QUALITY IN COMMAND - SINCE 1937

CAESAR PROPULSION CONTROL SYSTEMS



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CAESAR PCS FOR CPP TRAILING SUCTION HOPPER DREDGERS

The electronics revolution over the last decades has a serious impact which is not limited to:

- Obsoleteness of analogue electrical components such as dedicated circuit boards.
- Lack of skilled engineers to service older systems. Therefore keeping spare parts onboard does not guarantee uninterrupted ship's service.
- Growing complexity and diversification of digital systems further limiting the possibility to find skilled engineers.

The above is becoming a serious but often ignored risk for ship operators, since a major malfunction in the control system can create idle time of the vessel. The good news is that a retrofit with a CAESAR Propulsion Control System (CAESAR PCS) can eliminate this risk. Furthermore, it will result in lower maintenance costs as well as improvements such as reduced fuel consumption. Over the years the proven CAESAR PCS has grown towards an extensive installed base for the world's leading maritime companies, including the leading dredging corporates. CAESAR systems are dedicated for control of propulsion and steering. All systems are built; to fulfill customer requirements and according to the rules & regulations of the Classification Societies. Its modular configuration allows for its versatile application on various types of ships. Furthermore, the CAESAR PCS is developed on a generic platform allowing to become independent of availability of Commercial-Off-The-Shelf (COTS) hardware.

For Trailing Suction Hopper Dredgers (TSHD), dedicated (software) modules are designed, which makes the CAESAR PCS well suitable for various configurations and control principles. Both for main machinery driving dredge pumps and controllable pitch propellers (CPP's) onboard of the TSHD





THE CAESAR PCS CONSISTS OF:

- Propulsion controllers (Follow-Up & Non Follow-Up) installed in a dedicated cabinet
- Operator station(s) consisting of remote control panels and levers

The CAESAR PCS cabinet contains two digital controllers: the main (FU) and back-up (NFU) controller. The main controller is used for CPP lever follow-up control to support various modes of operation:

- *Free-sailing mode:* during a transit voyage, the diesel-engine RPM and CPP pitch is optimised for the lever-demanded CPP thrust.
- Dredging mode: while performing a dredging operation at low speed, the CAESAR modules optimise to maximise productivity. Diesel-engine load control with priority for the generator or pump Power-Take-Off (PTO), which can be combined with drag-head speed-over-ground control.

Various CAESAR control modules for the load-control support optimised productivity:

- Classic load-control : allowed fuel-injection as function of propeller-speed and manifold pressure.
- Advanced load-control: combining classic loadcontrol with adaptive control, including PTO power feed-forward control.
- Fixed fuel-rack control with pitch-governing, in case propeller speed drops too much.

MACHINERY INTERFACING:

The CAESAR cabinet interfaces with machinery sensors and actuators. The pzitch of the CPP is actuated via a proportional or servo valve. The diesel-engine governor is tightly interfaced with the CAESAR PCS for improved and optimized integration.

REMOTE CONTROL PANELS:

The remote control panels are customised to the onboard bridge layout and support required functionality. They interface with the CAESAR PCS cabinet either hardwired or by fieldbus (e.g. CAN). For a retrofit, existing (hard) wiring is reused. Typical components are:

- Remote control lever(s) for setting the thrust
- Pushbuttons or jog-switches for NFU control
- Pushbuttons for station-in-control transfer, mode selection, clutch-control, CPP hydraulic pump control.
- HMI displays

CAESAR system are assembled at the Kwant Controls' facility and supplied with customer's choice classification. After assembly, it is subject to a thorough Factory Acceptance Test (FAT), in attendance of the Classification surveyor, owner and / or the yard representatives.

THE SYSTEM CAN BE EXTENDED WITH:

- Emergency telegraph system
- Indication of RPM and pitch
- Encrypted access point for remote service



AVAILABLE CAESAR SYSTEMS

Kwant Controls propulsion and steering solutions are part of the elementary systems on all kinds of vessels. Whether for primary control of steering and propulsion, backup control or emergency telegraph operations: tailored components and concepts are available for optimized operations, safety, reliability and maintainability.



At early stage of the project, by functional specification the scope and system functions are defined. This forms the basis for our engineering process towards full flush simulation tests at our in-house test-facility.

Available CAESAR Propulsion Control Systems for:

- **Fixed Pitch Propellers**
- Controllable Pitch Propellers
- Waterjets
- Rudders
- Azimuth/Steerable thrusters
- Transverse thrusters
- Motion demping

Please ask us for possibilities.













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