
Navantia
Innovation
where it matters

Strategic Solutions.

National leading public company in the development of new technologies applied to the defence sector.

Our wide range of services and our experience in complex system integration mean we can work with our clients to find the best solutions for their needs. Applying 4.0 technologies both to our shipyards and to our smart services and products, we are developing our role as a driving company in the defence sector, working in collaboration with the rest of Spanish industry.

- Comprehensive
- Services Technology
- Innovation
- Innovative technology
- Sustainability
- Collaboration industrial
- Internationalization

Our goal:

To build a secure and sustainable future through technological excellence and industrial collaboration.

We live in a time of geopolitical, energy and digital change. A time of opportunities.

We have a new roadmap for the future, towards our Horizon 5.0.

We are facing economic, social and environmental sustainability challenges.

We have a vision of growth and cost efficiency. We are committed to new business opportunities.

We collaborate with the entire value chain.

We work internationally.

We promote a network of Centres of Excellence and an innovation hub to generate creativity and attract talent.

Technology, a guarantee for international recognition.

Ferrol estuary

Shipbuilding
Repairs
Life cycle support
propulsion and generation
Wind Power

Our facilities. A driving force in Spain.

Shipbuilding
System
Repairs
Life cycle support
Wind Power

Bay of Cadiz

Committed to quality.

Navantia has production centres strategically located in three different parts of Spain. These facilities are equipped with a wide range of docks and slipways, allowing for the construction and repair of large vessels.

Head offices

Madrid

Shipbuilding
System
Repairs
Life cycle support
Propulsion and generation

Cartagena

Cadiz

11,088
jobs created[1]

2.5%
of employment

26.7%
of industrial employment

2.4%
of the province's GDP

34.7%
of industrial GVA

A Coruña

6,183
jobs created[1]

1.3%
of employment

9.7%
of industrial employment

1.1%
of the province's GDP

11%
of industrial GVA

Murcia Region

7,089
jobs created[1]

1.1%
of employment

8.2%
of industrial employment

1%
of the province's GDP

8.1%
of industrial GVA

[1]Direct, indirect and collaborating industry employment. Source: OCDE, Input-Output Tables (IOTs)

Subsidiaries

Navantia Australia Pty.
Navantia Arabia LLC.
Navantia UK LTP.

Commercial offices

Bergen
Brest
Brussels
Delhi
Istanbul
Miami

International. Expansion and diversification policy.

Expansion and diversification policy.

In recent years Navantia has significantly increased its involvement in international programmes, thanks to the success of its work with the Spanish Navy, which has allowed it to move into the overseas market with the guarantee of having reliable products, with more sophisticated systems and minimizing the risks associated with the engineering of applied design and construction systems.

Subsidiaries.

Launch of Navantia Australia Pty.

This part of the internationalization process was consolidated in 2012 with the launch of Navantia Australia Pty. The fruitful relationship between Navantia and the Australian Navy began with the design contracts for the AWD destroyers, the design and co-production of the ALHD amphibious ships, construction of twelve landing crafts, and management services for the destroyer programme. The recent contract for the construction and maintenance of AOR ships has strengthened this partnership, positioning Navantia with good opportunities for future participation in Royal Australian Navy programmes. Today, Navantia, headquartered in Canberra, has facilities in Melbourne, Sydney and Perth, with more than 140 workers.

Increased presence in international programmes

Creation of Navantia Arabia LLC.

This part of the internationalization process was consolidated in 2012 with the launch of Navantia Australia Pty. The fruitful relationship between Navantia and the Australian Navy began with the design contracts for the AWD destroyers, the design and co-production of the ALHD amphibious ships, construction

In addition, as a result of the contract for the construction of 5 corvettes, a joint venture was created with SAMI (Saudi Arabian Military Industries – Saudi state-run company), called SAMINavantia. This company is responsible for supplying combat systems for the corvettes, in addition to training Saudi engineers for the local development and maintenance of ship combat system, with a view to becoming the go-to systems supplier the Royal Saudi Navy.

Launch of Navantia UK LTD

Navantia has set up a subsidiary in the United Kingdom, Navantia UK LTD, as part of its interna

tionalization, to have a permanent presence in said country and to be eligible for contracts both in the military business and in that of Navantia Seanergies.

creased

Engineering excellence.

We have an excellent in-house engineering capacity that allows us to maintain technological independence and offer our clients an agile and flexible response.

Innovation.

We encourage investment in R&D&I, anticipating the future by improving current products with innovative solutions and investing in the development of new products and services, to continue being leaders in the industry.

Customer focus.

We work closely with our clients to meet the most demanding of requirements and adapt to their specific needs.

Comprehensive Solutions.

We offer comprehensive solutions including not only platforms but also systems, training and life cycle support; as well as our portfolio of consulting services for shipyards, enabling us to offer a tailored solution to covers all our clients' needs.

Technology transfer.

We have extensive experience in international technology transfer programmes in complex projects, which allows us to minimize programme risks effectively.

Astillero 5.0.

We are in the midst of a transformation process to adapt to the new environment that the market demands. At the heart of the global European Industry 5.0 strategy, Navantia is working to achieve Shipyard 5.0, with the technology and facilities that enable us to take a leap in our industry evolution, guaranteeing competitiveness and continuing to offer a high quality in our products. A new shipyard for the 21st century.

Global Solutions.

Navantia offers global solutions to its clients.

We offer global solutions to our clients: engineering, manufacturing, complex system integration, maintenance services, simulation and training. We work with strategic partners, both national and international, contributing to the Spanish brand.

A benchmark in design and construction of high-technology ships.

A secure future

1. Shipbuilding 16

More than 300 years' history consolidate Navantia as a benchmark shipyard around the world, with a large portfolio of the most innovative products and services.

2. Systems 18

Centre of excellence for the design, development and integration of sophisticated systems, giving Navantia high technological value.

3. Services 20

Comprehensive services that can adapt to the requirements of each client, using cutting edge technology and applicable to the entire value chain.

4. Repairs 24

A world reference point for the repair, maintenance, conversion and renovation of civil and military ships, with three centres strategically located on important international maritime routes.

High technology for defence.

A sustainable future

5. Sustainability Strategy 26

Committed to the environment, people, social action and governance, Navantia promotes its own Sustainability Strategy, aiming to facilitate more responsible management.

6. Navantia Seanergies 28

New line of business that contributes to energy transition and decarbonization, based on synergies with our shipbuilding business.

We promote responsible management.

Technological excellence

7. Digital transformation: Towards shipyard 5.0 **30**

Future commitment towards a more digital, sustainable and competitive shipyard, transforming products, processes and knowledge.

8. Network of centres of excellence **34**

Launch of a network of Centres of Excellence, in different workplaces, specializing in areas that Navantia has identified as areas of future growth.

9.Monodon, our innovation cell **38**

Open innovation cell to promote research and experimentation with disruptive technologies and speed up their implementation within the company.

We are committed to innovation.

Industrial collaboration

10. ToT experience 40

More than twenty years of experience in technology transfer programmes to other countries, developing a number of products: frigates, submarine, patrol boats, LHDs.

11. European projects 44

Participation in European Defence Fund projects, which will stimulate competitiveness and innovation and consolidate Navantia's leadership in strategic aspects for its business.

We guarantee strategic interests.

1 SHIPBUILDING

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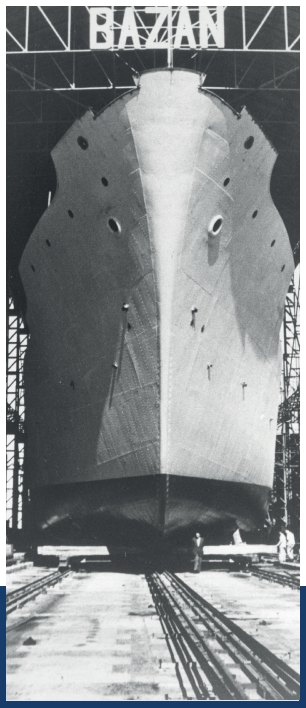

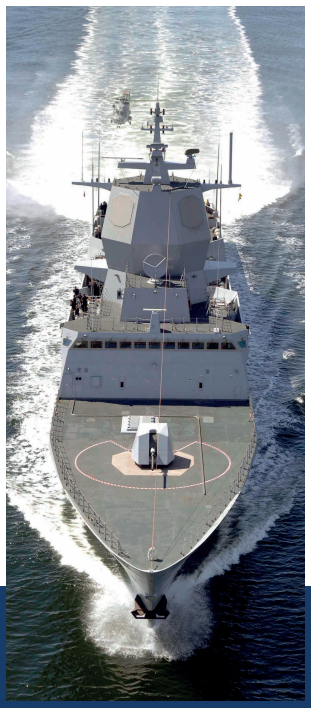

Navantia started out in Shipbuilding. Dating back more than 300 years, Navantia offers solutions to safety challenges at sea, adapting to the specific needs of each client, with the guaranteed quality of one of the world leaders in shipbuilding. We are the go-to supplier for the Spanish Navy, whose fleet is undoubtedly the best showcase of our work. In addition, Navantia has a long tradition of exporting. Countries such as Australia, Saudi Arabia, Norway, Chile, Venezuela, Thailand, India and Turkey, among others, have trusted us for the construction of their amphibious ships, aircraft carriers, patrol boats, frigates and submarines.

Navantia has a wide catalogue that includes all types of ships (Aircraft Carriers, Amphibious Ships, Destroyers, Frigates, Corvettes, Patrol Ships, Submarines, Auxiliary Ships, etc...), and has the capacity to integrate the necessary technologies to create a global solution that covers the our clients' needs throughout the different phases of the life cycle.

The five F-100 frigates built for the Navy proved to be a success story from all points of view: operational, industrial and technological; promoting the internationalization of Navantia with the production of eight similar ships for Norway and Australia.

Navantia as a benchmark.

We work in close collaboration with the client, adapting to their requirements and offering a comprehensive service to deliver fully operational vessels: design, construction, systems integration, training and maintenance throughout the life cycle.

2003 **2007** **2010** **2022**

The company is currently undergoing a new process of evolution and innovation to respond to the most demanding requirements of naval forces and the opportunities of Industry 5.0. This innovative period has resulted in the development of the S80 submarines and the new Spanish frigates, the F-110s, which will be the first type of surface ship in the Spanish Navy's 4.0 fleet, the frigate of the 21st century.

The design of this new F-110 incorporates notable technological and operational advances. In parallel to the design of the F110, a digital model is being developed, an exact 3D virtual replica of the frigate, to which data, models and information from the ship are added to create a sophisticated Digital Twin capable of optimizing the operation, maintenance, logistical support and training processes of the real frigate. This Digital Twin makes it possible to create a cyber-physical system, by combining and highlighting real and virtual features.

The development of the S-80 Submarine positions Navantia as one of the main designers/builders of (non-nuclear) submarines in the world, capable of integrating the most advanced technologies, such as the AIP system that will make the S-80 unique in its segment.

2

NAVANTIA SYSTEMS

The excellence of Navantia Systems.

Navantia Systems is the centre of excellence for the design, development and integration of complex high-tech systems, providing the Company with great added value, standing our from the rest of the traditional shipyards.

The Systems Business Unit has extensive experience in the area of systems integration, which translates into risk reduction and the security of meeting set objectives with full guarantees. Navantia Sistemas covers the entire spectrum of defence capabilities for both naval and land units: command and control, platform control, communications, navigation, weapons and training. Technology is part of the DNA of Navantia Systems, and for this reason, it provides solutions for autonomous vehicles and connected to the digital twin of the platform where it is integrated.

Fully integrated solution.

The contribution of Navantia Sistemas within the company organization allows Navantia to offer an integrated and complete solution to its clients, which is a competitive advantage in the international military shipbuilding market.

Platform control.

- IPCS - Integrated Platform Control System

Communications.

- HERMESYS - Integrated communications control system

DORNA Fire Control and Intelligence.

- DORNA - Naval radar and electro-optical fire control solutions for use with any type of weapon
- SERT - Advanced intelligence and surveillance systems for ground units

Naval and Land Artillery.

- Lengthy experience in the manufacturing, overhaul and maintenance of cannons under licence from the main international suppliers
- SKYDOR - Coastal Artillery Solutions

Technological DNA.

- Mission-oriented solutions in autonomous vehicles
- SSI (Integrated Service Systems) - Reduction of cables, increase in performance.
- Digital Twin

Training and Sustainment Systems.

- NAVANTIS - Advanced training environments
- NOTS - Guided training
- E-LEARNING - Training management platform
- ATAVIA – Maintenance Management integrated
- REMOTE ASSISTANCE

ystems

3 SERVICES

Digital services

Navantia offers digital services both for platforms and the client's own facilities. Key examples include developments in the fields of smart maintenance, predictive maintenance, remote assistance, digital twins and data analysis. This is achieved using different key digital technologies, such as modelling and simulation, Internet of Things (IoT), artificial intelligence (AI), virtual and augmented reality (VR and AR), and big data.

Modernization

The Services team is responsible for updating all types of platforms to make them compatible with current technologies, increase their useful life and adapt them to continuous changes in regulations and environmental restrictions. Navantia Servicios takes part in all phases of the process, including feasibility studies, basic and detailed engineering, and execution.

Navantia Services offers solutions adapted to the client's needs in a comprehensive, profitable, sustainable and cutting-edge technological way, and applied to the entire value chain, from the asset's entry into operation until the end of its useful life, acting as a strategic partner for the client.

Eminently transversal in nature, the Services unit brings together all the functions necessary to provide services to the customer, including Life Cycle Support (LCS) activities, modernization, digital services, engine manufacturing and supply, and training.

Navantia offers high-quality local and digital services thanks to licences with original equipment manufacturers (OEM) and technological partners, qualified workers and engineers, and a strong commitment to R&D&I.

Life Cycle Support

One of the most important elements for the reliability of missions and the fulfilment of the useful life of the platforms is LCS. Navantia has extensive experience in this service inherited from original support contracts, which it offers not only to platforms designed and manufactured by our company but also by third parties.

Navantia Servicios is present in all areas of Life Cycle Support: creation of logistics and spare parts documents (ILS, Integrated Logistics Support), configuration auditing, engineering, LCS management and execution, and remote and on-site assistance 24 hours a day, 365 days a year.

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Solut

Engines

Navantia Servicios designs and manufactures propulsion engines and generating sets for all types of ships and land propulsion systems, as well as generation and co-generation plants for industry or energy companies. We have a large catalogue of engines and experience thanks to over 75 years of history, and licences or technological cooperation agreements with top-level manufacturers such as MTU, MAN or Caterpillar, among others.

In recent decades, in addition to manufacturing, the Engines unit has strengthened its vocation for service and has opted for Life Cycle Support, offering after-sales service, preventive and corrective maintenance, real-time diagnosis and supply chain management. Likewise, we have increased investment in R&D&I, reinforcing the development of new, cleaner propulsion technologies, such as the hydrogen-based Dual Fuel Engine or the adaptation of engines to allow the use of biofuels or synthetic fuels, AR and VR-based assistance, or the implementation of the Plant Digital Twin.

prehensive tions

Training

Navantia Services has a division dedicated to training for all the above services, not only in partnership with universities for naval training specialities, but also for the staff training on the platforms designed and built by Navantia, as well as for crew members of the yachts and megayachts that enter the Repairs unit and who, according to the legislation in force at the time, need to retrain with certain certificates and titles to be able to sail. Not forgetting, of course, the valuable work of training local companies, clients and users and, therefore, the transformative power of Navantia to create local industrial capacity.

Navantia is therefore no longer a mere product supplier and has also become the clients' "partner", providing them with specialized staff and technologically advanced tools developed by Navantia Services with which to train and offer operational capacity throughout the platform life cycle, since client staff will be able to safely operate the ships and ensure their full availability.

Turbines

Navantia focuses its production activity on the following product lines: Manufacturing, assembly and maintenance of main equipment for ships. Propulsion plants, gearboxes, rudders, axle lines, torpedo tubes, combat system cooling, etc.

Manufacturing, assembly and maintenance of energy generation equipment and plants. Steam turbines for thermal and nuclear power plants, combined cycle installations, co-generation, biomass and other applications.

After-sales service (24 hours/day anywhere in the world). Machining, on-site rotor balancing, technical assistance, complete operation and maintenance service, supply of spare parts, equipment optimization and training of operation and maintenance staff.

4 REPAIRS

Navantia repairs all types of ships and civil or military units in its shipyards located on strategic maritime navigation routes, both in the Atlantic and the Mediterranean, with specialization in repair, transformation and renovation of LNGs, luxury cruisers and megayachts.

Strategic situation

Navantia has three specialized naval repair centres near the main maritime navigation routes in the Atlantic and the Mediterranean:

Ferrol estuary (NW)
Bay of Cadiz (SW)
Cartagena (SE)

Our shipyards are located in areas with a privileged climate where you can work 365 days a year, in cities with excellent infrastructure in communications, accommodation and services for crews to use during the repair period.

Cualificados y homologados

The Repairs unit has 370 highly qualified workers and the support of a selection of approved auxiliary industries, thanks to whom Navantia can offer high levels of safety, quality of work, reliability in delivery times, and competitiveness on the international naval repairs market.

International certifications

The excellence of service offered by this business unit is endorsed with the most important international certifications for the quality, occupational health and safety, environment, and industrial safety management systems: ISO 9001, ISO 45001, ISO 14001, UNE ISO PECAL / NATO AQAP 2110/2210, MARPOL and PBIB/ ISPS.

Navantia is a leader and international benchmark in the repair, conversion and/or modernization of LNG vessels, luxury cruise ships and megayachts.

Repair and Maintenance

Diversity and Flexibility

Navantia Repairs is capable of performing all types of civil and military naval repairs (gas tankers, cruise ships, megayachts, oil tankers, container ships, chemical tankers, dredgers, cablers, ROROs, offshore units, aircraft carriers, frigates, corvettes, patrol vessels, etc.), including a wide range of highly skilled jobs and technically complex modernization, updating, revitalization, life extension, and transformation of ships, as well as hull lengthening work and other important structural modifications, re-purposing, and the installation of new systems, equipment adaptation, etc.

Specialization in LNGs, cruise ships and

Repairs has specialized over recent decades in 3 main business lines:

LNGs / Oil & Gas (LNGs, FSRUs, FPSOs, LPGs, etc)
Luxury cruise ships (large passenger ships)
Megayachts (large motor and sailing yachts)

Our proven experience gained over all these years, our commitment, excellence of the service, and the great capacity of our technical and human resources has allowed Navantia to achieve a clear leading edge position in each of these lines of speciality, both in Europe and worldwide, offering our select list of international clients one of the best global options for the repair and maintenance of their vessels.

5 SUSTAINABILITY STRATEGY

Environment.

We are fighting against climate change with a very ambitious Decarbonization Plan that aims to reach net zero in 2040. With this challenge we are 10 years ahead of European forecasts.

We are committed to biodiversity and the marine environment, which is why we have created the “Navantia Ecosystem” project, which in addition to the creation of “Navantia Forests” in areas close to our shipyards, includes getting involved in the restoration of marine ecosystems in our areas of influence, known as “blue carbon”. A project in which we are pioneers and that has the greatest relationship with our activity.

We promote eco-design, so that our products and services are increasingly less polluting.

In addition, we are reinforcing the circular economy until we reach zero waste, with actions such as reusing products and raw materials, promoting the use of renewable energies and a responsible consumption of water and electricity.

People.

People and their safety are at the heart of Navantia. Achieving zero accidents is our first priority.

In the Equality and Diversity unit, we are promoting the presence of women in management positions. By 2025, the goal is for there to be 30%, and in 2030, 40%

We are committed to Talent and Employment. Training must be a constant, which is why we have also set ourselves the goal for half of our staff to be graduates by 2030. And in 2025, all workers will be able to take training courses.

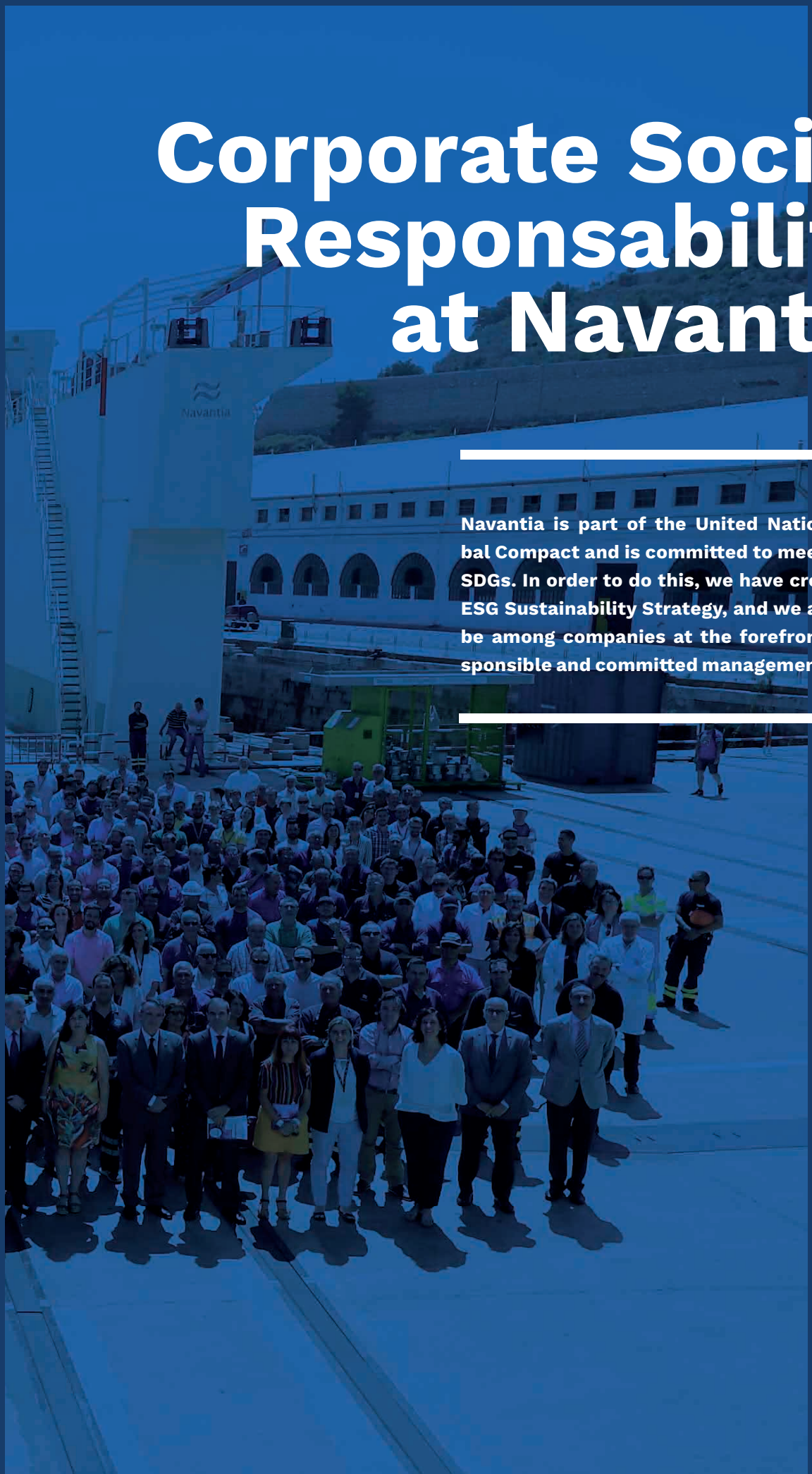
Social action.

We are reinforcing our commitment to our interest groups, promoting Navantia volunteering and partnerships, and working with local associations, universities and educational centres to encourage STEM vocations among women. We are committed to disseminating and caring for naval heritage and our museums.

Gobernance.

Navantia is part of the United Nations Global Compact and is committed to achieving the SDGs. We aspire to be a reference in the best governance practices, improving our policy and compliance actions, responsible management and respect for human rights. We are also working to adopt the best practices in reporting and transparency.

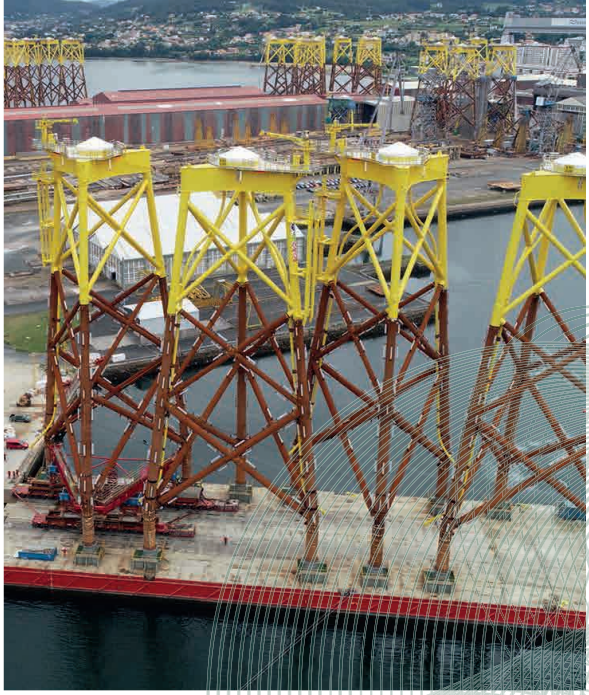
Corporate Social Responsability at Navantia



Navantia is part of the United Nations Global Compact and is committed to meeting the SDGs. In order to do this, we have created an ESG Sustainability Strategy, and we aspire to be among companies at the forefront of responsible and committed management.

6

Navantia
SEANERGIES



Better energies for a better world

Navantia Seanergies is one of the company's three new business units, created to become a global supplier of products and services in green energies, such as offshore wind energy and hydrogen, all supported by our experience, industrial capabilities, and innovation.

Navantia Seanergies was born out of synergies with the other units, to contribute to energy transition, the decarbonization of maritime transport and more sustainable development for the planet.

Centre of Excellence: driver of innovation

With three offices in Spain, located in Fene, Puerto Real and Cartagena, the Navantia Seanergies centre of excellence is a space for collaboration with other innovation players in the sustainable energy industry, such as our clients, the companies in our supply chain, SMEs, business add-ons, R&D&I agents (universities, technology centres, etc.), and other strategic partners.

This collaboration drives and reinforces innovation. The Centre of Excellence is also a hub for the traction and strengthening of the industrial fabric surrounding our company, making us part of the construction of a sustainable and profitable future energy sector. futuro.

Technology and experience to lead the Energy Revolution

In line with the UN objectives and within the context of the global trend to reduce CO2 emissions and maximize energy independence, Navantia aims to become a main player in the green energy industry, both in Spain and around the world. Proven capability.

Proven offshore wind capacity

The company began its activity in the area of offshore wind energy in 2014 and has since been involved in large offshore wind farm projects in Europe, with frontline developers, supplying foundations and substations. Today, Navantia has the capacity to manufacture all types of fixed foundations for wind turbines: such as monopiles, XXL monopiles and jackets and floating structures, as well as substations.

These activities are carried out in facilities adapted to Shipyard 5.0 requirements located in Puerto Real and Fene.

The possibility of locating industry where it is required contributes to optimizing project results. The division has a solid and proven collaboration model with local partners, focused on overall value chain development.

Navantia Seanergies is also ready to manufacture, assemble and integrate products and components for various green energy markets, such as hydrogen or biomass turbines.

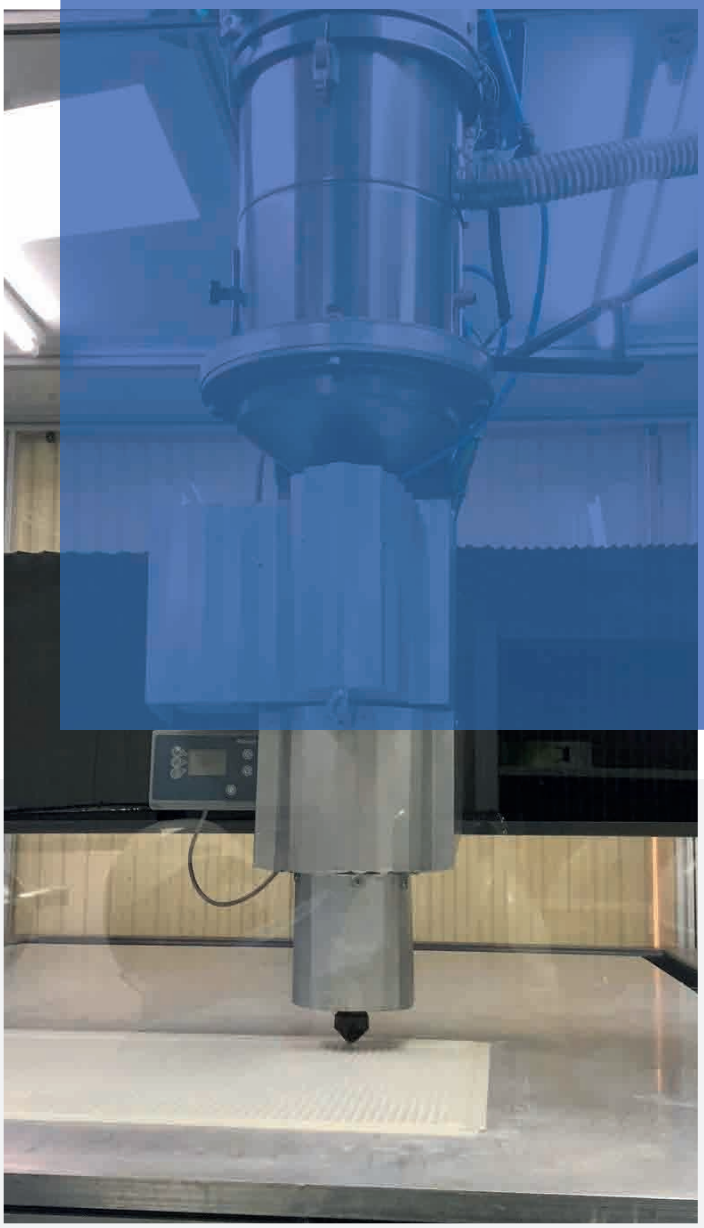
Hydrogen: Towards the decarbonization of the maritime sector

Green hydrogen is a clean fuel that will play a starring role in the future of naval propulsion. Navantia Seanergies' experience in the hydrogen fuel cell submarine propulsion sector is the perfect starting point for the development of vessel propulsion projects, as well as hydrogen engine systems, in collaboration with major designers.

In Cartagena, Navantia Seanergies already has facilities (3600 m2) dedicated to the integration and testing of real components in production. These include fuel cells, repurposed hydrogen generators, cryogenic storage and battery emulation, among others.

Navantia Seanergies also has the industrial capacity to build electrolyzers at the Ferrol Turbine Factory.

7 DIGITAL TRANSFORMATION: TOWARDS SHIPYARD 5.0



We design the future.

It will incorporate innovative and environmentally-friendly propulsion systems; energy production, storage and management systems for high energy naval applications; flexible architecture designs through reasonable modularity; maximum possible automation and autonomy, being able to control its environment to have an appropriate reaction to any type of threat. The 'smart ship' encompasses a wide range of predictive/remote maintenance possibilities, performance optimization and decision support tools. All of these technologies will increase system availability and vessel reliability.

The ship's health monitoring system, high sensorization, digitalization (augmented reality, an improved decision support system in complex situations such as data fusion) will be part of the ship. Using these connected systems and equipment, ships will produce completely new data sets in large quantities, allowing automonitoring and automitigation of possible failures. New artificial intelligence, data fusion, deep learning and machine learning techniques and solutions will need to be developed to manage this data.

Supporting sustainability and competitiveness.

Digital transformation is a commitment to the future for the sustainability and competitiveness of the company, since it aims to translate into a very significant improvement in operations (20% of the cost, 20% of the deadline and 20% of the quality), thanks to the use of technologies such as big data, Internet of Things (IoT), industrial robotics, artificial intelligence, 3D printing, autonomous vehicles, Cloud computing, virtual and augmented reality, new digital platforms, etc.

Smart Shipyard.

A cyber-physical space for building physical ships and their “Digital Twins”. These are factories that use advanced analytics and artificial intelligence for programme monitoring, fault identification and production optimization; the Internet of Things (IoT), to monitor the performance of machines and the location of ship equipment and components; sensors and video analytics for continuous monitoring of worker health and safety conditions; mobility applications to connect the worker at all times; industrial robots and autonomous vehicles to relieve the worker of the most dangerous and least valuable tasks, etc.

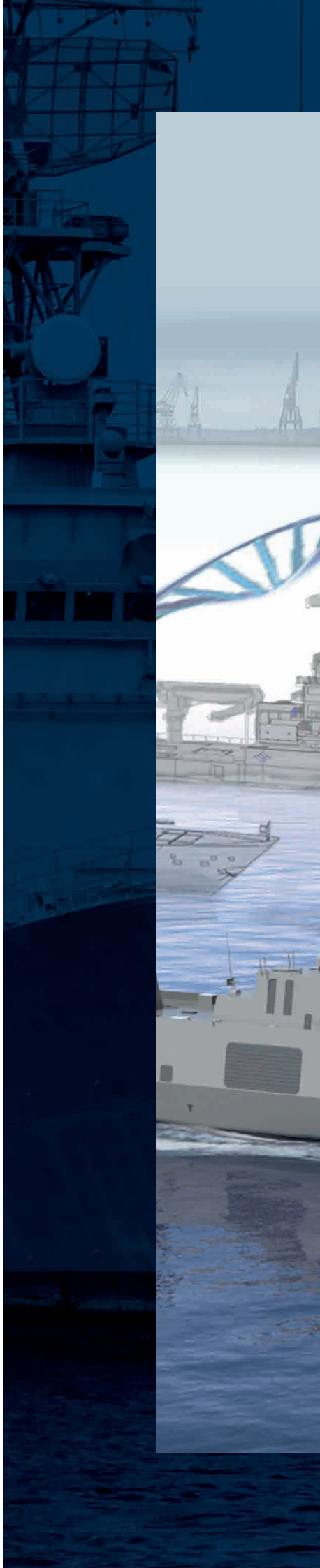
7 DIGITAL TRANSFORMATION: TOWARDS SHIPYARD 5.0

Processes 5.0.

These include the shipyard and life cycle production activities, as well as business activities (Administration and Finance, Human Resources...), with technological innovations such as those of the smart shipyard, the automation and robotization of office tasks that free workers up to work on tasks with greater added value.

People and knowledge 5.0.

People are the key to technological transformation, they are what make a company truly digital, through a new digital culture, more horizontal management, more collaborative and connected work, with an organization that encourages the use of digital technologies and renewed talent with skills and profiles highly oriented to the digital world.



Digital infrastructure.

This made up of the different technologies and platforms that connect machines, workers and the plant with the programme management and directors of the entire company, through different layers of technological architecture (sensors, IoT platform, MES, PLM, ERP, big data and Advanced Analytics...)

8 CENTRE OF EXCELLENCE NETWORK

Navantia has created a network of Centres of Excellence (COEX) to promote the use of new technologies and to act as a reference point for knowledge and collaboration for R&D&I activitiies and the exchange of information between companies, universities, clients, partners technological and other centres of excellence.

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Center of Excellence in Digital Twins

Located at the Ferrol shipyard, its mission is to drive the evolution of the Digital Twin as a Navantia product, exploring, developing and applying digital twin technologies to offer best practices and solutions to the rest of the company.

It is a space to develop, test and validate Digital Twin solutions on board the F110, in addition to other digital twins associated with new Navantia products, processes and services.

Centre of Excellence in Naval Systems

Located at Navantia Systems in San Fernando, its mission is to accelerate, improve and consolidate the design and integration of complex high-tech systems in Navantia products and services. It hosts our Artificial Intelligence and Cybersecurity spaces, creating a “Cyber-ecosystem” of open and participatory technological innovation, mixed research, testing and experimentation, seeking to accelerate, improve and strengthen the adoption of cybersecure and artificial intelligence technologies in the industry, focusing primarily on defence.

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ines

8 CENTRE OF EXCELLENCE NETWORK

Center of Excellence in Smart Ships

Located in Madrid and coordinated with the rest of the centres of excellence, its mission is to lead the creation and development of new cutting edge ship solutions and concepts, guaranteeing the future competitiveness of Navantia through technological innovation in products and design processes, and applying concepts such as sustainability, cybersecurity and autonomy.

Centre of Excellence in Additive Manufacturing

Located at the Puerto Real shipyard, its mission is to integrate additive manufacturing technologies into its products and services to implement them both for Navantia's internal and external clients, positioning Navantia as an international benchmark in the field of additive manufacturing for applied to the naval and industrial field.

The additive manufacturing of this type of parts will offer benefits such as weight reduction, advancing resistance reduction, process simplification and manufacturing optimization, as well as opportunities for hydrodynamic improvements and cost reduction.

Center of Excellence in Smart Services

Located at the Cartagena shipyard, it is aimed at creating Smart Services throughout the life cycle of Navantia products, specializing in Integrated Logistics Support, management of assets and their maintenance and performance through predictive data analysis, as well as in the creation of mobility and support solutions for the different users of our products. These solutions must be based on the premises of sustainability and scalability.

Center of Excellence in Green Energies

With three different offices in Cartagena, Fene and Puerto Real, it focuses on working towards the development of innovation vectors for hydrogen, offshore wind and other marine energies. All of this with sustainability as the transversal axis and promoting R&D&I, knowledge and entrepreneurship through the development of a collaborative ecosystem to strengthens the national industrial fabric in Spain.

9 MONODON, OUR INNOVATION CELL

Navantia creates 'monodon', an innovation cell to accelerate the adoption of disruptive technologies

Navantia has created ‘monodon’, and open innovation cell to promote research and experimentation with disruptive technologies and speed up their implementation within the company.

This new brand is based on the Latin term monodon monoceros, the scientific name for the narwhal, a species also known as the sea unicorn. 'Monodon' will be officially presented at the FEINDEF Defence Fair, due to be held in Madrid between 17–19 May and where Navantia will sponsor the space dedicated to start-ups, called Innova for Def&Sec.

'Monodon' will be the spearhead to test, experiment and attract technologies and connect with the technological and entrepreneurial ecosystem before these new technologies are adopted by Navantia. It will also be dedicated to exploring markets adjacent to the industries in which our company operates and to working on projects at different degrees of development.

The main objective will therefore be to build up a mechanism to increase access to technology, facilitate the incorporation of innovation in the company, achieve disruptive products in less time and support the national industrial fabric through joint strategic investments with other actors in the innovation ecosystem.

“Companies must operate in a permanent state of technological transformation and updating; even more so in a field such as Defence. With ‘Monodon', Navantia is equipping itself with tools to guarantee long-term innovation and to experiment and integrate disruptive technologies,” explained Navantia Chairman Ricardo Domínguez.

“The creation of ’Monodon' takes us one step further in our R&D&I strategy. The 2018-2022 Strategic Plan involved the adoption of technologies such as Artificial Intelligence or the Internet of Things, both in our processes and in the products and services we offer to our clients. Today Navantia is a leading company and in order to maintain this position it must use new mechanisms,” said the Navantia’s Technology and Digital Transformation Direct and Director of Systems and Services, Donato Martínez.

We create new smart proc

To fulfill its functions, ‘Monodon' will have several tools:

LAB: ANTICIPATING THE FUTURE

The ‘Monodon' laboratory will experiment with deep tech technologies, in order to be present in the initial phases of research products and determine which technologies Navantia must invest in to be differential. 'Monodon' will collaborate with research centres, universities and start-ups to detect future trends, carry out pilot projects and act as a talent attraction hub.

OPEN INNOVATION ECOSYSTEM

'Monodon' will have an open innovation strategy to encourage universities, research centres, technology centres and start-ups to work together on technologies of common interest. In this way, the driving role that Navantia has in the industry will be replicated in the field of innovation with 'monodon' as the axis of collaboration with mixed research units (MRUs), companies, innovation forums and research centres. This strategy has already taken its first steps in areas such as quantum technology, robotics, new materials, nanotechnology, and 4D printing among others, all with a focus on the naval and defence industries.

CREATION OF 'HUBS'

With the creation of 'hubs' alongside other companies, access to new solutions and connection to international networks will be promoted, in addition to the extension of infrastructure and demonstration and experimental spaces to test technologies in an integrated way. This will make it possible not only to detect technologies and run pilot projects to validate them throughout the value chain but also to scale and industrialize them, minimizing risks. Ultimately, the aim is to establish solid and systematic collaboration networks with which to co-develop, validate and scale deep tech technologies.

MONODON AND THE NAVANTIA INNOVATION STRUCTURE

'Monodon' will be an independent cell that will interact with the entire Navantia R&D&I structure, from the research projects linked to programmes (including the S80 and the F110) to the Centres of Excellence network (Navantia CoEx), in turn linked to their different businesses.

10

ToT EXPERIENCE

We have extensive experience working with industries and international defence organizations

We have amply proven our company's experience and its ability to undertake large and complex projects. We are currently, or have been involved in several international cooperation programmes with other ship-builders and foreign navies, for the joint design and construction of military ships, providing technology transfer and developing the local ship maintenance processes.

Experien

AVANTE 2200 Programme for Saudi Arabia: Design and construction of the five light frigates for the Royal Saudi Navy.

Programme with an important ToT content, particularly in the Combat System where a transfer of knowledge and technology will take place to the local company SAMINavantia (a SAMI - Navantia JV) through a training scheme for 50 Saudi engineers. It includes an LBTS (Land Based Test Site) with a replica of the Combat System (so that the Saudi industry is self-sufficient for system maintenance and future updates), the construction of training facilities with simulators at the Jeddah naval base, and training courses for instructors and local industry.

LHD Program for Turkey: SEDEF Shipyard-Navantia partnership programme for the design and construction of an amphibious landing ship based on the Spanish naval ship the Juan Carlos I, where we have set up a team to support the programme and ensure the transfer of technology. Navantia is providing the design, technical assistance, technology transfer, 5 diesel generators and the Integrated Platform Control System. The combat system is supplied by a Turkish Joint Venture between the public companies ASELSAN and HAVELSAN.

AWD Program for Australia: Contract with the Commonwealth and the Australian Navy for the design of 3 Hobart class ships and other supplies and services, including production information and technology transfer, training and assistance to enable construction in Australia. Project support through a team posted in Adelaide (Australia) and co-production of the vessels with the block construction of the second and third unit, undertaking responsibility for the results of the programme in terms of delivery and cost.

LHD Programme for Australia: Joint programme between BAES Australia and Navantia for the design and construction of two LHD platforms. Navantia built the vessels down to the flight deck, which were shipped to Australia for assembly of the Australian-built superstructure, testing, and final acceptance. Navantia was also responsible for providing the design, construction, testing and associated supply, including Integrated Logistics Support, with a team based in Williamstown (Melbourne, Australia) to support the programme.

Coastal Surveillance Vessel Programmes for Venezuela: Construction programme for three ships in Navantia and a fourth unit with the Venezuelan national shipyards DIANCA, where a construction support team has been deployed, as well as supplies and services, including construction information and transfer of technology, training and technical assistance to provide the DIANCA shipyard with the capacity to build BVLs in Venezuela.

F-310 programme for Norway: Design and construction of 5 frigates, where Norwegian shipyards built blocks for the latest ships in the series, according to Navantia's construction strategy, through the transfer of know-how. Likewise, Navantia has integrated equipment and systems developed by the Norwegian industry, opening up the Spanish market to the Norwegian defence industry.

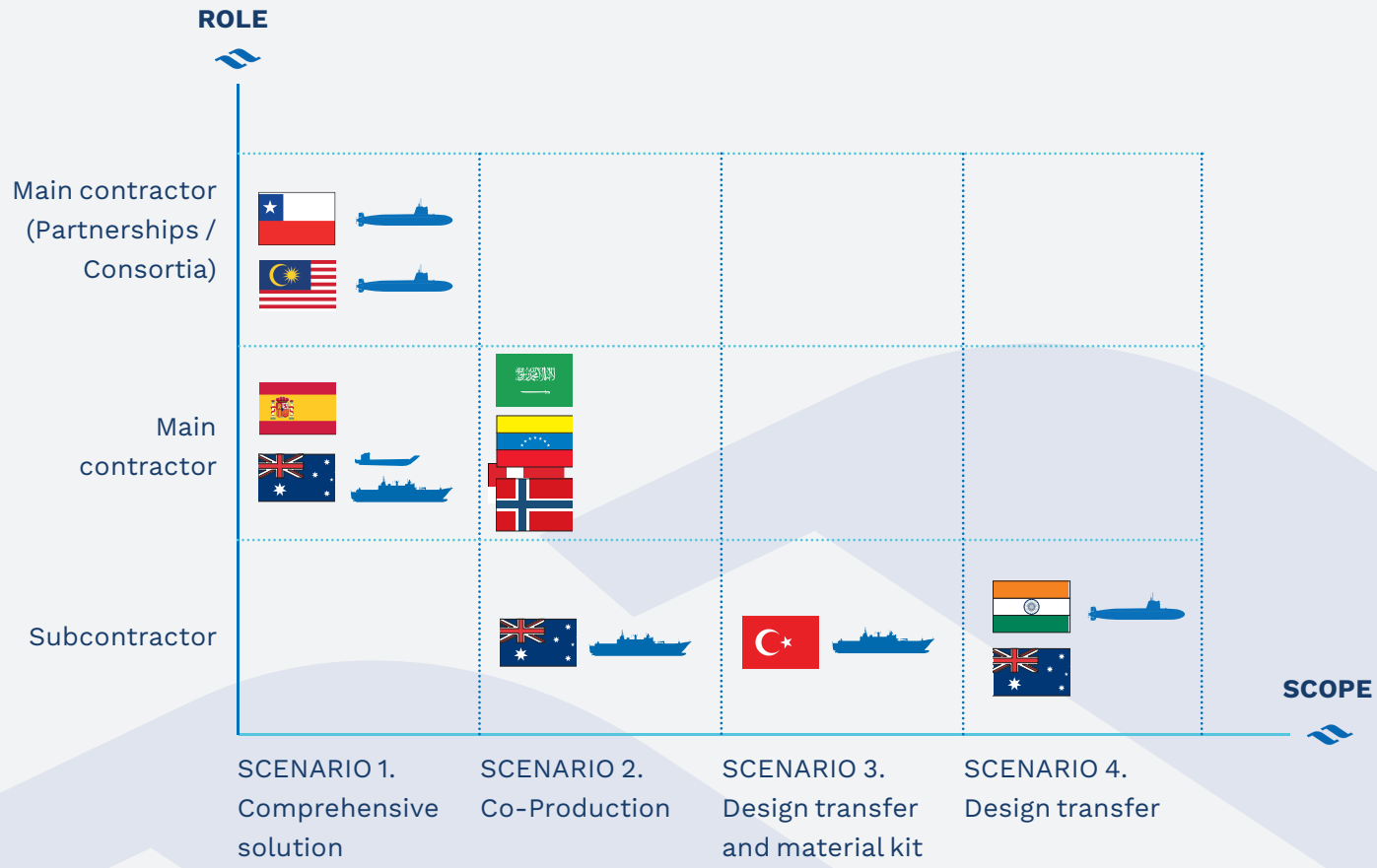
Scorpene Programme for India: Industrial Cooperation Program with Naval Group for the joint design and construction of Scorpene class submarines for Chile, Malaysia and India.

The Scorpene projects for Chile and Malaysia took place under a co-production scheme in which Navantia carried out the detailed design and construction of the stern sections and the assembly of the second submarine for each programme. Regarding the Scorpene project for the Indian Navy, the consortium provided engineering, technical assistance, technology transfer and training for the construction of six Scorpene submarines by Mazagon Dockyard Ltd (MDL) in Bombay (India), with a team from Navantia working alongside the CDM project team.

10 ToT EXPERIENCE

ToT Models

Navantia has applied its model in contracts with different scopes of supply and different contractual formats. These options are represented in the following figure:



Thanks to this experience, Navantia can offer global and long-term solutions, adapted to the needs and requirements of each client, minimizing the risk in the programmes.

THE HORIZONTAL AXIS shows the 4 partnership scenarios: from Scenario 1, a “turnkey” solution, where Navantia is responsible for the entire construction programme until the delivery of the final product, fully tested, ready for entry into service; to Scenario 4, “design transfer”, when Navantia supplies its own design to be built by the client, always in collaboration with Navantia depending on the agreement reached with the client.

THE VERTICAL AXIS shows the role of Navantia within each signed contract: subcontractor, prime contractor, or as a member of a consortium that is main contractor for the programme.

Navantia presents a model that is adaptable to the client’s requirements, for example:

- With the Spanish Navy it acts as the main contractor, delivering a “turnkey” solution
- With the Royal Australian Navy it acted as a subcontractor for BAE or the Commonwealth, building part of the ships in Spain and part in Australia (ALHD amphibious ships) or delivering the design to be built in Australia with the collaboration of Navantia (AWD frigates).
- With the Royal Saudi Naval Forces we are acting as the main contractor in a co-production contract where the units are built in Spain, but the final integration and tests of the Combat System of the last two ships are carried out in KSA, which is where the ships are delivered.

11 EUROPEAN PROJECTS

Technology

Navantia is involved in six technological development projects

These projects are financed by the European Defence Fund (EDF) under the 2021 call.

These are six projects that, in a consortium with other large companies, SMEs, universities and European technology centres, have been selected by the European Commission, representing a success for the company and its European cooperation strategy.

Navantia, with a solid presence in European industrial and institutional forums, can reinforce its role as a driving company of the Spanish naval and defence industry in the European environment and enhance its projection by establishing collaboration mechanisms with the benchmark defence industry in Europe.

The awarding of these projects will allow Navantia to consolidate its leadership in key strategic business areas, such as the digitalization of naval platforms and the development and integration of unmanned vehicles and new generation weapons. Progress is also being made in establishing partnerships that will allow the collaborative development of combat ships that respond to the needs of European navies.

The goal of the EDF is to strengthen the technological and industrial base of European Defence, with collaborative projects that stimulate competitiveness and its own capacity for innovation, facilitating strategic autonomy and freedom of operation, and providing the Armed Forces with the military capacity necessary to face the challenges of potential future conflicts.

Q-SING Project.

Focused on developing an inertial navigation system based on interoperable quantum and gravimetric vector technology, it aims to be an alternative to satellite navigation systems. Navantia's contribution is based on its deep knowledge of the development of naval navigation systems and its expertise as a designer and integrator of naval systems.

d'THOR Project.

This project seeks to establish a common framework and associated standards to improve the monitoring of the ship structure through sensorization and mass data exchange. Knowing the current state of a ship's structure at all times will allow maintenance to be optimized following a condition-based maintenance scheme and will advise the crew on the actual performance of the structure throughout the vessel's life cycle.

European Patrol Corvette Project (EPC).

Navantia will develop the initial design phase of a modular, flexible, green, interoperable and innovative corvette, including the final development of innovative technologies that will provide the necessary capabilities to this new class of ships. The project has the support of the PESCO EPC Programme, which involves the Ministries of Defence from France, Italy, Greece and Spain. Together with Fincantieri and Naval Group, Navantia is part of the main group of partners and is involved in the technical side of the project in close collaboration with the Spanish Ministry of Defense and the rest of the country's Defence industry.

EDINAF Project.

Navantia plays the leading role in this project, which focuses on the development of the reference architecture for a digital ship, facilitating the standardization of interfaces without losing sight of the necessary flexibility, scalability and universality of the solution.

HYDEF Project.

Focused on the research and definition of the concept of a European interceptor against hypersonic threats from both ballistic missiles and supersonic vehicles. The consortium is led by the Spanish company Sener and the participation of Navantia, the only shipbuilder working on the project, ensuring the future integration of the interceptor system into a naval combat platform.

EDOCC Project.

This project aims to provide the EU and its Member States with a "multi-domain combat cloud", a virtual platform based on cloud technologies that will increase the interoperability, efficiency and resilience of military operations. The consortium is led by Airbus Germany, and Navantia's role is to guarantee the interoperability of the solution developed with naval platforms.

11 EUROPEAN PROJECTS

In the field of collaboration in the European defence industry, in addition to these six projects covered by the EDF, we also have programmes currently underway awarded in tenders by the predcessor of the EDF, the European Defence Industrial Development Programme (EDIDP).

USSPs Project.

This project was awarded under the 2020 EDIDP tender, for the development of a prototype for an unmanned, highly autonomous, energy-efficient platform, based on miniaturized oil platform technologies and with a wide range of sensors in the air, on the water and in submarines. A total of 15 European companies make up the consortium from Bulgaria, Cyprus, Spain, France, Greece, Ireland and the Netherlands, coordinated by the Greek company ETME. At present, the first phase, corresponding to the pre-feasibility study, has been completed. It will culminate in 2025 with the construction of a prototype in Greek facilities under the supervision of Navantia.

SEADEFENCE Project.

Initiative launched in December 2019, awarded under the 2019 tender, involving the main European military shipbuilders to analyze the integration on board of new technologies and their impact on improving naval platform capabilities. The consortium, led by the Dutch shipbuilders DAMEN, plans to present the final results of this feasibility study in 2023.

Navantia

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