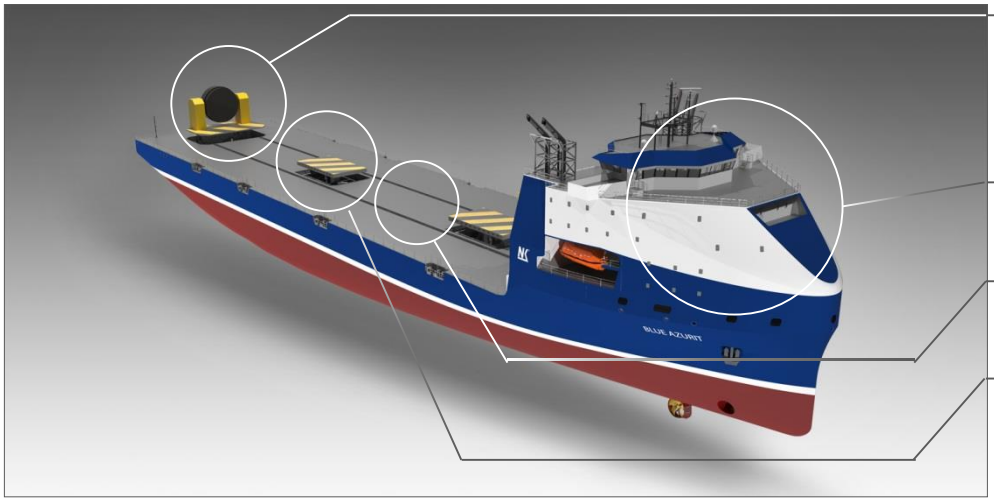
OFFSHORE WIND 2020



Gripper for upending
- Motion compensated
- Monopile
- Tower

Complement
- Comfort Class for 32 + 12SPS

Flush cargo deck
- Up to 15 t/sqm

Ship Motion Compensation Platform
- Safe transfer of cargo components

WIND TURBINE TRANSPORT VESSEL (WTTV)

The *Blue Azurit* is the first Wind Turbine Transport Vessel which is designed to transport wind turbine parts of future sizes above 8MW. Such could be the monopiles, the TP`s, the towers, the nacelles and the blades. The high efficient and environmental friendly DPS2-vessel powered by frequency controlled gensets and driven by VFD propulsion units is capable to pick up the components direct at suppliers berth and transport them to the offshore harbour. All turbine elements will be skidded to main deck and vice versa by vessels own equipment. Heavy vessel cranes and shore cranes are not required for loading and unloading the vessel! Tidal range of app. 4,5m are compensated by effective automatic controlled ballast system as well active controlled anti heeling system. The vessels principle to inspire the wind turbine maker for the design of full length welded towers, horizontal outfitted/painted at manufactures berth

Blue Azurit is also able to transport such cargo direct to our jackup installation vessel *Blue Amber*, intent to supply - Just in Time .

Efficiency of the installation process and logistical approaches benefits the LCoE. The vessel is equipped with SMCS (Ship Motion Compensation System), two in main deck and one aft end with gripper for the monopile/tower upending sequence. Packages of 3 blades will be compensated on two main deck platforms and picked up by use of special spreader, operated from *Blue Amber* main crane. A large deckhouse providing comfort class accommodation for the crew and special purpose persons as well on main deck level located store rooms for the cargo skidding equipment.

Clean Design notation guarantees an efficient and ecological operation of the vessel.

This design, coordinated with the main equipment suppliers, is ready to bring the offshore wind industry around the world a step forward.

Neptun Ship Design – Germany's largest ship design office established in 1992.

Tradition and innovative spirit are successfully driving our business ever since. Neptun's cutting-edge designs are durable and highly fuel-efficient – viable for a challenging future. Modular concepts and energy-efficient approaches result in economic solutions for your shipping business.

Worldwide, Neptun designs enjoy an excellent reputation for tailor-made solutions with customized or specialised off-the-shelf arrangements for your type of ship.

DESIGNED BY NEPTUN

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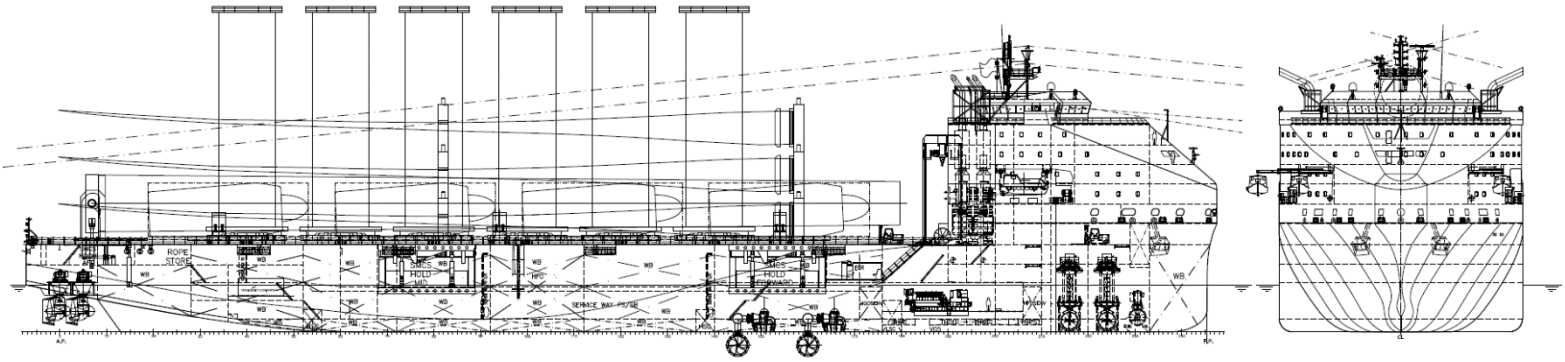
Wind Turbine Transport Vessel



MAIN PARTICULARS

Class: **ABS** ✠A1, Offshore Support Vessel (Supply, Wind IMR),SPS, HDC (15 t/m2, Cargo Deck), ✠AMS, ACC, DPS(2), BWT, HAB, NIBS, ENVIRO+, CPS, CRC(OC), HM2(LC) or equivalent

Main Particulars		approx.
Length, overall	L_{oa}	178.34 m
Length, between pp	L_{pp}	171.80 m
Breadth, moulded	B	36.50 m
Depth, freeboard	D	11.50 m
Depth, to cargo deck	D	13.00 m
Draught, design	T_{des}	5.50 m
Draught, freeboard	T_{fb}	7.00 m
Deadweight, design	DWT_{des}	9,300 t
Deadweight, freeboard	DWT_{fb}	17,500 t
Speed (Tdes,service)		15.5 kn
Consumpt. (ISO-cond., excl.5% tol.)		53.3 t/day
Endurance		16,500 nm
Complement		32 + 12SPS + Suez crew
Tonnage (gross/net)		24,990 / 7,497

Tank capacities		
WB	center tanks	16,700 t
	tidal range compensation	
	side + wing tanks	13,240 t
	trim + heel compensation	
FW / TW		380 / 285 t
HFO / MGO storage		1.280 t
HFO/LSHFO storage		770 t
HFO/ULSHFO storage		770 t

Design areas & loads			
Cargo Deck (total, levelled)	approx.	4,200	sqm
uniform deck load		15	t/sqm
line load bulkheads (long. + transv.)		200	t/m
line load webframe		50	t/m
Cargo Equipment Store			
on main deck in superstructure	approx.	265	sqm
Cargo Equipment			
SMCS - comp. platform with gripper	SWL	600	t
aft, handling tower foot			
SMCS - compensation platform	SWL	850	t
middle + fwd, handling nacelle, blades, transition pieces and tower tip			
Integrated trolley system for transv. and long. cargo operation			
Portal crane for secondary handlings	SWL	30	t
	outreach deck side	5	m
Fork lifts for equipment handling 2 pc.	SWL	10	t

Machinery				
Main Generators		Tier III (Tier II + SCR)		
HIMSEN 6 x 16H25/33V		900 rpm.	31,332	kW (total)
or equivalent		*frequency controlled*		
Emergency/ Habour diesel		Tier III (Tier II + SCR)		
		1800 rpm.	450	kWe
Thermal Oil Heating Plant				
Oil-fired vertical tube type		1 pc.	1,250	kW
Economizer		1 pc.	1,250	kW
Propulsion	*variable frequency drives*			
Azimuth thrusters	aft	3 pc.	3,940	kW
Equipment	*variable frequency drives*			
Thrusters	bow	1 pc.	*tunnel*	1,500 kW
	bow	2 pc.	*retr.*	2,000 kW
	middle	2 pc.	*swing-up*	3,000 kW
Anti-Heeling system			active	
Tidal compensation system		approx.	4.5	m
ACDC Energy Management System				
DPS2-System	wave height		3.2	m
	wind speed	approx.	10.0	$m*s^{-1}$
	current velocity		1.5	kn

YOUR WTTV	TRANSPORT TASK	DPS2	SMCPs	SKIDDING EQ.	REMARK
OPTION I	Harbour to harbour	ready	ready	ready	optional add. main crane
OPTION II	Harbour to harbour (self-loading)	ready	ready	**yes**	independent from port
OPTION III	Offshore to harbour	**yes**	ready	ready	e.g. for decommissioning
OPTION IV	Harbour to offshore (general)	**yes**	**middle and/or fwd**	ready	various cargo types
OPTION V	Harbour to offshore (to WTIV)	**yes**	**aft, middle & fwd**	**yes**	for all wind turbine parts

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