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Naval Review

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NAVAL GROUP

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On 18 March, Naval Group welcomed the French President, Emmanuel Macron, and five members of the government to the site of Nantes-Indret, alongside its partners Chantiers de l'Atlantique and TechnicAtome, for the launch of construction of the *France Libre* aircraft carrier. This shared adventure, on which the France team has already been working since 2019, is being conducted, under integrated program ownership, by the French Defence Procurement Agency (DGA) and the French Alternative Energies and Atomic Energy Commission (CEA). The launch of construction marks a new phase in this large-scale program, a real strategic tool for the projection of French power, sovereignty and deterrence. It combines technological innovation, technical expertise, industrial mastery and national sovereignty. The result of cutting-edge know-how, it requires the mobilisation of sovereign skills and benefits the economy across France as a whole, mobilising hundreds of large groups, mid-market enterprises and small and medium-sized enterprises. Its construction will involve thousands of jobs until its entry into service.

Discover our report on page 6.

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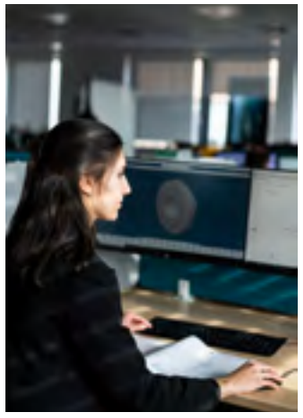

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PIERRE ÉRIC POMMELLET
Chairman and Chief Executive Officer of Naval Group

Dear readers,

The last few months have been rich in emotion, both in France and internationally, with three dates standing out in particular.

On 2 March, the French President, Emmanuel Macron, delivered a strong and solemn speech on French nuclear deterrence from the Île Longue operational base, where nuclear ballistic missile submarines (SSBN) are stationed.
During this speech, the Head of State revealed the name of the first third-generation nuclear ballistic missile submarine (SSBN 3G): *L'Invincible (see our article on page 12)*.
At Naval Group, three generations of engineers, technicians and workers have contributed to the development and maintenance of French deterrence, from the Le Redoutable-class in the 1970s, to the Le Triomphant-class in the 1990s and now the L'Invincible-class, which will set sail in 2036.

Two weeks later, on 18 March, we were honoured and proud to welcome the French President, Emmanuel Macron, back to the Naval Group site of Nantes-Indret. Alongside our partners Chantiers de l'Atlantique and TechnicAtome, the French President launched the construction program for the new-generation aircraft carrier (PA-NG) and unveiled its name: *France Libre (see our article on page 6)*.

Finally, on 19 May, we had the honour of being selected to provide the Royal Swedish Navy with four defence and intervention frigates (FDI). This program will provide the Royal Swedish Navy with a state-of-the-art frigate and extended capabilities in all areas of combat *(see our article on page 32)*, with a short delivery lead time, to meet the operational needs expressed by the Swedish Ministry of Defence.

These three dates were major milestones in our shared adventure in pursuit of our rationale: we deliver power at sea.

Four L'Invincible-class nuclear ballistic missile submarines (SSBNs) will gradually replace the four Le Triomphant-class SSBNs from 2037.

Trends in action

DISCOVER THE *FRANCE LIBRE* AIRCRAFT CARRIER, A TOOL FOR STRATEGIC AUTONOMY PAGE 6. THIRD-GENERATION NUCLEAR BALLISTIC MISSILE SUBMARINES (SSBN 3G) IN THE INTERESTS OF DETERRENCE PAGE 12. STEERIS: A PRODUCT LINE PAGE 21.

PA-NG

Naval power at the service of French sovereignty

Laurent Coudray,
PA-NG Program Director, Naval Group

Alexandre d'Ersu,
Program Purchasing and Bid Manager, Naval Group

AT THE END OF DECEMBER 2025, THE FRENCH PRESIDENT ANNOUNCED THE LAUNCH OF THE NEW-GENERATION AIRCRAFT CARRIER (PA-NG), BEFORE UNVEILING ITS NAME, *FRANCE LIBRE*, DURING A VISIT TO THE NAVAL GROUP SITE OF NANTES-INDRET IN MARCH OF THIS YEAR. A STRATEGIC TOOL FOR PROJECTING POWER, THIS VESSEL IS OF MAJOR IMPORTANCE FOR OUR COUNTRY.

The objective of the PA-NG program is to ensure the replacement of the *Charles de Gaulle* aircraft carrier with no disruption to capability upon its withdrawal from service in 2038.

As the flagship of the French Navy, the aircraft carrier constitutes one of the pillars of nuclear deterrence through the airborne nuclear force it provides, and ensures the projection of power from the sea via its carrier air group. It is therefore an indispensable tool of strategic autonomy, enabling France to maintain its status as a military and diplomatic force in the world. With the accompanying aeronaval group, the aircraft carrier also defends freedom of movement in international spaces and the security of air-sea space, in addition to participating in intelligence gathering.

"The PA-NG will be larger than the *Charles de Gaulle*, which will greatly enhance its carrying capacity. It will be innovative and scalable, with the ability to accommodate future aircraft of the carrier air group throughout its life", according to Laurent Coudray, PA-NG Program Director at Naval Group.

Innovations incorporated into the future vessel include improved nuclear propulsion, superior aircraft-carrying capability, a modular, resilient and scalable combat system, a data-centric and cybersecure digital architecture, and the ability to implement the future ASN4G missile, a vehicle for nuclear deterrence.

As the responsibility of an integrated project ownership structure bringing together the French Defence Procurement Agency (DGA) and the French Alternative Energies and Atomic Energy Commission (CEA), implementation of the PA-NG program is the result of the cutting-edge know-how of three industrial players with world-renowned expertise.

"Naval Group is the whole warship architect. It integrates critical systems such as power conversion, naval aviation and the combat system. It also produces nuclear reactor subassemblies. TechnicAtome designs, produces and commissions the nuclear reactors for naval propulsion as the architect and prime contractor, while Chantiers de l'Atlantique uses its expertise in the construction of very large ships", explains Laurent Coudray.

The launch of construction, which follows on from outlining work and industrial feasibility studies, marks a concrete phase for this project that began in late 2018. Naval Group and Chantiers de l'Atlantique then went on to create the company MO Porte-Avions in 2021 to conduct overall project management of the program in collaboration with TechnicAtome, and the summarised preliminary project phase began, followed by the detailed preliminary project phase from February 2023. This involved defining the vessel and its systems, as well as nuclear safety objectives and the industrial organisation.

"The manufacturers and prime contractors are already fully engaged in the activities for this major program for the French Navy", confirms Laurent Coudray. "Manufacturing of the main components of the nuclear reactors and containment ►

A tool of strategic autonomy, enabling France to maintain its status as a military and diplomatic force in the world.

▸ structures began in 2025 at the Naval Group sites of Nantes-Indret and Cherbourg. During the development and construction phase of the program, which is now commencing and is set to last until 2036, the detailed outfitting of the PA-NG will be produced and its equipment industrialised, developed and integrated. Its hull will be shaped by Chantiers de l'Atlantique in Saint-Nazaire from 2031. Finally, sea acceptance tests will begin in 2036 and culminate in delivery in 2037."
"The economic benefits of the PA-NG program will benefit the entire country," adds Alexandre d'Ersu, Program Purchasing and Bid Manager. "90% of purchases will be made in France. Its construction will involve an average of 8,800 jobs between 2026 and 2037, nearly half of which will be with our suppliers and subcontractors, and up to 14,000 at the peak of activity. More than 200 roles and areas of expertise are being mobilised to meet the technological challenges. In addition, the PA-NG program will harness the skills of 800 suppliers, including 600 small and medium-sized enterprises and mid-market enterprises, largely from the defence technological and industrial base (DTIB), spread across all employment areas. Among the regions most involved are the Pays de la Loire, Brittany, Provence-Alpes-Côte d'Azur (PACA) and Auvergne-Rhône-Alpes. In order to mobilise this ecosystem to meet the challenges of the program, the Purchasing Department and the Program Department worked with the DGA and the CEA to organise Industry Days. These meetings with our suppliers took place in Lyon in April and in Nantes in July.]

THE *FRANCE LIBRE* AIRCRAFT CARRIER IN FIGURES

- **Displacement:** 78,000 tonnes
- **Length:** 310 metres
- **Width:** 90 metres
- **Speed:** 27 knots
- **Flight deck area:** approx. 17 000 m²
- **Crew on board:** 2,000 people

TRENDS IN ACTION_PA-NG

ADAPTING TO MEET PROGRAM REQUIREMENTS

The site of Nantes-Indret needed to simultaneously address the issue of scale and the quantity of energy and propulsion systems and equipment to be produced for the series of third-generation nuclear ballistic missile submarines (SSBN 3G) and the PA-NG. The industrial upgrade is clearly visible on the site and the recruitment drive continues. Explanations by Bertrand Schruoffeneger, Director of the Naval Group site of Nantes-Indret.

Bertrand Schruoffeneger,
Director of the Naval Group site of Nantes-Indret

"Production is underway for the two PA-NG new nuclear reactors and its four turbo-generators. As these systems are of unprecedented sizes – each reactor weighs 2,000 tonnes and each engine unit 800 tonnes – and require highly complex engineering. The industrial upgrades began back in 2022 in parallel with design studies, especially since the site is also responsible for construction of the propulsion modules and the reactors of the four future third-generation SSBNs. The site's industrial surface area is expanding as a result, our handling equipment is being modernised and our industrial processes improved to produce these extraordinary items in record time. As the aircraft carrier is built around propulsion, it is crucial that we are ready for the 2031 rendezvous with Chantiers de l'Atlantique.
In order to meet program needs, the challenge in terms of human resources is not only to increase the number of staff, but also to train our employees. We have been recruiting around 100 per year since 2020, with the target to be reached by the end of 2027. By the end of 2026, the training campus for our welding, metalwork and mechanical assembly schools will open in a dedicated building on site. This will enable our teams and partners to practise, thereby allowing them to get things right first time down the line.
Finally, our efforts also focus on improving the quality of life at work and reducing the environmental impact of the new infrastructure. Significant improvements are being made to workstations, particularly in terms of safety and movement.
The pace is sustained, with a new building delivered every year since 2022. The industrial transformation of the site of Nantes-Indret is part of an approach to optimise its environmental footprint, favouring density over extension of the site. For example, the two halls dedicated to the PA-NG are designed in such a way that they can be dismantled or reconfigured after 2032."

Antoine Houzé,
PA-NG Account Manager at Chantiers de l'Atlantique

"AN AIRCRAFT CARRIER IS NOT JUST A SUM OF ITS SYSTEMS"

Each manufacturer is responsible for its particular scope. However, an aircraft carrier is not just a sum of its systems. Good interface management is therefore necessary for all the systems to work together.

"Chantiers de l'Atlantique is responsible for the design, manufacture and testing of the major systems of this propulsion powered vessel. This includes naval architecture (hydrodynamics, stability, manoeuvrability, speed, etc.), structure, electric propulsion, life on board (housing, catering, hospital, entertainment, etc.) and the auxiliary systems (fire, compressed air, fresh water, etc.).
At Saint-Nazaire, we have a unique and effective industrial base for building large civil and military vessels, which is specifically adapted to the precise needs of aircraft carrier construction.
Production at Saint-Nazaire will begin in 2031, with a launch in 2033 and a departure for Toulon in 2035.
We interface with our industrial partners for each of the systems.
Since 2021, the interfaces between our respective scopes have been managed under the leadership of our joint company, MO Porte-Avions. We are now entering into the details of each system and each piece of equipment. Coordination and synchronisation between manufacturers for the studies and the execution of the program are essential and will intensify in the years to come."

A HIGHLY MOTIVATING AND UNIFYING PROGRAM

The point of view of Sébastien Czernecki, PA-NG Reactor Program Manager at TechnicAtome.

Sébastien Czernecki,
PA-NG Reactor Program Manager at TechnicAtome.

"As architect and prime contractor for nuclear reactors for the PA-NG, TechnicAtome is responsible for their design, construction, integration and commissioning on board the aircraft carrier, as well as being in charge of nuclear fuel fabrication.
TechnicAtome oversees the production engineering studies and manufacture of the main components of the reactors carried out by Naval Group at the sites of Cherbourg and Nantes-Indret, including the containment structures, reactor vessel and steam generator. Chantiers de l'Atlantique will then integrate these pre-equipped containment structures into the platform built at Saint-Nazaire.

In order to manage the multiple interfaces and build these exceptionally large objects at a sustained pace, we have adopted an innovative organisation between manufacturers, through a consortium with the joint venture MO Porte-Avions. The partners are in daily contact and regularly share ideas.
This large-scale program requires ongoing dialogue between manufacturers in order to resolve any technical difficulties that arise and find solutions that satisfy both the highly ambitious schedule of the program and its budgetary framework.
Though ambitious, this program is also very motivating and unifying for all stakeholders involved, allowing us to overcome any difficulties and divergences that may arise. We are all focused on the end goal, which is completing it on schedule.

INTERVIEW WITH **CLAIRE,** ARMAMENT CHIEF ENGINEER, DIRECTOR OF THE SSBN MANAGEMENT SEGMENT AND DIRECTOR OF THE SSBN 3G PROGRAM AT THE FRENCH DEFENCE PROCUREMENT AGENCY (DGA), AND **STÉPHANE OBLED**, DIRECTOR OF THE SSBN 3G PROGRAM AT NAVAL GROUP.

SSBN 3G
A KEY PROGRAM FOR LONG-TERM DETERRENCE

FOUR L'INVINCIBLE-CLASS NUCLEAR BALLISTIC MISSILE SUBMARINES (SSBNS) WILL GRADUALLY, FROM 2037, REPLACE THE FOUR LE TRIOMPHANT-CLASS SSBNS THAT CURRENTLY PROVIDE THE OCEANIC COMPONENT OF FRENCH NUCLEAR DETERRENCE. A DISCUSSION THAT SHEDS LIGHT ON THE CHALLENGES OF THIS EXCEPTIONAL PROGRAM.

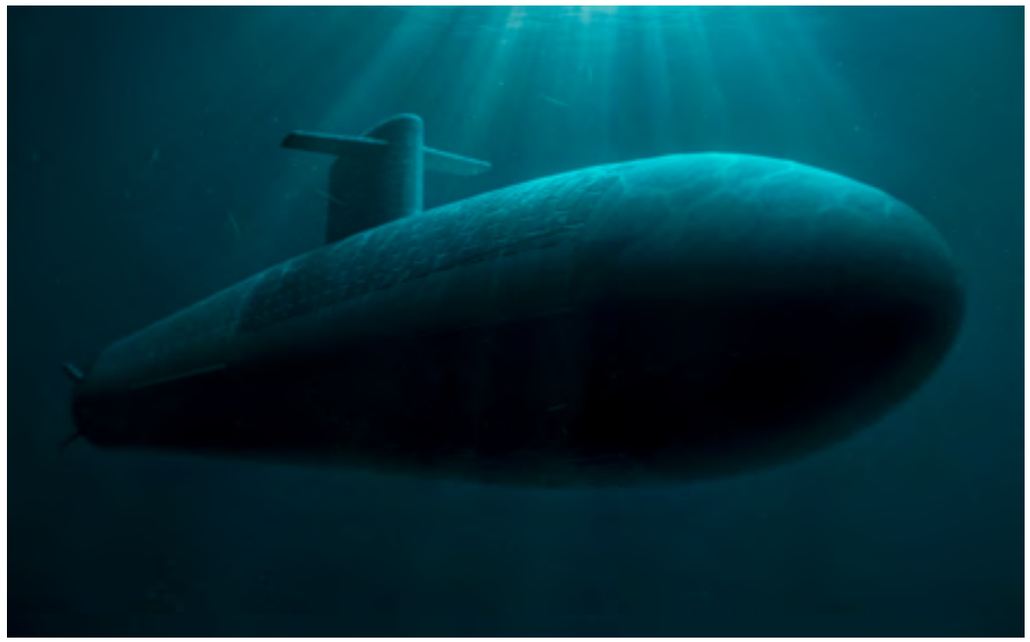
Why and when was the SSBN 3G program launched?

Claire: The purpose of the SSBN 3G program is to develop and build four SSBNs to replace the Le Triomphant-class SSBNs as they are withdrawn from active service, the first of which will be 40 years old in 2037. The continuity of the oceanic component of French nuclear deterrence, unbroken since the first patrol of the Le Redoutable in 1972, is at stake.

Deterrence is key to our security and the SSBNs contribute to this thanks to their ability to disappear into the oceans and launch missiles loaded with nuclear warheads. The SSBN 3G program therefore lies at the heart of the role of the French Defence Procurement Agency (DGA), but also of Naval Group, as it aims to provide the French Navy with one of its main means of power.

Stéphane Obled: The development of such a complex object – 1 million components, 20 million hours of work – requires planning far in advance. Reflections on the successor of *Le Triomphant* began even before the last second-generation SSBN entered into active service and. This continued up until the launch of the program in February 2021, with an initial contract including the basic design studies for the submarine, the launch of long lead-time supplies, the construction of the first parts of the hull and reactor for the first third-generation SSBN, and the adaptation of the industrial facilities to the specific needs of the third-generation SSBN.

The second contract began in November 2025. This covers the continuing upgrade of the means of production, the detailed design of the submarines, the launch of all supplies, and the construction of the first third-generation SSBN, whose name, *L'Invincible*, was unveiled last March by the French President. ▸



The cutting of the first sheet metal for the first third-generation SSBN took place at the Naval Group site of Cherbourg on 20 March 2024. This symbolic gesture marked the beginning of the manufacture of the hull of these submarines, which will ensure French deterrence until the end of the 21st century.

▸ **How have these vessels evolved?**

C.: The DGA, in its strategic capacity, has defined their characteristics keeping in mind that their performance will have to respond to future threats.
Third-generation SSBNs will have a higher level of discretion than those of the second generation thanks to an innovative acoustic coating and an attenuated magnetic signature. Their detection capabilities will also be increased, thanks to improved sonar, in particular.

S. O.: The third-generation SSBNs will also be larger than their predecessors, therefore allowing their evolution throughout their life cycle just as in the case of second-generation SSBNs.

How is the program organised and what is its schedule?

C.: The DGA is project owner for the program along with the French Alternative Energies and Atomic Energy Commission (CEA). Naval Group is the prime contractor for submarines, alongside TechnicAtome for the nuclear reactors.
Our collaboration dates back to the creation of the DGA by General de Gaulle in 1961 on the basis of deterrence, a shared project that transcends us and has enabled us to work together in harmony for more than sixty years.
The program also draws on the know-how of leading equipment manufacturers – Thales, ArianeGroup and Safran – and the metalwork industry – Aubert & Duval and Framatome – and relies on about 500 companies of all sizes from the defence technological and industrial base throughout France.
The DGA supports them and ensures the maintenance of the industrial capacities needed to enable France to retain its sovereignty.

S. O.: The SSBN 3G program mobilises the highest level of skills across all the group's departments and entities, on all its sites. Expectations are very high in many areas, such as discretion, safety and cybersecurity.

Our teams can nevertheless rely on the architecture of the second-generation SSBN and on the industrial expertise acquired thanks to the Barracuda program.
In 2026, the internal whole warship preliminary design review (PDR) will take place, followed by the basic design review chaired by the customer. The rest of the schedule provides for the launch of *L'Invincible* in 2036, its delivery at the end of 2037 and then that of the following units every five years. Naval Group is ready to take on this project, which challenges us to go above and beyond!]

TRANSFORMATION AND MODERNISATION

Muriel Lenglin, Director of the Naval Group site of Cherbourg, describes the changes underway to accommodate the construction of *L'Invincible*.

Muriel Lenglin,
Director of the Naval Group site of Cherbourg

"The construction of the third-generation SSBN *L'Invincible* requires adapting and modernising the industrial facilities at the site of Cherbourg. These upgrades are being carried out with a view both to industrial performance and to improving the occupational health and safety conditions for operators. At the site of Cherbourg, major civil engineering work has been undertaken since 2021 in the Legris hull and structures workshop to extend the existing infrastructure and install new means of production. The modernisation of the industrial facilities takes into account new hull manufacturing processes and the size of the future submarine. More ergonomic, mechanised and automated industrial equipment makes it possible to reduce the strain of activities. The transformation of the workshop for the third-generation SSBN will be completed this year with the entry into service of the industrial equipment for the reconstitution and welding of the sub-sections.
The site continues to transform for the construction of this new submarine. Work began this summer at the integration site of Laubeuf, with the renovation of the support workshops. The SSBN 3G program already involves nearly 2,000 employees, including nearly 1,000 at the Cherbourg site, where architecture, design and construction activities take place.
Our employees, as well as our customers and partners present or visiting the site, are gradually witnessing its transformation and modernisation. It's exciting to be a part of this industrial adventure!"

At the site of Nantes-Indret, major work has also been undertaken on the infrastructure and means of production. Check out our article on page 9.

Qualified welders needed!

Recruited in 2020 upon obtaining her welding licence, after three years on a work-study contract at Naval Group, Mélanie Seychelles, now a welding and special processes technician at the Naval Group site of Nantes-Indret, manages the qualification files for welding procedures for the SSBN 3G program.
A busy job that is far from repetitive, which she finds both interesting and fulfilling.

"My role is to contribute to the qualification of welders and the welding they perform on all parts of the reactors and propulsion modules of the third-generation SSBNs – reactor vessel, steam generator, pressuriser, propulsion system cradle, propeller pump module, propulsion system module, etc. My job requires me to work in both, offices and workshops, independently and in teams.
I draft the work sequences that set out in detail the order and content of the operations to be carried out, making sure to integrate the standards that apply to welding. Alongside a quality inspector and an engineer, I then supervise the welding operations carried out in the workshop by the operators on representative models of the finished product. Destructive tests then make it possible to ensure their quality.

Finally, back in my office, I complete the qualification file and draft the operating procedure to be used on the different parts of the submarine.
It's an exciting job that requires a combination of rigour and method, good interpersonal skills, a good knowledge of welding methods and controls, and the ability to juggle different subjects, as we also qualify various parts for the PA-NG program. I learn a lot through my exchanges with the production, design and quality teams, and with the industrial technicians. Each qualification brings something new and interesting; there is no shortage of work and definitely no room for boredom!
We can feel the site ramping up at every level: buildings are being built, teams are growing, and the workload is increasing."

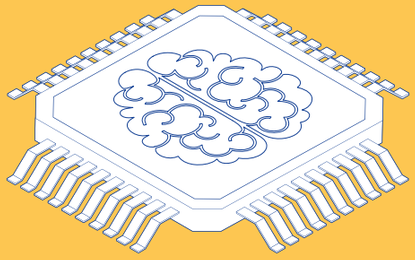
Steeris

1 name, 3 solutions

The Steeris product line includes three solutions:
• **Steeris On Board**, nour controlled decision-making autonomy (CDA) solution, is the "on-board brain" of autonomous naval systems, making it possible to render a drone autonomous and integrate it into the naval combat system.
• **Steeris MS** (Mission System), which manages the missions of one or more drones or autonomous systems incorporated into a naval force from end to end. It is interfaced with the vessel's combat management system (CMS), as part of naval collaborative combat.
• **Steeris Command,** ua containerised solution that can be deployed on land or on a vessel of opportunity (civilian or military) and is designed to implement and manage the missions of one or more drones.

NAVAL DRONES

The battles of tomorrow will be drone-intensive, connected and collaborative. Naval Group therefore offers solutions to meet customers' needs in terms of drones and multimission autonomous naval systems, whether autonomous or remotely operated, and easily integrated into fleets. Steeris, Seaquest, Seagent and Sealken: our product lines meet the challenges of collaborative combat.



Visit our website to find out more about our drone offer.

naval-group.com

Engineering represents more than a quarter of the 17,000 employees at Naval Group.

ideas

CORTAIX, ARTIFICIAL INTELLIGENCE SERVING REAL-WORLD OPERATIONS PAGE 20.
ENGINEERING: DISCOVER A WIDE VARIETY OF PROFESSIONS IN THE SERVICE OF SOVEREIGNTY PAGE 24.

CORTAIX

A “team France” for defence AI

AT THE BEGINNING OF 2026, NAVAL GROUP ACQUIRED THE CAPITAL AND GOVERNANCE OF CORTAIX FRANCE, THALES'S ARTIFICIAL INTELLIGENCE (AI) ACCELERATOR DEDICATED TO CRITICAL SYSTEMS. NAVAL GROUP EMPLOYEES, EXPERTS IN AI APPLIED TO OUR SYSTEMS, HAVE SINCE JOINED ITS TEAMS. UPDATE ON THE FIRST FEW MONTHS OF A STRATEGIC COLLABORATION FOR FRANCE, WITH MICKAEL BROSSARD, CHIEF EXECUTIVE OFFICER (CEO) OF CORTAIX.

Mickael Brossard,
Chief Executive Officer (CEO) of cortAIx

Which issues does cortAIx address?
Thales has been committed to artificial intelligence for more than ten years now and has already integrated this technology into around a hundred of its products through continuous investment in research and development (R&D). Launched in 2024, the cortAIx initiative, Thales's artificial intelligence accelerator for critical systems, addresses a new phase of technological acceleration marked by the rise of generative AI and the need expressed by our customers for ever-increasing capacities thanks to this technology, in particular with the creation of a structure like the Ministerial Agency for Artificial Intelligence in Defence (AMIAD), which was created around the same time. Faced with this rapid evolution, it had become essential to unite the AI expertise and capabilities present in the different entities of the group in order to accelerate its industrialisation and integration into critical solutions. In a particularly unstable geopolitical context, moreover, the emergence of disruptive technologies and the evolution of the threat have placed the issues of defence and technological sovereignty at the forefront, making cooperation between manufacturers essential. At the end of 2025, we entered into a strategic partnership with Dassault Aviation, then with Naval Group in early 2026. The ambition of cortAIx is to contribute to the creation of a real “team France” in AI for critical systems, able to meet the operational challenges of tomorrow and to be ready for this turning point in history.

How does the collaboration with the Naval Group teams within cortAIx in France work in practice?
From March to July 2026, some fifteen Naval Group employees gradually joined the cortAIx teams. Initially, they divided their work between the Naval Group site of Ollioules and the Thales premises in Île-de-France. Since the beginning of July, they have been working full-time in Ollioules, in Naval Group's new buildings hosting the Digital Centre of Excellence. Comprising system architects, user experience (UX) engineers and product owners among others, the Naval Group team provides in-depth knowledge of the naval environment and systems and operational needs. Thales's AI experts, for their part – data scientists, machine learning operations (MLOps) engineers and DevOps – steer the engineering using proven methods and tools. This complementarity of expertise makes it possible to quickly increase the maturity of solutions integrating trusted AI applied to Naval Group systems, with a clear objective: to strengthen the French Navy's operational superiority.

What work is being done today and what are the prospects for the future?
The work focuses on what we call system AI, i.e. solutions capable of analysing large volumes of data from multiple sources in order to generate predictions, recommendations and help operators make decisions. Several use cases identified by Naval Group are already being studied. Among them are collaborative combat, allowing systems on board different carriers to interact and conduct coordinated operations within the carrier group, or autonomy on missions, especially for swarms of drones. The teams are also working on logistics and maintenance support services, as well as integrated tactical situation modules for command and control centres. Close-range combat is another area of application on which we are about to start work.

> The ambition of cortAIx is to be prepared for this turning point in history.

What is your way of working?
We rely on a proven methodology and these first few months have enabled the Naval Group teams to familiarise themselves with our processes. The first step is to ensure that the operational need is clearly identified and that AI will provide real added value. Workshops make it possible to cover all aspects of the subject and to define the characteristics of the expected deliverable more precisely. We work in an agile way, with three-week sprints. Depending on the objectives – exploration, demonstrator or industrialised solution – a use case can be developed between three to nine months. The cortAIx philosophy is to be open, agile and fast. Our ambition is to provide the best possible response to our customers by capitalising on the technological bricks already developed by Thales and on collaboration with external partners such as Mistral AI, AMIAD and French start-ups. By combining our expertise and that of Naval Group, we have everything we need to build together solutions integrating the latest technological advances for the benefit of the French Navy and French sovereignty.

AIMING FOR A SOVEREIGN, CYBERSECURE AND TRUSTED AI

Éric Papin,
Naval Group Executive Vice President, Technical

Éric Papin, Naval Group Executive Vice President, Technical, shares his perspective on this new phase in the integration of artificial intelligence at the heart of French defence systems.

"By joining cortAIx France, Naval Group is accelerating the integration of sovereign, cybersecure and trusted AI into its systems in order to effectively meet the operational needs of the French Navy, as expressed in the "Artificial Intelligence Strategy for Naval Warfare" (SIGNAL) project, launched in 2025. The emergence of onboard data centres, the protocol signed with the French Navy on data, and the open and scalable architectures of ships' combat systems are now paving the way for the integration of AI directly on board. As long-standing partners when it comes to combat systems, Thales and Naval Group are already collaborating on several R&D projects dedicated to the reliability, control and accountability of AI solutions applied to critical systems. Working alongside cortAIx engineers, Naval Group experts provide their in-depth knowledge of our systems and our business challenges. Working as an integrated team, they will benefit from the machine learning operations (MLOps) engineering methodology and AI components already developed by Thales. This synergy will make it possible to respond more quickly to a wide range of operational use cases on which both groups can capitalise.

The use cases submitted to cortAIx France include decision support and mission preparation by exploiting data from the ship, intelligence (including space) or the environment, and acceleration of the Observe-Orient-Decide-Act (OODA) loop to assist in conducting the action through the real-time exploitation of data from multiple sensors on board or those of neighbouring vessels and aircraft. The analysis of threats and the means to counter them will enable the optimal implementation of various effectors to maximise the direct military effect, in particular for close-range combat (anti-drones) to counter asymmetric threats. Other topics include assistance with operation, diagnosis and maintenance through the development of a chatbot to exploit the documentation and data recorded."

> **"Together, we will no doubt accelerate the deployment of AI in naval defence systems."**

CORTAIX: A LEVER TO ACCELERATE THE DEPLOYMENT OF AI ON BOARD SHIPS

"I worked for two years on the cortAIx project in my previous role as Chief AI Officer and Head of the Centre of Expertise in AI and Human Factors at the Naval Group site of Ollioules. My integration into the team at the beginning of March with the first Naval Group employees was therefore a natural progression for me. My role is to manage the delivery of use cases on time and at the expected level of quality. We provide our in-depth knowledge of Naval Group's systems and, in return, we rely on the expertise and methods developed by Thales within cortAIx France. This complementarity makes it possible to develop systems augmented by AI, for the benefit of the operational superiority of our French customer. After a period of integration and on-the-job training, during which we familiarised ourselves with the tools and working methods of the cortAIx engineers – who welcomed us very warmly and integrated us into their teams – we set to work on scoping the first use cases. The aim was to accurately assess the operational contribution and value of using AI in certain features. For example, the exploitation of automatic dependent surveillance-broadcast (ADS-B) data on our ships to identify potentially suspicious behaviour in air traffic. Or the development of a video classification tool for close-range combat: this consists in capitalising on the various onboard video systems in order to map and identify the nature of all ships and objects on the surface or in the air that revolve around the vessel. cortAIx offers state-of-the-art tools and methods for the integration of a trusted AI into Naval Group critical systems, and constitutes a major lever for achieving operational superiority."

Sébastien Rousset,
seconded Naval Group employee, Deputy Chief Technical Officer (CTO) and Engineering Delivery Manager of cortAIx

BY **PIERRE ÉRIC POMMELLET,**
CHAIRMAN AND CHIEF EXECUTIVE OFFICER OF NAVAL GROUP

ENGINEERING

WHAT ARE THE CHALLENGES FOR NAVAL GROUP AND FOR FRANCE?

ENGINEERING REPRESENTS MORE THAN A QUARTER OF THE 17,000 EMPLOYEES AT NAVAL GROUP. IT INCLUDES THE DESIGN AND DEVELOPMENT OF A VERY WIDE RANGE OF PRODUCTS, INCLUDING THE MOST COMPLEX IN THE WORLD: THE AIRCRAFT CARRIER AND NUCLEAR BALLISTIC MISSILE SUBMARINES (SSBNS), PILLARS OF THE OCEANIC COMPONENT OF FRENCH NUCLEAR DETERRENCE. FROM DESIGN TO DECOMMISSIONING AND FROM CONSTRUCTION TO THROUGH-LIFE SUPPORT, THE VARIETY OF ENGINEERING TRADES IS VAST.

Enabling our customers, and first and foremost the French Navy, to deliver power at sea requires a large number of skills and trades, including studies/test managers, methods and processes managers, functional systems integrators and project architects, to name but a few.

MULTIPLE TYPES OF ENGINEERING

Certain traditional trades such as hull, mechanics, electricity, ventilation and fluids are common to civilian naval applications while presenting specific military characteristics. They are complemented by trades specific to warships. This is the case for stealth, acoustic discretion, nuclear safety, pyrotechnics, diving safety and combat systems, sonars, radars and weapons. In a context of accelerating digitalisation of ships and theatres of operation, our engineering has also acquired digital and cybersecurity specialists, ensuring the robustness and resilience of our ships' capabilities when in operation. A boat never acts alone; it is always engaged in a system of forces composed of other ships, submarines, drones, etc.
This system must respond collectively to the missions entrusted to it, and communicate and coordinate securely. Also, as our ships are manned by crews, the size of which varies as required, engineering must also create an environment adapted to their needs. This is where specialists in human factors, physical integration and arrangement come in, coordinated by the project architecture team.

THE CHALLENGE OF PERMANENCE AT SEA

Like the increased competitiveness of our engineering offices, software integration platforms, workshops and shipyards, increasing the availability requirement of our products is a challenge that all our engineering trades have been addressing in recent years. France's maritime sovereignty depends on it. We have risen to this challenge of building ships whose mid-cycle docking periods must be as short as possible, with an extended lifetime.

> **"One of our biggest challenges is maintaining strategic skills."**

Our best example is that of the defence and intervention frigate (FDI), which has a high level of maintainability, making it possible to reduce its maintenance times and optimise its operational availability. A capacity comparable to that of the French Navy's multimission frigates (FREMM), which have been achieving an 80% availability rate for a decade now. This is a reflection of our maintenance capabilities ▸

Pierre Éric Pommellet in Lorient on 19 May 2026, during the launch ceremony of the defence and intervention frigate (FDI), *Amiral Louzeau*.

and the capacity to take into account the constraints of our support engineering right from the preliminary project stage. These capabilities are ever-evolving; navies today – in particular first ranking navies such as the French Navy – expect to maintain their superiority. Whereas the logic in the past was for a mid-life redesign fifteen to twenty years after the commissioning of a ship, our engineering today reflects on, proposes and produces innovation continuously, both in the context of current programs and for those to come. This is, of course, the case for the third-generation SSBN (SSBN 3G) and for the new-generation aircraft carrier (PA-NG): we anticipate their scalability, whether simple or complex, right from the design stage. To nurture this incremental approach and remain disruptive, the teams must be attuned to sailors' needs and to the upheavals taking place in the world. Our role is also to take risks on subjects that may be divisive, as was the case for drones. Thanks to our visionary approach and ability to invest our own money to develop these new capabilities, we today stand ready for the 'dronisation' of the French Navy's forces. After the creation of a department dedicated to drones, autonomous systems and underwater weapons in 2023, Naval Group will open a state-of-the-art centre of excellence at the end of 2027 in La Londe-les-Maures, in the Var.

ACCELERATING DEVELOPMENT CYCLES

Our ambition is to promote the agile mode to accelerate development and delivery cycles. If we believe in a new concept, we offer our partners and customers a basic demonstration followed by an initial prototype if their interest is confirmed and, very quickly, a piece of equipment or system that can be integrated on board a ship. For our engineering teams, this pace requires taking shortcuts to meet the precise need with a simple, robust, effective solution. At Naval Group, this acceleration of innovation coexists with the long timespan of our programs. If we project into the future a little, the third-generation SSBN will fulfil its role in terms of deterrence until the end of the 2080s: just imagine, the commander of the last unit has not yet been born! Our programs last several decades. It is rare for an engineer to work on a program from start to finish. However, it is imperative to ensure continuity over the long term. One of our key challenges is the maintenance of strategic skills, some of which are demanding, specialised, and specific to us, not to mention the many years sometimes needed to acquire them. However, this necessity must be adapted to the younger generations, who are used to innovation and change. In order to attract and retain talent, we need to structure these long-distance races into a multitude of sprints that coexist over a long period of time. And as Naval Group, like other manufacturers, is building ever more digital ships, its engineering teams must move in the same direction; a challenge for a naval defence player, with our ultra-strict rules of defence secrecy and confidentiality. Making the digital working environment of our young developers more attractive and more communicative, like those they find outside the company, is one of the objectives of our digital transformation plan launched in 2023, which is gradually filtering into other trades apart from software development.

PROMOTING ENGINEERING FOR WOMEN

Finally, feminisation, inclusion and diversity also constitute key concerns. With the support of the Elles Bougent association, of which Naval Group has been a partner since 2014, and with all our teams, we are pursuing an active approach to promoting our engineering and technical professions to female middle school and high school students. More than 400 employees of Naval Group are godmothers or liaison officers, multiplying actions to make the range of professions in the naval and defence industry more visible and promote better inclusion of women. Although our partnerships are guided by innovation with a number of schools (École navale, Institut polytechnique de Paris, Ensta, Institut-Mines Télécom), the subjects covered (scientific calculation, technical and operational simulation, physical simulation and artificial intelligence) have no gender. I'd say neither does management, which offers a lot of opportunities in our rapidly changing and growing sector (313+ FTEs in engineering in 2025, 19% of women recruited).

> **"Our ambition is to promote the agile mode to accelerate development and delivery cycles."**

"YOU HAVE TO BE A CHAMELEON AND ADAPT TO EACH PROGRAM"

Caroline Pitaval,
Integrated Logistics Support (ILS) Program Package and Work Package Coordination Manager, Naval Group

Caroline Pitaval discovered integrated logistics support (ILS) in her very first position and has pursued a career in it for more than twenty years. "This field continues to fascinate me for the richness of both its interfaces and its activities, which cover the entire life cycle of ships," she explains.

"I entered the world of ILS by chance, at the end of my master's degree in fluid and solid mechanics applied to aerospace, which culminated in a final-year internship at Alcatel Space," says Caroline. Her professional career began at Airbus Helicopters in Marignane, where she worked for fifteen years in spare parts catalogue management.

UPSKILLING THROUGH EXPERIENCE

Seeking a change in environment while continuing to work on cutting-edge products, she joined Naval Group's maintenance engineering team in 2018. She headed up several digital transformation and innovation missions at the naval base in Toulon, working in particular on the establishment of the maintenance production chain to enable the digitalisation of reference preparation files. "I studied various innovation use cases in our trades, including the traceability of hoses by radio frequency identification (RFID) microchips, the benefits of additive manufacturing, and artificial intelligence. This last topic will enable the implementation of an ILS chatbot to help our employees analyse their large amounts of input data. Over the past three years, I have also taken part in a project bringing together customers and industry to standardise digital data exchanges concerning our business deliverables in France and with the Netherlands, thanks to the deployment of S-series specifications."

A MANAGEMENT-ORIENTED POSITION

In the spring of 2026, Caroline took on new responsibilities. Her mission is now to conduct the ILS program packages and work packages for submarines and surface ships in the as-built phase, ensuring that contractual costs, quality and deadlines are met. "Each delivery contract for a ship is associated with a logistics support system that may include, among other things, the ship's maintenance plan, operation and maintenance documentation, crew training packages, port infrastructure set-up, and simulator packages. My team manages the packages associated with this support, in conjunction with the program departments and French and foreign navy customers. My role is to ensure overall project management consistency, which means standardising practices," explains Caroline. "ILS is a very rich field with many interfaces, which makes it both interesting and difficult," she continues. We work on various sites of the group, not only with engineering offices and new construction teams but also with suppliers, industrial partners, the French Defence Procurement Agency (DGA), the Fleet Support Service (SSF) and their local representatives, as well as with foreign navies. You have to be a chameleon and adapt to each program, regardless of its requirements and budget. It's a constant intellectual challenge but I certainly learn a lot about the product!"

The *Amiral Ronarc'h* defence and intervention frigate (FDI) arrives in New York, a port of call during its lengthy deployment.

Team spirit

ALL ABOARD THE FIRST DEFENCE AND INTERVENTION FRIGATE (FDI) PAGE 36. FORMING AND PLANING TECHNICIAN: DISCOVER A TRADE AT THE HEART OF OUR PROGRAMS PAGE 44. NAVAL GROUP TAKES PART IN YOUTH AND OFFSHORE TERRITORIES DAYS: REPORT PAGE 47. WITH NAVAL REUSE, NOTHING IS WASTED, EVERYTHING IS REUSED! READ ALL ABOUT IT ON PAGE 52.

TEAM SPIRIT_FDI

THE *AMIRAL RONARC'H*

PUT TO THE TEST AT SEA

THERE ARE TIMES WHEN YEARS OF ENGINEERING AND TECHNICAL EXPERTISE FINALLY COME INTO CONTACT WITH THE OCEAN. WHEN EVERYTHING THAT HAS BEEN DESIGNED, CALCULATED, BUILT AND SIMULATED IS PUT TO THE TEST. FOR THE *AMIRAL RONARC'H*, A FIRST OF CLASS (FOC) DEFENCE AND INTERVENTION FRIGATE (FDI) OF THE FRENCH NAVY, THIS MOMENT BEGAN ON 14 JANUARY 2026, SETTING SAIL FROM BREST IN THE COLD AND GREY OF THE ATLANTIC IN WINTER.

The FDI *Amiral Ronarc'h* makes a stopover in Mexico.

TEAM SPIRIT_FDI

Lengthy deployment tests the vessel in the real world – several months at sea, in varied and sometimes extreme conditions – in order to validate what no test bench or one-off test at sea can reproduce: the endurance of the systems, the reliability of the equipment, the performance of the weapon systems, the cohesion of the crew, the capability to decide and operate far and wide over time, all while conducting first-level maintenance. In short, it marks the transition from the shipyard to the ocean, from a static system to an operational entity, providing valuable feedback and enabling the next frigates in the series to be refined and made more reliable.

FROM THE FAR NORTH TO THE CARIBBEAN

The journey took place in two main sequences, at both ends of the climate spectrum. First in the Far North and the North Atlantic, where temperatures approach 0°C and frost threatens circuits, anti-icing systems and everything exposed to cold. Then in the South Atlantic and the Gulf of Mexico, where temperatures rise to 36 or 37°C, putting pressure on the ship's cooling capacities, as well as on its computer systems and onboard data centres.
Before reaching the Mediterranean, the *Amiral Ronarc'h* will have experienced environments that few ships face in the same deployment. This is no coincidence: the FDI was designed to operate on all the seas of the globe, reflecting the extent of the French maritime domain, second in the world covering almost 11 million km².

OPERATING TOGETHER, AND FAST

Lengthy deployment also tests the ship's ability to integrate joint operations. Off the coast of Brest, the Orion exercise demonstrated its added value within a coalition, alongside the *Charles de Gaulle* aircraft carrier and multimission frigates (FREMM), with the FDI being able to exchange tactical data in real time and establish a complete situation in the three dimensions of combat (air, surface and submarine). Replenishment manoeuvres with the new replenishment vessels (BRF) were carried out, including a loading operation of missiles at sea, validating the support that these vessels are capable of providing to the FDI.

UNPRECEDENTED PROXIMITY, INCREASED CONFIDENCE

Behind the operational performance, Naval Group teams were mobilised to support the ship and its crew throughout the deployment. A pair of engineers (a warranty engineer and a product engineer) operated from the ship's base port (Brest) as a veritable control tower: centralising technical information, coordinating expertise, organising flows of spare parts, providing rapid responses to hazards and helping the crew get to grips with the ship. In terms of support, multi-site teams were mobilised, such as from the Naval Group site of Nantes-Indret for propulsion, Ollioules for the combat system and Lorient for the platform, for example. The continuous presence of Naval Group teams on board illustrated an unprecedented level of proximity with the crew and helped to strengthen their relationship, based on partnership and trust.

A COMBAT-READY SHIP

As first of class, the *Amiral Ronarc'h* is leading the way. "Each lesson learned from its lengthy deployment will refine the operational readiness of the four FDIs that will succeed it," concludes Thibaut Bourjaillat, FDI France in-service support (ISS) Program Director and Chief Service Officer (CSO) of the FDI product.
A first major technical stop is planned in Brest between September and December 2026, marking the end of the warranty period and paving the way for admission into active service. This will be the final step before the *Amiral Ronarc'h* enters its operational cycle, fully armed and ready to provide the French Navy with the capabilities it needs to deliver power at sea.]

Martinique

Naval Group teams support sailors around the world. In 2025, for example, they intervened in 11 international ports on multimission frigates (FREMM) of the French Navy.

New York

"THE FINDINGS ARE CLEAR: EXCELLENT AVAILABILITY."

Alone or as part of a naval force, the FDI is capable of detecting and neutralising any type of threat: surface, air, submarine, asymmetric or cyber. It also allows the deployment of special forces as well as aerial and surface drones.

Check out the FDI product sheet and all the program news on our website at naval-group.com

THIBAULT

Frigate Captain, Deputy Commanding Officer

Four months of deployment, contrasting environments, demanding conditions... From Toulon, Frigate Captain Thibault, Deputy Commanding Officer, looks back on the lengthy deployment of the *Amiral Ronarc'h*, the first operational test for this new generation ship.

From the Arctic to the Caribbean: has the frigate delivered what it promised?
Lengthy deployment is the real test of truth, as it enables all systems to be tested under varied, even extreme conditions, in both cold and hot water. We sailed in temperatures ranging from 2 to 30°C and the findings are clear: excellent availability. The propulsion system, the production of electrical energy, the air conditioning and, more generally, all the utilities enabling operation of the combat systems: everything worked without difficulty.

Were there any surprises on board?
Yes, and they were positive. What did not surprise us, however, was the intrinsic quality of the ship: its ability to sail in all seas, the robustness of the systems, and the level of comfort on board, whatever the conditions. The *Amiral Ronarc'h* therefore completed its lengthy deployment in line with expectations.

The Orion joint and international military exercise put the frigate in a situation alongside the *Charles de Gaulle* and multimission frigates (FREMM). What was the *Amiral Ronarc'h*'s main contribution?
Orion enabled us to verify our ability to operate in coalition, within the aeronaval group, and to interact fully with it in terms of information exchanges, communications and transmission systems.
In particular, the frigate confirmed its ability to play a central role in controlling anti-submarine warfare actions.

How was the collaboration with the Naval Group teams?
Our collaboration was marked with a spirit of proximity and cooperation, in pursuit of a shared goal for the French Navy and the company: to ensure the availability of the ship and all its equipment and systems. Between the as-built shipyard at the Naval Group site of Lorient and the in-service support (ISS) teams based in Brest and Toulon, who will accompany the entire life cycle of the ship, continuity is ensured. The Services teams embarked, observed, learned, and provided real-time responses to situations encountered, such as damage. These achievements are essential for the future.

Is the frigate ready to face the threat of drones and high-speed boats?
Lengthy deployment is not designed to deal directly with this type of scenario, which requires specific resources and systems. On the other hand, these aspects were addressed during the shakedown training which took place last November and December. Shakedown training takes place at the end of acceptance of the vessel: the crew operates the vessel alone, which implies being trained in all domains: conventional safety, machine control and the main areas of combat (firing, anti-submarine and anti-aircraft). The goal is to confirm that the crew is ready for deployment.

A first technical stop is planned for the end of 2026 before the frigate enters its operational cycle. What does this next milestone represent?
The technical stop scheduled for Brest between September and December 2026 will mark the end of the warranty period. This will be an opportunity to finalise certain points, address the observations following deployment and do anything that could not be done before. This will consist in limited, non-structural work. It is normal for there to be adjustments on a first of class. However, the reliability observed at this stage for the *Amiral Ronarc'h* is very satisfactory.

A final word: what is your assessment of this lengthy deployment?
Given the complexity of the program, the level reached is excellent for a First of Class (FoC). The ship fulfilled its objectives and demonstrated very solid performance. This is a source of satisfaction for the crew, but also a source of great pride.

THE FDI IN FIGURES

- **Length:** 122 metres
- **Displacement:** 4,500 tonnes
- **Speed:** 27 knots
- **Autonomy:** 5,000 nautical miles and 45 days

SSF: focus on availability

2026 is a pivotal year for the *Amiral Ronarc'h*. After a successful lengthy deployment, the First of Class defence and intervention frigate (FDI) is preparing for its first technical stop between September and December 2026. Behind these key milestones is a committed contributor: the Fleet Support Service (SSF), the entity of the French Navy responsible for the in-service support (ISS) of its vessels.

For the SSF, the lengthy deployment of the first of class, the *Amiral Ronarc'h*, was revealing. This is where support came in, for the first time, in real conditions, with a clear priority: to maximise the availability of the vessel. Mobilised throughout the deployment, the SSF coordinated interventions and contributors, facilitating decision-making. Right from the departure from Brest it oversaw all actions taken, constantly striving to limit the impact on the operational activity of the FDI.

Several examples illustrate their commitment. In Northern Europe, interventions were carried out at ports of call with particularly tight deadlines. In the Atlantic, a major update of the combat management system was carried out at sea – a first – thanks in particular to the boarding of experts from Naval Group's site of Ollioules. The same logic applied to each of these operations: responsiveness, commitment and close coordination between the Naval Group as-built teams and the ISS teams.

To succeed, the SSF relies on a tried-and-tested system of organisation on multimission frigates (FREMM), taking advantage of synergies between these classes of surface vessels while supporting the specific characteristics of a first of class such as the *Amiral Ronarc'h*.

ASSESSING VESSEL MATURITY, ORCHESTRATING SUPPORT

Apart from the interventions carried out, the lengthy deployment also made it possible to assess the maturity of the frigate and that of its entire support system, in terms of technical documentation, logistics, spare parts and the organisation of interventions. As Stéphane Merlet, SSF Operations Manager in charge of ISS for FREMMs, FDIs and offshore patrol boats, explains, this crucial step had been meticulously prepared, "The SSF was particularly invested in the upstream phase, with the aim of achieving the best possible level of availability at the time of the frigate's departure for lengthy deployment." Nothing was left to chance when it came to dealing with technical issues, making installations more reliable, and upgrading logistics and documentation.

The preparation phase included operational availability periods, interrupting the vessel's activity temporarily to conduct the necessary maintenance operations.

FROM AS-BUILT TO ISS: A KEY TRANSITION STAGE

This is a particularly pivotal moment for all contributors, both as-built and ISS. Until the end of 2026, support is part of a warranty phase, during which responsibilities are shared between the SSF and the DGA.

"The end-of-warranty technical stop, scheduled between September and December 2026, is a critical milestone for the ship, for Naval Group and for ISS," explains Florent Arnoux, Ship Executive Engineer in charge of the availability and technical stops of FDIs.

The expectations of the SSF vis-à-vis Naval Group, from program management to services, are high: rectify any teething problems observed during the lengthy deployment, inspect certain installations (hull sleeves and valves, shaft line, underwater hull, etc.) and launch the maintenance cycle, all in close coordination with the DGA.

The post-lengthy deployment analysis work is all the more decisive as the *Amiral Ronarc'h* is a first of class, facing intensive use for the first time. Each technical event is therefore examined to determine whether it is due to teething problems or operating conditions.

Apart from the ship itself, the entire support system will be evaluated during the technical stop of the last quarter of 2026, including documentation, logistics, spare parts and the organisation of interventions.

Added to this is a particularly demanding context, marked by the simultaneous conduct by Naval Group of a major technical stop of FREMM in Brest. The focus is on September 2026, in Brest, the ship's home port, where the *Amiral Ronarc'h* will be restored to its full potential in order to be able to meet the needs of French sovereignty in full. This will be a decisive moment, commensurate with the commitment and expectations of those preparing for its entry into active service.]

SSF: ISS PROJECT OWNER

The SSF guarantees the long-term availability of vessels, acting as project owner for the through-life support of vessels of the French Navy, but also of other armed forces and the national police.

It defines the needs, sets the requirements and oversees the support system. Located in Brest and Toulon, close to the ships and manufacturers, it coordinates the actions of multiple contributors. It works in particular with the French Defence Procurement Agency (DGA) during the warranty phase (as-built) and during modernisations, and with manufacturers – including Naval Group – responsible for carrying out maintenance and modifications. The SSF's central role ensures continuous support, from mission preparation to technical stops.

Meeting the forming and planing technicians

AT THE HULL AND STRUCTURES WORKSHOP IN CHERBOURG, FORMING AND PLANING TECHNICIANS ARE AMONG THE FIRST EMPLOYEES TO INTERVENE IN THE SHIP PRODUCTION PROCESS, AFTER THE DESIGNERS AND PLOTTERS. BETWEEN TRADITIONAL KNOW-HOW AND CUTTING-EDGE TECHNOLOGY, HARMONY, A FORMING AND PLANING TECHNICIAN SINCE 2019, DESCRIBES A PROFESSION AS EXCITING AS IT IS DEMANDING, AT THE HEART OF LEADING-EDGE SHIP PROGRAMS.

What is your job? What programs do you work on?
I form and assemble metal structures and framework components ranging from small parts (such as collars for air cylinders, for example) to very large ones such as those for the bridge fin of a submarine, including ballast and other tanks. I receive the technical details from the engineering office: the manufacturing range and the process to be followed for the forming and the parts to be assembled. Different techniques are used depending on the component to be produced, requiring different numerically controlled machine tools. Rolling, for example, using a rolling machine, makes it possible to obtain cylindrical or conical shapes using the wooden templates produced by the plotters. Folding by hydraulic press makes it possible to bend, press or straighten the sheet when it has been subject to torsion, or to rectify a sheet that is too closed. After the forming, we carry out tracing to indicate where to position the parts to be assembled, then the assembly by tack welding. The part is then sent for welding, after which it returns to us to be rectified after inspection. The activities are therefore very varied! For the past few months, I have been working on hull forming: strakes for the new-generation aircraft carrier (PA-NG) and flanges – large parts 9 metres long – for third-generation nuclear ballistic missile submarines (SSBN).

TEAM SPIRIT_FORMING AND PLANING TECHNICIANS

What training do you need for this job? Could you describe your professional background?
There are several avenues for learning this trade, such as the professional baccalaureate in industrial metalwork for high school students or, as in my case, a retraining course leading to a qualification: I actually used to work in a shop! When I became a mother I felt the need for a more concrete profession and decided to change sectors. I discovered metalwork thanks to my father-in-law, and as I had always liked working with my hands, I threw myself into it. I took a course with the adult vocational training association (AFPA) during which I did two internships in industry, including one at Naval Group, which was a real eye-opener! At the end of my course, I obtained a professional qualification in metalwork. I joined Naval Group just after qualifying, first as a temporary worker in 2019 and then on a permanent contract in 2020. As a new hire, the most experienced employees support you and pass on their know-how. This on-the-job training is essential in order to acquire full mastery of the trade after eight years of training.

What skills are needed to perform your job? What do you particularly enjoy and what are the difficulties?
The ability to depict volumes in space and understand plans are important. As well as precision and rigour, of course. You also need to pay careful attention to each gesture to avoid injury when moving or handling parts on the machine. What I like is the diversity of my daily tasks, the constant learning, the teamwork, as well as the sense of pride in contributing to such large-scale naval programs. Some tasks can be physical and noisy, such as sheet rectification using a pneumatic hammer or hot forming followed by hammering: this traditional know-how exists alongside the latest generation machines. We also sometimes need to work in cramped spaces, like inside a tank, for example.

SOVEREIGN EXPERTISE: NAVAL FORMING AND PLANING TECHNICIAN

In 2026, Naval Group employs more than 100 forming and planing technicians on its sites in Cherbourg, Lorient, Brest, Angoulême-Ruelle and Toulon. In June, the Naval Group site of Cherbourg, in partnership with UIMM Grand Ouest Normandie, launched a training course for the profession of forming and planing technician, for which positions are available in the group. Ten candidates will complete an initial three-month course before joining us on a twenty-four month work-study contract.

LAURENT GRAVOUIL

Head of the UIMM
Training Centre in Lorient

The Union of Metalworking Industries and Trades (UIMM) supports Naval Group and all its member companies through its training centres in the regions. UIMM supports 42,000 member companies, from craftsmen to large groups, on all issues in order to support their development, from regulations, social dialogue and recruitment and training to economic and technological transformations. In order to respond as closely as possible to local economic realities, the organisation is structured around 57 regional UIMMs and 136 training centres throughout France.

"The purpose of the UIMM Training Centre is to meet the skills needs expressed by manufacturers through the recruitment or training of work-study students or employees. Organised according to employment areas in each region, it is structured around different centres (UIMM and partner institutions such as university institutes of technology (IUT), high schools, higher education institutions, etc.) offering young people from 15 years of age initial training on work-study courses, or continuing training for employees and jobseekers. Whether vocational qualifications such as CAP, BAC pro or BTS, or bachelor's degrees, we put in place courses, issue National Education diplomas and design in conjunction with manufacturers specific training courses leading to a professional certification, such as joint qualification certificates in metallurgy (CQPM), or professional qualifications, often taken up by people seeking to retrain. By focusing on employment, our training courses aim to provide the necessary technical background as well as interpersonal skills (autonomy, reflective approach, proactivity, etc.) and knowledge of the future working environment. The specific needs of each region and local ecosystem are what constitute our DNA. The employment area of Lorient, for example, is strongly oriented towards t he naval defence professions. With Naval Group, we design continuing training courses for naval electricians and hull shipwrights. We also work with the Region and respond to the calls for tenders it issues to set up training for high-demand professions identified within a particular area, and we collaborate with France Travail and temping agencies to set up tailored projects for manufacturers who approach us for help. Although focused historically on the metalworking trades, UIMM has expanded its offer to meet all the needs of manufacturers in the various professions, whether industrial techniques (modelling design and automation) or digital technology, robotics, cybersecurity or support functions (purchasing, human resources, quality, safety and the environment). Increasing the proportion of women on courses is a major challenge shared by manufacturers and all those involved in training. Our efforts are now bearing fruit: over the past five years, the proportion of women has grown steadily and now represents 10 to 30% of participants depending on the course, and even up to 50% on some courses. With regard to young people, 85% of graduates find employment, while the others go on to pursue further studies."

KEY FACTS

In 2025, for the UIMM Bretagne training centre:

3,600
work-study students enrolled (UIMM Bretagne training centre + partner institutions);

8,700
trainees in continuous training: lasting from one or two days (for an accreditation) to about one year (CQPM or professional qualifications).

"THE AIM OF THE UIMM TRAINING CENTRE IS TO MEET MANUFACTURERS' NEEDS IN TERMS OF SKILLS."

Naval Group supports Youth and Offshore Territories Days

EIN 2026, THE FRENCH NAVY CELEBRATES ITS 400TH ANNIVERSARY. AS A HISTORICAL PLAYER IN SHIPBUILDING, NAVAL GROUP IS SUPPORTING THE EVENTS SCHEDULED THROUGHOUT THE YEAR BY WAY OF ITS PATRONAGE. OUR TEAMS ALSO TOOK PART IN THE YOUTH AND OFFSHORE TERRITORIES DAYS ORGANISED FROM 24 MAY TO 28 JUNE IN MANY FRENCH CITIES, MOST OF WHICH ARE FAR FROM THE COAST. THIS PROVIDED AN OPPORTUNITY TO SHOWCASE OUR PROFESSIONS AND SKILLS FOR THE GENERAL PUBLIC, ESPECIALLY YOUNG PEOPLE.

Established in 1626, the French Navy has protected the French on every ocean for 400 years. Its history is inseparable from that of the shipyards, of which Naval Group is the direct heir. It is therefore natural that our group should join in the celebrations organised for this anniversary as an "aircraft carrier" contributor, the highest level of patronage.
For 400 years, our industrial sites have been designing, building, maintaining and repairing French warships and developing the technical and technological innovations necessary to ensure their superiority. For 400 years, we have been sharing the challenges and issues facing the Navy and working alongside it to anticipate and meet its operational needs, along with all our suppliers.
This longstanding support has made Naval Group a pillar of defence and a trusted industrial partner, whose stability and commitment constitute essential assets enabling it to carry out its activities. It explains the very strong institutional ties that bind French sailors and employees of our group, who share their challenges, difficulties and successes and help them build the naval combat of the future. This patronage is therefore a strong symbolic act that consolidates our role as a leading industrial partner.

A SHARED SENSE OF PRIDE

The French Navy is one of the world's leading navies. The events scheduled this year to highlight its role and its links with the French people are an opportunity to reiterate this, and our group is proud to work alongside to help fulfil its missions, by combining its industry capabilities with its technological agility.
As heirs to a maritime tradition spanning several centuries, our employees share the same values as the sailors: commitment, a sense of belonging to the same crew, and transmission. This anniversary is an opportunity to highlight this shared heritage and our membership of the same family, composed of responsible contributors working to protect the French people.

PATRONAGE, A LEVER OF INFLUENCE

The history of the Navy does not only take place on the seas and in shipyards, but has its roots throughout France. The Youth and Offshore Territories Days, which took place between 24 May and 28 June in 46 French cities, were an opportunity to remind young people and their families of the human, cultural and industrial links that each French department has with the Navy. The program for each day included a military ceremony followed by various activities, such as conferences, round tables, meetings with sailors and representatives of the Navy's partners grouped together in a "village", and finally, the screening of a film about the Navy.

"Naval Group participated in these events in 13 cities, from 30 May to 27 June, as well as in two round tables," says Laurent Fay, Director of Recruitment, Attractiveness, Diversity and Inclusion at Naval Group. These events presented a unique opportunity to reach out to audiences geographically distant from our sites of activity, and to young people who may not have had the confidence to approach us. The vessels that Naval Group supplies to the Navy are among the most complex products in the world. These days enabled us to promote our trades and the cutting-edge know-how developed by our group to ensure its sovereignty."

"About thirty employees in charge of recruitment got involved to manage our stands and discuss with visitors," says Marie-Gabrielle de Bondy, Recruitment, Attractiveness, Diversity and Inclusion Operations Manager at Naval Group. Various tools were at their disposal to spark their curiosity and allow them to discover our activities. These included virtual reality headsets to visit a submarine and a frigate, and videos presenting our trades. We hope we have helped to reveal some vocations."]

DISCUSSION WITH CAPTAIN **MARIO BENEDETTI**, COMMANDING OFFICER OF THE NAVY RECRUITMENT SERVICE, CAPTAIN **TANGUY DE NOMAZY**, YOUTH AND OFFSHORE TERRITORIES DAYS LEADER, **LAURENT FAY**, DIRECTOR OF RECRUITMENT, ATTRACTIVENESS, DIVERSITY AND INCLUSION AT NAVAL GROUP AND **MARIE-GABRIELLE DE BONDY**, RECRUITMENT, ATTRACTIVENESS, DIVERSITY AND INCLUSION OPERATIONS MANAGER AT NAVAL GROUP.

COMMITMENTS, MISSIONS AND TRADES TO BE DISCOVERED

In a joint interview, the recruitment managers of the French Navy and Naval Group explain what led them to attend together the Youth and Offshore Territories Days to meet young people.

What was the purpose of your participation in these Days?

Mario Benedetti: Half of our sailors come from inland. Our links with the entire country are therefore vital for our activities. Beyond our home ports, however, the Navy is not sufficiently well-known by our citizens, or is sometimes seen as a force that operates offshore, far away from their concerns. This is why we need to reach out to young people in all our regions, as well as their parents and local education bodies, alongside our industrial partners, to introduce them to our missions and the training and career opportunities we offer, as well as the skills that experience in the Navy allows them to acquire. Day-to-day we are supported in this process by our local relays, such as information and recruitment centres for the armed forces, reservists, etc. But this anniversary represents a particular opportunity to bring us closer to the French people, especially young people seeking commitment or attracted to demanding professions, and to make them aware of the essential role of the Navy in the defence and sovereignty of our country.

Tanguy de Nomazy: The Youth and Offshore Territories Days have pushed us to leave our dockyards and reach out to all mainland and overseas territories. Our defence relies on both the link between the nation and the army and a better knowledge of its actions. These days were therefore primarily aimed at creating or reinforcing this link. During the activities offered, we wanted to convey the following messages: the Navy protects our interests in concrete terms through its various missions. In addition, those contributing to its operation come from all over the country, whether they be sailors, our industrial companies, public institutions or reservists.

Laurent Fay: Our approach is the same. For Naval Group, these days were of major interest in terms of image and attractiveness. Through our partnerships, particularly with leading engineering schools, we have noted that many young people far from our sites of activity – all of which are, with one exception, located on the coast – are very interested in our professions but don't think of applying to work with us, because they don't know us. This was the case for students at the École des Mines Saint-Étienne, for example. We therefore need to get out and meet these young people to talk to them about our professions and our missions, and help them in their quest for meaning by making them want to come and work with us!

What challenges do you share in terms of attractiveness?

Mario Benedetti: The French Navy and Naval Group are both recruiters and training bodies. The Navy recruits in 80 professions – particularly in highly specialised fields such as nuclear, digital technology and cybersecurity. Recruitment needs are 20% higher in 2026 compared to the number of new recruits in 2025, including the new national service – whether in traditional roles (sailors, petty officers and officers) or in technical fields through military apprenticeship (via a professional baccalaureate, a vocational training certificate (BTS) or an undergraduate diploma (BUT)).

The military apprenticeship courses we provide at the École Atomique de Cherbourg, the Naval Training Centre of Brest and the Pôle Écoles Méditerranée of Saint-Mandrier enable participants to obtain an academic degree and then work with a military status. National service, implemented from September 2026, is a new method of recruitment: 600 such contracts are open this year. We therefore take on young people with or without initial academic training and provide them with know-how related to the sea, enabling us to supply candidates for high-demand technical professions, not only in the Navy but also in industry. In fact, it is not uncommon for our employees, after several years in the Navy, to embark on a second career in the defence technological and industrial base (DTIB), particularly at Naval Group. We are therefore closely linked and our stories have been intertwined for a long time. We also collaborate within the Groupement des industries de construction et activités navales (GICAN, the French maritime industry association) and promote the maritime sector to young French people through a partnership with French national education authorities.

> **"Our links with the entire country are vital for our activities."**
> MARIO BENEDETTI

Marie-Gabrielle de Bondy: Over the past three years, we have recruited 4,500 employees to meet the workforce needs of our programs. For many years, we most often recruited people with a maritime culture, because of their personal interests or their geographical origins. However, the labour market is under pressure in our traditional employment areas. We therefore need to expand our scope of attractiveness beyond the coast and make our products and our businesses known in order to benefit in terms of recruitment.

We are developing our partnerships with vocational high schools, university institutes of technology (IUT) and engineering schools. In addition, we take on 400 trainees and 500 apprentices each year, who constitute a real recruitment pool for our group. Finally, we play a role in professional integration and reintegration through joint qualification certificates in metallurgy (CQPM), which we offer in several professions.

Reuse

MANTRA

"Nothing is wasted, everything is reused!": this is the mantra of Naval Reuse, the circular economy platform launched in 2023 by Naval Group.
The goal is to allow users to sell or donate unused company property to internal or external professionals. Industrial equipment, manufactured goods, materials: items are regularly posted online by a network of contacts on all our French sites. A win-win initiative that allows more unused items to be recycled, a reduction of waste and an improvement in our carbon footprint while reducing investment costs for buyers.

550 kilos

This is the cumulative weight of all the used safety clothing from the Naval Group site of Toulon that have been recycled to build a 15-metre-long acoustic wall in a reception area, making the space more pleasant in terms of noise levels.
Once shredded and mixed with an organically sourced binder, the safety clothing was used to manufacture more than 3,000 resistant and soundproofing bricks, from which a custom-made range of shades emerged in an organic pattern inspired by the sea, resonating strongly with our company and its history. Behind this feat, at the crossroads of reuse and design, were the site management teams and the company FabBRICK, signing here its largest work of wall art. This creative studio located in the 19th district of Paris is reinventing textile recycling by transforming fabrics into elegant and useful artistic bricks.

Visit our website at naval-group.com to learn more about our environmental approach
And to learn more about the Naval Reuse platform, visit reuse.naval-group.com

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

For further information:
NAVAL-GROUP.COM