Nevesbu

Submarines & Naval vessels

Naval Architects Since 1935

“Nevesbu provides independent naval architecture services to bring offshore operations to sea.”

ABOUT NEVESBU

Independent naval architects and platform systems integrators, based in the Netherlands.

> “FROM PROGRAM DEFINITION UP TO DESIGN & ENGINEERING AND THROUGH LIFE SUPPORT: WITH THE DRIVE TO EXCEED EXPECTATIONS WE TRANSLATE EVEN THE MOST COMPLEX ISSUES INTO FEASIBLE AND HIGH-QUALITY SOLUTIONS.”

Nevesbu contributes to security and prosperity by delivering advanced naval architecture and marine engineering services to the submarine, naval vessel, floating offshore energy and special ship industries worldwide.

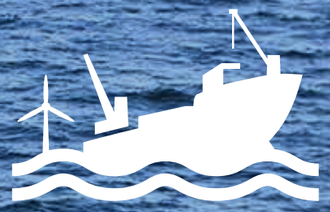
Nevesbu takes care of the total design & engineering of newbuild vessels or parts thereof, as well as ship conversions to integrate new systems, manage obsolescence and support owners with managing knowledge, requirements, safety and availability.

Submarines and naval vessels are used for crucial missions. Reliability of the platform and its systems, as well as the comfort of the crew, are essential factors which contribute to optimal performance at sea. This requires an integrated ship design with an exact balance between requirements, costs, risks and technology. Risks must be tightly controlled when constructing or converting complex vessels.

Using a pragmatic engineering approach, Nevesbu helps defence organisations and shipyards in realising complex projects cost-effectively and on time, and we help mission system suppliers and knowledge institutes to integrate their mission systems and innovations into the vessel successfully.

Submarines

Naval vessels



Floating offshore energy

Special ships

SINCE 1935

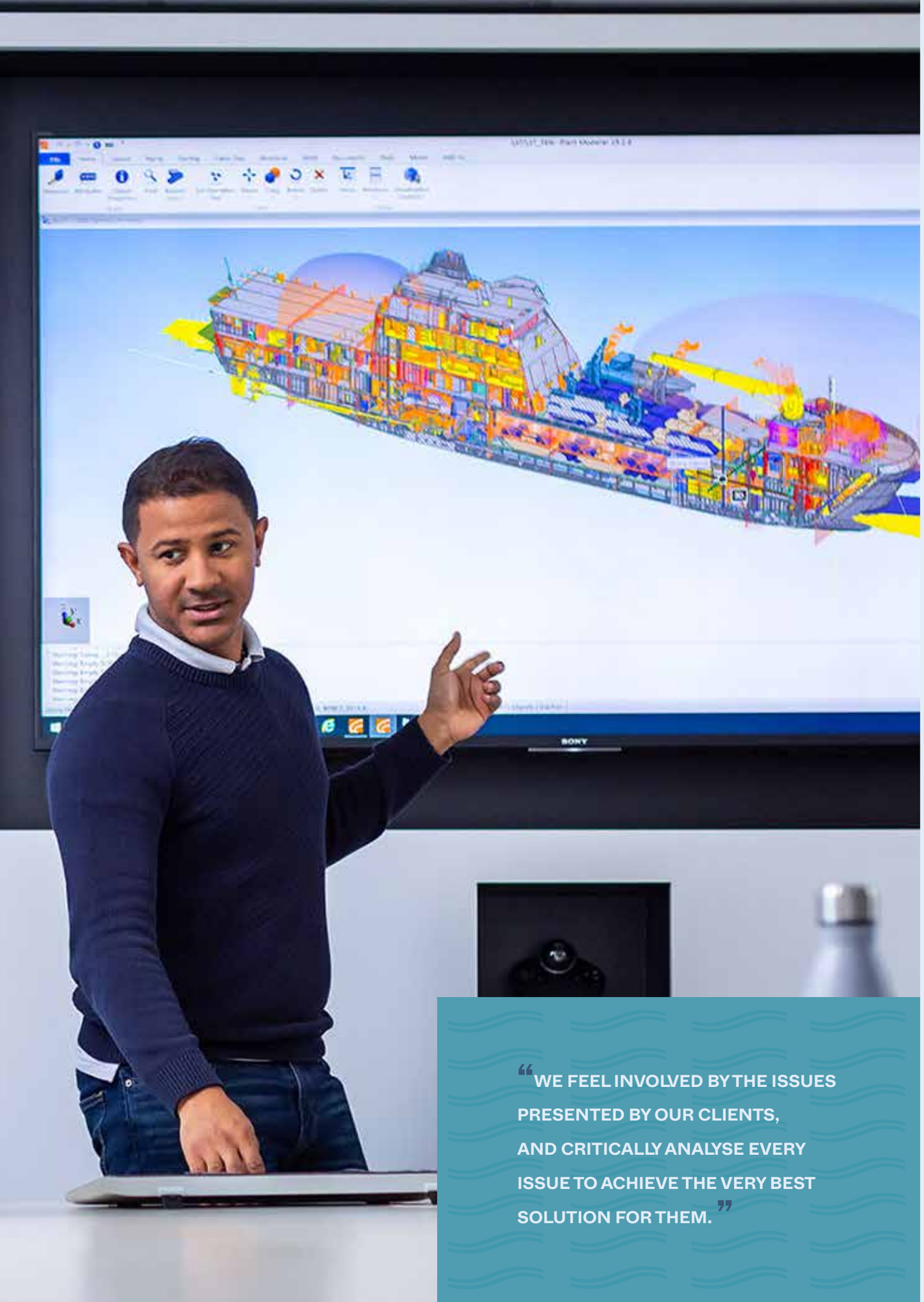
A LONG HISTORY IN THE NAVAL DEFENCE INDUSTRY

Nevesbu has been designing naval combatants ever since its founding in 1935.

Our first export contract was the design of the Sep and Orzel: two 1000 tonne submarines for the Polish navy. Since then Nevesbu has been involved in many domestic and export submarine and naval vessel projects and in service support programs.

Naval combatants and submarine technology are our particular strengths. Nevesbu is a submarine and naval vessel technology knowledge provider and a platform system integrator. We are competitive, creative and committed to delivering high quality in everything we do. Our team is multi-skilled and challenged by a wide variety of projects.

“IN EVERY PROJECT WE STRIVE TO ACHIEVE THE UTMOST FOR OUR CLIENTS. NO MATTER HOW COMPLEX AN ISSUE IS, WE WILL MAKE IT WORK.”



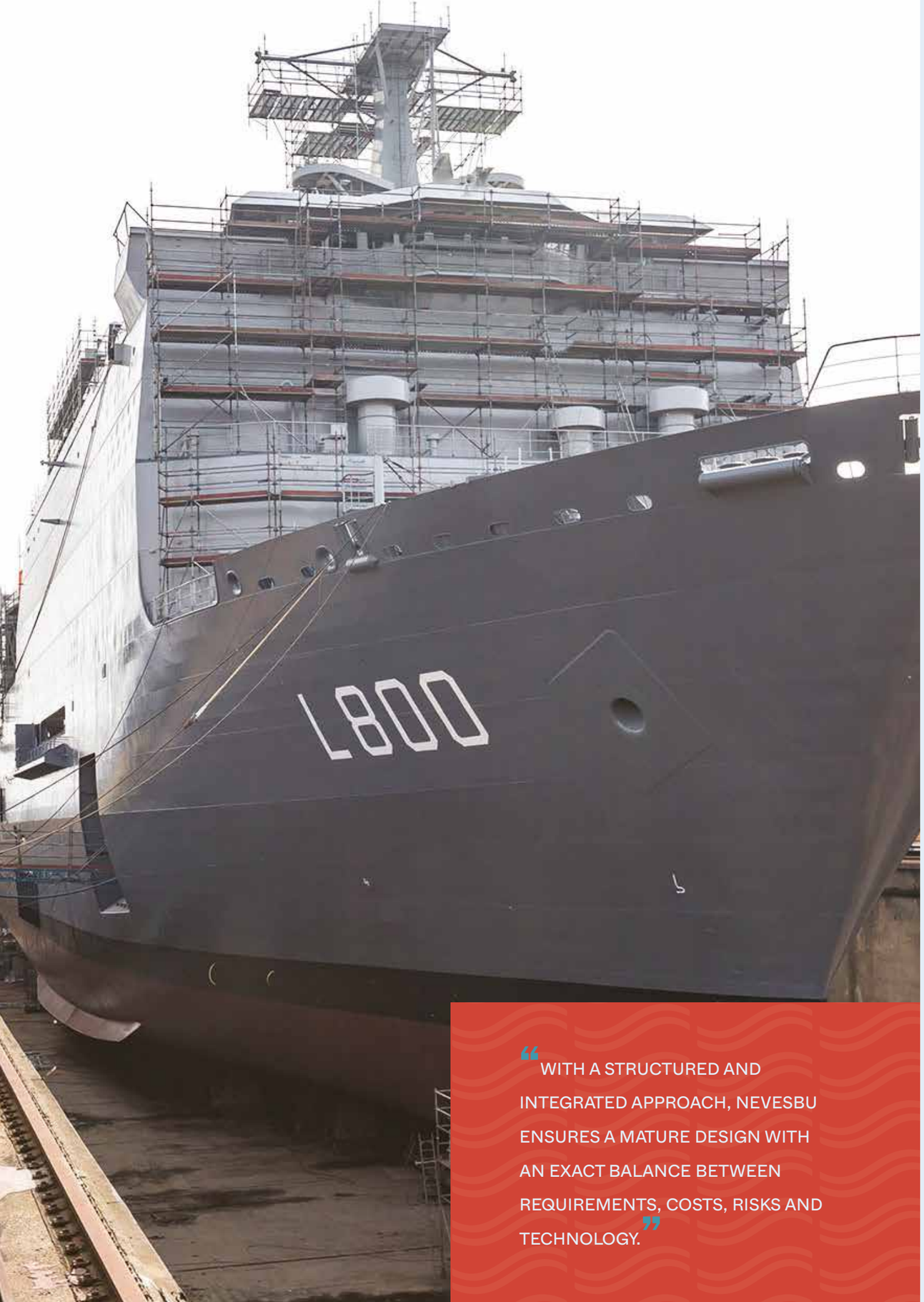
> “WE FEEL INVOLVED BY THE ISSUES PRESENTED BY OUR CLIENTS, AND CRITICALLY ANALYSE EVERY ISSUE TO ACHIEVE THE VERY BEST SOLUTION FOR THEM.”

SPECIALIST KNOW-HOW

Nevesbu has in-depth knowledge of all technical disciplines in-house.

Nevesbu provides high-quality design & engineering solutions for maritime projects of any size and complexity. Technique is what we really have a passion for and in which we are constantly at the forefront. Our strength is that our specialists think outside the box and translate even the most complex issues and problems into feasible solutions.

Our employees are technicians of the highest level, who with great passion translate the needs and requirements of our clients into feasible and high-quality designs and technical solutions. It’s our specialist knowledge and the passion we work with that make Nevesbu a much sought-after partner for (complex) maritime projects. We love nothing more than a technical challenge.



> “WITH A STRUCTURED AND INTEGRATED APPROACH, NEVESBU ENSURES A MATURE DESIGN WITH AN EXACT BALANCE BETWEEN REQUIREMENTS, COSTS, RISKS AND TECHNOLOGY.”

ADVICE IN ALL PROJECT PHASES

ADVISORY IN DEFINITION

Submarines are highly integrated complex systems. Only when the totality of a complex system is being considered, it is possible to identify and define all elements and control the availability, performance and risks. Nevesbu can support with the setup of a structured requirements environment to manage the evidence base. We also perform concept explorations to support the development and balancing of requirements and to make supportable decisions to validate requirements and test assumptions.

DESIGN & ENGINEERING

Nevesbu provides engineering and design solutions for new designs, integration design, in service support and mechanical components, including procurement support, performance verifications, submarine safety assurance and safety certification support.

PLATFORM SYSTEMS INTEGRATION

As an independent system to platform integrator of mission systems and equipment, Nevesbu provides system integration support, bringing together new and existing systems into one upgraded platform. We also monitor and manage all vital ship systems, safety, integrity such as weight and stability and compliance with shock, noise, environmental requirements, et cetera.

THROUGH LIFE SUPPORT

Nevesbu provides support through the life time across a range of engineering and technical domains for newbuild, upgrades, modification or life extensions and maintenance. We support clients to achieve safety, reliability, maintainability and availability with assessments, maintenance engineering, obsolescence management, technical assistance, training, support to seaworthiness certification and management, pressure hull stability assessments, damage tolerance analysis, structural integrity verifications throughout the service life.

NEWBUILD VESSELS

The design of submarines and naval vessels requires specialist know-how and an integrated design approach. Nevesbu can take care of the total design and engineering.

CONCEPT STUDIES

Nevesbu offers support in defining the design of new submarines and naval platforms. We assist in the selection of requirements and wishes, and translate these into concept design solutions to evaluate performance, benefits and operational costs.

SYSTEM INTEGRATION

Nevesbu acts as a platform system integrator for both newbuild and refit projects, bringing together new and existing systems into one platform, and ensuring that all subsystems function as a whole. We monitor all vital ship systems, such as available electrical power, heat load, ship weight as well as stability and strength. Furthermore we provide technical support on site.

DESIGN & DOCUMENTATION

Nevesbu supports clients with design and documentation of submarines and naval platforms or parts thereof based on specialist know-how and experience. We provide design and analysis of mechanical equipment and transport and handling systems, and also design mounting and integration of weapons and command systems provided by a third party. Nevesbu establishes procedures for design reviews, tests, installations, alignment et cetera, as well as requirement management. Additionally we provide detailed design and engineering for both newbuild and refit projects. Nevesbu brings added value to projects with a practical and structured design process. We manage meeting of pre-set requirements and, more-over, to achieve and maintain the target mission philosophy of the project.

COMPONENTS DESIGN

Nevesbu designs tailored equipment and components for project specific solutions. This is done as separate projects as well as integrated into other projects, such as SEWACO-to-Platform Integration projects and Designing the Requirements projects. Furthermore Nevesbu can perform verifications of components, skits, enclosures, consoles, et cetera for its compliance against the requirements such as shock, vibrations and noise including management of testing.

“WITH OVER 85 YEARS OF EXPERIENCE IN DESIGNING SUBMARINES AND NAVAL VESSELS, NEVESBU UNDERSTANDS THAT THE COMPLEXITY IN RESPECT TO THE VESSEL’S PURPOSE HAS A DIRECT RELATION TO THE TOTAL NEWBUILDING COSTS AS WELL AS TOTAL LIFE CYCLE COSTS.”

A SUBMARINE CONCEPT

Are total battery powered submarines the future?

Nevesbu has investigated the feasibility of a total battery powered submarine design. With modern battery technology the roadmap for total battery powered submarines seems feasible.

AN INTERESTING OPTION

Simulations with a created concept design show that with current battery technology local to medium range missions are already feasible. This makes a total battery powered submarine an interesting option for navies who want to use their submarine mainly for homeland defence. Changing the conventional diesel-electric powered submarine to a total battery powered submarine could enable more benefits than one might think.

A NUMBER OF ADVANTAGES

For example, the implementation of a total battery powered system will make the propulsion of the submarine air independent and will reduce the signature of the submarine. This contributes to an improvement in covertness of the submarine, which is an important tactical advantage. Other advantages are: reduced amount of installed systems, less maintenance, reduced workload for the crew, and with respect to safety, the creation of total battery powered submarine has advantages and disadvantages compared to diesel-electric submarines.

REDUCES RISKS OF FIRES, WATER INTAKE AND LEAKAGES

The use of large amounts of lithium based batteries will increase the risks of battery fires and explosions. On the other hand, the absence of the lead-acid batteries and diesel-generator sets will reduce the risk of fires and explosions as well. Furthermore, the amount of pressure hull penetrations will be reduced. This will reduce the risks of water intake and leakages.

MAINTENANCE & UPKEEP

To ensure overall operational availability, an upgrade is sometimes necessary.

Nevesbu's services for life extension and modification programmes include advisory in definition, design & engineering, system integration, and through life support. In addition to engineering and design we offer on-site building supervisory, and we can take care of the procurement of marine systems and class approval.

Nevesbu acts as a platform system integrator for upkeep and life extension programmes. As the platform engineering partner, Nevesbu carries out the engineering necessary to allow embedding of all modifications (including new systems) on board the platforms. Nevesbu ensures that all systems are able to operate as an integrated whole, and makes an inventory of systems to be decommissioned. Further steps in the process include, among others, designing the new arrangement, allocating space for new hardware, and as an architect giving all new and existing equipment a place in the ship or submarine. Furthermore, Nevesbu provides technical support and advice.

With a multidisciplinary approach and expert team, Nevesbu is capable of developing multiple platform configurations. For example, maintaining the capability to withstand high water pressures and shock (e.g. from explosions) in submarines while satisfying other requirements in areas like electromagnetic separation and radiated noise, or drawing a transport plan to find out how all components (structural elements as well as equipment) can be brought on board.

> "IT IS A COMPLEX PUZZLE TO FIND ROOM FOR ALL SYSTEMS AND TO ENSURE THAT THEY WORK ACCORDING TO PLAN. WITH NEVESBU AS A PARTNER, THIS CAN BE ACCOMPLISHED."

WALRUS CLASS LIFE EXTENSION

As the platform system integrator, Nevesbu was responsible for the engineering necessary to allow embedding of all modifications.

The objective of the Walrus class submarines Life Extension Programme was to prolong their service life to at least 2025 and to increase operability in coastal waters. To meet the new technical standards and requirements, the command center of the submarines had to be completely stripped and provided with new equipment, cable ducts, piping and technology. A puzzle which asked for efficient use of the available space and effective implementation of state-of-the-art engineering.

As the platform system integrator, Nevesbu ensured that all systems are able to operate as an integrated whole. Nevesbu was responsible for making an inventory of systems for decommissioning, designing the new arrangement, allocating space for new hardware, and as an architect give all new and existing equipment a place in the submarine. Nevesbu was also responsible for designing the foundations for equipment, cable ducts, piping and furniture, and designing connections for piping, electrical systems, controls and cooling systems, and monitoring essential aspects like the power distribution, heat load and the vessel's weight, volume, stability and strength. All designs are based on the new-build requirements and design rules. The systems are integrally designed to produce a design that functions harmoniously.

PLATFORM SYSTEM INTEGRATION

The Dutch air defense and command frigate Zr. Ms. Evertsen is currently being modernised and equipped with a new 127mm naval gun system from the Italian company Leonardo.

Within this project, Nevesbu is responsible for the design and engineering neccessary to integrate the new naval gun system into the ship and for the design of new ammunition handling systems and the new lay-out of the ammunition room. Nevesbu also provides on-site support during construction.

Integrating the new naval gun system and the ammunition handling systems was a complex puzzle, partly due to the many functionalities that come together in a small area in the ship. The ammunition space under the deck has been modified significantly to accomodate the ammunition, and to ensure that the ammunition handling can be carried out in compliance with the Health & Safety requirements. Nevesbu has made the design of this completely different lay-out and was also responsible for designing the new ammunition handling equipment. This equipment consists of bulk storage racks, a lift to the depot transport system, and an assisted ammunition transport system to transport the ammunition from the bulk storage racks to the gun hoist. Tackling the ammunition logistics from warehouse to barrel.

“NEVESBU’S PROJECT APPROACH ENCOMPASSES DESIGN, ORGANISATION AND COMMUNICATION, SUPPORTED BY EXPERT NAVAL ARCHITECTURE AND MARINE ENGINEERING. WE OVERSEE INTERFACES, IDENTIFY RISKS AND MAKE THEM MANAGEABLE. IN ADDITION TO DESIGN AND ENGINEERING, NEVESBU CAN ORGANISE (LARGE) MULTI-DISCIPLINARY PROJECTS AND ACT AS AN INDEPENDENT LINK BETWEEN THE DIFFERENT PARTIES INVOLVED IN A PROJECT.”

> “NEVESBU’S MASTERCLASS SUBMARINE DESIGN IS A STEPPING STONE TO EXECUTE SUBMARINE DESIGN ACTIVITIES, AND FOCUSES ON THE BASIC PRINCIPLES OF DESIGNING SUBMARINES.”

MASTERCLASS SUBMARINE DESIGN

Submarines are one of the most complex engineering platforms. Only by practical experience and training you will learn how to design a submarine.

In order to come to a good design, but also to be able to properly assess the designs of others and to be able to formulate the right requirements, knowledge of the general characteristics of submarines is essential.

The masterclass lasts five days and will be given at the client’s location. At the end of the masterclass the attendees will have insight into the complexity and interfaces between all technical disciplines, and the typical differences between submarines and surface vessels.

The content of the masterclass is unique and is composed by specialists with many years of experience in the design and engineering of submarines, and by specialists with operational experience onboard.

The masterclass provides insight into what a sumarine is and how it differs from surface vessels, the process of a submarine design, the importance of design choices, the struggles in submarine design, the importance of structured working, and the importance of a multi-disciplinary approach.

Would you like to know more about our services?

Albert will be pleased to tell you more. You can e-mail Albert via sales@nevesbu.com or call +31 88 943 3400.

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