

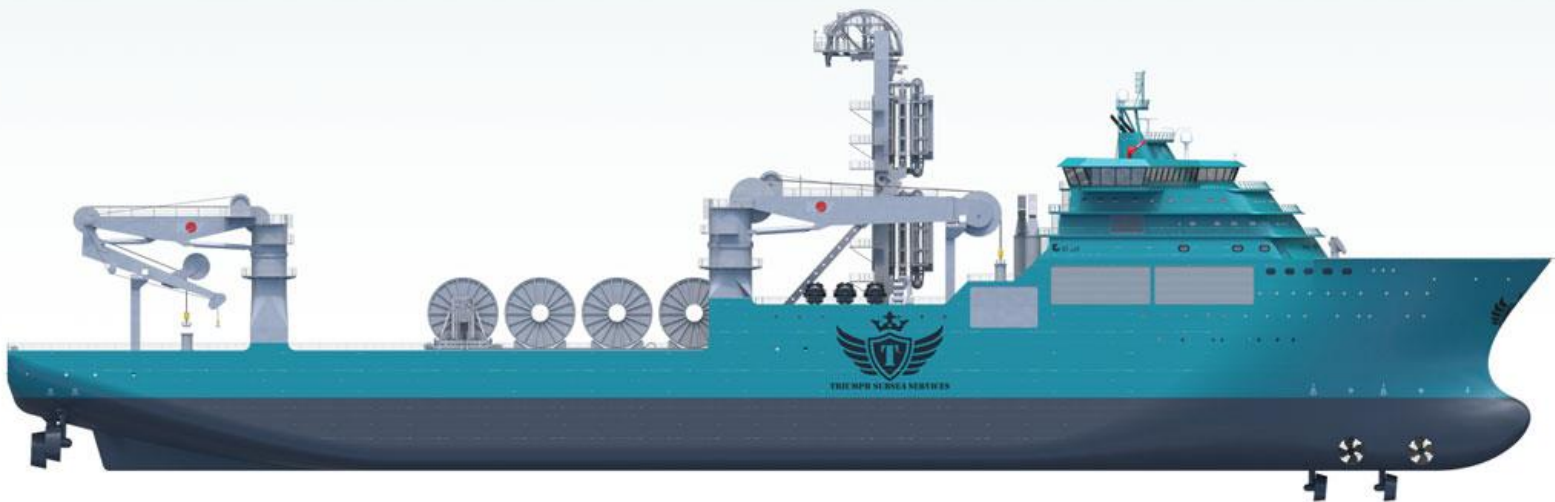


TRIUMPH SUBSEA SERVICES



DNV ENVIRONMENTAL

CLASS NOTATION DESCRIPTIONS





DNV ENVIRONMENTAL CLASS NOTATION DESCRIPTIONS

Aside from standard DNV class notations, Triumph Subsea Services new-build vessels have the following class notations that are specific to be future proofed and environmentally compliant with the current and future IMO regulations.

EP-D: Environmental Passport by Design.

ECA (SOx – A): Vessel designed to operate all machinery components e.g., main propulsion plant, power generation plant, steam/thermal oil plant, etc. on marine distillate fuel.

CLEAN (DESIGN, TIER III): Environmental and pollution control. Compliant with NOx emissions requirements of Tier III according to MARPOL Annex VI, Regulation 13.

BWM (T): Ballast water management.

FC (POWER): Fuel cell installation for essential, important and emergency power.

BATTERY (POWER): ESS power is used for redundant source of power.

SHORE (POWER): Electrical shore power connections while in port.

VIBR: Vibration levels for machinery, components and structures.

QUIET I: Measuring of airborne noise emitted from vessels when berthed.

SILENT E: Vessels demonstrating a controlled noise emission.

Cyber Security Advanced +: Addresses, assesses and secures against cyber security incidents.

RECYCLABLE: Development of Inventory of Hazardous Materials Part 1.

Design and Future Proof Notation

EP-D	<p>Environmental Passport for Design</p> <p><i>Purpose:</i> The E-D for new vessels is proof of eco-friendly ship design and equipment. EP-D demonstrates improved environmental protection beyond current standards and a commitment to greener transport on a voluntary basis.</p> <p><i>Features:</i> This class notation provides and demonstrates a future proof design.</p> <ul style="list-style-type: none"> • Addresses technical requirements related to the environmental-friendliness of ship design and equipment • Documents compliance with all the relevant MARPOL regulations and other environment-related IMO conventions • Surpasses regulations by also addressing some carefully selected upcoming requirements, such as those on ballast water management systems, ship recycling, bilge water separation and refrigerants <p><i>Benefits:</i> It is a future-proof design allowing for reductions in the environmental impact of new vessels beyond the requirements of relevant regulations. Regular updates take into account updated mandatory regulations and to reflect expected future regulatory requirements.</p>
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Emissions and Discharges

<p>ECA(SOx-A)</p>	<p>This class notation gives requirements to vessels fuel and lubrication oil systems and arrangement for meeting regulations in emission control areas.</p> <p><i>Purpose:</i> To meet the requirement for control of emission to air in environmental control areas, the on-board machinery needs to be enabled to change between residual oil and marine distillate fuels, as well as operate over time on fuels with very low viscosity and sulphur content. Hence, the vessel can safely operate on these specialised and emission reducing fuels.</p> <p><i>Features:</i> Provides requirements to the tank and piping arrangement, including fuel oil capacity, and the location of tanks to reduce risk of unintentional reduction of viscosity. There are further requirements to allowable change-over time from residual fuel to marine distillates.</p> <p><i>Benefits:</i> For an environmental profile, and compliance with requirements applicable in emission control areas. ECA is a pre-requisite to obtain the class notation Clean.</p>
<p>CLEAN</p>	<p>Requirements for controlling and limiting operational emissions and discharges.</p> <p><i>Purpose:</i> Environmental legislations are becoming increasingly strict regarding emissions to air (such as SOx and NOx) and sea pollution (such as bilge and ballast water and waste oil). By adopting the CLEAN Notations, the ship owner and operators choose to comply with environmentally friendly regulations and a set of criteria in order to clearly demonstrate to customers and authorities that the company's policy is to be environmentally proactive.</p> <p><i>Features:</i> This class notation contains requirements stipulating how to control and limit operational air emissions and sea discharges. The Rules state an environmental approach to installed equipment and arrangements on board, such as:</p> <ul style="list-style-type: none"> • Combustion machinery emissions (NOx and SOx) • The use of refrigerants • Limits on the use of TBT-based antifouling • Sewage and other wastewater treatment <p><i>Benefits:</i> For promoting an environmental profile, the notation confirms a higher environmental standard and shows pro-environmental steps and responsibility.</p>
<p>BWM (T)</p>	<p>Ballast water management system complying with the Ballast Water Convention (BWM/CONF/36). Ballast water treatment method.</p> <p><i>Purpose:</i> This class notation for control and management systems for ships' ballast water and sediments confirms compliance with the International Convention for the Control of Ships' Ballast Water and Sediments and covers the ballast water treatment system on board all ships.</p> <p><i>Features:</i> The BWM-T standard ensures that the arrangement used for ballast water treatment is designed according to IMO guidelines for the approval of Ballast water management systems.</p> <p><i>Benefits:</i> This notation is a suitable specification to ensure compliance with the Ballast Water Convention related to ballast water treatment systems.</p>

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Alternative Fuel and Power Notations

<p>FC - Power</p>	<p>Fuel Cell</p> <p><i>Purpose:</i> For vessels where a fuel cell is installed for essential, important and emergency power contributing to reduced carbon emissions and produce less harmful air pollutants.</p> <p><i>Features:</i> Provides design, installation and certification requirements for fuel cells, as well as fire safety measures suitable for FC installations.</p> <p><i>Benefits:</i> Fuel cells do not need an environment specific location to work well, are highly efficient, produce much less harmful air pollutants and have no carbon emissions.</p>
<p>Battery Power</p>	<p>Electrical Energy Storage (EES)</p> <p><i>Purpose:</i> For vessels where the ESS power is used for electrical propulsion of the vessel as main source of power, or as a redundant source, contributing to reduced noise emission and emission to air in environmentally sensitive areas.</p> <p><i>Features:</i> Provides design, installation and certification requirements for batteries and capacitors, as well as fire safety measures suitable for large EES installations.</p> <p><i>Benefits:</i> The EES installation is designed for commercial operation with batteries as part of the energy mix, and provides an environmentally sound power source, both with respect to noise emission, and, when charged in port, contributing to reductions of emissions to air.</p>
<p>Shore Power</p>	<p>Electrical shore connections while in port</p> <p><i>Purpose:</i> For vessels wanting to lower the environmental footprint, or entering ports where power supply from shore is required due to emission control areas and local legislation.</p> <p><i>Features:</i></p> <ul style="list-style-type: none"> • Functionality of the electrical shore connection as a total system Control systems and control system interface between the shore and the vessel. Requirements are given for necessary functionality. However, the physical installations on shore are not covered by these rules • Ship side electrical equipment and installations <p><i>Benefits:</i> The additional class notation Shore power applies to vessels utilizing electrical shore connections while in port and is mandatory for vessels with high voltage shore connection and low voltage shore connection with power rating greater than or equal to 1 MVA. Provides possibility to enter any port, regardless of local or international legislation on emission to air.</p>

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Vibration, Noise and Acoustic Notations

<p>VIBR</p>	<p>Vibration notation provides a clear definition of vibration limits for structures, machinery and equipment.</p> <p><i>Purpose:</i> The aim of the Vibration class notation is to avoid vibration induced breakdowns by ensuring that the vibration levels for machinery and equipment are within defined limits.</p> <p><i>Features:</i> Compliance with the rules are verified through an extensive measurement campaign when the vessel is completed. In addition to the measurements executed in the predefined positions, possible additional vibration issues revealed through the survey will be included.</p> <p><i>Benefits:</i> Providing an optimal environmental profile and also reducing maintenance costs normally associated with components wearing to due to vibrations.</p>
<p>SILENT</p>	<p>Underwater noise emission</p> <p><i>Purpose:</i> For all vessels, noise emission is considered an environmental disturbance. The class notation ensures that vessels with a need for a controlled underwater noise emission can be designed and tested towards technically realistic requirements.</p> <p><i>Features:</i> Provides requirements to allowable noise emission in:</p> <ul style="list-style-type: none"> • Normal transit condition • Quiet cruise condition <p>The notation is based on measurements at defined distances from the primary sources of noise emission.</p> <p><i>Benefits:</i> For an environmental profile, the care for marine life is important. The confirmed, acceptable noise emissions will contribute to minimal disturbance on the marine life, compared to a conventionally designed vessel.</p>
<p>QUIET</p>	<p>External airborne noise emission</p> <p><i>Purpose:</i> Presents the vessels external airborne noise emission during port stays based upon a realistic and practically feasible measurement methodology.</p> <p><i>Features:</i> Test procedure and measuring methodology under defined operating conditions to allow for demonstration controlled airborne noise emission. It includes requirements to ensure that vessels can be tested for external noise emissions in idle and working condition whilst in port</p> <p><i>Benefits:</i> Providing an optimal environmental profile, this notation provides a realistic and un-biased measurement on noise emission. In several ports, the admission to enter in the most favourable quays are, amongst other things, based on the noise emission level.</p>

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Security Notation

<p>Cyber Secure</p>	<p>Cyber security protection</p> <p><i>Purpose:</i> The aim of the Cyber Secure class notation is to address, assess and secure against cyber security incidents of a vessel's main functions and the owner's operational needs. It establishes the recognised requirements for vessels in operation and new-builds across different segment and security levels.</p> <p><i>Features:</i> Cyber Secure entry-level class notation addresses the most critical vulnerabilities. In addition, the notation requires that a cyber security management system is established to ensure secure ship operation and the upcoming IMO resolution MSC.428(98).</p> <p>Cyber Secure (Essential) includes all of entry-level notations, but in addition examines the control systems in more detail to ensure security controls / capabilities at security profile 1 (profile of IEC 62443 security level 1). It is primarily intended for more complex ships in operation whereby cyber security is implemented into existing procedures and systems, aiming to establish an adequate security level.</p> <p>Cyber Secure (Advanced) covers the same scope as the Essential scope, however with increased security level (security profile 3). This is primarily intended for more complex new-build projects and is designed to protect against intentional violations using sophisticated means and specific control systems skills.</p> <p>The (+) plus notation allows the inclusion of additional systems. It addresses threats as well as assesses and secures additional which are particularly important for operations and not part of the standard scope of essential and important functions such as cargo systems, entertainment systems and IT systems.</p> <p><i>Benefits:</i></p> <ul style="list-style-type: none"> • Less risk of cyber security threats and reduced downtime due to cyber attacks • Proof of cyber security resilience for the vessel and ensure compliance with the IMO cyber risk resolution • Regular audits to verify continuous compliance and focus on upcoming cyber security threats • Increased cyber security awareness of both crew and shore personnel
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Recycling Notation

<p>Recyclable</p>	<p>Showing compliance with:</p> <ul style="list-style-type: none"> • The Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on Ship Recycling (EU SRR) • The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 SR/CONF/45 (HKC) <p><i>Purpose:</i> The Recyclable class notation, facilitates correct documentation of hazardous materials used on board, also supporting that the recycling process of a ship may be carried out without posing unnecessary risks to human health, safety and to the environment.</p> <p><i>Features:</i> The class notation gives specific requirements for the establishment and maintenance of inventory of hazardous materials (IHM). The scope is built on EU SRR and HKC. The scope covers all 15 hazardous materials for IHM Part I, as stated in the Annex I and Annex II of EU SRR. The 13 hazardous materials of the HKC is covered by the EU SRR.</p> <p><i>Benefits:</i> The class notation confirms compliance with international regulation, which is expected to come into force in the near future. With regards to EU SRR, any EU-flagged vessel it is already required to carry a certified inventory of hazardous materials, and non-EU flagged vessels calling EU ports shall have a certified IHM from 31st December 2020.</p>
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