US Wind
OCS Air Permit Application
Responses to MDE Review
November 6, 2024

1) **Need for more specific (type) vessel information** (i.e., engine size, category, etc.)

   a) How the Company selected the vessel(s) that is listed and used in the calculation? In the absence of a contract list, how does the Company select each vessel that is input in the calculation? Would it be possible to clearly address the vessel selection methodology? What were the assumptions taken in the selection methodology? There is a need to better understand the vessel selection methodology, and the variables that goes into the selection of a given vessel among the entire suite of potential vessels that might be available from the fleet.

Response:

General vessel identification
US Wind's team reviewed TRC's selection of representative vessels from review of OCS air permits[1] issued by the USEPA at the time and input from the US Wind construction management team. The personnel and consultants of US Wind's engineering and construction team have decades of experience developing and constructing offshore wind projects. US Wind's staff expertise and input were used as the primary source of representative vessels.

The offshore construction plan is based on US Wind's Construction and Operations Plan submitted to the Bureau of Ocean Energy Management in order to install the Project, specifically, up to 121 wind turbine generators (WTGs) to produce the electricity, up to 4 offshore substations (OSS) to collect the power and transmit it to shore, inter-array cables to connect strings of 4-6 WTGs to one of the 4 OSSs, up to four offshore export cables, one from each corresponding OSS, to bring the power to shore, and one fixed-platform Meteorological Tower (Met Tower) to measure environmental conditions offshore and serve as a platform for communication and research efforts.

The Project would be constructed in four construction campaigns (one per OSS) over three years, with the estimated number of WTGs and associated infrastructure installed summarized below. It must be noted that these are estimates of the construction progression and the number of WTGs installed per year may be adjusted based on component- and vessel-availability as well as weather and other factors. Additionally, US

[1] https://www.epa.gov/caa-permitting/permit-documents-vineyard-wind-1-llcs-wind-energy-development-project-800mw-offshore
https://www.epa.gov/caa-permitting/permit-documents-new-england-wind-2-wind-energy-development-project

Wind estimated a maximum of 121 WTGs although removed 7 WTGs as a mitigation measure to set back from the nearby shipping lane (Traffic Separation Scheme) into and out of Delaware Bay.

- Year 1 – 21 WTGs, 1 OSS, inter-array cables, and 1 offshore export cable
- Year 2 – 55 WTGs, 2 OSS, 1 Met Tower, inter-array cables, and 2 offshore export cables
- Year 3 – 45 WTGs, 1 OSS inter-array cables, and 1 offshore export cable

Below is a description by category in the emissions tables of the purpose for the vessels selected and, as appropriate, the conservative nature of the number or usage (trips) of selected vessels.

- Scour protection
    - **Scour protection installation vessel** – A large vessel carrying rock and gravel material is necessary to install scour protection at each WTG foundation location.
- Foundation installation
    - **Foundation installation vessel** – A large heavy lift vessel is needed to lift and install the foundations with a pile-driving hammer, and transition pieces on top of each foundation. Heavy lift vessels are in limited supply worldwide. The heavy lift vessel is assumed to come from Europe to offshore the U.S. and would not make any trips to a U.S. port due to the Jones Act.
    - **Tugboats** – One tugboat is assumed to be needed offshore for support of foundation installation. Additionally, three tugboats would transport the barges carrying the monopile foundations (2 per tug) and transition pieces (2 per tug) from Sparrows Point to the offshore installation locations.
    - **Crew transfer vessel** – A CTV is assumed to be needed to transport technicians to the offshore installation locations during construction.
    - **Noise mitigation vessel** – An offshore support vessel will be required to deploy the double bubble curtain at each foundation location to minimize underwater sound during pile driving.
    - **Acoustic monitoring buoy support vessel** – Underwater sound monitoring is required during pile driving and a vessel to deploy and monitor buoys would support foundation installations.
    - **Marine mammal observation** – An additional vessel carrying Protected Species Observers during pile driving will be required.
    - **Environmental monitoring vessel** – An additional environmental monitoring vessel is assumed to carry PSOs and/or support acoustic monitoring or conduct other environmental monitoring. At the time of the application, the requirements are not final; US Wind assumed a vessel would be needed at each foundation location similar to the marine mammal observation vessel.
- WTG installation

    - **WTG installation jack-up vessel** – A large, specialized WTG installation vessel would be needed to install the towers, nacelles, and blades at each foundation location.
    - **Tugboats** – Three tugboats to transport WTG components by barge and assist with installation were assumed.
- WTG commissioning
    - **CTVs** – Crew transfer vessels to transport technicians to the offshore installation locations during commissioning of the WTGs would be needed. US Wind assumed 3 CTVs for this work.
- OSS installation
    - **OSS installation** – A large heavy lift vessel is needed to lift and install the foundations with a pile-driving hammer, and the substation topside on top of each foundation. Heavy lift vessels are in limited supply worldwide. The heavy lift vessel is assumed to come from Sparrows Point or similar port to conduct installation activities.
    - **Tugs** – Three tugs are assumed to transport components by barges and assist with installation. Two tugs would be needed to transport the jacket foundation and piles at each of the four installation locations, and to separately transport the topside to each of the four locations. One tug is assumed to assist with installation of the jacket foundation installation and separate topside installation.
    - **Acoustic monitoring buoy support vessel** – Underwater sound monitoring is required during pile driving and a vessel to deploy and monitor buoys would support foundation installations. This vessel would also likely carry PSOs.
    - **Refueling and supply vessel** – An offshore support vessel is assumed to provide fueling services to the OSS and to resupply the crew "hotel" vessel.
    - **Crew hotel vessel** – A jack-up or similar vessel is assumed to house crew offshore during OSS installation and commissioning.
    - **OSS emergency generators** – 150-kW diesel backup generators are assumed on each OSS during installation.
- IAC installation
    - **Cable lay vessel** – A specialized vessel to carry inter-array cables that can survey the seabed prior to installation, lay the cables, and pull cables into the WTGs and OSS will be necessary to connect WTGs.
    - **Offshore support vessel** - Prior to installing cables a pre-lay grapnel run is needed to clear debris from the cable area.
    - **CTVs** - Two crew transfer vessels to transport technicians to the offshore installation locations during cable installation and connection to the WTGs and OSSs. An additional CTV or similar vessel is assumed as a guard vessel.
    - **Trenching vessel** – A support vessel to conduct surveys before and after cable installations and pulls as needed.
- Offshore export cable installation

    - **Cable lay vessel** – A specialized vessel to carry export cables that can survey the seabed prior to installation, lay the cables, and pull cables into each OSS.
    - **Offshore support vessel** - Prior to installing cables a pre-lay grapnel run is needed to clear debris from the cable area.
    - **Trenching vessel** – A support vessel to conduct surveys before and after cable installations and pulls as needed.
    - **Jack-up vessel** – A small jack-up vessel that can support the pull through the horizontal directional drill (HDD) ducts from the shore landing site.
    - **Research/survey vessel** – A small survey vessel to support divers as needed at the HDD punch out location.
    - **Offshore support vessel** – A support vessel to support pulling in the cables through the HDD ducts.
- Met Tower installation
    - **Met Tower installation** - A large heavy lift vessel is needed to lift and install the foundation with a pile-driving hammer, and the Met Tower topside on top of the foundation. Heavy lift vessels are in limited supply worldwide. The heavy lift vessel is assumed to come from Sparrows Point or similar port to conduct installation activities.
    - **Tugboats** – Three tugs are assumed to transport components by barges and assist with installation. Two tugs would be needed to transport the foundation and piles at the Met Tower installation location, and to separately transport the topside to each of the location. One tug is assumed to assist with installation of the jacket foundation installation and topside installation.
    - **Acoustic monitoring buoy support vessel** – Underwater sound monitoring is required during pile driving and a vessel to deploy and monitor buoys would support foundation installations. This vessel would also likely carry PSOs.
    - **Refueling and supply vessel** – An offshore support vessel is assumed to provide fueling services to the Met Tower and to resupply the crew "hotel" vessel.
    - **Crew hotel vessel** – A jack-up or similar vessel is assumed to house crew offshore during Met Tower installation and commissioning.

Similarly, US Wind's construction management team made conservative assumptions for the operation of the Project:

- Scour protection repair
    - **Scour protection installation vessel** – A large vessel carrying rock and gravel material is necessary to make any repairs to scour protection at WTG foundation locations.
- OSS refueling
    - **Refueling operations** – A CTV is assumed to provide fueling services to the OSS.
- WTG inspection/maintenance/repair

    - **Main repair vessel** – US Wind included 1 major repair to a WTG requiring a jack-up vessel during the operations phase.
    - **Multi-role survey vessel** – A small vessel is assumed to be needed for cable surveys and inspections related to WTG maintenance.
- Cable burial repair
    - **Multi-role survey vessel** – A small vessel is assumed to be needed for cable burial repair five times during the operations phase.
- Daily O&M and Miscellaneous
    - **Crew transfer vessels** – US Wind assumed four crew transfer vessels (CTVs) would make daily trips to the Project. It is likely that maintenance and inspection visits to the Project would occur more frequently in the summer months due to weather, and less likely that CTVs would venture out to the Project during the winter months and other times of bad weather. Additionally, US Wind may not have four CTVs available. Daily trips of four CTVs was used as a worst-case or maximum scenario.
    - **Environmental monitoring vessel** – US Wind assumes a small vessel would make 100 trips per year to the windfarm for various environmental monitoring needs such as foundation inspection for ghost fishing gear, fisheries resource monitoring, marine mammal monitoring, and other post-construction studies that have not all been finalized with BOEM and BSEE.
    - **Electrical service** – US Wind assumed operation of one 150-kW standard back-up diesel engine on in operation 24/7 each year of windfarm operation due to the potential need for emergency generation on an OSS. It is unlikely that any back-up diesel generators would operate for such an extended time if the WTGs and OSSs operate as designed. Again, to be conservative, US Wind included operation of a back-up engine in the emissions calculations.

Vessel selections for emissions modeling
The engine sizes and durations of activities used in the OCS air permit application reflect the most current Project design to the best of US Wind's knowledge. The OCS air permit application was based on marine vessels and marine engines that are representative of the types, configurations, and sizes that are anticipated to be used during construction, commissioning and operations and maintenance (O&M).

US Wind is unable to identify specific 3rd party construction contractors until development is advanced further, permits and project financing are secured, and vessel contracts are signed; therefore, single vessel specifications such as engine size and other operational details are not available.

US Wind will consider a number of factors when evaluating potential suppliers, including health, safety, and environmental credentials. US Wind will not know exactly which third-party engines will be used until contracts are signed. Note that construction and repair plans change on short notice, availability of vessels may change based on condition and weather, the market demand for vessels is vast, and the Jones Act imposes limitations on

available vessels. For these reasons, vessels may also be substituted after construction begins.

This methodology for issuing OCS air permits prior to selection of vessels has been approved by USEPA for all other OCS air permits and most recently, in the Atlantic Shores OCS air permit issued on September 30, 2024, as discussed in the fact sheet[2]:

> *"The application identifies various types of emission sources (namely, engines on vessels, on wind turbine generators, and on offshore substations) that will be associated with the Atlantic Shores project. However, in its application, the applicant states that most or all of its construction and commissioning ("C&C") and operations and maintenance ("O&M") contracts will be finalized after the project reaches financial closure, which will occur after all permits, including the OCS air permit, are issued. According to the applicant, the actual specifications of the vessels and engines (model years, displacements, etc.) will depend on vessel and contractor availability, which is also dependent on the final construction schedule of the Atlantic Shores project. Therefore, the information provided in the application is based on representative vessel types necessary for this type of project."*

As discussed in the OCS application, vessel emission estimates are based on currently built vessels used for constructing OCS wind facilities that may be used for the Project or are closely representative of the type of vessel anticipated to be used for the Project. Equipment specification sheets for representative sample vessels in some cases include engine sizes, although not all specifications sheets identify the size of the main and/or auxiliary engines, or differentiate between auxiliary engines and main engines. If all engines were the same size, one engine was assumed as an auxiliary engine while the others were assumed to be main engines. In diesel-electric vessels, the main engines are used to provide both auxiliary and propulsion power. In these vessels, at low loads, some engines can be shut down to allow others to operate more efficiently. Consequently, for diesel-electric vessels, it was assumed that one or more of the main engines provides auxiliary power.

US wind has provided vessel specification literature for sample vessels utilized in the emissions calculations in Attachment A. The sample vessels specifications are currently built vessels used for constructing OCS wind facilities that may be used for the Project or are closely representative of the type of vessel anticipated to be used for the Project. These specifications provide typical vessel engine sizes for vessels for the types of vessels that are anticipated to be utilized. These specifications are not intended to represent the entire fleet of available vessels available to construct and operate the US Wind facility, noting that many vessels that will be available to US Wind's 3rd party contractor are currently under construction or are in the design stages by vessel suppliers. Note that the sample vessel specifications are only provided for the purposes of the engine sizes; the vessel

[2] https://www.epa.gov/system/files/documents/2024-07/atlantic-shores-ocs-fact-sheet-july-11-2024_0.pdf

specifications were not utilized to prepare specific engine load factors and emission factors.

Tugboats are assumed to transport many of the Project components offshore, as described above. Thousands of tugboats are available throughout the world. As such, US Wind utilized a representative tugboat that has propulsion engine sizes greater than 90% of the available tugboats worldwide[3] based on review of table "U.S. Sea-Going Tug Fleet Over 100GRT By BHP According to Lloyd's Register as of May 2023." This methodology is consistent with the assumptions used for the Vineyard Wind and New England Wind air permits issued by USEPA. Additionally, US Wind assessed the tugboat fleets for two of the major tug boat suppliers to the Port of Baltimore[4] and Philadelphia, considered to be likely suppliers for the Project. The propulsion engine sizes in both fleets do not exceed the representative tugboat assumed for modeling purposes. One tugboat in the port of Philadelphia has nearly identical engine sizes to the size utilized as representative by US Wind's construction management team.

b) This information is needed for the assumptions and procedures that are listed when using the various tables that are available in the 2022 USEPA Port Emissions Inventory Guidance. For example, this information is needed to appropriately select loading factors for the vessels.

Response: The US Wind construction management team provided the number of round trips to and from port and anticipated transit speeds as representative of expected construction and O&M operations.

Load Factors
As discussed in the US Wind sample Potential to Emit emission calculations using the 2022 Ports Emissions Inventory Guidance, US Wind utilized the following methodology when developing load factors:

1. USEPA Port Emissions 2022 Guidance Table 4.4 for most auxiliary engine load factors and some propulsion engines during transit.
2. When the USEPA Ports Emissions Inventory Guidance did not provide default load factors during transit, the propulsion engine load factors were based on the 2014 USEPA Commercial Marine Vessels – 2014 EPA Estimates – Section 2.2 – Engine Operating Loads[5] and 2009 USEPA Current Methodologies in Preparing Mobile

[3] http://www.marcon.com/library/market_reports/2023/TG_May/Tug_Boat_05-23_MR.pdf

[4] https://www.mcallistertowing.com/our-fleet
https://www.morantug.com/fleet/

[5] https://gaftp.epa.gov/air/nei/2014/doc/2014v2_supportingdata/rail_cmv/CMVv2_2EPAMethodsReference_20180209.pdf

Source Port-Related Emission Inventories[6]. As discussed in these guidance documents, vessels in transit are assumed to operate at cruise speed, which is defined as approximately 94% of maximum speed per USEPA. Based on the Propeller Law described in 2009 USEPA Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories, for the main (propulsion) engines of vessels operating at 94% of maximum speed, the load factor is 0.83.

3. When the USEPA Ports Guidance did not provide default load factors during maneuvering, the engine load factors were based on the Section 2.2 of 2014 National Emission Inventory for Commercial Marine Vessel Activity[7] and 2022 USEPA Port Emission Inventory Guidance – Table 3.11. Note that Table 3.11 provides a load factor that is less than or equal to 0.2 for propulsion engine operation during maneuvering. As such, US Wind selected 0.2 as the maximum value from the USEPA Ports Emissions Inventory Guidance.

In general, the 2022 USEPA Port Emissions Inventory Guidance is predicated on the assumption that the transit vessel speeds and maximum potential vessel speeds will be known to calculate the load factors using the Propeller Law. Vessel speeds are highly variable during transit and depend on ambient weather conditions and other marine safety considerations, therefore, it is not possible to assume a single combination of vessel speed during transit. Maximum potential vessel speed is predicated on the selection of a vessel by the eventual vessel contractor and the specifications of that particular vessel. As such, US Wind determined that using a maximum transit speed of 94%[8] of the maximum potential vessel speed for the vessel selected is an underlying conservative assumption for calculation of load factors during vessel transit.

US Wind is providing Attachment B to summarize and detail the selected vessel categories, emission factors, and load factors from the 2022 Ports Emission Inventory Guidance that are applicable to each vessel type. For load factors, US Wind selected vessel types provided in Table 4.4 of the 2022 Port Emissions Inventory Guidance that most closely represent the US Wind vessel fleet. For example, crew transfer vessels and other small support craft such as marine mammal observation vessels have similar operational and vessel characteristics (i.e., engine sizes) to the USEPA's ship type for crew and supply vessels. Other vessels that have similar characteristics for the US Wind fleet to the 2022 Ports Emission Inventory Guidance fleet categories are tugboats. Many of the larger vessels (i.e., WTG installation jack-up vessels, cable laying vessels) that are utilized for the offshore wind industry have not been incorporated into Table 4.4 of the 2022 Ports Emission Inventory Guidance. Thus, these vessels utilized default conservative assumptions as described in items 2 and 3 of the load factor methodology described previously.

[6] https://www.epa.gov/sites/default/files/2016-06/documents/2009-port-inventory-guidance.pdf.
[7] https://gaftp.epa.gov/air/nei/2014/doc/2014v2_supportingdata/rail_cmv/CMVv2_2EPAMethodsReference_20180209.pdf

[8] Table 2-5 of https://www.epa.gov/sites/default/files/2016-06/documents/2009-port-inventory-guidance.pdf.

Emissions Factors
US Wind utilized the default emission factors from the 2022 Ports Emission Inventory Guidance, providing a conservative estimate. Most of the marine vessels used for Project construction and O&M are assumed to be equipped with either Category 1 or Category 2 engines and will qualify as harbor craft. Some of the larger installation vessels will be equipped with Category 3 propulsion engines based on the larger engines that meet the Category 3 displacement criteria.

The USEPA established a tier structure for emission standards based on the age of the engine and cylinder displacement. The 2022 Ports Emission Inventory Guidance presents emission factors for Tier 1 through Tier 4 (Category 1 and Category 2 engines), and Tier 1 through Tier 3 (Category 3 engines). For the purpose of selecting default emission factors, which might involve the use of vessels with older engines, the highest default values provided for each engine category were used to provide a conservative estimate.

The engine categories were assigned based on a review of sample vessel engines and the USEPA criteria. In general, most propulsion engines and the larger auxiliary engines are Category 2 engines. The propulsion engines and auxiliary engines used on relatively small vessels, such as crew transfer vessels, are Category 1 engines. The jack-up vessels will have relatively large propulsion systems that were assigned as Category 3 engines.

Sample Vessel Categorization

<u>WTG Installation Vessel</u>

Vessel Type: Jack-up Vessel
Emission Factor (Propulsion Engines): USEPA Default Cat 3 (pre 1999)
Emission Factor (Auxiliary Engines): USEPA Default Cat 2 (Tier 1/2)
Load Factor (Propulsion Engines - Propulsion): Default Main Propulsion (C1/C2/C3)
Load Factor (Propulsion Engines - Maneuvering): Barge (2022 Ports Guidance Table 4.4)
Load Factor (Auxiliary Engines): Default Auxiliary Engine (C1/C2)

A WTG installation vessel is classified as a jack-up vessel per the design and capabilitites of WTG installation vessels. The propulsion engines for jack-up vessels are large, with displacements greater than 30 liters per cylinder. Thus, they are categorized by USEPA as Category 3 engines. The auxiliary engines will likely have a displacement between 7 and 30 liters per cylinder as they are typically smaller than the propulsion engines. Thus, they are classified as USEPA Category 2 engines.

The propulsion engine load factors during transit are the default maximum load factors assuming maximum transit speeds at all times. During the non-transit time period, the vessel will be jacked up and the propulsion system will be located out of the ocean. Thus, the propulsion engines are shutdown during this time period and as such, were assigned

the floating barge load factor from the 2022 Ports Emission Inventory Guidance. The auxiliary engines were assigned the default load factor from Table 3.11 of the 2022 Ports Emission Inventory Guidance. In summary, US Wind assigned default load factors and emission factors based on the 2022 USEPA Ports Emission Inventory Guidance.

WTG Transport Tugboat

Vessel Type: Tugboat
Emission Factor (Propulsion Engines): USEPA Default Cat 2 (Tier 1/2)
Emission Factor (Auxiliary Engines): USEPA Default Cat 1 (Tier 1/2)
Load Factor (Propulsion Engines - Propulsion): Tugboat (2022 Ports Guidance Table 4.4)
Load Factor (Propulsion Engines - Maneuvering): Default Main Propulsion (C1/C2/C3)
Load Factor (Auxiliary Engines): Tugboat (2022 Ports Guidance Table 4.4)

A WTG transport tugboat is classified as a tugboat vessel. The propulsion engines for tugboats vessels will likely have displacements between 7 and 30 liters per cylinder. Thus, they are classified as USEPA Category 2 engines. The auxiliary engines, which are smaller than the propulsion engines will likely have Category 1 engines, with displacements less than 7 liters per cylinder.

The propulsion engine load factors during transit and the auxiliary engine load factors are the default load factors for tugboats from the 2022 Ports Emission Inventory Guidance. The propulsion engines during vessel maneuvering were assigned the default load factor from Table 3.11 of the 2022 Ports Emission Inventory Guidance. In summary, US Wind assigned default load factors and emission factors based on the 2022 Ports Emission Inventory Guidance.

2) **Concerns on stated number of vessels to be used and projected travel distances**.

a) How the Company determined the total number of the vessels that are needed?

Response: See response to 1.a.

b) How the Company determined the total number of operating hours for each vessel?

Response: The number of annual operating hours is calculated as the sum of the time period the vessel is in transit and maneuvering modes. The time during transit is calculated with the following formula:

= (Round Trip Distance x # of Days of Operation) / Vessel Speed in Transit within 25 NM of OCS Sources

The time during maneuvering is calculated as the product of the number of days a vessel will be operated for a certain construction activity multiplied by the maximum number of anticipated daily hours a vessel could be supporting the construction or O&M activity.

The US Wind construction management team provided the assumed maximum number of daily operating hours in the WDA in addition to transit speeds that are anticipated for each construction and O&M activity. The vast majority of vessels are assumed to be operating 24 hours per day, as captured in "daily operating hours." Smaller vessels, such as the crew transfer vessels, are assumed to be traveling back and forth to a port each work day, so therefore during the construction period such small vessels are assumed to operate up to 12 hours per day of operation. For crew transfer vessels operating during O&M, US Wind assumed up to the maximum of 24 hours per day.

For the environmental and marine mammal observation vessels, US Wind assumed they would operate up to 6 hours per day during construction. These vessels will be active during the hammering operations for typically 3 hours. However, for the purposes of the OCS air permit application, US Wind assumed up to 6 hours per day to account for any potential delays in the expected construction activity.

The vessel transit speeds were primarily based on selection of representative vessels from review of OCS air permits issued by the USEPA at the time and input from the US Wind construction management team. For the larger vessels, US Wind assumed a transit speed that would result in conservative air emissions. As discussed previously, the 2022 Port Emissions Inventory Guidance is predicated on the assumption that the transit vessel speeds and maximum potential vessel speeds will be known to calculate the load factors using the Propeller Law. Vessel speeds are highly variable during transit and depend on ambient weather conditions and other marine safety considerations, therefore, it is not possible to assume a single combination of vessel speed during transit. Maximum potential vessel speed is predicated on the selection of a vessel by the eventual vessel contractor and the specifications of that particular vessel. As such, US Wind determined that using a maximum transit speed of 94%[9] of the maximum potential vessel speed for the vessel [class] selected is an underlying conservative assumption for calculation of load factors during vessel transit.

For example, if a vessel has a maximum speed of 15 knots, application of the Propeller Law with an assumption of a transit speed of 14 knots versus 7 knots, yields an engine load factor that is 8 times higher. While the engine may be operated in transit mode for twice as much time if moving at half the speed (7 knots versus 14 knots), the potential to emit would be four times higher because the Propeller Law results in a load factor that is 8 times higher for the faster vessel. Thus, the assumption that the larger vessels operate at their maximum transit speeds results in conservative estimates of the potential to emit.

[9] Table 2-5 of https://www.epa.gov/sites/default/files/2016-06/documents/2009-port-inventory-guidance.pdf.

c) What were the assumptions taken to determine these factors? There is a need to better understand this particular methodology, and the variables that goes into the approach taken. What tools does the Company used to reach these conclusions? Would like clarification regarding the total hours, total distance traveled by the vessels per turbine construction and what parameters are they considering for calculating those values.

Response: The US Wind construction management team collaborated to prepare the assumptions regarding the number and types of vessels and the expected number of transits and operating hours. The team members paired their knowledge of the vessel requirements to construct each component of the WTGs and OSSs with the understanding of the project schedule, maximum design envelope, and environmental conditions in both the air and sea. For example, the US Wind construction team determined that it would take an average of 3 to 3.5 days to install and commission the component parts of a WTG and with 114 WTGs to install for the fully built-out project, an underlying assumption of 400 days of vessel operation for WTG installation.

d) How and what tools do the Company used to determine all the construction and operations parameters?

Response: The construction and operation parameters are not based on a standardized offshore wind construction management tool or program as US Wind is not aware that these tools exist. Each OCS wind project has a unique set of contractual schedules, engineering, environmental and safety requirements so a uniform set of assumptions between OCS wind projects is not appropriate.

US Wind utilized a pragmatic and practicable approach amongst a team of civil engineers and marine infrastructure construction managers to develop the construction and operational vessel parameters, in addition to regular engagement with the vessel and contractor marketplace.

Attachment A

Sample Vessel Specifications

Attachment B

Vessel Categories for Emission and Load Factors

SPECIFICATIONS:

JACK-UP INSTALLATION VESSEL BOLD TERN - NEW CRANE

Classification and Rules

Vessel type: Gusto MSC NG8000C-HPE
Class: DNV + 1A1, SELF-ELEVATING CRANE UNIT WIND TURBINE INSTALLATION UNIT, CLEAN DESIGN NAUT CRANE-OFFSHORE (OSV(A))
OPP-F DYNPOS-AUTR EO HELDK
Delivery: 2012/2013
Yard: Lamprell PLC, Dubai
Flag: Republic of Malta

Principal Dimensions

Hull length o.a. [m]: 132
Hull breadth mid [m]: 45
Hull depth [m]: 9
Min. draft (light) [m]: 4.25 (+0,8 to spud can tip)
Draft at max. variable payload [m]: 5.8 at elevated 22,700t (+0,8 to spud can tip)

Cargo Capacity

Max variable load (t): 9000
Deck area [m^2]: 3400
Uniform deck loading [t/m^2]: 5-10
WTG capacity (typical): 4 x 9.5 MW, 3 x 12 MW

Propulsion, Manoeuvring and Positioning

Aft propulsion: 3 x 3800 kW Voith Schneider propellers
Fwd manoeuvring: 3 x 1750 kW Wärtsila Lips tunnel thrusters
Max speed [knots]: 12
Positioning: DP2

Operational Limitations

All year survival water depth range[1] [m]: 7.5 - 55
Operation water depth range[1] [m]: 5.5 - 60
Transit fully loaded: up to wave 3.5m Hs
Jacking: up to wave 1.8m Hs

Boskalis

EQUIPMENT SHEET

ROCKPIPER
SUBSEA ROCK INSTALLATION VESSEL

CONSTRUCTION / CLASSIFICATION

Vessel built by	Keppel Singmarine Pte Ltd
Year of construction	2011
Classification	Bureau Veritas
Port of registry	Limassol, Cyprus

FEATURES

Rock installation capacity abt. 2,000 t/h.

Installation depth of 700 m through fallpipe with inner diameter of abt. 700 mm. Optional: Depth range can be extended to 1,500 m.

Diesel electric propulsion system comprising three main diesel generator sets and one auxiliary diesel generator set.

Accommodation on fore ship, complement 60 persons.

Rock installation system and moonpool in mid ship.

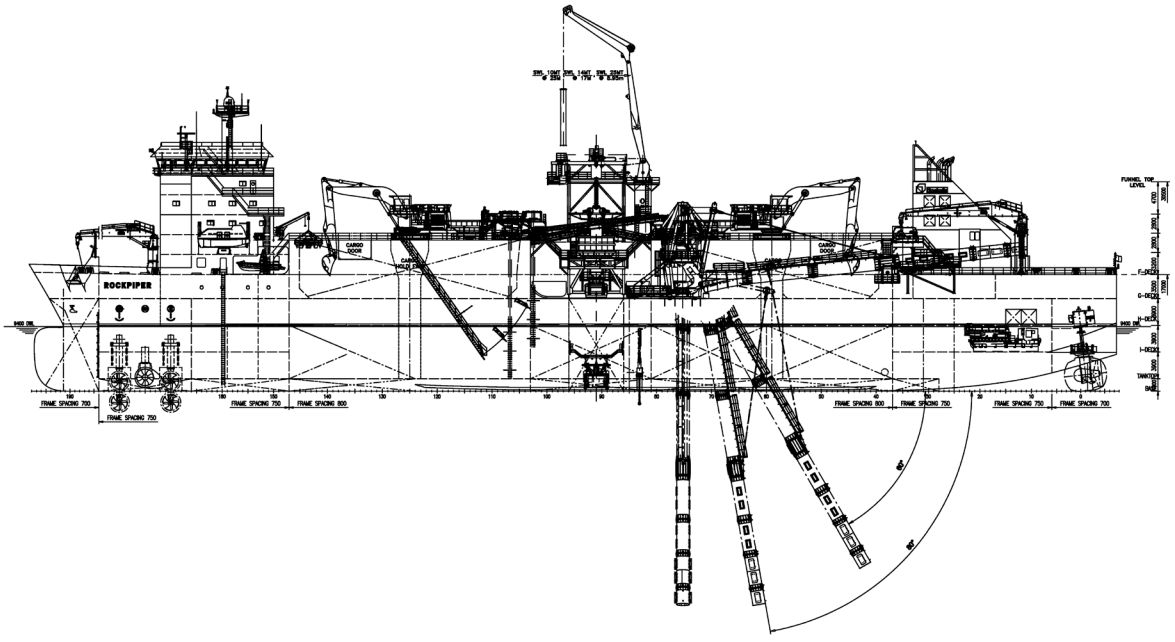
Innovative fall pipe ROV with integrated various survey systems.

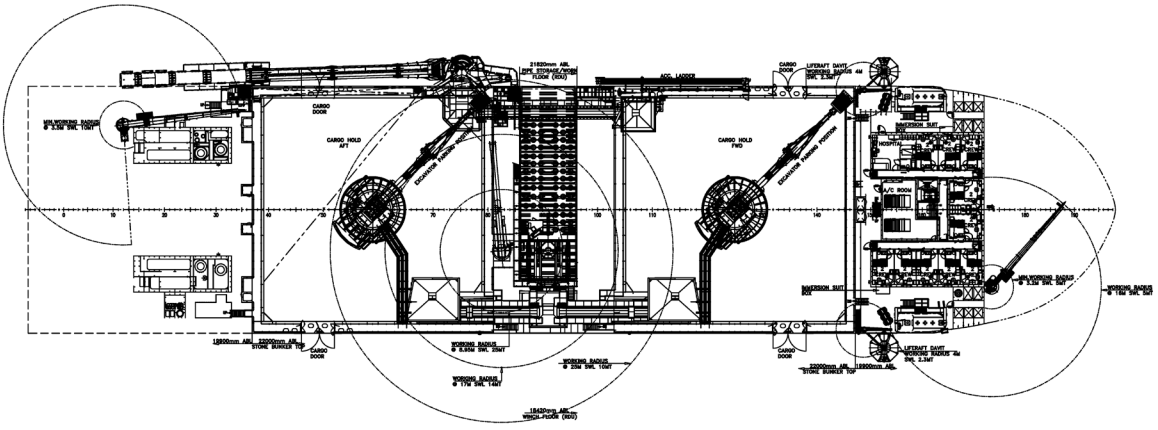
Optional:

- Deflector, mountable on fallpipe ROV
- Jet Flow Tool, mountable on fallpipe ROV
- Solid Ballast Unit, mountable on aft deck
- FPROV leveling tool, mountable on the fallpipe ROV
- Inclined fallpipe (IFP), mountable on the port side of the vessel (outside of the hull)
- Fallpipe with inner diameter 1,000 mm
- Aft belt / side chute

MAIN DATA

Dynamic Positioning system	DP-2
Positioning system	DGPS, HIPAP, Fanbeam
Length overall	158.60 m
Breadth	36.00 m
Moulded depth	13.50 m
Design draught	9.40 m
Cargo carrying capacity	24,000 t
Cargo hold capacity	15,500 m^3
Sailing speed loaded	12.0 kn
Total installed power	15,192 kW (3 x 4,500 kW + 1 x 1,200 kW + 1 x 492 kW)
Main engines	3 x 4,500 kW (3 x main generator sets)
Main propellers	2 x 4,500 kW (2 x azimuth thrusters)
Azimuth thrusters	2 x 1,500 kW (2 x retractable thrusters)
Bow thruster	1 x 1,000 kW





TOP VIEW - DECK LEVEL

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The Netherlands
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offshore.energy@boskalis.com

www.boskalis.com/offshore

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Athena

Trenching Support Vessel

Features

- DP 3
- 275T Offshore Crane
- 170T A-Frame
- SAT & Surface Diving Systems
- SPS Certified
- 1,500T Cable Carousel (optional)

Athena

The **Athena** is a MarinTeknikk® MT6024 design DP-3 Trenching Support Vessel built for worldwide subsea operations, specially outfitted for supporting a variety of subsea trenching vehicles. She is also well equipped for cable laying and repairs as well as for diving, ROV, Survey and IMR work.

She features a unique twin-deck arrangement, a 150T AHC A&R winch combined with a stern-mounted 170T A-Frame with a stabilization scissor frame, a 275T offshore & subsea crane, a set of Anchor Handling and Towing winches, an integrated Saturated Diving System, a Surface Diving System and a Helideck.

The vessel has been built in Singapore in 2013, to the requirements of DnV Comfort Class (V-3) and is certified under the Special Purpose Ships Safety Code (SPS Code 2008) for up to 100 persons onboard.

She holds an extensive track record, on a variety of diverse subsea construction projects and she is well known in the market as a reliable and robust unit, capable of handling harsh environmental conditions.

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Athena

Trenching Support Vessel

General information

IMO Number	9624988
Classification	ABS A1, Offshore Support Vessel (SPS), AMS, ACCU, DPS-3, BWT, CRC(I), ENVIRO, HELIDK, HAB(WB)
Flag	Greece
Built	Singapore, 2013
Length Overall	111.20 m
Breadth Moulded	25.00 m
Depth (Main Deck)	10.20 m
Draught (Max.)	7.70 m
Gross Tonnage	11,197
Deadweight	5,200 T

Power & Propulsion

Main Generators	2 x Wärtsilä 9L26, each 2,810 ekW 4 x Wärtsilä 6L26, each 1,870 ekW
Emergency Gen.	Cummins KTA38-D, 910 eKW
Main Propulsion	2 x Wärtsilä CPPs, each 3,000 kW
Bow Thrusters	2 x Tunnel, each 1,500kW 1 x Tunnel 1,200 kW
Stern Thrusters	2 x Tunnel, each 1,200kW

Performance

Bollard Pull	110 MT
Normal Transit Speed	abt. 11 kn
Cons. on Normal Transit Speed	abt. 25 T/D
Economic Speed	abt. 9.0 kn
Cons. on Economic Speed	abt. 20 T/D
Port Consumption	abt. 3 T/D

D.P. System

Maker	Kongsberg Maritime
Type	KPos 21 & 11 with C-Joy (DP-3)
ERN Number	99,99,96,63
Sensors	3 x Gyro Compass 3 x MRU 5 3 x Wind Sensors
Position Reference Units	2 x DGPS with Sat. Corrections 1 x Kongsberg HiPAP-501 2 x BANDAK LTWS 1 x CySCAN

Survey Systems

EIVA NaviSuite	1 x NaviPac, NaviScan online 1 x NaviModel, NaviEdit 5 x NaviPac Remote Stations
Time	1 x ATTU (Accurate Time Tagging) 1 x PPS Distributor
Network	2 x Moxa Nports Fiber Optics, Lan & Serial connections through all Stations

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Athena

Trenching Support Vessel

Deck Facilities

Upper Deck Area	abt. 810 m^2 – strength 10t/m^2
Main Deck Area	abt. 440 m^2 – strength 5t/m^2
Anchor Handling Area	abt. 140 m^2 – strength 15t/m^2
Wood Covered	Upper Deck
Stern Roller	3m Diameter
Main Winch	Double Drum, 200T Pull Force
A&R Winch	AHC, 150T Pull Force
Tugger Winches	3 x 10T, 1 x 20T, 1 x 5T
CCTV System	Full coverage of deck areas with surveillance & recording stations

Tank Capacities

Fuel (MGO)	abt. 1,350 MT
Fresh Water	abt. 1,050 MT (Production 55 T/D)
Ballast Water	abt. 5,900 MT

Lifting Appliances

Offshore Crane	TTS, Knuckle-Boom SWL 275MT @ 8.5m (4-fall) Whip Hoist 20MT @40m Man Riding.
A-Frame	170T SWL, complete with stabilizing scissor frame.
Auxiliary Cranes	2 x Melcal Folding Boom, each 2T @ 15m (winch) or 8T @ 4.9m (hook)

Personnel Transfer Systems

Boat Landing	Removable type
Helideck	22.2m Diameter

ROVs Installed

Number	1
Owner / Operator	Helix Robotic Solutions
Position	Port side, on deck
Launching method	A-Frame, over side
Type / Class	Work Class
Maker / Model	Triton XLX
Power	220 HP
Depth Rating	3,000m
Special Tooling	TBA

Diving Systems

SAT Diving Spread	12 – person System 3 x Living Chambers 1 x 3-person diving bell
Air Diving Spread	1 x Air diving chamber 2 x Independent LARS

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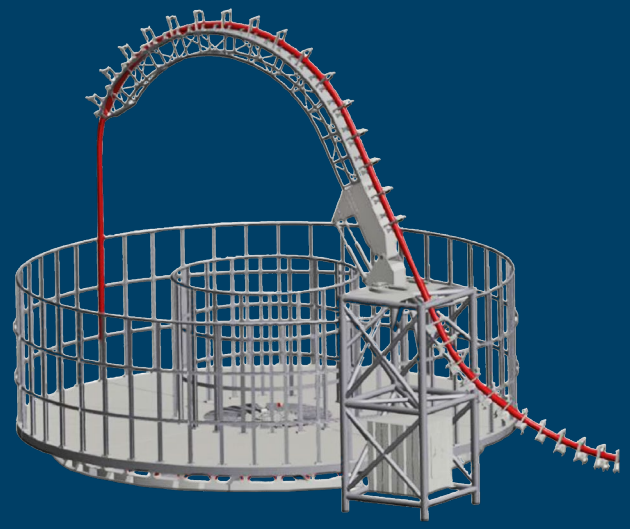
Athena

Trenching Support Vessel

Cable Handling (Option)

Turntable	1 x 1,500T (16 m OD / min. 6 m ID)
Cable Tensioners	1 x 10T LCE*
Cable Chutes	2 x 3 m Radius*
Cableways Radius	5 m all over, except Chutes

** Equipment can be customized depending on the needs of each specific project*



Accommodation

Total POB	100
Cabins	4 x Suites 30 x Single Cabins 33 x Double Cabins
Mess Room (60 Seats)	
Coffee Corner	
3 x Saloons incl. one dedicated for Client use	
4 x Offices	
2 x Conference Rooms	
Hospital	
Gymnasium	
Changing / Washing Room (separate for male / female)	
Duty Mess / Smokers Room	
Internet Café	
Helicopter briefing room / lobby	

Communications

Satellite Telephone
2 x V-Sat System w/ Land Lines
Satellite TV System
GMDSS Plant as required for A3 Area

Life Saving Arrangements

Life Boats	2 x 68 Persons (1 each side) 1 x 22 Person Hyperbaric
Life Rafts	4 x 25 Persons
Other LSA	As required by the SOLAS Convention

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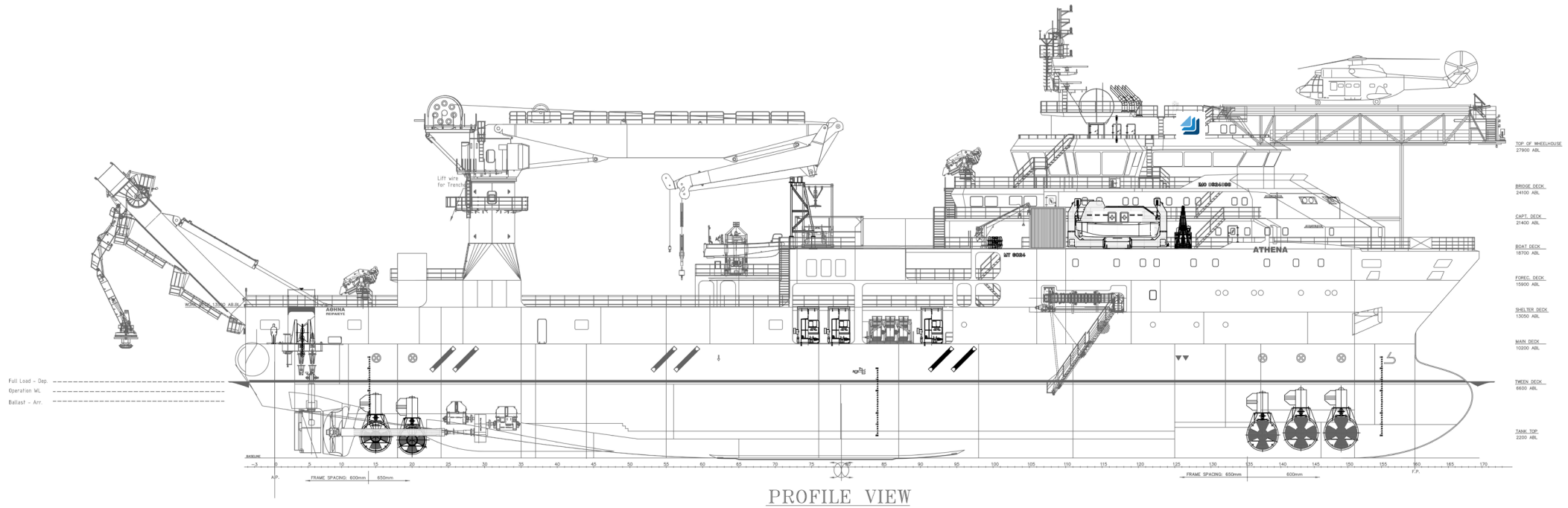
Athena

Trenching Support Vessel



PROFILE VIEW

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Athena

Trenching Support Vessel

Name “Athena”

The Athena (ə-thē'nə / in Greek: Ἀθηνᾶ) is named after the ancient Greek Goddess of the same name, who was associated with wisdom, handicraft and warfare. Athena was regarded as the patron and protectress of various cities across Greece, particularly the city of Athens, the current capital of the Hellenic Republic.

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Contact Information

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Membership - Accreditations

IMCA Contractor Member
International Marine Contractors Association www.imca-int.com
ISO 9001 ISO 14001 OHSAS 18001 BUREAU VERITAS Certification
BIMCO
HELMEPA
Achilles

Disclaimer

Wind Installation Vessel (WIV)

Maersk WIV

Maersk Supply Service has designed and commissioned a first-of-its-kind Wind Installation Vessel (WIV) that will make the installation of bottom-fixed offshore wind turbines up to 30% faster than the conventional jack-up method.
Developed inhouse, this innovative new methodology will see the WIV stationed permanently at a windfarm to carry out successive installations, while tugs and barges ferry the turbine components out to the installation site. These will be delivered to the WIV using a patented load transfer system that will enable safe transfer of cargo.
The key to efficiency lies in fact that the Wind Installation Vessel stays on-site for assembly, while only the tugs and barges shuttle back and forth with the turbine components. There are four steps to the new methodology: (1) Barge docks at our new on-location Wind Installation Vessel; (2) Locking system engages to stabilise the barge; (3) Tray with turbine components is elevated off the barge and locking system retracts, releasing the barge; (4) Tower, nacelle and blades are assembled using a standard method.

Key Features:

- Bespoke offshore feeding jack-up: Purpose-built barges designed to fit with the WIV
- Jones Act approved concept
- 180m lifting height above the deck, designed to install 20 MW+ WTGs
- 1900t @35,8m leg encircling crane with a lattice boom
- All main engines Tier III compliant and can be operated on biofuels

MAERSK SUPPLY SERVICE

TECHNICAL SPECIFICATIONS

General

Delivery	2025
Shipbuilder	Seatrium Singapore
Ship design	Seatrium
IMO	9972309
Call sign	02A02
Engine builder	HiMSEN
Flag	Danish
Class	ABS
Class notation	✠A1 SELF ELEVATING UNIT, ✠AMS, ✠ACCU ✠DPS-2, HELIDK, CRC(HC, OC-PL), OHCM, Wind IMR, UWILD, E
Notation	IHM; Comply with DNV : CLEAN DESIGN & COMF V(2) & C(2); Green Passport EU (Recycling); Compliance – Hongkong convention for ship recycling; EU (SRR)

Dimensions

Overall length	145,0 m (without Heli Deck)
Breadth	83,2m
Moulded depth	11,0m (main hull)
Max. Draft	6,5m (hull) / 13,5m (appendage)

Main Engines & Propulsion

Main generators	Diesel electric,6 pcs @ 4.300 KW
Main propulsion	6 pcs Azimuth thrusters – 4.500 kW 2 pcs Tunnel thrusters – 900 kW, DP2
Dynamic positioning	DP2
Max speed	7 knots
Emissions	Imo tier III, LP-SCR

Jacking System 6 Deck

System (NOV)	Rack & Pinion, VFD
Max elev. weight	47.335t (jacking), 80.000 t (holding)
Deck	4.000m2 + 875m2 in cargo frame
Leg length incl. spudcan	118m; max. 87,5m /b hull; 80,0m /b appen.
Spud cans	4 @ 315 m2
Max. Spudcan load	75 t/m2
Cargo Deck	4.000m2
Max. Variable deck load	12.000t
Max. Deck load	7,5 t/m2

Crane

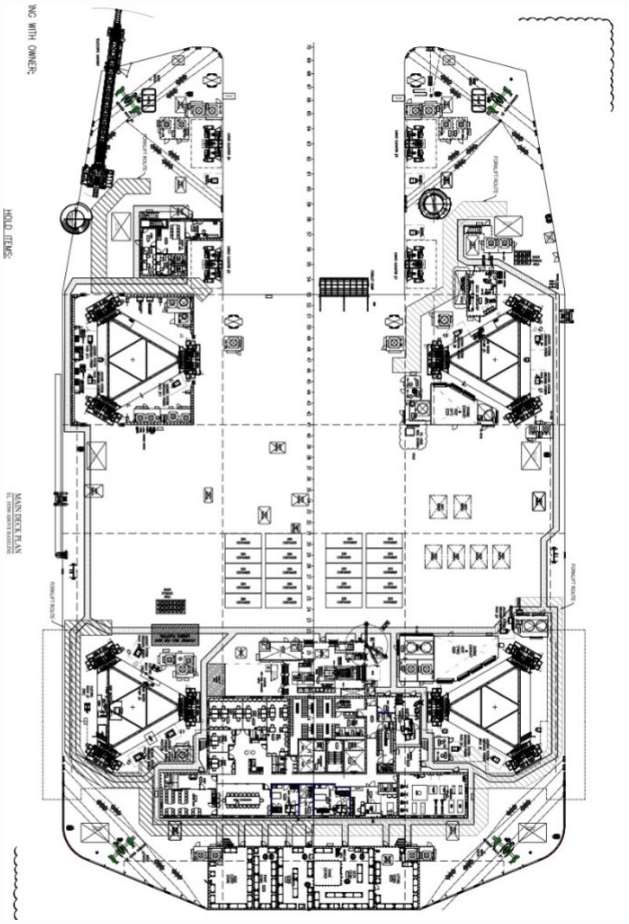
Make	NOV
Capacity	1.900t
Lifting Height above deck	180m
Radius at max. capacity	35,8m
Whip hoist (above deck)	300t@190m
Aux cranes (#3)	2x25mt@40m, 1x15mt@55m

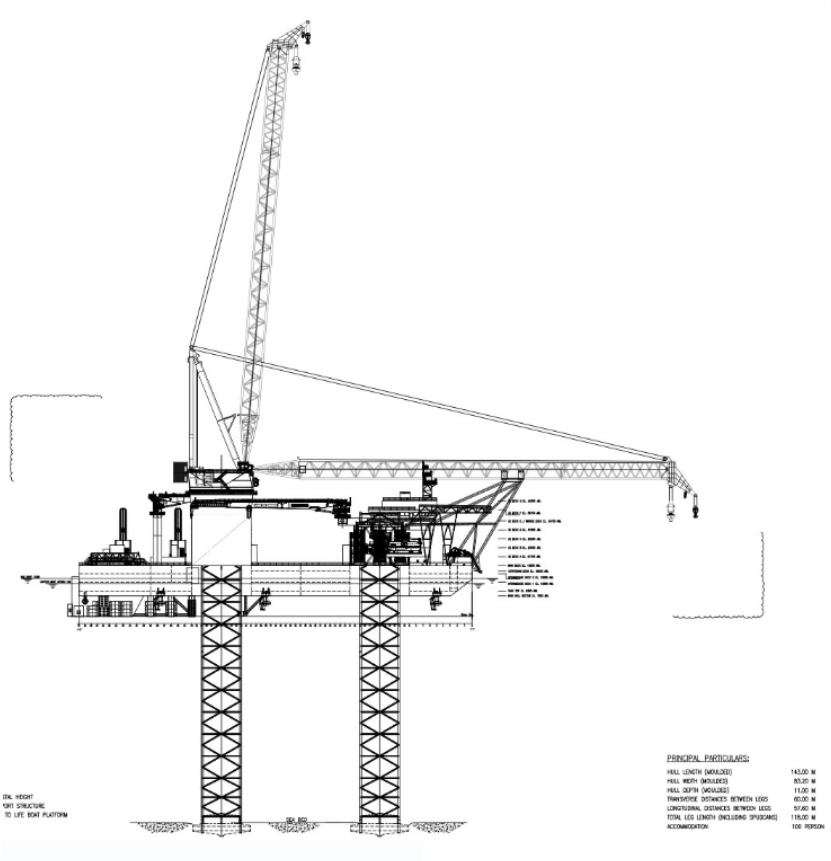
Cargo pushdown/Elevation system

Max. Cargo weight for elevator:	5.000t (3.000t payload)
Push-down of barge:	2m (normal operation)
Total pushdown capacity	9.200t active / 14.400t passive
# jacking pistons	4

Accommodation & Access

POB	100 single cabins
Office	5 client office, 24 pax in 2 conference rooms
Heli Deck	Yes
Walk-to-work	40m gangway (self-deployed)





*All figures and data believed to be correct, but not guaranteed
Update 12/2023

MAERSK SUPPLY SERVICE

BLUE ALFA

IMO number	7921007
MMSI	219189000
Name of the ship	BLUE ALFA
Former names	NAUTICAST (2015) ASSO QUATTORDICI (2009) AUGUSTEA QUATTORDICI (1997) MAERSK DETECTOR (1993) SING FU STAR
Vessel type	AHT
Operating status	Active
Flag	Denmark
Gross tonnage	1887 tons
Deadweight	2160 tons
Breadth	15 m
Engine type	MAK
Engine model	12M-453K
Engine power	6620 KW
Year of build	1981
Builder	DANYARD FREDERIKSHAVN - FREDERIKSHAVN, DENMARK
Class society	REGISTRO ITALIANO NAVALE
Home port	FAABORG
Owner	BLUE STAR LINE - FAABORG, DENMARK
Manager	BLUE STAR LINE - FAABORG, DENMARK

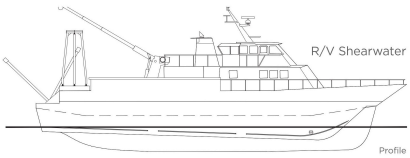
RV SHEARWATER

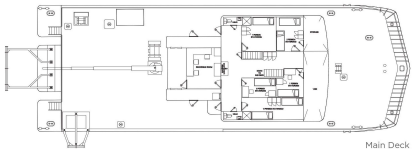
The 110’ RV Shearwater combines a shallow draft, with excellent maneuverability and a wide range of capabilities for a vessel its size, making it a unique multi-purpose, cost effective platform, for marine surveying. The Shearwater was designed to fill a key need for our clients between small coastal, and large offshore, research vessels.

Despite its size and shallow draft, the Shearwater can operate on a 24hr basis, sleeps 22 people, and has a dedicated data acquisition lab.

Its Azimuth Drive propulsion system make it an ideal platform for both slow speed survey line navigation and station keeping for sampling activities.

Rounding out its capabilities, the Shearwater features two equipment moon-pools, a hull mounted multi-beam, a crane, hydraulic stern A-frame capable of splitting into 2 independent T-frames, fixed starboard A-frame, and dedicated equipment winches.





RV Shearwater Vessel Specifications

Vessel Details	
Name	RV Shearwater
Type	Multi-role Survey Vessel
Year of Build	1981
Reconfigured, Refit & Repowered	2024
Dimensions	
Length	110’
Beam	39’
Draft	9’
GRT	198
NRT	175
Aft Deck	1175 sq. ft. with separate stern rescue deck
Accommodations	
Berths	22 including crew
Survey Lab	127 sq. ft.
Processing Office	72 sq. ft.
Propulsion & Machinery	

Survey Capabilities

Hydrography & Geophysics

Multibeam & Single Beam Echosounders

Side Scan Sonars

Sub-bottom Profilers

Boomers

Sparkers

Mini Air Gun

Multi-Channel Streamers

Magnetometers & Gradiometers

Benthic & Oceanographic

CTD & SVPs

Water Sampling Systems

Turbidity Monitoring Systems

Benthic Grabs

Box Corers

Drop Down Cameras

Geotechnical

RV Shearwater Vessel Specifications

Main Engines	2x John Deere Model 6090 Tier 3 AFM
Propulsion	2x Hydraulically driven “Z” drives (raise/lower/tilt) with 360° steering
Bow Thruster	Thrustmaster 100 hp
Generators	2x John Deere Model 6068A Tier 3 AFM/Marathon 135 kw
Capacities	
Desalination System	Up to 900 gallons/day
Fresh Water Storage	5,000 gallons
Fuel Storage	13,800 gallons
Septic	Zero discharge with 2,000 gallon holding tank
Endurance	14 days
Fuel Consumption	
Survey (24 hrs.)	300 gallons/day
Steaming	500-600 gallons/day
Standby at Sea	70-100 gallons/day
Navigation	
Radar	Furuno 1944C/NT
Charting System	Furuno 1935
Auto Pilot	Garmin 5208 GPS with Chart Plot
Echosounders	Furuno FCV 620 – Color in each hull

Survey Capabilities

10 to 30’ Pneumatic & Electric Vibracores

Mini-CPTs

Piston Corers

Drop Corers

Grab Samples

Other

Deployment & Retrieval of Inspections

Class ROVs & Compact AUVs

Dive Platform Capable

Permanently Installed Networked System

Geophysical and Geotechnical Capabilities

Hydrography & Geophysics

Capable of deploying a full suite of sensors for a one pass solution including Multibeam & Single Beam, Side Scan Sonar, Sub bottom profiler -Boomer or Sparker, Multichannel, magnetometer or Transverse gradiometer.

Benthic & Oceanographic

RV Shearwater Vessel Specifications

AIS	Furuno FA 150
Navtex	Furuno NX700
Survey, GPS, Heading, IMU	Applanix POS MV
Acoustic Positioning	Moon Pool mounted USBL
Communication	
VHF	2x Icom IC-M504
SSB	SEA 245 HF/SSB
SART	Sevenstar Electronics S.701
Satellite (Phone/Data)	Intellian v80G VSAT
Equipment Handling	
Equipment Moon Pools	Port & Starboard 3-foot diameter moon pools
Hydraulic Stern A-Frame	2 Ton capacity (can operate as two separate davits)
Fixed Starboard A-Frame	5 Ton capacity
Crane	14 Ton Maximum capacity, 5 Ton w/ single part line, 2 Ton at 40' extension
Geotechnical Winch	5 Ton capacity
Survey Equipment Winch	2500m (11mm diameter capacity)

Geophysical and Geotechnical Capabilities

Capable of CTD & SVPs, water sampling, Turbidity Monitoring, Benthic grabs, box coring and Drop Camera work for video of the benthic habitat.

Geotechnical

Capable of collecting 10 to 30' Pneumatic & Electric Vibracores, Thermal Resistivity Tests, small CPT's, Piston corers and grab samples.

Other

Deployment & Retrieval of Inspections, Proven ROV vessel, Compact AUV's, Surface supplied dive support.

RV MINERVA UNO

NEARSHORE & INSHORE VESSELS

Email Us

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Marine Geophysical S.r.l.
An Alpine Company
Via dell'Arcoveggio n.74
40129 Bologna BO, Italia
Tel: +39 051 082 7407

Multi-Purpose Vessel

Grane R

Grane R is a powerful offshore grab dredger and rock installation vessel, equipped with a large 875E Sennebogen material handler and a Liebherr HS 8300 HDE crane and monitored with RESON PDS2000. Grane R is capable of performing a variety of projects related to trench dredging and backfilling, boulder removal, rock installation, and other offshore activities. Grane R operates with a multitude of grabs.

Grane R is furthermore equipped with an innovative telescopic and motion-compensated fall pipe system, allowing precise and efficient rock installation down to depths of 60m, with possibilities to extend.

Results are immediately documentable with installed state-of-the-art multi-beam survey equipment and USBL system.

Grane R is capable of precisely maintaining a fixed position by means of Dynamic Positioning (DP2) with high accuracy during operations. “No anchors, no spuds”.

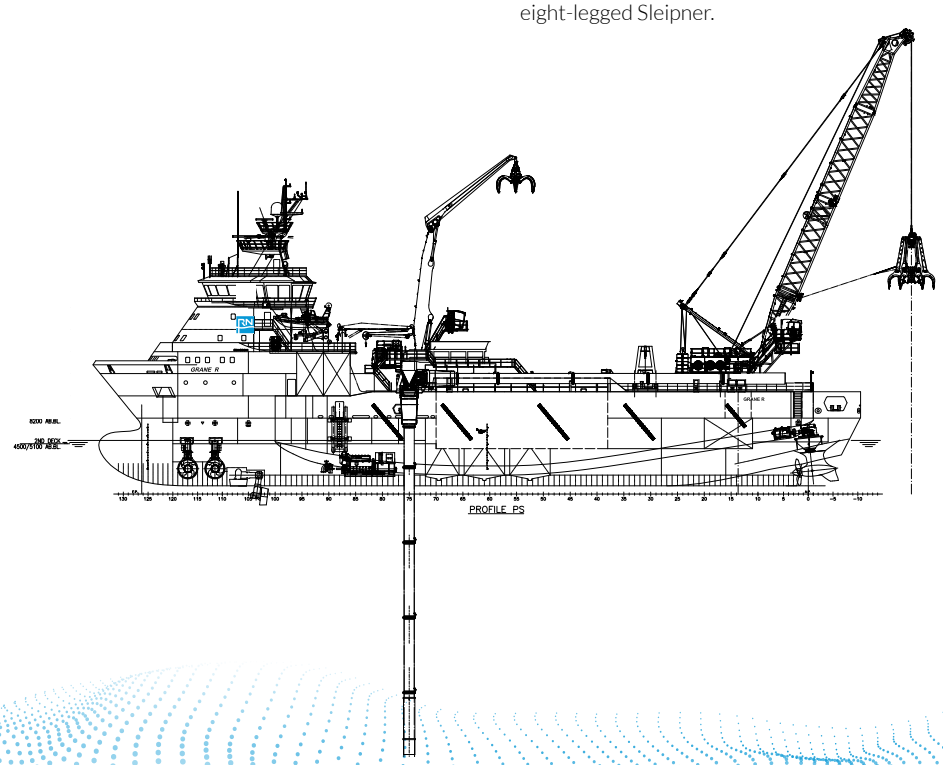
With high propulsion power, four transverse thrusters combined with the DP2 system, and a subsea monitoring system, this vessel is the perfect solution for dredging, offshore, and subsea works.

Specifications

IMO	9448530
Call sign	OYRD2
MMSI	219301000
Gross Tonnage	6,029GT
LOA	93.00m
Breadth	23.20m
Rock capacity	4,900t
Fall pipe size	Ø 1,200mm
Max rock size	400mm
Fall pipe operational depth	8-60m
Accomodation	Crew + 6dbl cabins
Draught loaded	6.80m
Dredging depth	up to 100m
Gen set	4x1,740kW 2x2,500kW (Azipull)
Bow thruster	3x883kW (Azimuth)
Stern thruster	2x3,400kW
Total power installed	6,960kW
Speed	15kn
Flag	Danish
Class	Bureau Veritas
Cranes	HS8300 HD Liebherr crane 875E Sennebogen material handler
Grabs	10m^3 Flatnose Clamshell; 6m^3 Roundnose HD Clamshell; 7m^3 Orange Peel HD; 12m^3 Flatnose Clamshell; 12m^3 Enviromental

Nordic mythology

Grane is an eight-legged horse owned by the hero Sigurd. He is the horse that Sigurd receives, through advice from the god Odin, as Grane is the son of Odin's own horse, the magical eight-legged Sleipner.



Rohde Nielsen | Amager Strandvej 403 | DK-2770 Kastrup
Phone: +45 33 91 25 07 | E-mail: mail@rohde-nielsen.dk | www.rohde-nielsen.com

21 m Catamaran - BAYARD 6

Bayard 6 bieng the sixth of in total 7 Windcarrier Service Vessels.

The Bayard class vessels are multi-purpose and specifically designed and built for supporting offshore wind farms. The vessels are known for their outstanding performance, and in combination with their flexibility and efficiency, they are redefining the role of maritime support in the offshore wind industry.

Specifications

- **Type of vessel:** Service Vessel for Offshore Wind Turbines
- **Design:** Båtservice Mandal Verft AS - Ola Lilloe Olsen
- **Client:** Fred Olsen Windcarrier
- **Building material:** Aluminium Alloy
- **Lenght overall:** 20,90m
- **Breath:** 7m
- **Draft:** 1,5m
- **Speed:** 30 knots
- **Range:** 300 n.m.
- **Fuel tank:** 6000 l
- **Main engine:** 2 x MAN D2842 LE410 V12 749kW
- **Class:** DNV + 1A1 HSLC R2, Windfarm Service 1
- **Yard No:** 100
- **Gear:** Servogear 220 Ration 2,952:1
- **Propulsion:** CP Propeller Servogear Ecoflow
- **Delivered:** 07.01.2013

Place

Båtservice Mandal Verft AS

Gismerøyveien 227, 4515 Mandal

address

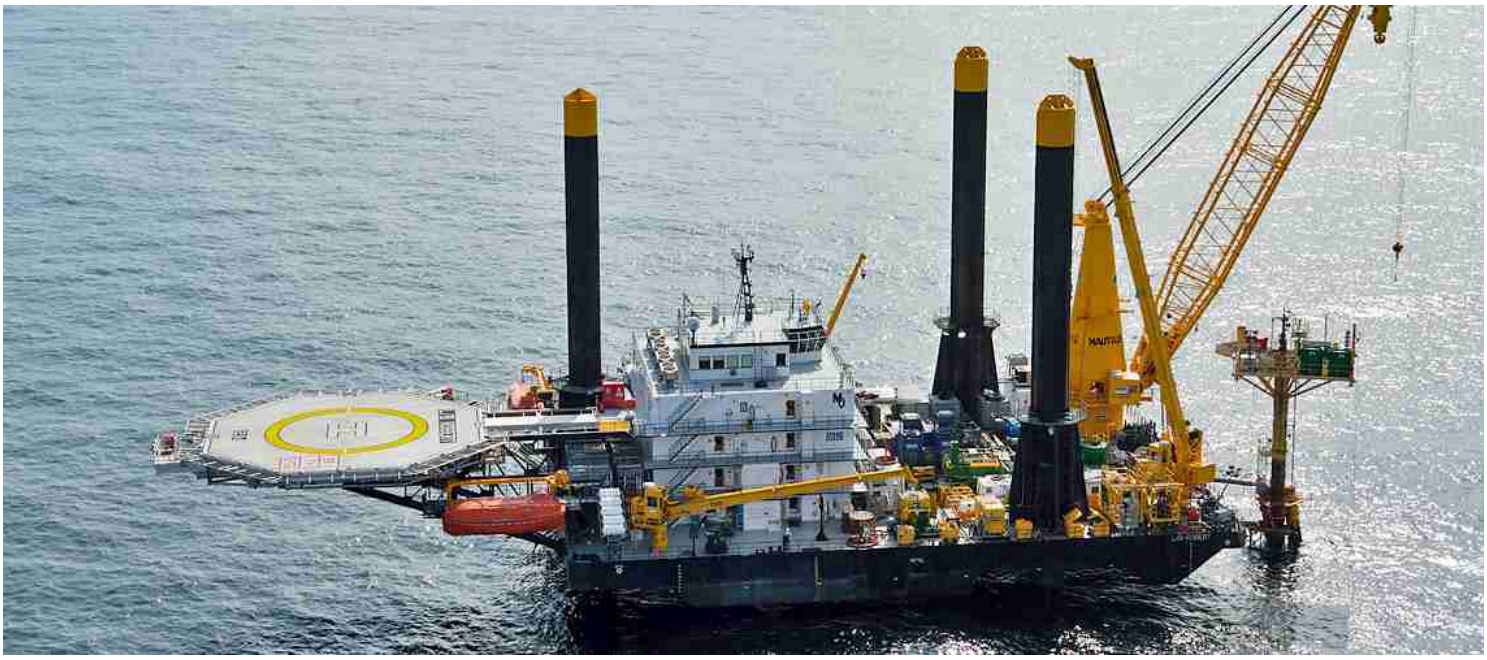
P.O. Box 113
4502 Mandal
Norway

Contact

post@batservice.no
info@batserviceyards.com
Tlf: +47 38 27 13 00

335 Class - L/B Robert

Liftboats



Main Particulars

Length Overall	185.0 ft	56.4 m
Beam Overall	135.0 ft	41.2 m
Depth	15.0 ft	4.6 m
Light Draft	10.00 ft	3.05 m
Tonnage (US) GRT	3,915	
Tonnage (US) NRT	487	
Tonnage (ITC) GRT	3,977	

Tonnage (ITC) NRT	495	

Cargo Deck

Strength	840.0 Lb/ft²	4.1 Mt/m²
Clear Area	15,400.0 ft²	1,430.7 m²

Capacities

Fuel Oil	74,672 USG	283 m³
Potable Water	112,012 USG	424 m³
Zero Discharge	81,328 USG	308 m³

Machinery

Main Generators	2 x Cat 3516C- 2,350 kW@690v
Aux. Generator	2 x Cat C32-1000 kW@690v
Total Installed Power	8985 HP / 6700 kW
Emergency Generator	Cat C6.6 158 kW
Bow Thruster #1	Berg TFTT-211, 400 kW Tunnel
Azimuths	2x Steerprop SP 25 D 2466hp

Crane Capabilities

Max SWL	500 Tons
Crane #1	Port crane: 500tons w/ 140' boom: Heel pin 15'

above deck		
Crane #2	Stbd crane: 60Tons w/ 80'-115' telescoping boom	
Crane #3	Stbd stern crane: 25tons w/70' boom	
Crane #4	Port Amidship crane: 10Tons w/50' boom	

Jacking

Leg Configuration	3	
Jack Maximum Load	667.00 Lt	677.70 Mt
Pad Dimensions	45' (L) and 30 '(W) and 6' (Depth)	
Pad Configuration	Raked -Non Buoyant	
Max Working Depth	275.00 ft	83.82 m
Max Separation	305.00	92.96

Performance

Maximum Speed	6.0 Knots	

Fuel Consumption

Cruising	80.0 USG/hr	7.3 m^3/Day
Elevated	35.00	132.49

Accomodation

Berths	148	

Crew Capacity	16
Passengers	132
Offices	2
Gymnasium	1
Lounges	3

Electronics & Controls

Dynamic Positioning	Class 1
DP System	Kongsberg cPos DP-1,
DP Reference #1	GPS
Gyros	2x Gyro Compass
Radar #1	Equiped
Radar #2	1
AIS	1

Special Equipment

Helideck	Sikorski S-92 capable
Water Maker	(2) 12,000 gal/day (each)
ROV Capabilities	Inspection/Light-Work ROV w/1500’ Tether & Mesotech

Documentation

Class

ABS ✠A1 SEU, Wind IMR, SOLAS, MNS DPS
1 ACCU, Helideck USCG & CAP-437

Class ID	12217423
Flag	USA
USCG	O.S.V. Sub Chapter L
Official Number	1237383
IMO	9649809
Call Sign	WDG2290
MMSI Number	367514120
Build Year	2011

Special Features

-ALL ACCOMMODATION AREAS INCLUDING NAVIGATIONAL BRIDGE ARE PROTECTED BY HYGENSEA HYDROXYL GENERATORS TO ELIMINATE AEROSOLIZED BACTERIA, VIRUS AND SPORES.

Drawings

VIEW HIGH-QUALITY DRAWING

Tug Fleet

Moran maintains a powerful tug fleet, totaling over 400,000 hp with over 45 Tractor Tugs. The fleet list below indicates each tug's horsepower and its home port; drive types are also shown, denoted by the symbols next to each listing. Moran offers the right tug for most any application.

Legend

- TZ Twin Screw Z Drive
- T Twin Screw
- S Single Screw
- M Mortrac®
- ATB Articulated Tug

Portsmouth, New Hampshire

T	Handy- Four	3,400 HP
M	Town Point	3,005 HP
TZ	Z-One	4,000 HP
T	Handy-Three	3,200 HP
M	Harriet Moran	3,005 HP

New York/New Jersey

TZ	James D Moran	6,000 HP
TZ	JRT Moran	6,000 HP
TZ	Jonathan C Moran	6,000 HP
TZ	Kirby Moran	6,000 HP
TZ	Laura K. Moran	5,100 HP
T	Doris Moran	4,610 HP
T	Mary Turecamo	3,900 HP
T	Miriam Moran	3,000 HP
T	Kimberly Turecamo	3,000 HP
T	Margaret Moran	3,000 HP
T	Marie J. Turecamo	2,250 HP
T	James Turecamo	1,700 HP

Articulated Tug Fleet

ATB	Mariya Moran	6,000 HP
ATB	Leigh Ann Moran	6,000 HP
ATB	Barbara Carol Ann Moran	6,000 HP
ATB	Mary Ann Moran	5,100 HP
ATB	Linda Moran	5,100 HP
ATB	Lois Ann L. Moran	5,100 HP
ATB	Pati R. Moran	5,100 HP
ATB	Scott Turecamo	5,100 HP
ATB	Barney Turecamo	5,100 HP

Philadelphia, Pennsylvania

TZ	Annabelle Dorothy Moran	5,100 HP
T	Bart Turecamo	3,000 HP
TZ	Cape Lookout	4,100 HP

Baltimore, Maryland

TZ	Lynne Moran	5,100 HP
TZ	Mark Moran	5,100 HP
TZ	April Moran	5,100 HP
TZ	Paul T.Moran	5,100 HP

Norfolk/Hampton Roads, Virginia

TZ	Jan Moran	6,800 HP
TZ	Maxwell Paul Moran	6,000 HP
TZ	Clayton W Moran	6,000 HP
TZ	James R. Moran	5,100 HP
TZ	Kaye E. Moran	5,100 HP
TZ	Fort Bragg	4,400 HP
TZ	Surrie Moran	4,200 HP
TZ	Patricia Moran	4,200 HP
TZ	Wendy Moran	4,200 HP
TZ	Susan Moran	4,200 HP
TZ	Tracy Moran	4,200 HP
TZ	Kerry Moran	4,200 HP
TZ	Marci Moran	4,200 HP
TZ	Karen Moran	4,200 HP
T	Cape Charles	3,000 HP

Wilmington, North Carolina

T	Cape Henry	3,900 HP
T	Cape Cod	3,900 HP
T	Cape Henlopen	3,000 HP

Charleston, South Carolina

TZ	Elizabeth Turecamo	6,140 HP
TZ	James A. Moran	6,000 HP
TZ	Wyatt Moran	5,100 HP

Savannah, Georgia

TZ	Edward J. Moran	6,500 HP
TZ	Cooper Moran	6,000 HP
TZ	Jack T Moran	6,000 HP
TZ	Dennis Moran	5,100 HP
T	Cape Romain	3,000 HP

Brunswick, Georgia

T	Ann Moran	3,000 HP
TZ	Diane Moran	5,100 HP
TZ	Shiney V. Moran	5,100 HP

Jacksonville & Fernandina, Florida

TZ	Capt. Jimmy T. Moran	5,100 HP
M	Sewells Point	3,005 HP
T	Cathleen E. Moran	3,200 HP

Miami, Florida

TZ	George T Moran	6,000 HP
TZ	Payton Grace Moran	6,000 HP

New Orleans, Louisiana

TZ	Sommer S	5,360 HP
TZ	Lizzy B. Moran	5,100 HP
T	Jean Turecamo	4,300 HP
T	Greg Turecamo	3,900 HP
T	Valentine Moran	3,520 HP
T	Mary Moran	3,000 HP

Port Arthur, Beaumont, & Orange, TX

TZ	Benson George Moran	6,770 HP
TZ	Hayley Moran	6,000 HP
TZ	Eleanor F. Moran	5,100 HP
TZ	Katie T. Moran	5,100 HP
TZ	Andrew Moran	5,100 HP
T	Cape Ann	4,300 HP
T	Joan Turecamo	3,900 HP

San Juan, Puerto Rico

TZ	Gramma Lee T. Moran	3,900 HP
T	Dorothy Moran	3,000 HP

Morehead City, North Carolina

T	Mary M. Coppedge	3,200 HP
S	Fort Macon	1,600 HP

LNG Tugs Under Charter

TZ	Judy Moran	6,770 HP
TZ	Loretta B. Moran	6,000 HP
TZ	Catherine C. Moran	6,000 HP

Barge Fleet

Moran operates an extensive fleet of Petroleum and Dry cargo vessels including ten ATB's. The table below identifies the vessel type, dimensions, capacity and the year built for each barge in our fleet. For additional information please contact Mr. Bruce Richards at chartering@morantug.com

Legend

- PETRO Conventional Tank Barge
- ATB Articulated Tug & Barge
- DRY Dry Cargo Barge

Barge Name	Dimensions	Capacity	Year Built
Tank Vessels			
ATB Georgia	425 x 78 x 34' 6"	118,000 bbls	2005
ATB New Hampshire	425 x 78 x 34' 6"	118,000 bbls	2004
ATB Charleston	425 x 78 x 34' 6"	118,000 bbls	2007
ATB Houston	425 x 78 x 34' 6"	118,000 bbls	2007
ATB Philadelphia	425 x 78 x 34' 6"	118,000 bbls	2008
ATB Texas	494' 7" x 78 x 41.0"	160,815 bbls	2015
ATB Mississippi	494' 7" x 78 x 41'.0"	160,815 bbls	2015
ATB Louisiana	468 x 78 x 34	122,236 bbls	2016
PETRO Connecticut	325 x 60 x 21	41,500 bbls	1994
Bulk Vessels			
ATB Virginia	532' 6" x 85 x 40	27,325 tons	1982
DRY Carolina	420 x 80 x 37	20,530 tons	1965
DRY Montville	418 x 75 x 29	14,700 tons	2006
DRY Portsmouth	418 x 75 x 29	14,700 tons	1996
DRY Somerset	418 x 75 x 29	14,700 tons	1990

Moran Towing Corporation · 50 Locust Avenue, New Canaan, CT 06840-4737 · Tel: (203) 442-2800 · Fax: (203) 442-2857 · www.morantug.com

Updated September 16, 2022

Our Fleet

Fleet: All Vessels

Port: All Ports

View

Maine

	Andrew McAllister	Tractor Tug	6,000 HP
	Jackie F. McAllister	Single Screw	2,000 HP
	McAllister Brothers	Single Screw	2,000 HP
	Nancy McAllister	Twin Screw, Kort Nozzle	4,000 HP
	Roderick McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	1,800 HP

Providence

	Buckley McAllister	Tractor Tug	5,150 HP

	Gaspee	Windfarm Support Vessel	3,060 HP
	Iona McAlister	Twin Screw, Kort Nozzle, Flanking Rudder	4,200 HP
	Matthew McAllister	Tractor Tug	3,000 HP
	Patrick McAllister	Tractor Tug	5,150 HP
	Rainbow	Tractor Tug	5,000 HP
	Reliance	Twin Screw	3,000 HP
	Roger Williams	Windfarm Supply Vessel	3,060 HP
	Shannon McAllister	Twin Screw	3,200 HP

Connecticut

	Gregg McAllister	Tractor Tug	4,000 HP
	Resolute	Twin Screw	3,000 HP
	The Hunter	Crew Boat	1,200 HP

New York

	Alex McAllister	Tractor Tug	4,000 HP
	Atlantic Trader	Barge	N/A
	Bruce A. McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	4,000 HP
	Capt. Brian A. McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP
	Charles D. McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	2,800 HP

	Christine McAllister	Twin Screw, Kort Nozzle	6,140 HP
	David McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	2,200 HP
	Donny F. McAllister	Twin Screw	6,140 HP
	Ellen McAllister	Tractor Tug	4,000 HP
	Grace McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP
	Justine McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	4,000 HP
	Marjorie B. McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	4,000 HP
	Maurania III	Twin Screw	4,000 HP
	McAllister Sisters	Twin Screw, Kort Nozzle, Flanking Rudder	4,000 HP

	Patrice McAllister	Twin Screw, Kort Nozzle	4,000 HP
	Rowan M. McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	4,650 HP
	Washington	Ocean Towing Tractor Tug	5,358 HP

Philadelphia / New Jersey

	Beverly R. McAllister	Tractor Tug	4,400 HP
	McAllister Responder	Twin Screw, Kort Nozzle	2,800 HP
	McCrews	Motor Launch	600 HP
	Point Comfort	Utility Launch	N/A
	Reid McAllister	Tractor Tug	4,000 HP

	Robert E. McAllister	Tractor Tug	4,000 HP
	Suzanne McAllister	Tractor Tug	6,700 HP
	Teresa McAllister	Single Screw, Kort Nozzle, Flanking Rudder	2,200 HP

Baltimore

	Bridget McAllister	Tractor Tug	5,080 HP
	Eric McAllister	Tractor Tug	5,150 HP
	Vicki M. McAllister	Tractor Tug	4,650 HP

Virginia

	AJ McAllister	Tractor Tug	5,150 HP
	Alicia F. McAllister	Tractor Tug	4,400 HP

	Emily Anne McAllister	Tractor Tug	4,650 HP
	Jane McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP
	Rosemary McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP
	Steven McAllister	Tractor Tug	4,000 HP

Wilmington

	Erin McAllister	Tractor Tug	5,100 HP
	GM McAllister	Twin Screw, Kort Nozzle, Flanking Rudder	4,200 HP

Charleston

	Ava M. McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP
	Capt. Jim McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP

	Margaret McAllister	Tractor Tug	4,000 HP
	Moira McAllister	Tractor Tug	5,000 HP

Jacksonville

	Janet M. McAllister	Tractor Tug	4,650 HP
	Jeffrey McAllister	Tractor Tug	5,000 HP
	Kaleen McAllister	Tractor Tug	3,000 HP
	New River	Tractor Tug	4,000 HP
	Stacy McAllister	Tractor Tug	4,000 HP

Port Everglades

	Eileen McAllister Low Emissions Vessel – Class Certified	Tractor Tug	6,770 HP

	Tate McAllister	Tractor Tug	6,000 HP

San Juan, PR

	Beth M. McAllister	Tractor Tug	3,000 HP
	Brooklyn McAllister	Tractor Tug	4,000 HP
	Dorothy McAllister	Tractor Tug	4,000 HP
	Timothy McAllister	Tractor Tug	4,000 HP

New Builds

COMING SOON	Isabel McAllister	Tractor Tug	6,770 HP

Attachment 2
US Wind
Maryland Offshore Wind Project

Vessel Categories - Emission and Load Factors

2022 USEPA Port Emissions Inventory Guidance Basis

Activity	Representative Vessel Type	MDE Form 11 Vessel ID	Engine Operation	Engine Size (kW)	EF Reference (Table A-40 of OCS	2022 USEPA Ports Guidance EF Classification	EF Basis (Engine Category)	LF Reference (Table A-40)	LF Classification (USEPA Ports Inventory - Table 4.4 or Default)
Foundation Installation									
Scour protection installation vessel	Fallpipe vessel	Foundation Installation Fallpipe vessel	Main Engine - In Transit	4500	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	4500	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	492	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1200	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Foundation installation vessel	Heavy lift vessel	Foundation Installtion Heavy Lift Vessel	Main Engine - In Transit	4500	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L07	Main Propulsion (C1/C2/C3)
			Main Engine - Maneuvering	4500	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L15	Heavy Lift Vessel - Maneuvering
			Auxiliary Engines - Transit	4500	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	4500	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Tug for assisting foundation installation 1 -- Offshore	Tug	Foundation Installation Tugs	Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Foundation transport tug 1	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Foundation transport tug 2	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Foundation transport tug 3	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Crew transfer vessel 1	Crew transfer vessel	Foundation Installation CTV	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Noise mitigation vessel	OSV	Foundation Installation OSV Noise Vessels	Main Engine - In Transit	3310	13M	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Main Engine - Maneuvering	3310	13M	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	499	13A	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	499	13A	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
Acoustic monitoring - buoy support vessel	OSV		Main Engine - In Transit	2540	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Main Engine - Maneuvering	2540	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	199	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Marine mammal observation 1	Crew transfer vessel	Foundation Installation Environmental CTVs	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Environmental monitoring	Crew transfer vessel		Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
WTG Installation									
WTG installation jack-up vessel	Jack-up installation vessel	WTG Installation Jack-up vessel	Main Engine - In Transit	3800	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L07	Main Propulsion (C1/C2/C3)
			Main Engine - Maneuvering	3800	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L01	Barge
			Auxiliary Engines - Transit	2880	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	2880	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Tug to transport WTG 1	Tug	WTG Installation Tugs	Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering

Activity	Representative Vessel Type	MDE Form 11 Vessel ID	Engine Operation	Engine Size (kW)	EF Reference (Table A-40 of OCS	2022 USEPA Ports Guidance EF Classification	EF Basis (Engine Category)	LF Reference (Table A-40)	LF Classification (USEPA Ports Inventory - Table 4.4 or Default)
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Tug to transport WTG 2	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Tug to support WTG Installation / maneuvering offshore	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
WTG Commissioning									
Crew transfer vessel 1	Crew transfer vessel	WTG Commissioning CTVs	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Crew transfer vessel 2	Crew transfer vessel		Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Crew transfer vessel 3	Crew transfer vessel		Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
OSS Installation									
OSS installation	Heavy lift vessel	OSS Installation Heavy lift vessel	Main Engine - In Transit	4500	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L07	Main Propulsion (C1/C2/C3)
			Main Engine - Maneuvering	4500	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L15	Heavy Lift Vessel - Maneuvering
			Auxiliary Engines - Transit	4500	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	4500	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Assisting tug for OSS Jacket and topside install	Tug	OSS Installation Tug	Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
OSS Jacket and pilesTransport tug	Tug		Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
OSS Jacket Install Noise Mitigation Vessel	OSV	OSS Installation OSV	Main Engine - In Transit	3310	13M	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Main Engine - Maneuvering	3310	13M	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	499	13A	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	499	13A	Noise Mitigation	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
Acoustic monitoring buoy maint	OSV		Main Engine - In Transit	2500	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L02	Crew and Supply
			Main Engine - Maneuvering	2500	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	199	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
OSS Topside Transport (assume separate from Jacket/piles)	Tug	OSS Installation Topside Tug	Main Engine - In Transit	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L13	Tugboat
			Main Engine - Maneuvering	2540	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
			Auxiliary Engines - Maneuvering	199	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L13	Tugboat
Refueling operations to OSS and resupply to Hotel vessel	OSV	OSS Installation Refueling OSV	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
Crew Hotel Vessel	Jack-up vessel	OSS Installation Hotel Jack-up vessel	Main Engine - In Transit	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L01	Barge
			Auxiliary Engines - Transit	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Inter-Array Cable Installation									
Array cable transport, pre- lay survey, lay and pull	Cable lay vessel	Array cable lay vessel	Main Engine - In Transit	1750	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	1750	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	1750	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1750	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)

Activity	Representative Vessel Type	MDE Form 11 Vessel ID	Engine Operation	Engine Size (kW)	EF Reference (Table A-40 of OCS	2022 USEPA Ports Guidance EF Classification	EF Basis (Engine Category)	LF Reference (Table A-40)	LF Classification (USEPA Ports Inventory - Table 4.4 or Default)
Pre-lay grapnel run	Multipurpose offshore support vessel	Array offshore support vessel	Main Engine - In Transit	1611	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	1611	11M	Tug	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	123	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	123	11A	Tug	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
Crew transfer vessel 1	Crew transfer vessel	Array CTV	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Crew transfer vessel 2	Crew transfer vessel		Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Trenching vessel	Purpose-built offshore construction/ROV/survey vessel	Array trenching vessel	Main Engine - In Transit	3000	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	3000	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	3000	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	3000	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Guard vessel	Crew transfer vessel	Array guard vessel	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L02	Crew and Supply
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Offshore Export Cable Installation									
Offshore export cable pre-lay survey, trenching, cable lay and pull	Cable lay vessel	Export Cable lay vessel	Main Engine - In Transit	1750	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	1750	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	1750	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1750	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Pre-lay grapnel run & pre-lay survey; post lay survey after completion	Multipurpose offshore support vessel	Export Cable Multipurpose OSV	Main Engine - In Transit	1611	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	1611	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	123	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	123	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Trenching vessel	Purpose built offshore construction/survey vessel	Export Cable Trenching Vessel	Main Engine - In Transit	3000	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	3000	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	3000	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	3000	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
HDD pull in lift vessel	Jack-up vessel	Export Cable HDD Lift Vessel	Main Engine - In Transit	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L01	Barge
			Auxiliary Engines - Transit	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Diving support for HDD pull in	Research / Survey	Export Cable HDD pull in Vessel	Main Engine - In Transit	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
HDD pull in support vessel	Multipurpose offshore support vessel	Export Cable pull in support vessel	Main Engine - In Transit	1611	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	1611	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	123	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	123	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Operations Phase									
Scour protection repair	Fallpipe vessel	Operation Scour Protection Repair Vessel	Main Engine - In Transit	4500	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	4500	3M	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	492	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1200	3A	Cable Laying	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Refueling operations to OSS	Crew transfer vessel	Operation Refueling Vessel	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
Main repair vessel	Jack-up vessel	Operation Main Repair Vessel	Main Engine - In Transit	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L07	Main Propulsion (C1/C2/C3)
			Main Engine - Maneuvering	2350	7M	Jackup	EPA default, Cat 3, pre-1999 (propulsion)	L01	Barge
			Auxiliary Engines - Transit	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	1000	7A	Jackup	EPA default, Cat 2, Tier 1/2 (all)	L10	Miscellaneous (C1/C2/C3)
Ad hoc survey workand cable survey/inspections	Multi-role survey vessel	Operation survey vessel	Main Engine - In Transit	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering

Activity	Representative Vessel Type	MDE Form 11 Vessel ID	Engine Operation	Engine Size (kW)	EF Reference (Table A-40 of OCS	2022 USEPA Ports Guidance EF Classification	EF Basis (Engine Category)	LF Reference (Table A-40)	LF Classification (USEPA Ports Inventory - Table 4.4 or Default)
			Auxiliary Engines - Transit	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
Cable burial repair	Multi-role survey vessel		Main Engine - In Transit	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	392	8M	Research / Survey	EPA default, Cat 2, Tier 1/2 (all)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
			Auxiliary Engines - Maneuvering	135	8A	Research / Survey	EPA default, Cat 1, Tier 1/2 (auxiliary)	L10	Miscellaneous (C1/C2/C3)
Daily crew transfer vessel	Crew transfer vessel #1	Operation CTVs	Main Engine - In Transit	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
Daily crew transfer vessel	Crew transfer vessel #2		Main Engine - In Transit	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
Daily crew transfer vessel	Crew transfer vessel #3		Main Engine - In Transit	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
Daily crew transfer vessel	Crew transfer vessel #4		Main Engine - In Transit	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	12M	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	12A	Primary Crew	EPA Tier 4 - Cat 1/Cat 2 (auxiliary)	L02	Crew and Supply
Environmental monitoring Vessel	Sportfisher	Operation Environmental Monitoring Vessel	Main Engine - In Transit	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L08	Main Propulsion Transit
			Main Engine - Maneuvering	749	4M	Secondary Crew	EPA default, Cat 1, Tier 1/2 (propulsion)	L09	Main Propulsion - Manuevering
			Auxiliary Engines - Transit	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply
			Auxiliary Engines - Maneuvering	20	4A	Secondary Crew	EPA default, Cat 1, Tier 1/2 (auxiliary)	L02	Crew and Supply