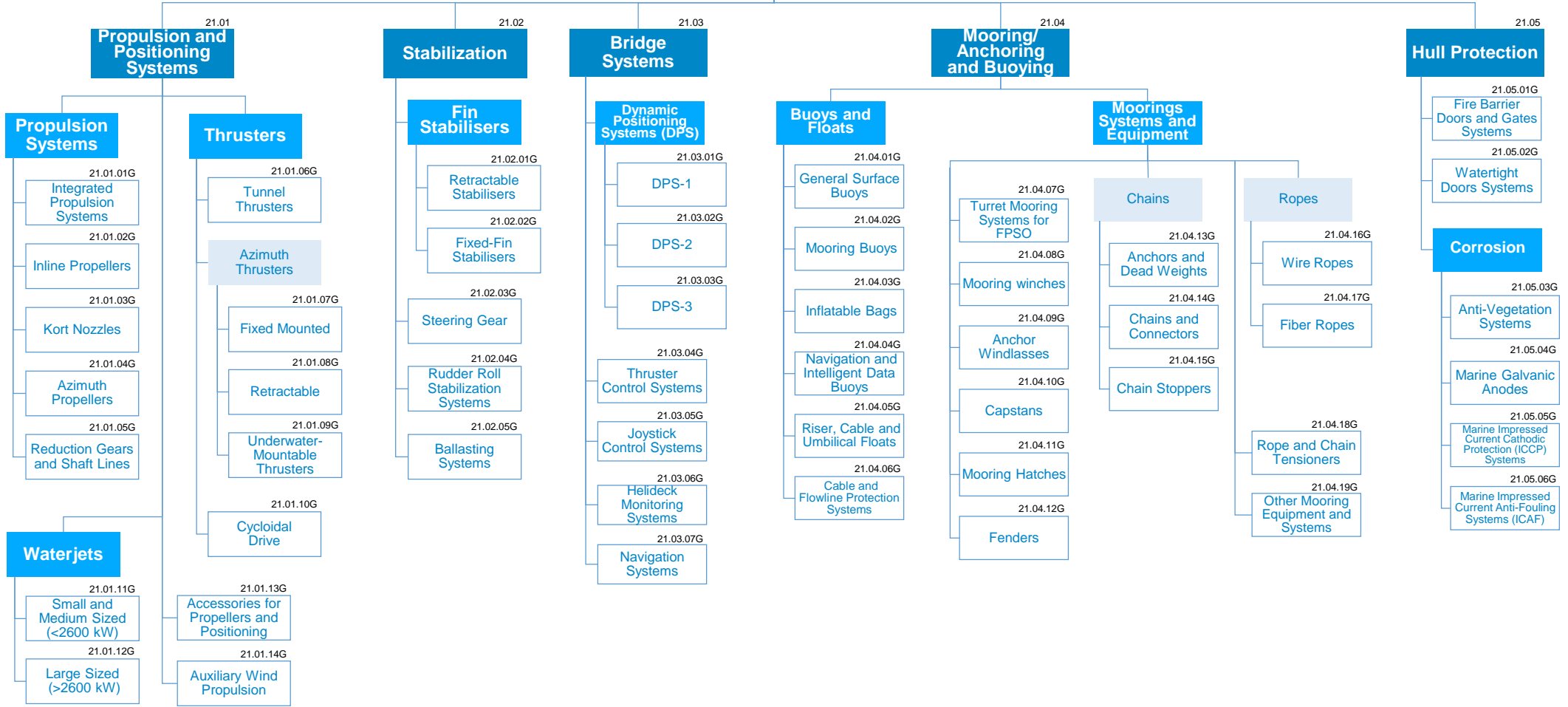


21 Components and Systems for Vessels



Components and Systems for Vessels

This Group covers the large set of Components and Systems used in the maritime industry to meet high requirements for safety and reliability of a vessel.

Focus is on the components and systems that enable the vessel to navigate in safety and that are common to all vessels, no matter of the operational need of the vessel itself. In fact, components and systems for offshore activities, e.g. lifting systems and deck handling equipment, deck machineries, ... are included in Group 21.

Several products would require more complex categorization, reaching a "catalogue"-oriented view. However, the competition among players is homogeneous within each category of supply.

MAIN RATIONALES BEHIND THE STANDARD CATEGORIZATION

Propulsion and Positioning Systems

- The functional market segmentation helps to target the exact needs of the Buyers.
- For the purposes of this categorization, "position" is a synonymous of "manoeuvring".
- Applications can be extremely broad: inland shipping, river and coastal shipping, ferries, yachts, harbour and sea-going tugs, ocean-going vessels, offshore systems, and military applications.
- Azimuth Propellers are not differentiated based on the type of transmission: Mechanical (L-drive and Z-drive) and Azipod (Electrical L-drive transmission).
- Tunnel Thrusters are Tunnel thrusters built into the bow, below the waterline. Most tunnel thrusters are driven by electric motors, but some are hydraulically powered.
- Azimuth Thrusters include Fixed Pitch Propellers (FPP) as well as Controllable Pitch Propellers (CPP). Moreover, there is no differentiation between Mechanical transmission (L-drive and Z-drive) and Azipod (Electrical L-drive transmission).
- The cycloidal drive propeller is also known as the Voith Schneider propeller (VSP).
- A waterjet generates propulsive thrust from the reaction created when water is forced in a rearward direction.
- Main market trends:
 - Offshore is moving toward integrated propulsion and positioning "package": some large players are able to offer integrated package of propulsion together with engines and electric motors;
 - Propulsion and positioning for Offshore vessels are converging, increasingly leveraging on thrusters;
 - Clear trend in propulsion toward the azimuth solution with reduction of in-line propulsion;
 - Positioning trend toward retractable thrusters especially for pipe and cable laying.

Stabilization

- Ship stabilizers are fins or rotors mounted beneath the waterline and emerging laterally from the hull to reduce a ship's roll due to wind or waves.
- Active fins are controlled by a gyroscopic control system.

Bridge Systems

- The categorization of Dynamic Positioning Systems (DPS) is based on IMO (International Maritime Organization) publication 645 and are described as Class 1, Class 2 and Class 3.
 - Equipment Class 1 has no redundancy. Loss of position may occur in the event of a single fault
 - Equipment Class 2 has redundancy so that no single fault in an active system will cause the system to fail. Loss of position should not occur from a single fault of an active component or system such as generators, thruster, switchboards, remote controlled valves etc. But may occur after failure of a static component such as cables, pipes, manual valves etc.
 - Equipment Class 3 which also has to withstand fire or flood in any one compartment without the system failing. Loss of position should not occur from any single failure including a completely burnt fire sub division or flooded watertight compartment
- Navigation System is a broad Category that includes: Radars, GPS, Navcom Eqm Installer, Auto Pilot, BNWAS, Gyro System, Speed Log, Loading Computer, Central Clock, Automatic Identification Systems, Voyage Data Recorder, Sound Reception System, Radio Plant, VHF Station, Telephone / Intercommunication, CCTV, Navigation Light Controller, Meteorological Systems,...
- Navigation Systems do not includes Subsea Acoustic Positioning systems such as Sonars echo sounders(mapped in Group 23)
- Vessel Central UPS is mapped in Group 13.

Mooring/ Anchoring and Buoying

- General Surface support Buoys are extensively used in single point mooring (SPM) system and this category covers the three main types: cylindrical, chain-through and pick-up.
- Mooring Buoys includes Catenary Anchor Leg Mooring (CALM) used in both shallow and deep waters, and Single Anchor Leg Mooring (SALM) use in shallow waters only.
- Navigational Buoys are the "traffic signals" that guide boat operators safely along some waterways. They also identify dangerous or controlled areas and give directions to a specific location. While Intelligent Data Buoys are devices that provide to the operator information such as wave direction, surface current or water temperature.

- Turret Mooring Systems for FPSO are becoming even more complex systems with a tendency for being internal and submerged.
- Mooring winches are devices used during mooring operations to hold a boat in place at a pier or similar fixture. It necessary to specify that the formers are just a part of Anchor mooring systems. They may operate in a number of ways (e.g. in a Wire Spooling systems) and are fixed in place on the deck of a ship in key positions.
- A windlass is a complex device meant for the same purpose as that of capstan, but comprised of different parts, which together make the anchorage process smoother and easier.
- A capstan differs from a windlass only in the matter of the axis on which the rope or cable is wound (for a capstan it's vertical axis, whereas for a windlass it's horizontal)
- Fenders' category includes all main types of fenders: floating foam fenders and donut fenders, multi-purpose fenders – for dockside or vessel-side installation, vessel fendering systems, fixed fendering systems.
- In general, "wire rope" refers to diameter larger than 3/8 inch (9.52 mm). Sizes smaller than this are designated cable or cords. The wire, for rope, is made from several materials such as steel, iron, and/or stainless steel. High Carbon steel is the most widely used material.
- Other Mooring Equipment and Systems includes, but not limited to, Recovery equipment, deviation systems and Automatic Mooring systems.

Hull Protection

- Impressed Current Cathodic Protection (ICCP) Systems usually consist of anodes connected to a DC power source, often a transformer-rectifier connected to AC power. It includes tubular and solid rod shapes or continuous ribbons of various materials (e.g. high silicon cast iron, graphite, mixed metal oxide, platinum and niobium coated wire, ...).
- The Marine Growth Prevention System (MGPS) is also known as Impressed Current Anti Fouling (ICAF).