

Torque Marine Spezifikation EcoFlow Main propulsion and power plant

status 07.02.2011



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- **Meeting on 01.02.2011 by COMBI International B.V**

COMBI International B.V

Keizersveer 1b

NL 4941 TA Raamsdonksveer

- | | | | |
|----|----------------------|---|--|
| 1. | Bob van Amelsvoort | > | Combi International |
| 2. | Jan Buijks | > | TeamCo International |
| 3. | Bram Kruyt | > | Wärtsilä - Director Business Development Wärtsilä Netherlands B.V. |
| 4. | Dan Veen | > | Wärtsilä – Area Sales Development North Europe |
| 5. | Arie Koedood | > | KOEDOOD Dieselservice BV – Mitsubishi Diesel Engines |
| 6. | Toine Rullens | > | Nel Rullens den Boer – Elektro Installation |
| 7. | Claus D. Christophel | > | TORQUE Marine IPS |

CDC / Torquemarine were inviting from Bram Kruyt – Wärtsilä Netherland BV.

The agenda of the meeting:

- Introduction participants
- Explanation of newbuild project, scope, planning etc
- Presentation of Torque Marine system, benefits
- Discussion of Torque Marine proposal (technical)
- Discussion of Torque Marine proposal (commercially / partnership)

We agree, Torquemarine will offer the propulsion system without Gen Sets; this will be offer from Mitsubishi NL,

2 Sets as Gas – Engine, installed in the forship

2 Sets as Diesel – Engine, installed in the aftship (near the switchboard engine room aft)

- Torquemarine will deliver all interface information for the Gen Sets latest 08.02.2011 to Bram Kruyt.
- Torquemarine intend to send the update spezifikation and budgetary offer latest 10.02.2011 to Bram Kruyt.

We need soonest all information from Arie Koedood for the Mitsubishi Diesel Engines, according our spezifikation:

1. *A green and sustainable inland vessel in 2012*

Wärtsilä Netherlands B.V., Local Press release, 25 May 2010

Four leading companies in the inland navigation and shipping industry are bundling their knowledge and expertise in Project EcoFlow to design and build a green and economically sustainable inland ship. The aim is to put this vessel for the future into service in 2012. The vessel is to be cost efficient and will comply with all new laws and regulations.

In Project EcoFlow all aspects of the vessel are examined and looked at, such as design, equipment, loading and unloading, propulsion and automation. Consider for example low emission sailing, hybrid propulsion, fuel savings, ship's build (underwater) and integrated control systems on board.

Combi International (supplier of inland vessels), Wärtsilä Netherlands (including marine engines and propulsion systems), TeamCo Shipyard (fitting-out) and Reederei Deymann (inland tanker shipping) each have their own field of experience and expertise in developing green and economically sustainable products. These four parties expect to provide derived solutions to make existing ships greener, cleaner and more sustainable.

The project is currently in the preliminary phase. In this phase, exploratory talks are being held with several parties, that can each contribute from their own expertise to the development of the final result: a green and economically sustainable inland ship. Expert parties include government agencies, class societies, inland shipping interest groups and banks.

2. *Main Particulars*

It has been decided (!) to fit out an existing newbuild casco. Start March 2011. This twin screw 130m vessel for which we already have been in touch and exchanged various communications. Follow-up orders for at least two more vessels very likely.

Engines etc will be actually purchased/ ordered within two weeks!

Depending on availability following configurations are considered:

- Mitsubishi HS engines with after treatment
- Diesel/ Electric propulsion, potentially Gas/electric propulsion.
- Wartsila MS Engines with upgrade to LNG potential

This ship is meant to be a showcase of the new green generation Inland vessels. As such the owner expects all parties/ subcontractors to participate by offering the equipment at bare costs or less. Subsidies are applied for but decisions are not expected before end of April so we should start this project without with the risk that subsidies won't become available.

Wartsila (and EcoFlow partners) considers this a perfect opportunity to take become the frontrunner in Inland Waterways green shipping.

Please consider Torque Marine's interest to join this project and co-create the next generation "Enok" Assuming that TM is interested, you are kindly invited for a meeting on:

Date : February 1st 2011

Location : Wartsila Drunen (or nearby location of Ecoflow partner)

Time : To be agreed upon, preferably start in the morning

Agenda (proposed)

- Introduction participants
- Explanation of newbuild project, scope, planning etc
- Presentation of Torque Marine system, benefits
- Discussion of Torque Marine proposal (technical)
- Discussion of Torque Marine proposal (commercially / partnership)

- Next steps

Re commercial discussions, please be prepared to present actual costs/ pricing. Shortly after this meeting the three propulsion options will be evaluated and decisions taken.

I sincerely hope that we do find a common basis to co-operate taking this project as the starting point.

I look forward to your reaction with much interest and hope to meet with you on the 1st February. Other Torque Marine representatives are welcome too.

From: Kruyt, Bram

Sent: 26 January 2011 9:18

Subject: Twin Screw - UPDATE

Dear all,

Please be advised on updated requirements following discussions with the owner yesterday evening and this morning:

- Go-ahead of this project confirmed; start fitting out existing 130m casco in March 2011
- Triggered by the high waterlevel in the rivers, the owner considers an increased propulsionpower. **Base option : 2x approx 953 HP. Now preferred option: 2x approx 1278 HP** (this are the Mitsubishi ratings in case HS Engines would be selected after all.
- **Bow thrusters 2x 500Hp** (not Wartsila supply)
- Clutches on main shaftlines (in case of Diesel Engines) with "vrijloop"
- Decisions planned this week / next week

Related actions:

- Quotations for both shaftline versions
- Quotation for the W20's for both ratings
- Quotation for propellers/ nozzles
- **Quotation from Torque Marine for both options (action Bram)**

There are only very few shipowners right now that do newbuilds so this is by far the most concrete opportunity

Thanks/ regards,
 Bram

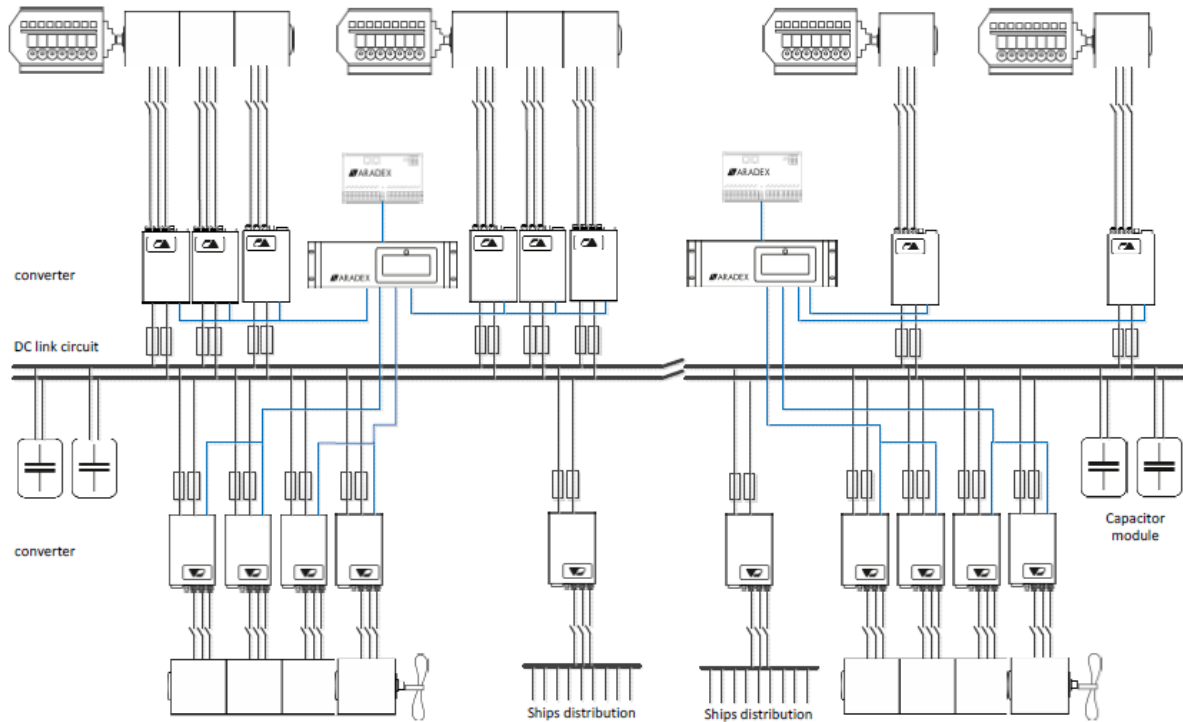
3. *Project members of Project EcoFlow*



Project members of Project EcoFlow. From left to right:
Martin Deymann (Reederei Deymann),
Marcel Zweers (TeamCo Shipyard),
Bob van Amelsvoort (Combi International),
Gerrie van Tiem (TeamCo International),
Simon Provoost (TeamCo International),
Bram Kruyt (Wärtsilä),
Jan Buijks (Combi International)

4. TORQUE Marine IPS System Propulsion Drawing:

20110204 - EcoFlow



- 2 GENSETS with 630 KWe Generator - **3 wather cooled converter each**
With Highspeed Diesel Mitsubishi for 630 KWe bei 1800 RPM
- 2 GENSETS with 230 KWe Generator - **1 wather cooled converter each**
With Highspeed Diesel Mitsubishi for 230 KWe bei 1800 RPM

Generatoren

	Leistung kW	Anzahl Umrichter	Drehzahl U/min	Drehmoment Nm	Durchmesser mm	Gesamtlänge mm	Gewicht kg
SGPW 290 L	630 Kwe	3	1.800	3.183	560	700	670
SGPW 290	220 Kwe	1	1.800	1.220	560	450	380

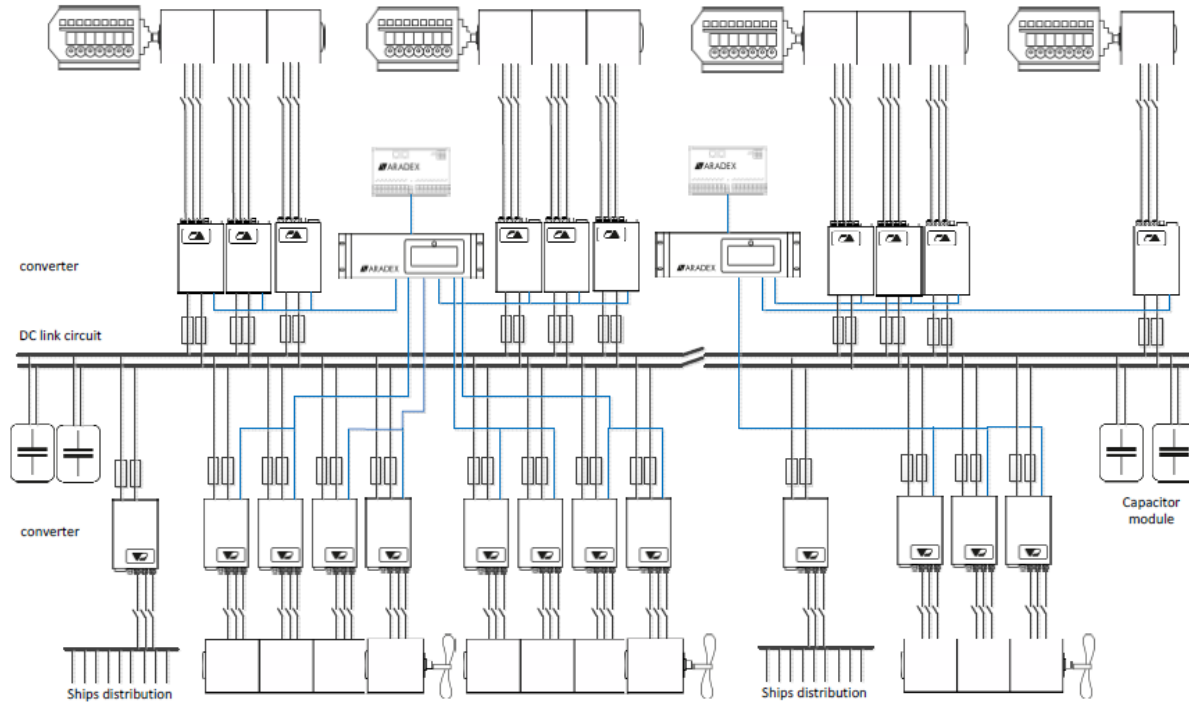
- 2 x PROPULSION Motor 720 Kwe (980 hp) - 4 wather cooled converter each

Motoren

	Leistung kW	Anzahl Umrichter	Drehzahl U/min	Drehmoment Nm	Durchmesser mm	Gesamtlänge mm	Gewicht kg
SGPW 480 M	720	4	400	15280	960	800	2.240

4.1 TORQUE Marine IPS System Propulsion incl. Bowtruster Drawing:

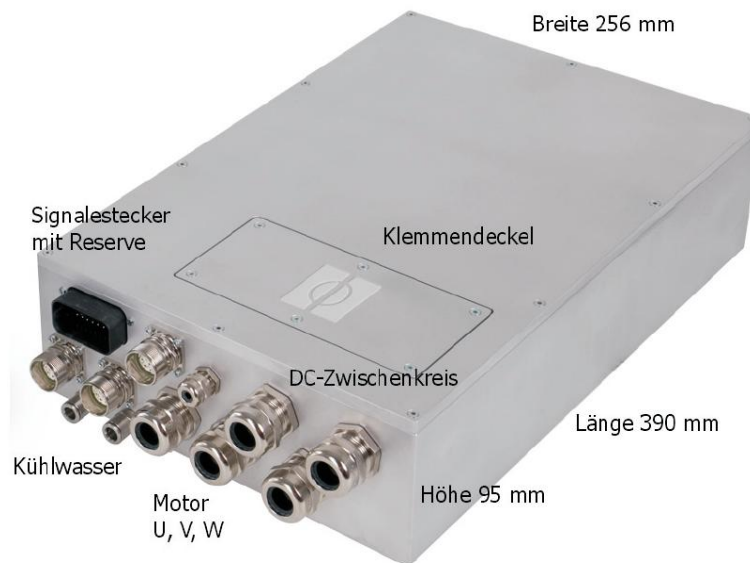
20110205 - EcoFlow



5. Diesel Gen Sets Mitsubishi

6. Mitsubishi drawing

7. AC – DC Inverter 210 Kwe - water cooled high efficiency 98,5 %



1. zum Einbau direkt im Antriebssystem (Klemmkasten), integrierte Wasserkühlung.
2. zum Einbau in eine bordseitige Schaltanlage, Einspeisung Generator für Stromversorgung Gleichstrom Zwischenkreis

8. Weigth – Volumen Calkulation

a. 2x Diesel Mitsubishi Type ? für 630 KWe by 1800 RPM

Länge	x	Breite	x	Höhe	Gewicht
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b. 2x Diesel Mitsubishi Type ? für 630 KWe by 1800 RPM

Länge	x	Breite	x	Höhe	Gewicht
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Generator SGPW 290 L 630 Kwe

Länge	x	Durchm.	x	Länge	Gewicht
620 mm		560 mm		700 mm	670 Kg

Motor SGPW 480 M 720 (800) KWe

Länge	x	Durchm.	x	Länge	Gewicht
840 mm		500 mm		800 mm	2.240 Kg