2023 was the year of the armed drones for Naval Group. These are projects that we have been able to build and run in close collaboration with the French Navy DGA, using an agile approach and a process involving iterative concepts, studies, development and experimentation (CD&E). The UCUV will be Europe's first XL UUV, and we're very proud to be working with the French Ministry of Defence."

TEAMS AND PARTNERSHIPS

Naval Group designs, develops and produces, alone or with its partners, the main building blocks of the armed drones. Led by DSA,

several Naval Group sites have teamed up to take on this vast contract, which calls on the expertise of architects and software designers in the fields of mission systems, detection, data fusion, autopilots, guidance and navigation, and cybersecurity. Not forgetting those of the French national aerospace research centre (ONERA), the National Digital Technologies research Centre (INRIA), the Montpellier Laboratory of Computer Science, Robotics, and Microelectronics (LIRMM) and Delfox, a start-up specialising in autonomous artificial intelligence. Special mention should also be given to the group's systems engineers, designers and architects of electrical plants for the production and management of energy using fuel cells, who are also collaborating for the benefit of UCUV's long endurance, in particular with the French Atomic Energy and Alternative Energies Commission (CEA). •

NAVAL GROUP IS EXCEPTIONALLY PROUD TO BE WORKING WITH THE FRENCH MINISTRY OF DEFENCE ON THIS NEW UAV CAPABILITY.

AURORE NEUSCHWANDER, DIRECTOR OF DRONES, AUTONOMOUS SYSTEMS AND UNDERWATER WEAPONS



IN THE FIELD

DRONES REALLY PUT TO THE TEST

Underwater, surface and aerial unmanned vehicle demonstrators: by 2023, Naval Group has taken up the challenge of putting a whole armada of drones to sea! So, what is the purpose? To test our concepts and give our sailors confidence.

Naval Group conducted several experimental campaigns in the Mediterranean over the course of the year. In particular, the aim is to support naval forces in defining their use cases and to test drone demonstrators in real-life conditions in order to assess their robustness, as well as enabling sailors to familiarise themselves with them. This was the case at the beginning of February, off the coast of Hyères, as part of the joint Orion exercise (large-scale operation for resilient, interoperable, high-intensity oriented and

innovating armies), the largest multinational military exercise of the last three decades, in terms of its duration (four sequences staggered between 2021 and 2023) and its numbers (several thousands of soldiers involved). Teams from Naval Group's Drones, Autonomous Systems and Submarine Weapons (DSA) Department have evaluated the use of the D2i (medium UUV, heavy torpedo format) submarine drone, equipped with the ADC®. This mission, steered from the operations centre at Euclide, an annex of the Naval Group site at Ollioules, was a response to a scenario proposed by the French Navy. The challenge was to re-plan in real time and adapt the mission to its

environment and to the position of the target, which was unknown at the outset, and the drone responded successfully. Sailors from the Naval program expertise centre (CEPN) expressed their satisfaction at the end of the day, which confirmed the robustness, modularity and operational value of this capability. A month later, Sirehna Remorina, an unmanned surface vehicle (small USV), was deployed off the coast of Sète for an experiment designed to demonstrate its expertise in electromagnetic intelligence and the efficacy of its Seahawk mission and supervision system. These initial successes are extremely encouraging for the prospects of integration and operation in naval forces.

AN EXPORT MARKET WITH CERTAIN CONDITIONS

Alongside the UCUV program for the French Ministry of Defence, Naval Group is refining and implementing its commercial strategy for UAVs and autonomous systems. We have received formal requests from foreign naval forces looking to acquire this type of capability. To overcome this challenge, the group and the International Development Department of the French Defence Procurement Agency (DGA/ID) began work in 2023 to define the conditions under which these resources can be exported to client countries. This joint work and the good results obtained with Naval Group's demonstrators give us hope that we will soon be able to promote export offers.



The Remorina unmanned surface vehicle.



In October 2023, the naval UAV system (NUAV) was successfully tested at sea on the Provence multimission frigate (FREM).

UAV SYSTEM FOR THE FRENCH NAVY (SDAM)

In October, Naval Group and Airbus Helicopters reached a major milestone, working with DGA and the French Navy, on the demonstrator for the naval UAV system (NUAV) on the *Provence*, a multimission frigate (FREM). Backed by the VSR700 rotary-wing UAV system from Airbus Helicopters and the I4® Drones mission system developed by Naval Group, it demonstrated during sea trials its seamless integration and ability to cohabit perfectly with the ship's other systems. The target date of 2026 for making the first operational capability available seems realistic, given the success of these initial trials. The SDAM program brings together the expertise of the French naval and aeronautical industries, both of which are committed to providing a sovereign airborne drone capability for the French Navy's top-ranking ships.

STERENN DU

Finally, the DSA and Sirehna teams ended the year on a high note, with promising initial integration tests under ADC® of *Sterenn Du*, the medium-sized unmanned surface vehicle demonstrator (medium USV). After its

WE HAVE REACHED AN IMPORTANT MILESTONE IN TERMS OF THE COMPLEXITY OF PHYSICALLY AND FUNCTIONALLY INTEGRATING UAVS WITH A HEAVILY ARMED SHIP.

PIERRE ÉRIC POMMELLET, CHAIRMAN AND CEO OF NAVAL GROUP, AT THE END OF THE SDAM TRIALS IN OCTOBER

transfer from Brest to Lorient at the beginning of 2023, *Sterenn Du* has been rigged with a new mast equipped with sensors, the data from which will be used to establish a navigation situation without a human being on board. Making this 17-metre aluminium catamaran autonomously seaworthy, but with operational remote control, was one of the first objectives for 2023. Milestone reached! Relocated to Toulon in the autumn, the USV will benefit from new installations in 2024 and a new battery of tests linked to the operation of sensors and the finalisation of integration work. •

2023

They've done it! The aim of deploying the ADC® on Naval Group's three autonomous systems demonstrators has been met.



F21 TORPEDO

VIVA O BRASIL!

What an adventure! After years of development and qualification, delivery of the F21 torpedoes, first to the French forces (from 2020) and then to the Brazilian forces, continued at a steady pace in 2023, with a net increase in training launches by both naval forces.

The F21 torpedo is a latest-generation wire-guided heavyweight torpedo with extremely high operational performances, making it one of the best in its category internationally. This F21, an asset exclusive to submarines, is a formidable weapon. It can engage a target at very long range, approaching it discreetly, dodging the most modern countermeasures and attacking with very high speed and a pyrotechnic charge sufficient to neutralise or destroy the most modern surface ships and submarines. Its advanced mission system, and particularly the tactical intelligence

it incorporates, have directly contributed to foreshadowing the decision-making autonomy of the underwater drones currently being developed by Naval Group. The F21 was developed as part of the Artémis program, led by the DGA, which will see around a hundred units delivered to all of the nuclear submarines in the French fleet (see box).

DO BRASIL

The Brazilian Navy has also chosen the F21 to equip its fleet of four Scorpène® submarines, currently under construction in Itaguaí, Brazil. Named Contract 3, it was signed as part of the Prosub program. In 2023, important milestones were reached. Let's start with the first firing exercise launched from the *Riachuelo*, the first in the series,

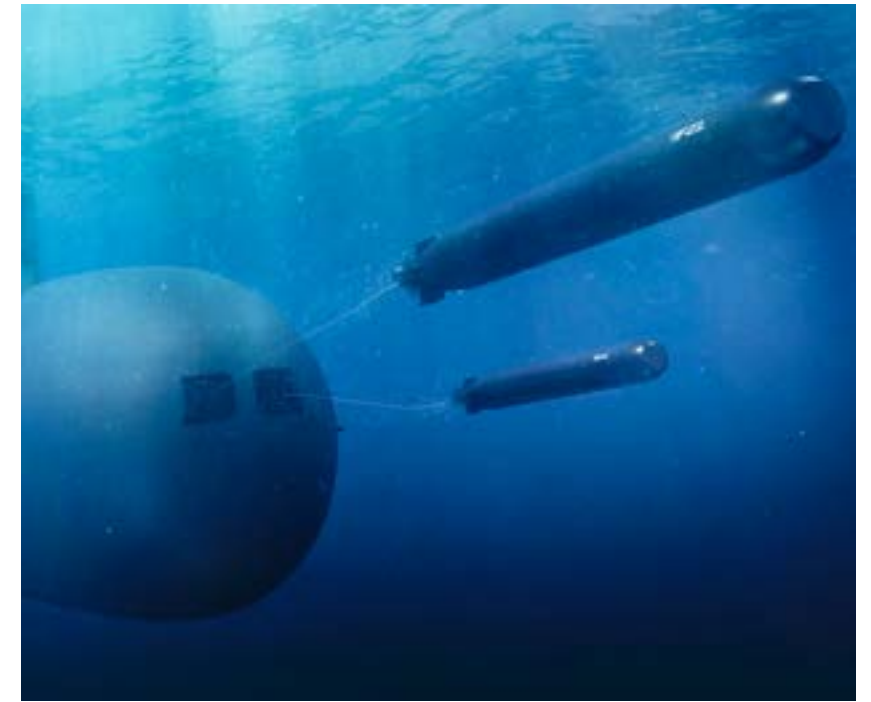
on November 11: on that day, months of preparation and close collaboration between teams from Naval Group, its subsidiary Naval Group do Brasil, Itaguaí Construções Navais (ICN) and the Brazilian Navy were crowned with success. Two months earlier, on September 5, the second submarine in the Prosub program, the *Humaitá*, fired its first F21 torpedo off the coast of Itaguaí. Given its link to a contractual clause, this success paved the way for the acceptance of the *Humaitá* by the Brazilian Navy at the end of the year. It was also a condition for the acceptance of the second of the four batches of torpedoes ordered, which were sent to Itaguaí in March before being integrated on board the ship in August. The third batch of torpedoes was delivered in November,



On September 5, 2023, the Brazilian submarine *Humaitá* fired its first F21 torpedo off the coast of Itaguaí.

F21: EXCEPTIONAL PERFORMANCE

- Start of design: 2008
- First commissioning: 2020
- Length: 6 metres
- Diameter: 533 millimetres
- Weight: 1.3 tonne
- Range: over 50 kilometres
- Maximum speed: > 50 knots
- Scope of application: complex environments in shallow and deep waters, including those with heavy traffic
- Missions: neutralising enemy ships and submarines
- Classes equipped: Barracuda (SSN), Rubis (SSN), Triomphant (SSBN) and Scorpène® Brasil (SSK)



whilst the third Scorpène® was in the trial phase and the fourth in the shipyard. In addition, since mid-2023, the Brazilian navy has been fully autonomous in the implementation of its sea firing training program and the maintenance of its torpedo stockpile. Naval Group has trained it for this purpose and provided it with the necessary equipment.

COLLECTIVE SUCCESS

The success of contract 3 of the Prosub program is, to their credit, the fruit of the mobilisation of the integrated team (combat system, firing installations, underwater weapons) from the Ollioules, Angoulême-Ruelle and Saint-Tropez sites, some of them having relocated to Brazil. Although the client is delighted, the manufacturer is also aware of the commercial stakes at hand, as this is the first export contract for the F21. This contract is closely linked to the Artémis program for France", explains Jean Gauthier, Director of Naval Group's Saint-Tropez site and submarine weapons activities. Development of the F21 was still underway when the Brazilian Navy opted for the F21. Naturally, it has kept a

close eye on the progress of the Artémis program, the delivery of the first batches of torpedoes to the French Navy and, above all, the first training trials. The F21 is now fully operational within the two naval forces, and their satisfaction with the torpedo's performance, particularly that of our first Brazilian export client, stands as ultimate testimony, giving us an excellent argument

to convince other naval forces to place their trust in us." Although she is already at the top of her generation, Naval Group is not resting on its laurels: the F21 continues to benefit from improvements. Fundamental steps in the design of future increments that can be offered to our clients were taken in 2023 by the teams. An exceptional year in 2023! •

THE F21 QUALIFIED FOR THE CLASSES OF FRENCH NUCLEAR SUBMARINES IN SERVICE

In addition to supplying the French Navy with F21s and their launch systems, the Artémis contract also involved adapting France's three classes of nuclear submarines (Rubis-class nuclear attack submarines, Suffren-class Barracuda nuclear attack submarines and Triomphant-class nuclear ballistic missile submarines) for this new heavyweight torpedo. Following the successful firing test on the *Suffren* nuclear attack submarine (SSN) acquired at the end of 2022, 2023 saw the momentum continue at a very sustained pace, with the successful test firing on the *Émeraude* SSN in March 2023, validating the Rubis class submarines. The challenge of this test campaign was overcome in record time. The campaign was completed in just six weeks, thanks to the unflinching cohesion and synergy of the teams, who immediately went on to carry out the firing test for the nuclear-powered ballistic missile submarine (SSBN) *Le Terrible*, which was successfully carried out in April, thereby completing the qualification of the three types of carrier. Collective efficiency.

JOHANNA BLANC PROGRAM DIRECTOR

Johanna Blanc joined the Programs Department on the Saint-Tropez site in June 2021.

CONTINUOUS PROGRESS

Johanna Blanc obtained a bachelor's degree in management in England, which she then followed up with a specialised master's degree in procurement and supply chain at Skema Business School. A work placement in the purchasing department at Naval Group's Saint-Tropez site gave her an insight into the defence industry. Having enjoyed the experience, she continued at the same site in the same business for her apprenticeship

Philippine Navy frigates - she played a big part in the signing of the contract. She also oversees the French contract for the same Canto® countermeasures solution, as well as other projects in the Drones, Autonomous Systems and Underwater Weapons (DSA) Department. "Once a contract has been signed, my job is to ensure that all goes to plan in terms of costs, quality, deadlines and client satisfaction. It's a matter of analysing the contract, organising its breakdown into activities

without unforeseen events, being able to handle stress and demonstrate versatility are great assets", says Johanna. My job requires me to enjoy working in a team, prioritising and communicating. You have to listen to your teams and the clients, and you need to know how to bounce back when things go wrong. A Program Director must also earn the trust of those they're working with, and they need to trust their colleagues and partners in return; delegation is part of the job."



NAVAL GROUP IS COMMITTED TO HELPING US PROGRESS. WITH EACH NEW CAREER MOVE, NEW SKILLS CAN BE ACQUIRED.

the following year, at the end of which Naval Group recruited her. For five years, she worked on proposals before moving on to French and international sales. "The company then offered me the chance to join the Programs Department. This progress meant that I could continue to monitor the contracts I had started as a sales person and develop new skills by now being involved in their execution and performance."

EXECUTING AND FULFILLING CONTRACTS

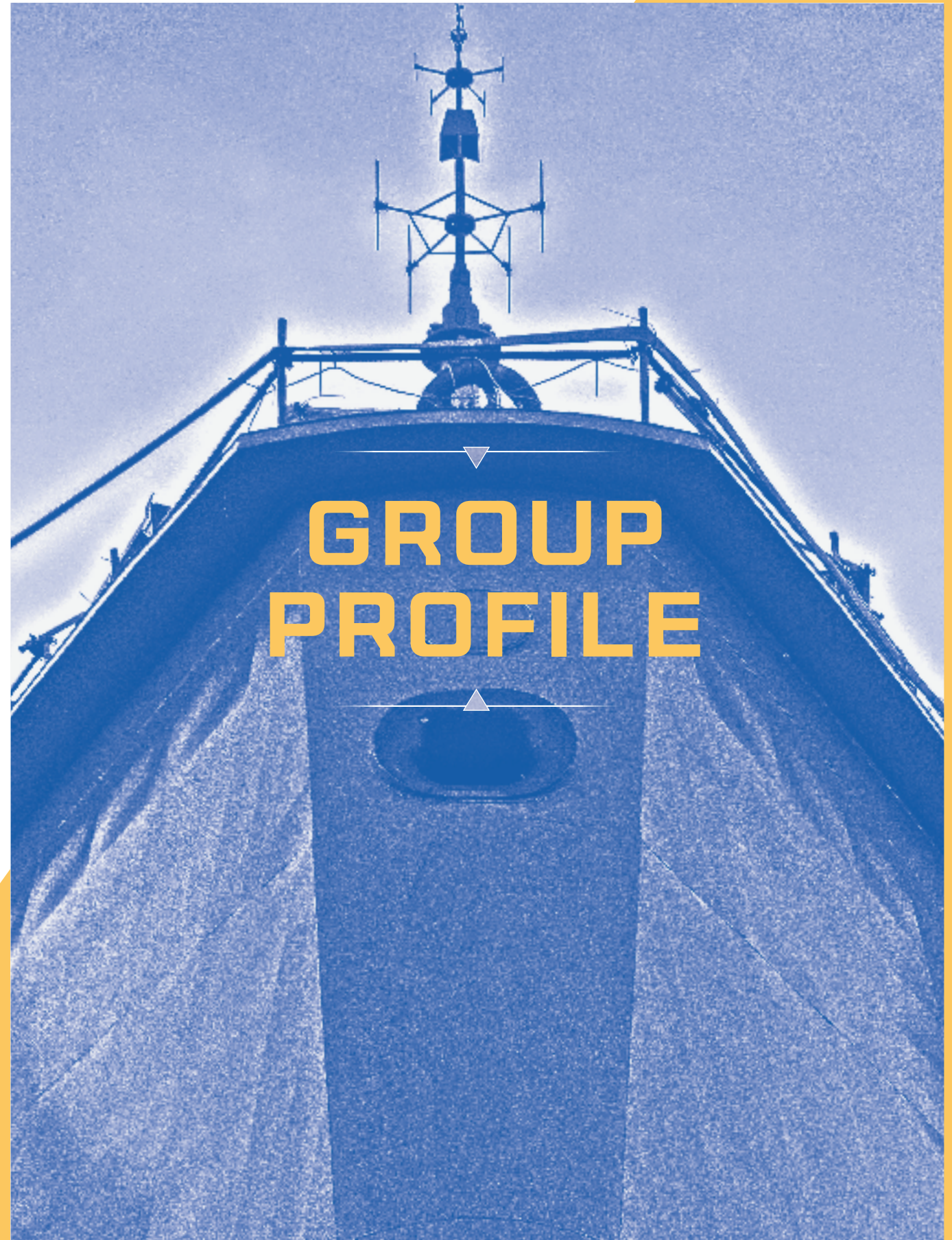
Johanna's remit includes monitoring the contract signed in 2021 to complete the torpedo defence system on two

for the project team and then coordinating progress, while managing communication internally and with clients", explains Johanna. It's a very transversal role, and I have the chance to work on complex and exciting products and to collaborate with entities spread across all of the group's sites, from engineering to production, including purchasing and export control. Good cooperation is essential if we want to honour our commitments."

WORK FOCUSED ON EXCHANGES

"Every day is different and brings new challenges, and as there aren't many projects

Proud to work for an industrial company that contributes to the country's sovereignty and has an international reputation, Johanna says she is grateful to have benefited from so many opportunities since joining Naval Group. She is also delighted to be part of the dynamic that has been built up since the creation of DSA. "My job is very rewarding, because I get to learn how our projects are run. As this job exists on all of the group's sites, there are multiple opportunities for transfers. Moving on to another cross-functional role would also be a possibility."



2023 HIGHLIGHTS



23 JANUARY

INDIA

Vagir, the fifth Scorpène® submarine built by the Indian shipyard Mazagon Dock Shipbuilders Limited (MDL), is commissioned and delivered to the Indian Navy.

23 JANUARY

OPEN INNOVATION

Naval Group signs an agreement with the Naval Materials Research Laboratory (NMRL) for the detailed design phase pertaining to the integration of the Air Independent Propulsion (AIP) system into Kalvari-class submarines.

1st JANUARY

NAVAL GROUP ROLL OUT ITS NEW ORGANISATION

Naval Group implements a new organisational structure aimed at driving its ambition in terms of growth and competitiveness, keeping its customers' best interests in mind.

23 JANUARY

DECONSTRUCTION OF L'INFLEXIBLE, THE FIRST-GENERATION NUCLEAR-POWERED BALLISTIC MISSILE SUBMARINE (SSBN), REMOVED FROM ACTIVE SERVICE IN 2008, STARTS ON THE SITE OF CHERBOURG.



18 FEBRUARY

ORION JOINT FORCES EXERCISE

Naval Group tests the D2i (torpedo format) underwater drone off the coast of Hyères as part of the Orion 2023 military exercise. Sirenha's surface drone Remorina is also deployed for this trial.

22 FEBRUARY

MINEHUNTERS

Oostende, the first of series of twelve mine countermeasure vessels included in the Belgian-Dutch rMCM program and intended for the Belgian Navy, is launched in Concarneau.



APRIL

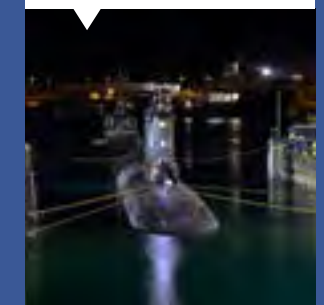
EQUIPMENT

Naval Group is awarded a contract with BAE Australia for shaft lines to be used on Australian T26 (Hunter-class) frigates.

27 MARCH

SEA TRAILS

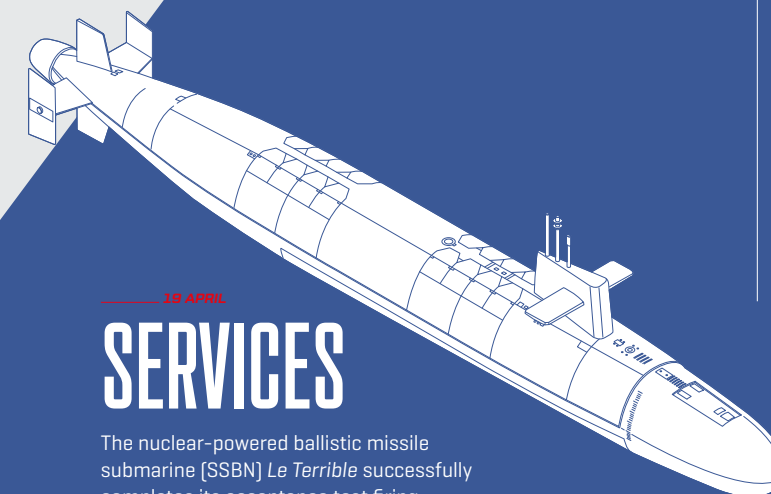
Duguay-Trouin, the Barracuda program's second nuclear attack submarine (SSN) performs its first sea outing.



4 MAY

AIRBORNE DRONES

An airborne drone is launched from a nuclear attack submarine (SSN) for the first time in France. Teams from Naval Group, the Original Equipment Manufacturer (OEM) Diodon and the French Navy accomplish this feat in real conditions.



18 APRIL

SERVICES

The nuclear-powered ballistic missile submarine (SSBN) *Le Terrible* successfully completes its acceptance test firing.

4 MAY
UCUV: A NEW CONTRACT

The French Defence Procurement Agency (DGA) signs a contract with Naval Group to study the main use cases and system architecture of Unmanned Combat Underwater Vehicles (UCUV).



JUNE

THE SSN PERLE IS DELIVERED!

Naval Group delivers the nuclear attack submarine (SSN) *Perle* to the French Navy while teams start work on the Mid-Cycle Docking (MCD) of the SSN *Suffren*.

18 JUNE

NAVAL GROUP, ATTRACTIVE COMPANY FOR STUDENTS

After making the Top 5 Universum ranking of attractive companies for engineering students in the sectors of defence and aerospace, Naval Group is now amongst the Top 10 most attractive companies for engineers and is progressing in all the business, commercial and IT categories.

07 JULY

A NEW SHIP FOR SENEGAL

Wala, the first of series of Offshore Patrol Vessels (OPV) for the Senegalese Navy is accepted in Dakar.



5 JUNE

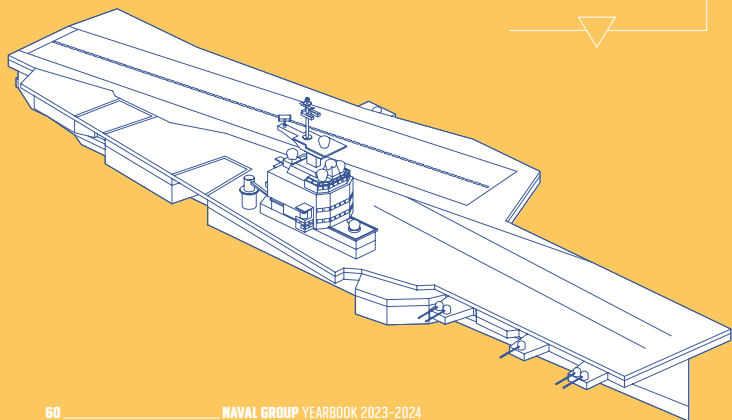
CYBER-SECURITY

Naval Group Belgium and its partners sign the Naval Cyber Alliance convention with the objective of federating actors from the academic, public and private worlds to respond effectively to Belgium's ambitions in the field of naval and maritime cybersecurity.

16 MAY

AIRCRAFT CARRIER

Mid-Cycle Docking (MCD) of the aircraft carrier *Charles de Gaulle* starts, aiming to address obsolescence, guarantee its availability in the future and renew its operational capabilities.



19 JULY

JACQUES CHEVALLIER IS DELIVERED

Jacques Chevallier, the first of four replenishment vessels (BRF) and a part of the logistics fleet (Flotlog) program is accepted in Toulon by the French Defence Procurement Agency (DGA) for delivery to the French Navy.



JULY

COUNTER-MEASURES

Naval Group delivers the Contralto® countermeasures system for surface vessels of the French Navy: defense and intervention frigates (FDI) and La Fayette-type frigates (FLF). During 2023, other deliveries are being made to our marine customers in the Philippines, Indonesia, the United Arab Emirates (UAE), Saudi Arabia, Bulgaria and Greece.



20 JULY

THE NUCLEAR ATTACK SUBMARINE (SSN) TOURVILLE, THE THIRD SHIP IN THE BARRACUDA PROGRAM IS TRANSFERRED TO THE LAUNCHING FACILITY.

SEPTEMBER

FCDs CONTINUE AT BREST SITE

End of the Full Cycle Docking (FCD) on the nuclear-powered ballistic missile submarine (SSBN) *Le Terrible*, and the beginning of the FCD phase on the SSBN *Le Vigilant*.



28 JULY

NAVIRIS WINS HORIZON FRIGATES UPGRADE CONTRACT

The Organisation for Joint Armament Co-operation (OCCAr) awards a contract to Naviris and Eurosam for the mid-life upgrade (MLU) of French and Italian Horizon frigates.

AUGUST

UAV: SUCCESSFUL DEMONSTRATION

Sirehna, Dronysos and Diodon successfully demonstrate the deployment of the UAV and a swarm of drones, the objective being to demonstrate the value of a USV equipped with a UAV for surveillance, detection and threat neutralisation missions.

26 SEPTEMBER

STUDYING BIODIVERSITY TO PROTECT IT BETTER

The Bougainville mission, bringing together the French National Centre for Scientific Research (CNRS), the French Navy, Paris Sorbonne University and Naval Group, is launched at the Roscoff Marine Station. The challenge: study the invisible marine biodiversity on a global scale.



SEPTEMBER

F21

The F21 is successfully test-fired from *Humaitá* taking the number of F21 compatible submarines to a total of seven.



SEPTEMBER

SSBN 3G

Industrial transformation on the sites of Cherbourg and Nantes-Indret progresses at a sustained pace to accommodate the third-generation nuclear-powered ballistic missile submarine program (SSBN 3G).

04 OCTOBER

A CEREMONY IS HELD IN LORIENT TO CELEBRATE THE FLOATING OUT OF THE FIRST DEFENCE AND INTERVENTION FRIGATE (FDI) *KIMON*, MEANT FOR THE GREEK NAVY.

04 OCTOBER

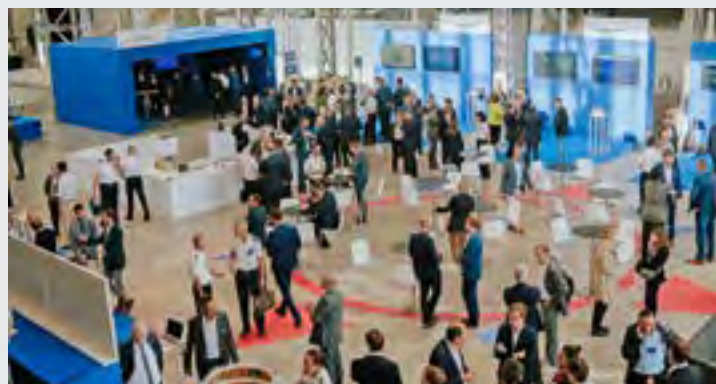
BRAZIL

The first metal sheet for the qualification section of the conventionally armed nuclear submarine (SCPN) for the Brazilian Navy is cut in Itaguaí.

05 OCTOBER

NAVAL INNOVATION DAYS

As has been the custom every two years since 2016, Naval Group brings customers and partners together during the 6th edition of Naval Innovation Days, the company's event dedicated to innovation.



OCTOBER

THE DEMONSTRATION AT SEA OF THE AIRBORNE DRONE SYSTEM FOR THE NAVY (SDAM) ON THE MULTIMISSION FRIGATE (*FREMM*) *PROVENCE* IS COMPLETED SUCCESSFULLY.



OCTOBER

THE LA FAYETTE-TYPE FRIGATES TRANSFORMATION

End of refit and upgrade works on the La Fayette-type frigate *Aconit* in Toulon to modernise the hull, the combat management and platform operating systems and equip the frigate with anti-submarine warfare capabilities.

19 OCTOBER

MINE-HUNTER

The floating out ceremony of *Vlissingen*, the rMCM program's second mine countermeasure vessel meant for the Royal Netherlands Navy, is held in Concarneau.



21 OCTOBER

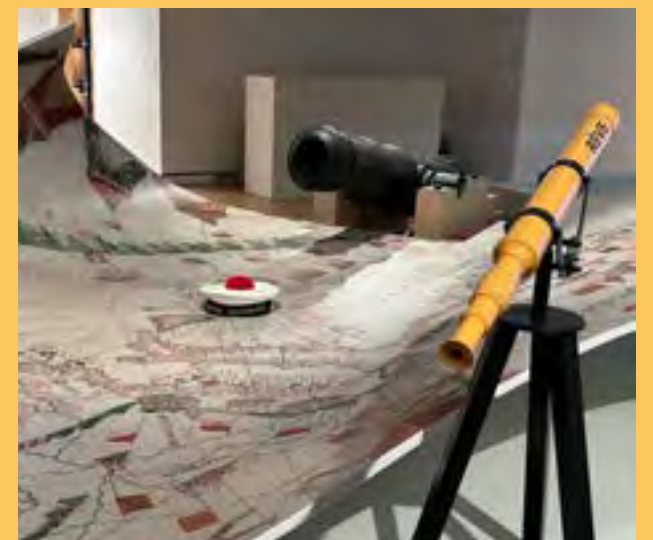
GOWIND®

The first corvette of the Gowind® program for the United Arab Emirates (UAE), *Bani Yas*, leaves the site of Lorient following its delivery ceremony.

17 NOVEMBER

LE MUSÉE DE LA MARINE REOPENS ITS DOORS!

The Musée national de la Marine in Paris reopens its doors following six years of renovation work. The first company to have joined the ranks of the Circle of builder patrons, Naval Group is proud to have contributed to the museum's renovation.



NOVEMBER

OVER 200 SYLVER® SOLD WORLDWIDE!

Naval Group proudly celebrates the sale of its 200th Sylver® vertical launching system. This significant step demonstrates Naval Group's efforts in terms of innovation while maintaining competitiveness in the design and production of state-of-the-art naval equipment.



11 NOVEMBER

NAVAL GROUP SUPPORTS LE BLEUET DE FRANCE

As part of Remembrance Day Commemorations on 11 November, Naval Group renews its support to the association Bleuets de France.

KEY FIGURES FOR **2023**
 (data as of 31 December 2023)

NAVAL GROUP: AN INTERNATIONAL GROUP AT THE FOREFRONT OF INNOVATION



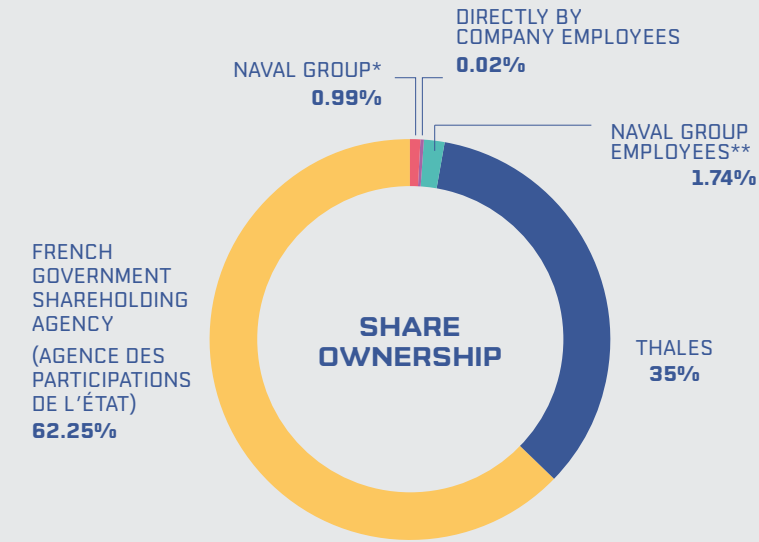
18
 COUNTRIES

- AUSTRALIA
- BELGIUM
- BRAZIL
- CHILE
- COLOMBIA
- EGYPT
- FRANCE
- GREECE
- INDIA
- INDONESIA
- ITALY
- MALAYSIA
- MEXICO
- NETHERLANDS
- PHILIPPINES
- SAUDI ARABIA
- SINGAPORE
- UNITED ARAB EMIRATES



**SITES IN
 FRANCE**

ANGOULÊME-RUELLE EQUIPMENT, SIMULATORS AND TRAINING, CONTROL AND NAVIGATION SYSTEMS BAGNEUX SYSTEMS BREST SERVICES CHERBOURG SUBMARINES LORIENT SURFACE SHIPS NANTES (INDRET / TECHNOCAMPUS Océan) ENERGY/PROPULSION, R&D, INNOVATION OLLIOULES SYSTEMS, CYBERSECURITY, COMPUTEREMERGENCY RESPONSE TEAM (CERT) PARIS HEAD OFFICE SAINT-TROPEZ UNDERWATER WEAPONS TOULON SERVICES



50
 NAVAL CLIENTS
 GLOBALLY

40 000
 DIRECT, INDIRECT
 AND INDUCED JOBS

* Naval Group Actionnariat.
 ** Current and former members of staff of the company and its subsidiaries through the Fonds Commun de Placement d'Entreprise Actionnariat Naval Group (FCPE Actionnariat Naval Group).

4.257 ^{€BN}
 REVENUES

3.376 €BN
 Order intake recorded
 during the 2023 financial year

14.4 €BN
 French and international
 booked orders

16 325
 EMPLOYEES*

* EQUIVALENT AVERAGE ANNUAL WORKFORCE FULL-TIME.

A MAJOR PLAYER IN NAVAL DEFENCE, WITH A UNIQUE MODEL



An international naval defence player, Naval Group is a partner to governments in the management of their maritime sovereignty. Naval Group uses the extraordinary know-how of its employees, its unique industrial resources and its capacity to arrange innovative strategic partnerships to meet its clients' requirements. The group designs, produces, supports, upgrades, decommissions and disassembles submarines and surface ships. As an industrial contractor, designer and builder of warships and combat systems, it also provides services for naval shipyards and bases. Aware of its corporate social responsibilities, Naval Group is a member of the United Nations Global Compact.

01

DESIGN AND PREPARATION

Naval Group's engineers, researchers and experts respond to the technological maritime challenges of tomorrow.

03

TRAINING AND SUPPORT

Naval Group offers its clients a comprehensive range of training and consulting services in all areas of naval defence.

02

PRODUCTION AND BUILDING

The industrial sites produce, assemble or build high-tech naval solutions.

04

MAINTENANCE, UPKEEP AND MODERNISATION

Naval Group ensures the in-service support of surface ships, submarines and equipment.

05

DECOMMISSIONING AND DISASSEMBLY

Naval Group performs the nuclear disassembly and the decommissioning of vessels.

GENERAL MANAGEMENT COMMITTEE

The General Management Committee considers all the major strategic, economic, financial or technological policies relating to the company's activity. As of 1 January 2024, Naval Group's General Management Committee has been composed of:

CHAIRMAN

Pierre Éric Pommellet.

ADMINISTRATOR APPOINTED BY DECREE AS A REPRESENTATIVE OF THE STATE

Pierre Jeannin

ADMINISTRATOR APPOINTED BY DECREE AS A REPRESENTATIVE OF THE STATE

Pierre Éric Pommellet, Patrice Caine, Nathalie Ravilly, Pascal Bouchiat, Bernard Rézat, Jacques Hardelay, Valérie Champagne, François Geleznikoff, Guenaëlle Penin de la Raudière, Geneviève Mouillerat, Monique Legrand-Larroche.

ADMINISTRATORS APPOINTED AS STAFF REPRESENTATIVES

Laurent Elie, Didier Chavrier, Tony Lecorps, Olivier Ménard, Béatrice Unia et Yvon Velly.



PIERRE ÉRIC POMMELLET
Chairman and Chief Executive Officer



FRANK LE REBELLER
Senior Executive Vice President, Finance



MARIE-LAURE BOURGEOIS
Executive Vice President, Sales and Marketing



GÉRALDINE LE MAIRE
Executive Vice President, General Secretary



VINCENT MARTINOT-LAGARDE
Executive Vice President, Services

THE MANAGEMENT TEAM

The governance of Naval Group is based on an Executive Committee. Presided over by the Chairman and Chief Executive Officer, the Executive Committee sets the group's objectives and rules on all matters that have a major impact on the group's strategy, its functioning and its commercial and operational activities.



LAURENT ESPINASSE
Executive Vice President, Submarines



JEAN-LUC FRANCE
Executive Vice President, Human Resources



GUILLAUME ROCHARD
Executive Vice President, Strategy, Partnerships and Institutional Affairs



OLIVIER DE LA BOURDONNAYE
Executive Vice President, Surface Ships



LAURENT MOSER
Executive Vice President, Operations and Performance



LILIAN BRAYLÉ
Executive Vice President, Systems, Equipment and Propulsion



CLAIRE ALLANCHE
Executive Vice President, Communications

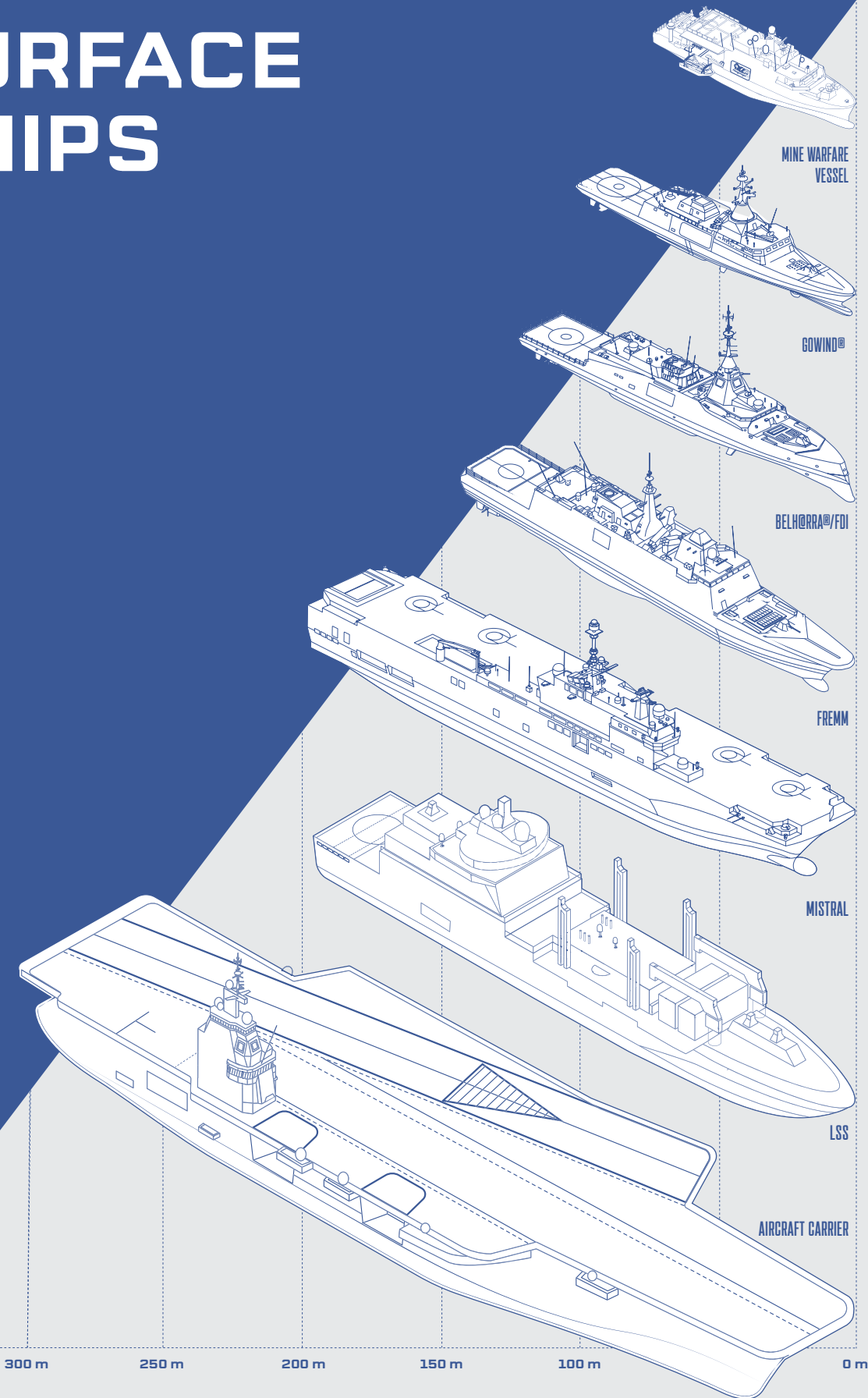


AURORE NEUSCHWANDER
Executive Vice President, Drones, Autonomous Systems and Underwater Weapons



ÉRIC PAPIN
Executive Vice President, Technical

SURFACE SHIPS



MINE WARFARE VESSEL

THE MINE WARFARE VESSEL STAND-OFF CONCEPT.

MISSIONS: completely drone-based mine hunting — safer for crews, with broader, scalable capabilities.

GOWIND®

THE BENCHMARK MULTI-ROLE CORVETTE.

MISSIONS: maritime defence and security operations, coastal and open sea, autonomous or in cooperation with a naval force.

BELHORRA®/FDI

THE LATEST GENERATION DIGITAL FRIGATE.

MISSIONS: all high-intensity naval operations, high detection capability, strong anti-aircraft firepower and command of sea warfare domains.

FREMM

THE EXPEDITION-CAPABLE MULTIMISSION FRIGATE (FREMM).

MISSIONS: all high-intensity naval operations, benchmark in anti-submarine warfare, long-range onshore strikes and naval force command at sea.

MISTRAL

THE AMPHIBIOUS HELICOPTER CARRIER WITH PROVEN EFFICIENCY.

MISSIONS: force projection, humanitarian support, aero-naval and amphibious operations command and hospital ship.

LSS

THE LOGISTIC SUPPORT SHIP.

MISSIONS: to ensure the operational availability and permanent presence of a task force at sea.

AIRCRAFT CARRIER

THE POWER PROJECTION SHIP.

MISSIONS: expeditionary aero-naval operations command, air support for sea to land operations.

ON-BOARD MISSION AND COMBAT SYSTEMS

SETIS®

The combat system for warships in high-intensity naval operations.

SUBTICS®

An integrated combat system for submarines that is powerful, highly automated and scalable.

I4®DRONES

The management system for unmanned operations.

PLATFORM SYSTEMS AND EQUIPMENT

A complete range of systems designed to ensure the security and control of surface ships and submarines in combat.

SHIPMASTER®

The automated control system for surface ships.

SYLVER®

Vertical missile launch systems.

SAMAHÉ®

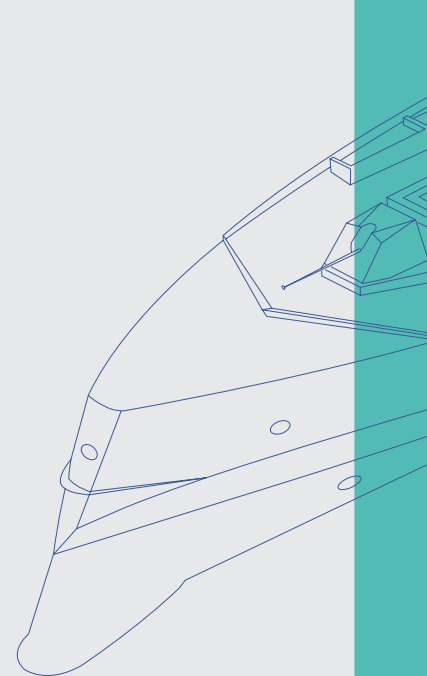
An efficient system for handling heavy on-board helicopters in rough seas.

INTEGRATED PLATFORM MANAGEMENT AND CONTROL SYSTEMS FOR SUBMARINES

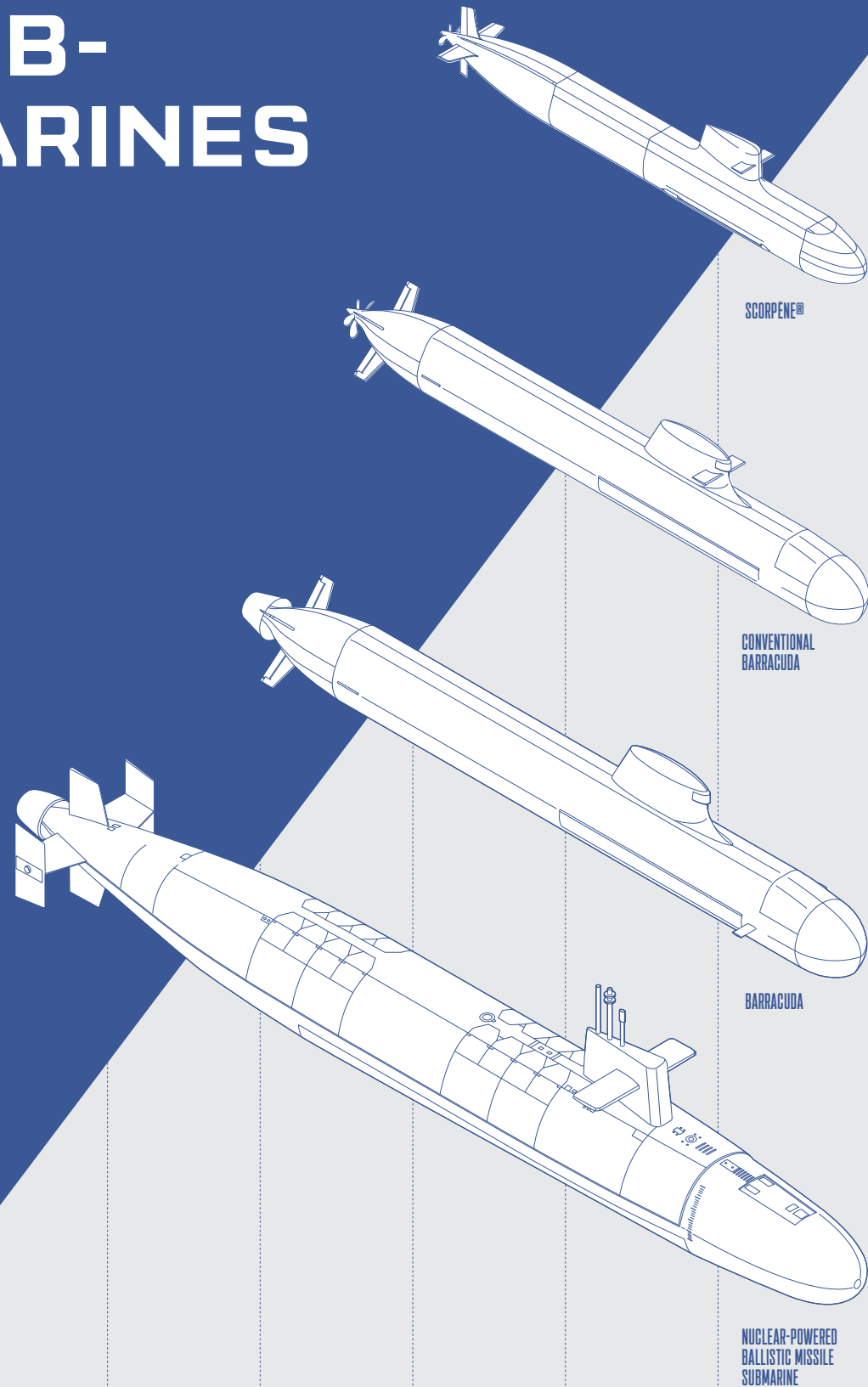
Integrated control systems ensuring centralised and particularly safe operation of submarines.

TORPEDO LAUNCHER INSTALLATIONS

For submarines and combat ships.



SUB-MARINES



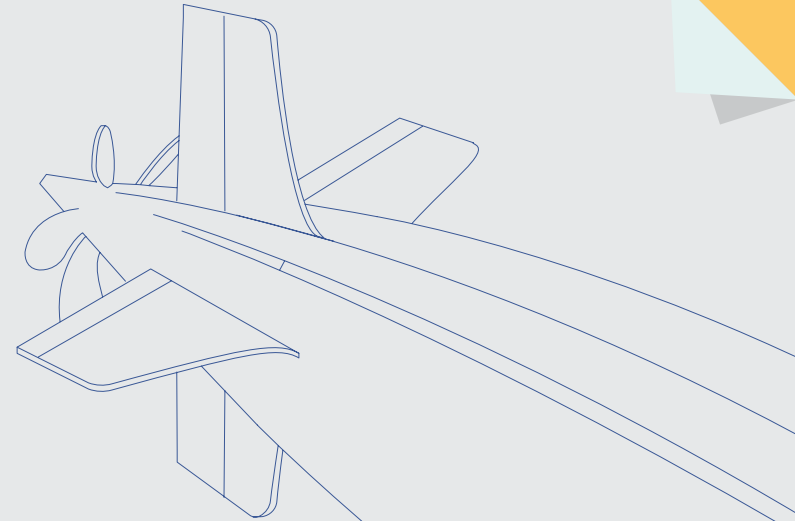
SCORPENE®

CONVENTIONAL BARRACUDA

BARRACUDA

NUCLEAR-POWERED BALLISTIC MISSILE SUBMARINE

150 m 125 m 100 m 75 m 50 m 25 m 0 m



SCORPENE® THE INTERNATIONAL BENCHMARK FOR CONVENTIONAL SUBMARINES. STEALTHY, POWERFUL AND DURABLE.

MISSIONS: warfare against surface ships and submarines, information gathering and special operations.

CONVENTIONAL BARRACUDA AN EXTREMELY QUIET, POWERFUL AND VERSATILE SUBMARINE THAT CAN BE DEPLOYED ON DISTANT AND LENGTHY OPERATIONS.

MISSIONS: all areas of warfare, high weapons carrying capability, various means of action for special forces and onshore strikes.

BARRACUDA A NUCLEAR STEALTH ATTACK SUBMARINE THAT IS PARTICULARLY MOBILE AND HAS GREAT ENDURANCE.

MISSIONS: all areas of warfare, dissuasion support, long-range strikes, wide-area surveillance, deployment with an aero-naval force and coalition deployment and special operations.

NUCLEAR-POWERED BALLISTIC MISSILE SUBMARINE THE BEST PERFORMANCE FOR NUCLEAR DISSUASION. INVULNERABLE BECAUSE UNDETECTABLE.

MISSIONS: nuclear dissuasion and ultimate protection of France's vital interests.

UNDERWATER WEAPONS

F21®

The latest-generation heavy torpedo for submarines.

MU90

The best-performing light torpedo in the world, adopted by nine navies and deployable from any naval or aerial platform.

CANTO®/CONTRALTO®

The benchmark torpedo defence system for surface and underwater vessels based on the revolutionary principle of confusion/dilution.

SERVICES

A range of bespoke services to ensure the operational excellence of surface ships and submarines in France and internationally.

MAINTENANCE, LOGISTICS SUPPORT AND MODERNISATION

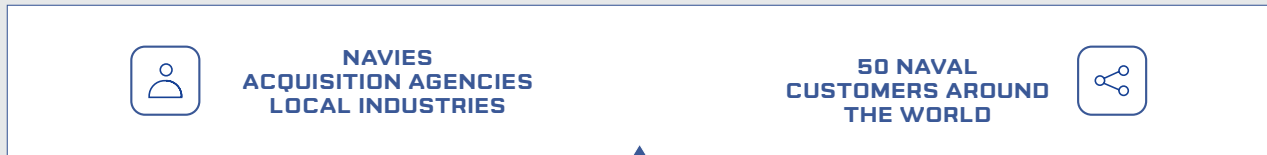
Ship maintenance and logistics support solutions meeting precise requirements: supply of spare parts via digital platforms such as Navigate, technical assistance from our experts and equipment manufacturers, back-up and support, and complete overhaul and incremental change solutions for ships.

EDUCATION AND TRAINING

A complete range of education and training solutions for the operation and maintenance of ships.

BUSINESS MODEL

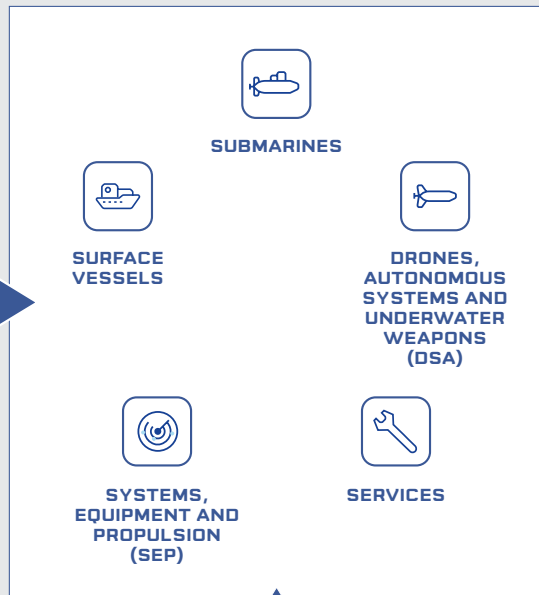
CUSTOMERS



ADVANTAGES

- Total control of armed vessels
- Control of the entire vessel life cycle
- 16,325 collaborateurs*
- Skills and know-how portfolio (naval architecture, engineering, industrialisation, production, in-service support, programme management, etc.)
- Commercial and operational references French Navy and other customers
- 10 sites in France
- 18 international locations (offices and subsidiaries)
- Transmission of knowledge and know-how
- Advanced member of the United Nations Global Compact

PRODUCTS AND SERVICES

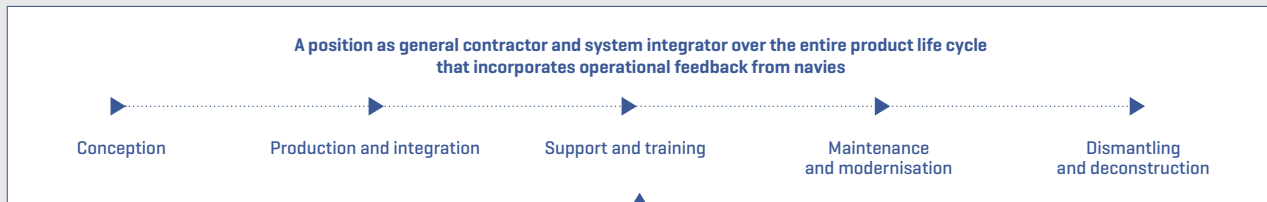


VALUE CREATED

- High-performance vessels and defence systems throughout their life cycle
- Maintaining the deterrent capabilities of the French Navy
- Fleet availability for our naval clients
- 40,000 jobs in the industry in over 80 departments in France
- Development of local industry in client countries, support for our clients' sovereignty issues
- Breakdown of added value created: investments, employees, ecosystem, shareholders

* Equivalent average annual workforce full-time.

KEY ACTIVITIES



PARTNERS

- Equipment manufacturers (propulsion, sensors, effectors, etc.)
- Subcontractors (engineering research, site services, etc.)
- Marine industries sector, universities, research centres, start-ups
- Public institutions and establishments
- Non-profit sector

OUR COMMITMENTS

Both in France and internationally, Naval Group wishes to advance its social approach in a collaborative and collective way with all stakeholders affected. Here are our commitments to each of them.

SHAREHOLDERS

To carry out the missions entrusted to us by relying on their support and expertise.

INDUSTRIAL PARTNERS

To engage in win-win cooperation.

EMPLOYEES

To give meaning to their tasks, to provide them with the keys to develop and commit themselves, and thus actively contribute to the company's performance.

PUBLIC AUTHORITIES, INSTITUTIONS

To involve them in decision-making by understanding their local constraints.

CLIENTS

[France and internationally] To create a favourable environment to meet their expectations.

MEDIA, JOURNALISTS

To create a positive dynamic of outreach and influence.

SCHOOLS, UNIVERSITIES

To ensure the expertise of current and future generations.

CHANNELS FOR EXCELLENCE AND INNOVATION

To be at the forefront of technologies that make a difference.

SUPPLIERS

To unite them around shared growth objectives.

An international naval defence player, Naval Group is a partner to governments in the management of their maritime sovereignty. Naval Group uses the extraordinary know-how of its employees, its unique industrial resources and its capacity to arrange innovative strategic partnerships to meet its clients' requirements. The group designs, produces, supports, upgrades, decommissions and disassembles submarines and surface ships. As an industrial contractor, designer and builder of warships and combat systems, it also provides services for naval shipyards and bases. Aware of its corporate social responsibilities, Naval Group is a member of the United Nations Global Compact.

For more information:
NAVAL-GROUP.COM

