Diesel-electric propulsion plants: Questionnaire

1. Diesel-electric propulsion plant layout data

In order to provide you with appropriate project material and to carry out proposals promptly and accurately, we would kindly request you to fill in as many of the following details as possible and return it with a complete set of arrangement drawings to your sales representative.

1.1   General data

Name: _____

Address: _____

Phone: _____

E-mail: _____

Project: _____

Type of vessel: _____

Propulsion principle:

☐ Diesel-electric   ☐ CODLAD   ☐ CODLAG   ☐ _____

Main particulars:

Length, overall [m]: _____

Length, pp [m]: _____

Breadth, moulded [m]: _____

Depth, moulded [m]: _____

Draught, design [m]: _____

Draught, scantling [m]: _____

DWT, at sct draught [t]: _____

Gross tonnage [GRT]: _____

Crew + Passengers: _____ + _____

Classification society: _____ Class notation: _____

Additional class notations: _____ Redundancy: _____

Ice class: _____

Ambient conditions:

Max. machinery room temperature [℃]: _____

Max. sea water temperature [℃]: _____

Max. fresh water temperature [℃]: _____

1.2 Speed and margins

Speed:

Ship design speed [kn] : _____ (at maximum propulsion shaft power)

Sea margin [%] : _____

Max. allowed load of engines [%] : _____ % MCR

1.3 Propulsion system and power demand

Main Propulsion:

☐ Shaft propulsion: ☐ Single Screw: ☐ Single in – single out

☐ Tandem

☐ Twin in – single out

☐ Twin Screw: ☐ Two shaft lines

☐ 2x Twin in – single out

☐ Steerable rudder propellers (= Azimuth thrusters)

☐ Pods

☐ _____

Data for main propulsion:

☐ FPP: Number: _____

Max. shaft power on propulsion E-motor (per propeller; <u>including</u> sea margin) [kW]: _____

Propeller revolution [RPM]: _____

Input speed (= E-motor RPM): _____

Reduction gearbox: ☐ yes ☐ no

☐ CPP: Number: _____

Max. shaft power on propulsion E-motor (per propeller; <u>including</u> sea margin) [kW]: _____

Propeller revolution [RPM]: _____

Input speed (= E-motor RPM): _____

Reduction gearbox: ☐ yes ☐ no

☐ Azi. thruster: Number: _____

Max. shaft power on propulsion E-motor (per thruster; <u>including</u> sea margin) [kW]: _____

Input speed (= E-motor RPM): _____

Propeller type: ☐ FPP ☐ CPP

☐ Pod: Number: _____

Max. shaft power on propulsion E-motor (per pod; <u>including</u> sea margin) [kW]: _____

E-motor speed [RPM]: _____

☐ _____ Number: _____

Max. shaft power on propulsion E-motor (each; <u>including</u> sea margin) [kW]: _____

Propeller revolution [RPM]: _____

Input speed (= E-motor RPM): _____

Reduction gearbox: ☐ yes ☐ no

Data for manoeuvering propulsors:

☐ Bow thruster: Number: _____

Max. shaft power on propulsion E-motor (each; <u>including</u> sea margin) [kW]: _____

Input speed (= E-motor RPM): _____

Propeller type: ☐ FPP ☐ CPP

☐ Stern thruster: Number: _____

Max. shaft power on prolusion E-motor (each; <u>including</u> sea margin) [kW]: _____

Input speed (= E-motor RPM): _____

Propeller type: ☐ FPP ☐ CPP

☐ _____ Number: _____

Max. shaft power on propulsion E-motor (each; <u>including</u> sea margin) [kW]: _____

Input speed (= E-motor RPM): _____

Propeller revolution [RPM]: _____

Propeller type: ☐ FPP ☐ CPP

1.4   Electrical load balance

Max. total electrical power demand at sea:

for main propulsion [kW_{el}]: _____

for vessel´s consumers [kW_{el}]: _____

Max. total electrical power demand at manoeuvering:

for main propulsion [kW_{el}]: _____

for manoeuvering propulsors [kW_{el}]: _____

for vessel´s consumers [kW_{el}]: _____

Max. total electrical power demand at port:

for vessel´s consumers [kW$_{el}$]: _____

The five biggest electrical consumers of the vessel
(apart from main propulsion and maneuvering propulsors):

Name:_____ ; kW$_{el}$:_____

Name:_____ ; kW$_{el}$:_____

Name:_____ ; kW$_{el}$:_____

Name:_____ ; kW$_{el}$:_____

Name:_____ ; kW$_{el}$:_____

Please provide us with a complete E-Load-Balance of the vessel.

1.5   Electrical system and motors

Number of generators: _____

Power per generator [kW$_{el}$]: _____

Power factor: _____

Revolution of generators [RPM]: _____

Frequency [Hz]: _____

Voltage level of generator and MSB [V]: _____

Voltage levels of sub-switchboards [V]: _____

System grounding of MSB: ☐ 3-phase, 3-wire, isolated from hull

☐ 3-phase, 3-wire, isolated via high-resistive resistor

☐ _____

Main propulsion E-motors:

Number of winding systems: ☐ 1   ☐ 2

Speed control: ☐ variable speed via frequency converter

☐ _____

Manoeuvering E-motors (i.e. bow thrusters):

☐ variable speed via frequency converter

☐ constant speed (Start via Y/Δ-unit)

☐ constant speed (Start via Softstarter)

☐ constant speed (Start via Autotransformer)

☐ _____

1.6   Dimensioning of the propulsion E-motor

For the design of the torque capability of the propulsion E-motor usually a constant power range of 5% …10% is applied (for a FPP-driven vessel). In case of additional load, like bollard pull or icy conditions, this range has to be extended.

Open water propeller power [%] ——

Request for additional torque [%] ••••
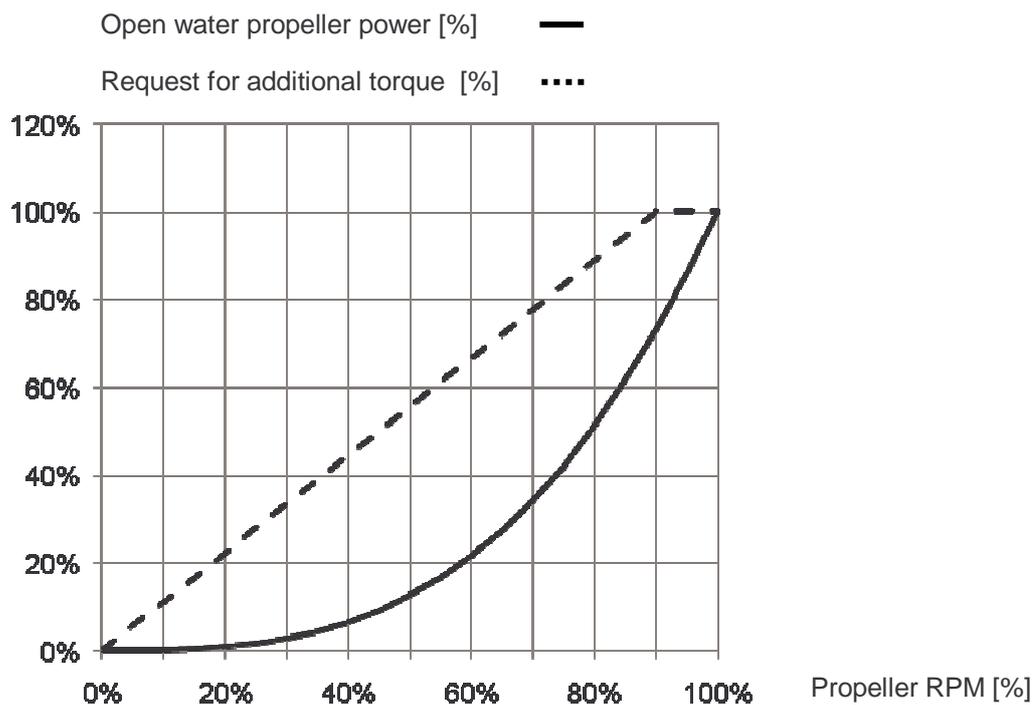
Torque capability: ☐ Constant power from _____ % to 100% of propeller RPM

☐ Max. over-torque capability of the E-motor: _____ %

1.7   Single line diagram

Please provide us with a complete single line diagram of the vessel.