



KONGSBERG

Yachts

Closer to perfection

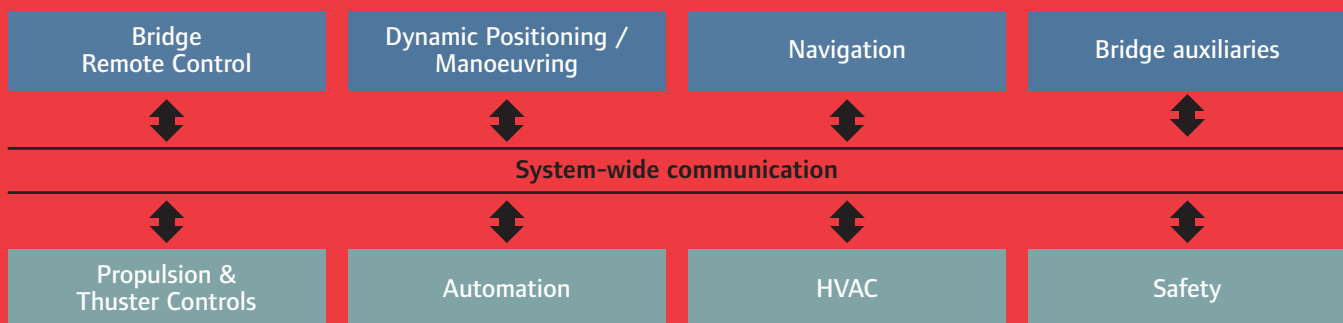


[www.kongsberg.com](http://www.kongsberg.com)

# Yachts

Integrated navigation  
Manoeuvring system & dynamic positioning  
Propulsion and thruster control  
Machinery automation  
Ventilation and air conditioning control  
Safety management

## We maximize marine performance by providing The Full Picture



### Our mission

We shall earn the respect and recognition for our dedication to provide innovative and reliable marine electronics that ensure optimal operation at sea. By utilising and integrating our technology, experience and competencies in positioning, hydroacoustics, communication, control, navigation, simulation, and automation, we aim to give our customers The Full Picture. The Full Picture yields professional solutions and global services that make a difference enabling you to stay ahead of the competition.

### Our philosophy

Our success depends on the success of our customers. Actively listening to our customers and truly understanding their needs, and then translating these needs into successful products and solutions is central to achieving our goal. Our people are the key to our success and we empower them to achieve. Working together in a global network of knowledge, guided by our values, engenders innovation and world class performance. Every day we have to think a little differently, because every client is unique. We aspire to translate the imagination and dedication of our staff into successful technologies and solutions. Our commitment is to add value to your operations by providing you with The Full Picture.

### To answer the questions you may ask tomorrow

Every day we drive the cutting edge of technology – sometimes inch by inch and occasionally in great leaps forward. We are committed to make the seemingly impossible, possible, in order to provide solutions to the challenges of tomorrow. We use advanced technology, not for its own sake, but to find practical solutions that further safety, are user-friendly, well engineered, and enable our customers to accomplish more.

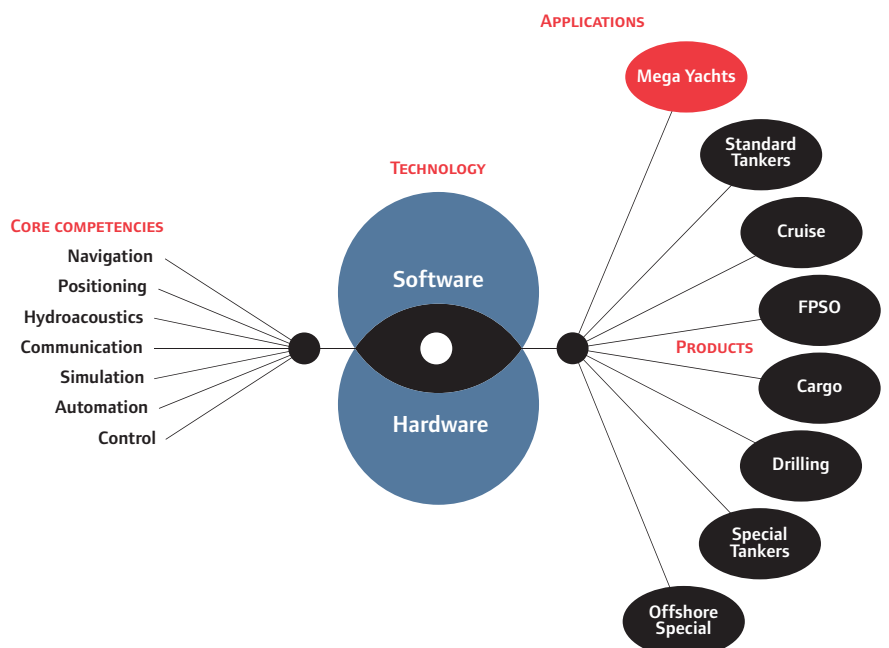
### Solutions that make a difference

KONGSBERG System Technology yields a distributed and open system design, utilizing a system wide standardized communication network. The network facilitates for free flow of information from all sub-systems, with vessel wide information available on multi-functional-work-stations. Common base technology and user interface for our products provide for a safe and an efficient operational environment, with consistent operation and increased reliability.

With our pledge to excellence, KONGSBERG System Technology is comprehensive, secure, scalable, integrated and tailored to your operational needs.

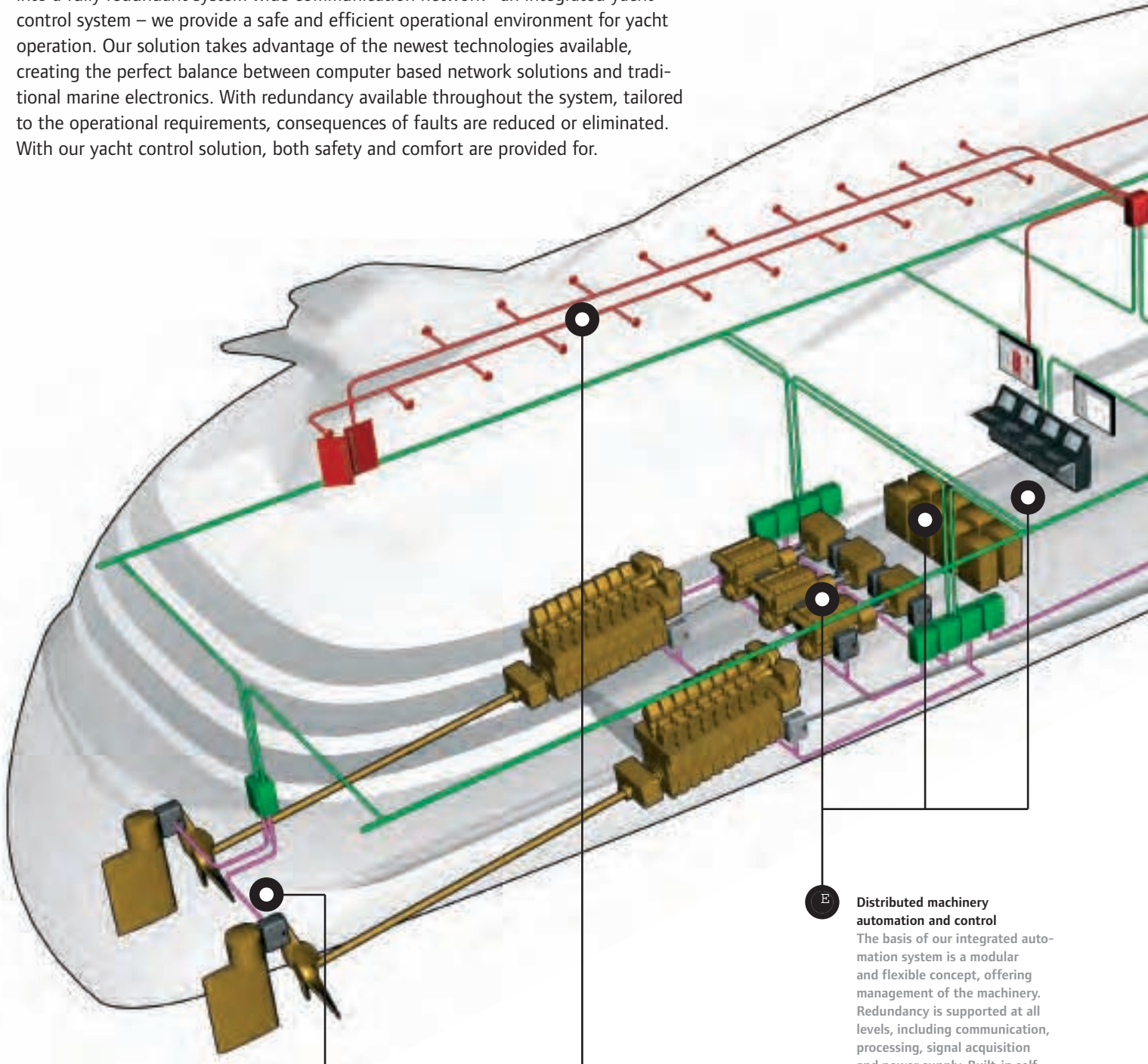
**Designed for operation**

With decades of real life operational experience and knowledge translated into our functionalities, KONGSBERG System Technology enables us to continue providing our customers with system solutions that make a huge difference to operations.



## Efficiency in yacht operation

The unique combination of navigation, manoeuvring, dynamic positioning and automation brings yachting closer to perfection. By integrating the various subsystems into a fully redundant system wide communication network– an integrated yacht control system – we provide a safe and efficient operational environment for yacht operation. Our solution takes advantage of the newest technologies available, creating the perfect balance between computer based network solutions and traditional marine electronics. With redundancy available throughout the system, tailored to the operational requirements, consequences of faults are reduced or eliminated. With our yacht control solution, both safety and comfort are provided for.

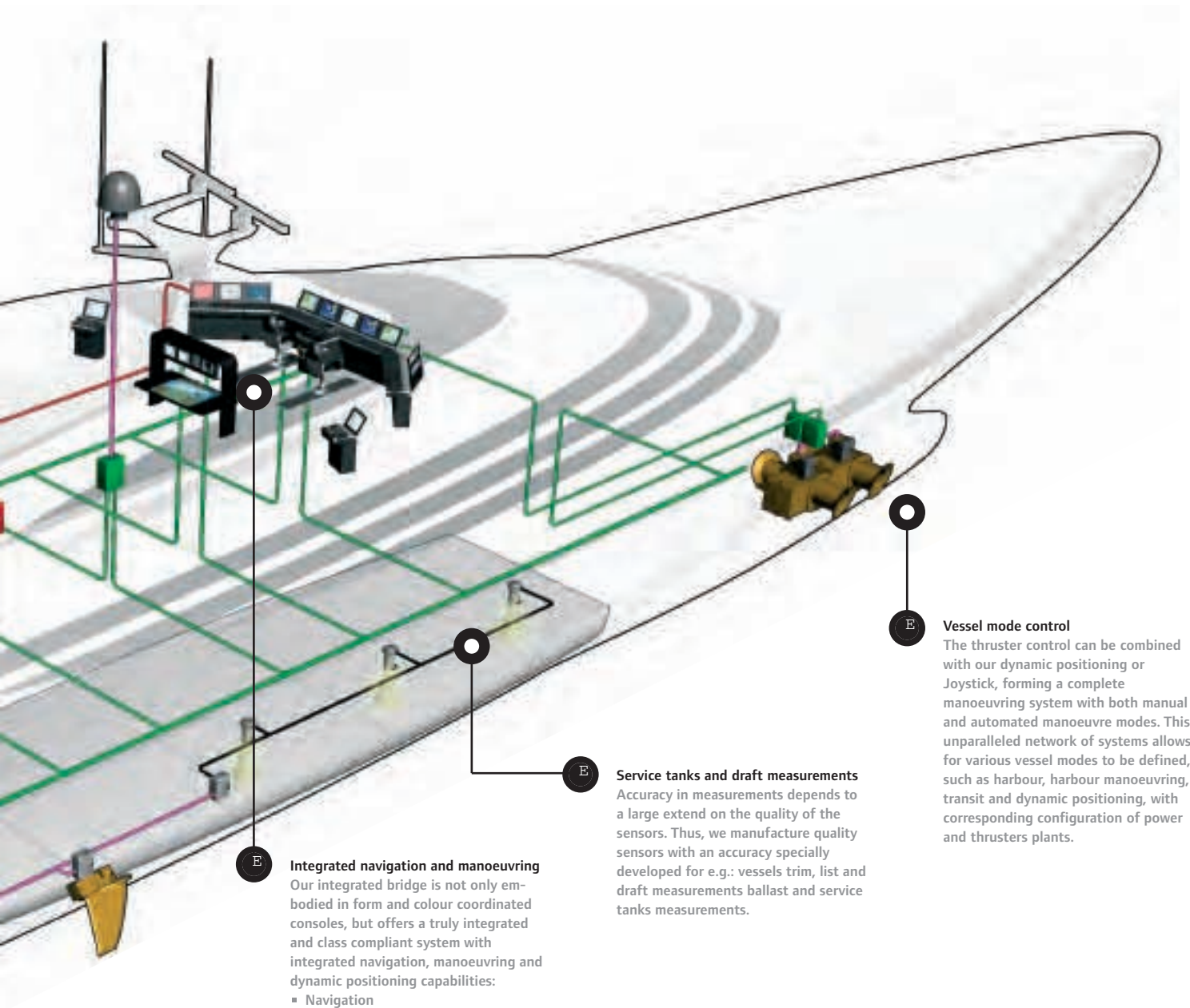


**Integrated remote control**  
Our solution for remote control of propulsion and thrusters combines autonomous control systems for each propulsion and thruster unit into one system, with mode selection and command responsibility transfer

**Managing critical situations**  
Clean and logical presentation of safety information is crucial in an emergency situation. All relevant safety information and controls are available in vessel general arrangement views.

**Distributed machinery automation and control**  
The basis of our integrated automation system is a modular and flexible concept, offering management of the machinery. Redundancy is supported at all levels, including communication, processing, signal acquisition and power supply. Built-in self-diagnostics monitor the entire system, including field circuits and earth fail detection. The automation system is based around a hierarchical, fully segregated and redundant network, featuring open system architecture, with processing units close to the equipment and systems controlled.





**E** **Integrated navigation and manoeuvring**  
 Our integrated bridge is not only embodied in form and colour coordinated consoles, but offers a truly integrated and class compliant system with integrated navigation, manoeuvring and dynamic positioning capabilities:

- Navigation
- Propulsion and thrusters remote control
- Steering
- Manoeuvring, including autopilot, track pilot, joystick and dynamic positioning

All operator stations support the full range of functionality, with a common user interface for all control devices.

**E** **Service tanks and draft measurements**  
 Accuracy in measurements depends to a large extent on the quality of the sensors. Thus, we manufacture quality sensors with an accuracy specially developed for e.g.: vessels trim, list and draft measurements ballast and service tanks measurements.

**E** **Vessel mode control**  
 The thruster control can be combined with our dynamic positioning or Joystick, forming a complete manoeuvring system with both manual and automated manoeuvre modes. This unparalleled network of systems allows for various vessel modes to be defined, such as harbour, harbour manoeuvring, transit and dynamic positioning, with corresponding configuration of power and thrusters plants.

**When details count**  
 Design is an intense synergy between art and science, that is, between heart and hand. With its distinct and timeless design our products and system solutions have been built to accommodate the seaworthiness needed to cope with the uncompromising conditions of the seven seas and for perfect operation in accordance with the highest maritime standards.



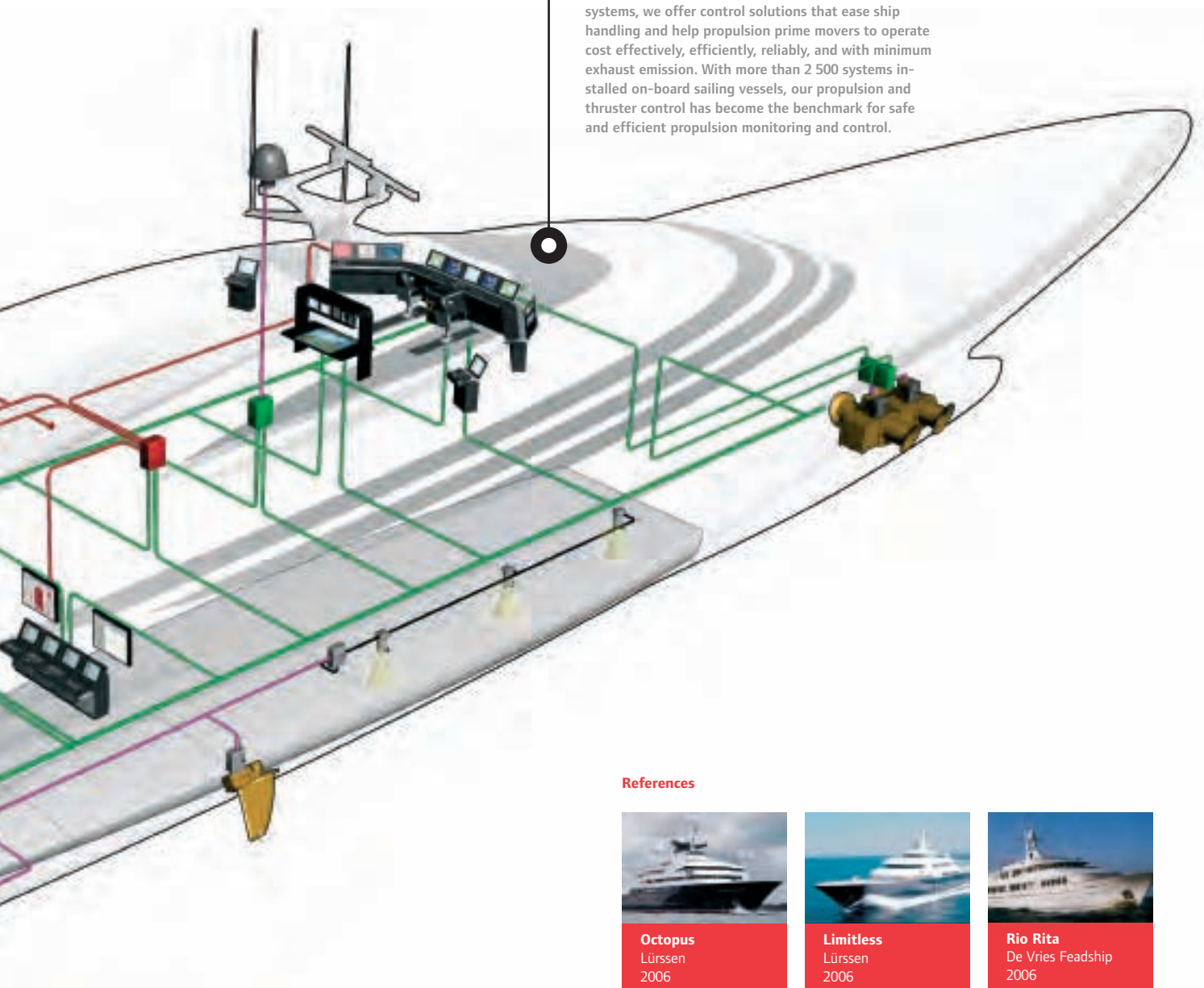
## Closer to perfection

The highest levels of quality, craftsmanship and construction in yacht design shall have to be supported by operational systems that match up. This is where our fully integrated approach and in-house expertise add value to your design. Navigation systems, dynamic positioning, and automation and control systems are all integrated into a fully redundant network, tailored to your specific requirements and needs. Purity and clarity are the main objectives of our design, resulting in products and system components with a distinct and timeless look that can be easily assembled into custom designed consoles.

E

### Designed for shiphandling

From decades of experience with control of diesel engine and electrical powered propulsion and thruster systems, we offer control solutions that ease ship handling and help propulsion prime movers to operate cost effectively, efficiently, reliably, and with minimum exhaust emission. With more than 2 500 systems installed on-board sailing vessels, our propulsion and thruster control has become the benchmark for safe and efficient propulsion monitoring and control.



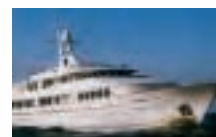
### References



**Octopus**  
Lürssen  
2006

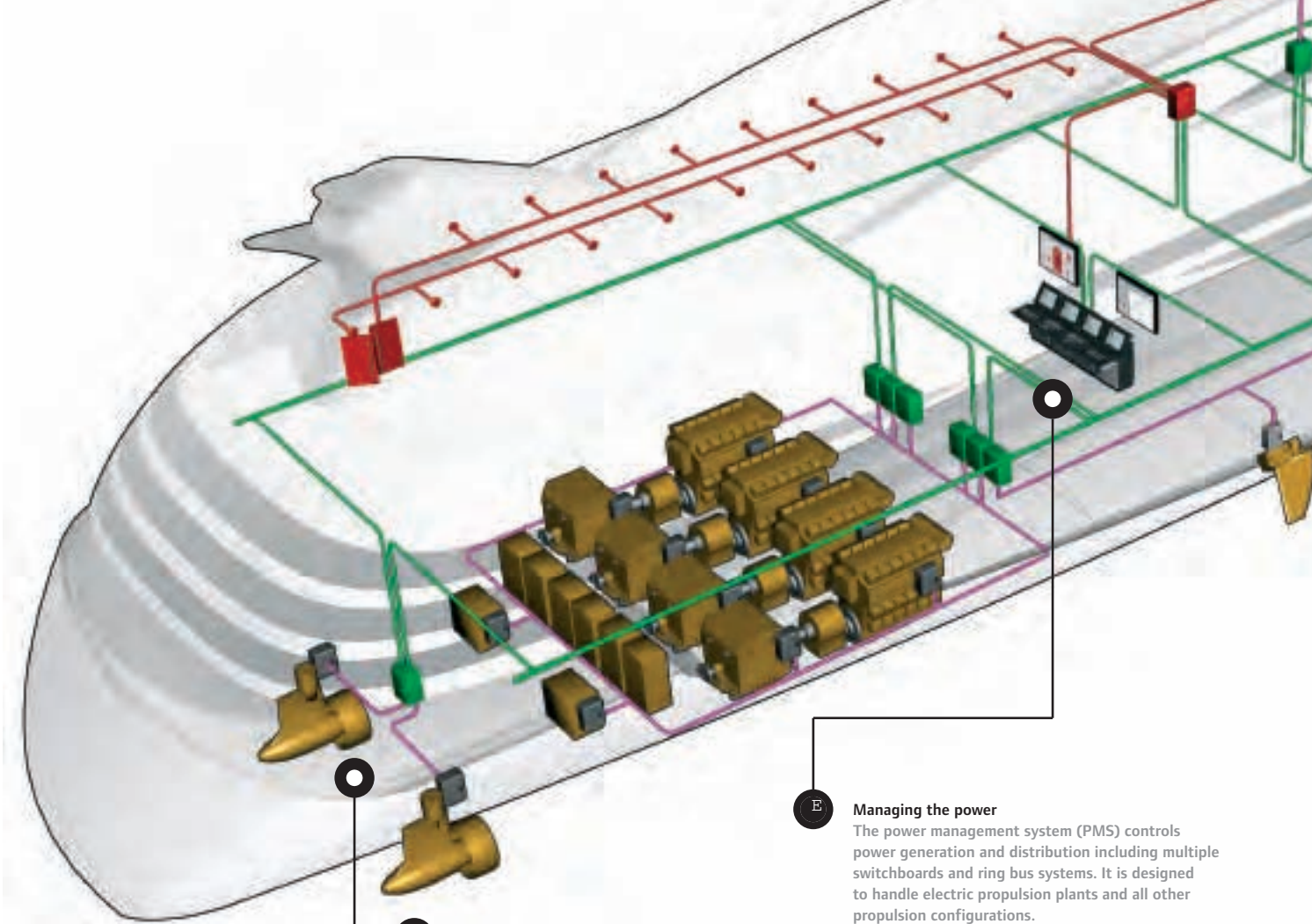


**Limitless**  
Lürssen  
2006



**Rio Rita**  
De Vries Feadship  
2006





**E Extending the manoeuvring capabilities**

The thruster control system provides remote control of electric propulsion systems, azimuth propulsion and side thrusters. Each propeller is controlled by an autonomous control system, with full functional integration allowing manual as well as automatic control. Our electronic steering control system is based on the KONGSBERG common technology platform, and also provides remote control of steering gears.

**E Managing the power**

The power management system (PMS) controls power generation and distribution including multiple switchboards and ring bus systems. It is designed to handle electric propulsion plants and all other propulsion configurations.

The PMS will ensure that the power or capacity is in line with the demand at any time. It ensures that the load of main consumers does not overload the plant capacity – even if a generator shuts down unexpectedly. For vessels with multiple engine rooms, the PMS will mirror the power plant with one autonomous PMS per switchboard. When the switchboards are interconnected, it works as a single PMS by interchanging information via the high speed communication network.

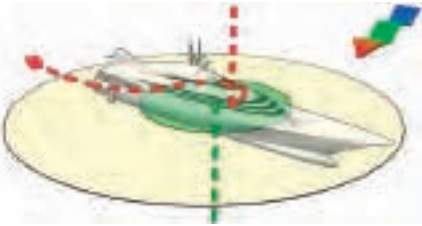
**Designed to please**

We design sophisticated solutions with technology and human interface as the core focus. The sea represents an uncompromising environment, where high quality personnel and equipment are among the most important pre-requisites for safe, efficient operation. To this end, we are committed to supporting our customers with world class products and services that are tailored to your requirements. Our concept bridge is one of several examples.

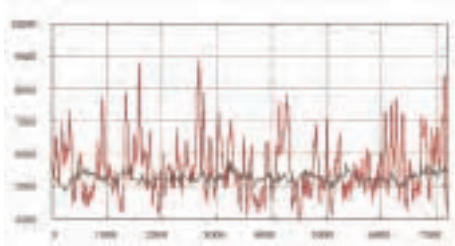


## Tailored to yacht operation

KONGSBERG System Technology forms the common basis for the individual products that constitute the backbone of our Yacht Control System. Each individual product is designed as an autonomous subsystem full functionalities. However, when they come together in an integrated network, you will have an efficient tool for yacht operation over and above what the individual products can provide for.



Predictive control



Power consumption

### Electronic anchoring

Electronic anchoring (GreenDP®) is designed with the objective of further reducing fuel consumption and wear and tear on mechanical parts of the power and thruster system. This sophisticated system employs a control strategy called "Non-Linear Model Predictive Control" that uses the smallest possible thrust vector, and thus power, to keep the vessel inside user defined

boundary of the working area, as opposed to the traditional "bull's-eye" station keeping.

Inside the working area, the controller gives a slowly varying thruster demand that compensates for the average environmental forces acting on the vessel. When the controller predicts that external forces will move the vessel outside the predefined boundaries, demand for more restoring thrust is swiftly issued.



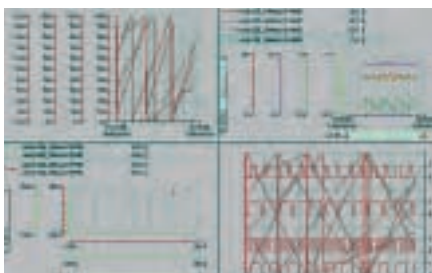
### Integrated navigation and maneuvering

With a common user interface, the integrated navigation and manoeuvring provides functions for navigation, propulsion and thrusters remote control, steering and manoeuvring.



### Manoeuvre assist

The assessment or traffic light system will advise the operator of which operational modes are safe to enter, which may be entered with caution, and which are illegal to enter. The advice will adapt to the present and actual operational situation e.g., vessel speed, rate of turn, thrusters in operation.



### Trend system and reporting

A built-in trend system allows the user to define tailor-made trend views, with any combination of process variables. The trend system enables the operator to observe the development of process variables and component states over time, and is a tool for machinery troubleshooting and process optimisation. A powerful and operator defined report generator will generate reports, cyclically, on request or by event.





## Enjoy the quality of KONGSBERG System Technology and cruise in comfort

### yachtPOS

yachtPOS is a dynamic positioning and joystick system, specially developed to meet the manoeuvring and station-keeping (electronic anchoring) requirements for large yachts.

yachtPOS satisfy the notation equivalent to IMO DP class 1 and provides e.g.:

- Wind compensated joystick control with automatic heading control.
- Auto heading mode, including present heading, change heading and minimum power heading
- Auto position mode, including present and change of position.
- Electronic anchoring – Green control providing minimum fuel consumption and minimum wear and tear on the propulsion equipment.



### K-Bridge integrated navigation

The K-Bridge system provides an integrated navigation solution designed to support the navigator in all phases of vessel operation with equipment arranged into workstations optimised for the bridge environment.

In accordance with the specifications for the individual project, one or more of the following stations are typical examples:

- Navigation, traffic surveillance and manoeuvring
- Conning
- Route planning & automatic route keeping
- Manual steering
- Safety monitoring
- Docking operations
- Radio communication
- Controls for navigational aids & bridge auxiliaries



## Monitoring and control



### **K-Chief Alarm, monitoring & control**

The machinery alarm, monitoring and control solution is an autonomous yet integral part of the overall yacht control system. All machinery controls may be handled by the machinery automation system, hence reducing the quantity of different computer systems onboard.

- Alarm and monitoring
- Power management
- Trend & performance monitoring
- Control of auxiliary machinery systems
- Remote / automatic control of pumps, fans and valves
- PID controllers
- Ballast and service tanks monitoring, remote control of pumps and valves
- Heat, ventilation, air condition control (HVAC)



### **K-Thrust remote control for propulsion and thrusters**

The KONGSBERG K-Thrust concept combines autonomous control systems for each propulsion and thruster unit into one system for mode selection and command responsibility transfer. K-Thrust is available, but not limited, for the control of;

- Azimuth propulsion units
- Retractable azimuth thrusters
- Electric-driven main propulsion
- Medium/high-speed diesel propulsion
- Side thrusters
- Rudders

### **K-Safe safety management**

K-Safe safety management system gathers all relevant information and presents the information in a clear and structured way. Such information may be fire detectors, fire doors and dampers, ventilation fans, flooding and bilge sensors, watertight doors, shell doors, etc.

The system may also show locations of fire and rescue teams, life saving apparatus and hazardous material, stability, stability condition and other safety related information.

As a result of the integration with the other subsystems, control actions may be carried out directly from the safety screen.



## We are always there, wherever you need us

KONGSBERG customer services organisation is designed to provide high-quality, global support, whenever and wherever it is needed. We are committed to providing easy access to support and service, and to responding promptly to your needs. Support and service activities are supervised from our headquarters in Norway, with service and support centres at strategic locations around the globe – where you are and the action is.

As part of our commitment to total customer satisfaction, we offer a wide variety of services to meet individual customers' operational needs. KONGSBERG support 24 is a solution designed to give round-the-clock support. For mission-critical operations, KONGSBERG support 24 can be extended to include remote monitoring. We can adapt the level of support needs by offering service agreements, on-site spare part stocks and quick on-site response arrangements.

### Global and local support

We provide global support from local service and support facilities at strategic locations world wide. Service and support work is carried out under the supervision of your personal account manager, who will ensure that you receive high-quality service and support where and when you need it. Your account manager will ensure continuity and work closely with your personnel to improve and optimise system availability and performance. Under the direction of your account manager, and with a local inventory of spare parts, our well-qualified field service engineers will be able to help you quickly and effectively.



### Solid competence reduces cost

We have always recognised the importance of supporting our products and systems with professional training.

A wide range of courses are therefore offered to ensure that you achieve the goal of full system utilisation with safe and efficient operation.

### Upgrading that pays

Product and system upgrades can improve your vessel's operations and reduce your overall maintenance costs. We will ensure that existing products and systems can be extended or upgraded based on standard upgrade kits.

## Support 24

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