

**Request for Proposal
Olympic Tug and Barge
Shipyard Work for Tug CE Repower Project**

1.0 Introduction

Olympic Tug and Barge is seeking solicitations for bids to perform the work required to remove the Tier 1 rated main engines on our Tug CE, install, and integrate the new Tier 3 rated main engines. The scope of work is defined in Attachment B of this document.

The Tug CE is a twin screw, 2000 HP wire tow vessel built by Main Iron Works, in Houma, LA. Please see the specification sheet for the vessel in Attachment A. Existing installed main engines are Cummins KTA 38 M1 Tier 1 engines and will be replaced with Cummins QSK 38 M1 Tier 3 engines.

2.0 Shipyard Scope Definition

This solicitation is to provide labor, materials and equipment to complete the following scope of work.

The shipyard must have the ability to haul the Tug CE and perform heavy lifts of the main engines while the vessel is hauled out. The shipyard will modify the center channel cooler piping and split the cooler into two circuits to accommodate an additional cooling circuit on the new Tier 3 engines. The shipyard will install the owner provided engine controls, engine monitoring system and all electrical and mechanical components associated with these items. The shipyard will modify any auxiliary systems as needed to ensure the new engines are installed to manufacturer's recommendations. These systems include but are not limited to fuel oil, lube oil, cooling water, inlet air and exhaust gas systems. The shipyard will also be required to connect main propulsion equipment to the new main engines and will meet or exceed engine manufacturer's alignment and installation specifications. While the vessel is out of the water, the shipyard must be able to complete any paintwork on the hulls coating system. The shipyard will be required to support initial startup of the engines as well as dock trials and sea trials to ensure the proper installation and function of equipment installed by the shipyard.

The bidder must commit be able to perform this work starting on or around the third week of June 2021.

3.0 Compliance

Funding for the project is provided in part by the Environmental Protection Agency and the Washington State Department of Ecology. The funding for this project is part of Grant No. OTGP-2020-PSCAA-00024. The grant will be administered by the Puget Sound Clean Air Agency. A copy of the grant and the contract between Olympic Tug and Barge and the Puget Sound Clean Air Agency is available upon request. Interested parties must review and comply with the following requirements:

3.1 Compliance with Clean Air Agency provisions

Selected bidders must comply with the following provisions of Sub-Recipient Contract between Olympic Tug and Barge and the Puget Sound Clean Air Agency.

Section 3, Task 13 “Comply with Ecology Grant requirements” For the purpose of this request for proposal, the bidder is the contractor:

A. CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY OR VOLUNTARY EXCLUSION:

- 1) The RECIPIENT/CONTRACTOR, by submitting a bid, certifies that it is not suspended, debarred, proposed for debarment, declared ineligible or otherwise excluded from contracting with the federal government, or from receiving contracts paid for with federal funds. If the RECIPIENT/CONTRACTOR is unable to certify to the statements contained in the certification, they must provide an explanation as to why they cannot.*
- 2) The RECIPIENT/CONTRACTOR shall provide immediate written notice to ECOLOGY if at any time the RECIPIENT/CONTRACTOR learns that its certification was erroneous when submitted or had become erroneous by reason of changed circumstances.*
- 3) The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this clause, have the meaning set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact ECOLOGY for assistance in obtaining a copy of those regulations.*
- 4) The RECIPIENT/CONTRACTOR agrees it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under the applicable Code of Federal Regulations, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction.*
- 5) The RECIPIENT/CONTRACTOR further agrees by signing this agreement, that it will include this clause titled “CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY OR VOLUNTARY EXCLUSION” without modification*

in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

- 6) Pursuant to 2 CFR 180.330, the RECIPIENT/CONTRACTOR is responsible for ensuring that any lower tier covered transaction complies with certification of suspension and debarment requirements.*
- 7) RECIPIENT/CONTRACTOR acknowledges that failing to disclose the information required in the Code of Federal Regulations may result in the delay or negation of this funding agreement, or pursuance of legal remedies, including suspension and debarment.*
- 8) RECIPIENT/CONTRACTOR agrees to keep proof in its agreement file, that it, and all lower tier recipients or contractors, are not suspended or debarred, and will make this proof available to ECOLOGY before requests for reimbursements will be approved for payment. RECIPIENT/CONTRACTOR must run a search in <http://www.sam.gov> and print a copy of completed searches to document proof of compliance.*

B. COMPLIANCE WITH ALL LAWS

Contractor agrees to comply fully with all applicable Federal, State and local laws, orders, regulations, and permits related to this Agreement, including but not limited to:

- 1) Contractor agrees to comply with all applicable laws, regulations, and policies of the United States and the State of Washington which affect wages and job safety.
- 2) Contractor agrees to be bound by all federal and state laws, regulations, and policies against discrimination.
- 3) Contractor certifies full compliance with all applicable state industrial insurance requirements.
- 4) Contractor agrees to secure and provide assurance to Ecology that all the necessary approvals and permits required by authorities having jurisdiction over the project are obtained. Contractor must include time in their project timeline for the permit and approval processes.

Ecology shall have the right to immediately terminate for cause this Agreement as provided herein if the Contractor fails to comply with above requirements. If any provision of this Agreement violates any statute or rule of law of the state of Washington, it is considered modified to conform to that statute or rule of law.

C. KICKBACKS

Contractor is prohibited from inducing by any means any person employed or otherwise involved in this Agreement to give up any part of the compensation to which he/she is otherwise entitled to or receive any fee, commission, or gift in return for award of a subcontract hereunder.

E. RECORDS, AUDITS, AND INSPECTIONS

Contractor shall maintain complete program and financial records relating to this Agreement, including any engineering documentation and field inspection reports of all construction work accomplished. All records shall:

- 1) Be kept in a manner which provides an audit trail for all expenditures.
- 2) Be kept in a common file to facilitate audits and inspections.
- 3) Clearly indicate total receipts and expenditures related to this Agreement.
- 4) Be open for audit or inspection by Ecology, or by any duly authorized audit representative of the State of Washington, for a period of at least three (3) years after the final grant payment or loan repayment, or any dispute resolution hereunder.

Contractor shall provide clarification and make necessary adjustments if any audits or inspections identify discrepancies in the records.

Ecology reserves the right to audit, or have a designated third party audit, applicable records to ensure that the state has been properly invoiced. Any remedies and penalties allowed by law to recover monies determined owed will be enforced. Repetitive instances of incorrect invoicing or inadequate records may be considered cause for termination.

All work performed under this Agreement and any property and equipment purchased shall be made available to Ecology and to any authorized state, federal or local representative for inspection at any time during the course of this Agreement and for at least three (3) years following grant or loan termination or dispute resolution hereunder.

Contractor shall provide right of access to Ecology, or any other authorized representative, at all reasonable times, in order to monitor and evaluate performance, compliance, and any other conditions under this Agreement.

F. THIRD PARTY BENEFICIARY Contractor shall ensure that in all subcontracts entered into by the Contractor pursuant to this Agreement, the state of Washington is named as an express third-party beneficiary of such subcontracts with full rights as such.

Section 23. "Nondiscrimination". During the performance of this contract, the Selected Bidder will comply with all federal and state nondiscrimination laws, regulations and policies. In the event of Selected Bidder's noncompliance or refusal to comply with any nondiscrimination law, regulation, or policy, this contract may be rescinded, canceled or terminated in whole or in part, and Selected Bidder may be declared ineligible for further contracts with the Agency. Selected Bidder will, however, be given a reasonable time in which to remedy this noncompliance.

Section 24. "Title VI." During the performance of this contract, Selected Bidder, for itself, its assignees and successors in interest agrees as follows:

A. Compliance with Regulations

Selected Bidder will comply with the Regulations relative to non-discrimination in federally assisted programs of EPA, Title 40, Code of federal Regulations, part 7, as

they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

B. Non-discrimination

The Selected Bidder, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of sub-contractors, including procurement of materials and leases of equipment. The Selected Bidder will not participate either directly or indirectly in the discrimination prohibited by the Regulations.

C. Solicitations for Sub-contracts, Including Procurement of Materials and Equipment

In all solicitations either by competitive bidding or negotiations made by the Selected Bidder for work to be performed under a sub-contract, including procurement of materials or leases of equipment, each potential sub-contractor or supplier will be notified by the Selected Bidder of the Selected Bidder's obligations under this contract and the Regulations relative to non-discrimination on the grounds of race, color, sex, or national origin.

D. Information and Reports

The Selected Bidder will provide all information and reports required by the Regulations or directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the Agency or the appropriate federal agency to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of the Selected Bidders is in the exclusive possession of another who fails or refuses to furnish this information, the Selected Bidder will so certify to the Agency or EPA, as appropriate, and will set forth what efforts it has made to obtain the information.

E. Sanctions for Non-compliance

In the event of the Selected Bidder's non-compliance with the non-discrimination provisions of this contract, the Agency will impose such sanctions as it or EPA may determine to be appropriate, including, but not limited to: (a) withholding of payments to the Selected Bidder under the contract until the Selected Bidder complies, and/or (b) cancelling, terminating, or suspending of the contract, in whole or in part.

3.2 Other requirements include:

Termination. Olympic Tug and Barge may terminate this contract at any time with or without cause by giving a thirty day (30) written notice to Selected Bidder of such termination and by specifying the effective date of the termination. Upon termination of this contract, Olympic Tug and Barge, in addition to any other rights provided in this contract, may require the Selected Bidder to deliver to Olympic Tug and Barge any property specifically produced or acquired for the performance of such part of this contract as has been terminated.

Olympic Tug and Barge will pay to the Selected Bidder the amount agreed upon by the Selected Bidder and the Agency for (i) completed work and services for which no separate price is stated,

(ii) partially completed work and services, and (iii) other property or services which are accepted by Olympic Tug and Barge, unless the termination is for default, in which case Olympic Tug and Barge will determine the extent of the liability of Centerline Logistics. Olympic Tug and Barge may withhold from any amounts due the Selected Bidder such sums as Olympic Tug and Barge determines to be necessary to protect Olympic Tug and Barge against potential loss or liability.

For a copy of either the EPA grant or the Sub-recipient agreement between Olympic Tug and Barge and the Puget Sound Agency please contact Ravi Sekhon @ (206)550-7659, rsekhon@centerlinelogistics.com or Jim Blake @ (206)450-5248, jblake@centerlinelogistics.com

4.0 Availability

Shipyards availability is preferred to be on June 26, 2021. Shipyard shall consider this a flexible date due to engine manufacturing and delivery schedules.

5.0 Proposal Due Date

The due date for receiving your proposal is April 23rd, 2021 5:00 pm PDT. Proposals received after the due date will not be accepted.

6.0 Warranty

Work performed by the shipyard shall be warranted to be defect free and for one year and on-site service must be provided for any warranty service. Any deviations to this warranty must be clearly identified.

7.0 Proposal Evaluation Criteria

Olympic Tug and Barge will evaluate the proposals and award points (100 points maximum) based on the following criteria:

1. Level of qualification – experience, knowledge and availability of qualified personnel and equipment. Length of time in business.
(Total points possible – 10)
2. Responsiveness to the RFP – understanding the project, project purpose, and importance of the project.
(Total points possible – 15)
3. Technical Performance – the ability of the products and services to meet the technical requirements of the project.
(Total points possible – 50)

4. Total Budget Proposed – the proposed cost of the project, including total costs and lifecycle costs.
(Total points possible – 25)

8.0 Award Timeline

Our expectation is to award a contract to the shipyard by May 21st, 2021. Please note that the costs of preparing the proposal and of negotiating the contract are not reimbursable and Olympic Tug and Barge is not bound to accept any of the proposals submitted. Olympic Tug and Barge is not bound to issue a contract related to this solicitation.

Activity to prepare the solicitation response will not be reimbursed.

9.0 Proposal Format

Proposals need to specify the following:

Shipyard Availability

Itemized Work Item Cost

Subcontracted Work

Payment Terms (please specify)

Your status as and your utilization of Small, Minority and Women's Business Enterprises for this solicitation:

The proposal must be valid for a minimum of 90 days.

Failure to comply with these guidelines may result in your proposal judged to be non-responsive.

10.0 Proposal Submission

Proposals should be delivered to:

Jim Blake

Centerline Logistics

Email: jblakc@centerlinelogistics.com

Aaron Thompson

Centerline Logistics

Email: athompson@centerlinelogistics.com

Physical Address:
910 SW Spokane St
Seattle, WA 98134

Mailing Address:
910 SW Spokane St
Seattle, WA 98134

11.0 Contacts

Questions should be addressed to:

Aaron Thompson: Project Engineer
Centerline Logistics
athompson@centerlinelogistics.com
(920)226-0614

Jim Blake: Port Engineer
Centerline Logistics
jblake@centerlinelogistics.com
(206)450-5248

Attachment A

CE



OFFICIAL #:

1229479



**910 SW Spokane Street
Seattle, WA 98134**

www.harleymarine.com

MAIN PARTICULARS:

Built:	2010
Builder:	Houma, LA - Main Iron Works
Service Class:	Harbor Conv. T/S
Call Sign:	WDI5089
Class:	ABS Load Line

DIMENSIONS:

Gross Tonnage:	118 GRT
Net Tonnage:	80 NRT
Length:	92.2 ft.
Beam:	30 ft.
Depth:	12 ft.
Draft Light:	N/A
Draft Loaded:	10 ft.
Height of Eye:	42 ft.
Air Draft:	48 ft.

CAPACITIES:

Fuel:	54,834 gallons
Water:	22,321 gallons
Lube:	1,576 gallons
Hydraulic:	N/A

MACHINERY:

Main Engines:	(2) Cummins KTA 38 M1 Tier 3 2,000 HP and 1,800 RPM
Z Drives:	N/A
Reduction Gears:	Twin Disc MG 5321 DC
Ratio:	TD 6.39:1
Propellers:	72 in. x 60 in.
Auxiliaries:	(2) Northern Lights M65C3; 65kw @ 1800 RPM

PERFORMANCE:

Bollard Pull Ahead:	Estimated 23 short tons
Bollard Pull Astern:	N/A
Range:	N/A

DECK GEAR:

Towing Winch:	Intercon DW175 air hydraulic double drum
Tow Wire:	3,000 in. of 1.75 in.
Bow Winch:	N/A
Bow Wire:	N/A

NOTES:

Combination of rubber tires, rubber laminate fenders, and formed split pipe rub rails.

Attachment B

Work Items List

0000	GENERAL ITEMS	REV DATE
0001	Vessel Particulars	3/8
0002	Dock Trials and Sea Trials	3/8
0003	Delivery and Redelivery	3/8
0004	General Services	3/8
0100	HULL STRUCTURE	REV DATE
0200	ELECTRICAL	REV DATE
0201	Install Main Engine Controls	3/8
0202	Install Main Engine Monitoring	3/8
2003	Install 24 V Power Supply for Main Engines	3/17
0300	NAVIGATION EQUIPMENT	REV DATE
0400	MACHINERY EQUIPMENT	REV DATE
0401	Remove and Install Main Engines	3/8
0402	Connect Auxiliary Systems to New Engine	3/8
0403	Modify Cooler Piping for New Engines	3/8
0500	PAINT	REV DATE
0501	Paint Spec	3/8
0600	DRY DOCK / UNDOCK	REV DATE
0601	Dry Docking	3/8
0602	Replace Hull Anodes	3/8

WORK ITEM 0001 – VESSEL PARTICULARS

1.0 ABSTRACT

The intent of this work item is introduce the shipyard to the vessel type, layout and equipment so the shipyard can produce the most accurate bids possible.

2.0 REFERENCES

2.1 CE General Properties Booklet

3.0 ITEM LOCATION

3.1 Location: Various

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

5.1 The CE is designed to maneuver barges in narrow marine passages and transport barges by pushing or towing. The tugs main propulsion consists of two main engines, Cummins KTA 38M1 Tier 1 (1,000 hp / EA) that are connected to Twin Disc MG 5321 DC marine gears and shafted to propellers. Auxiliary power is provided by two Northern Lights model M64C3 Tier 3, 65kw diesel generator sets. The tug boat CE was built by Main Iron Works Inc. Houma, Louisiana in 2010.

Type: 92' Tug

Building Yard: Main Iron Works Inc.

Year Built: 2010

Load Line: American Bureau of Shipping

Official Number: 1229479

IMO Number: N/A

5.2 Dimension:

Length Overall: 92'

Breadth Molded: 30'

Depth Molded: 12'

5.3 Tonnages:

Regulatory Gross Tonnage: 118

Regulatory Net Tonnage: 80

5.4 Machinery Particulars:

Propulsion Machinery: Cummins

Main Engine Type: KTA 38M1

Max Continuous Output at 1,800 RPM: 2,000 HP

Propeller Type: 4 Blade fixed pitch, 72 in x 60 in

Diesel Generators:

Engine: Northern Lights model M65C3

Max Continuous Output at 1,800 RPM: 65 kW, V, 60 Hz, 3-phase

Deck Machinery:

Bow Winch: N/A

Tow Winch: Intercon DW 175 Air Hydraulic Double Drum

Tow Pin/Tow Hook: Smith Berger, 3 Pins and 1 hook

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 None

7.0 NOTES

7.1 None

WORK ITEM 0002 – DOCK TRIALS AND SEA TRIALS

1.0 ABSTRACT

This item describes the requirements for Dock Trials and Sea Trials.

2.0 REFERENCES

2.1 None

3.0 ITEM LOCATION/DESCRIPTION

3.1 Various

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

5.1 Dock Trials

- 5.1.1** Shipyard shall develop and submit to the Port Engineer, two (2) days prior to dock trials, a Dock Trial Agenda that includes all equipment scheduled to be tested. Port Engineer may add items to dock trial if deemed necessary.
- 5.1.2** At a minimum the Shipyard shall operate and test main propulsion machinery, auxiliary machinery, and equipment that has been overhauled, repaired or otherwise worked on during the performance of the Work Package.
- 5.1.3** Dock Trials shall be carried out jointly with vessel crew and Port Engineer.
- 5.1.4** Dock Trial results shall be summarized and submitted to the Port Engineer via Condition Found Report prior to the start of Dock Trials.
- 5.1.5** Dock Trials shall be conducted two (2) days prior to Sea Trials, and should be conducted during the Day Shift.
- 5.1.6** Any/All deficiencies discovered during Dock Trials shall be corrected prior to the start of Sea Trials.

5.2 Sea Trials

- 5.2.1** Shipyard shall develop and submit to the Port Engineer, two (2) days prior to sea trials, a Sea Trial Agenda that includes all equipment scheduled to be tested. Port Engineer may add items to sea trial if deemed necessary.
- 5.2.2** Sea Trials shall be conducted one (1) day prior to scheduled redelivery.
- 5.2.3** At a minimum the Shipyard shall operate and test at equipment full power rating, all main propulsion machinery, auxiliary machinery, and equipment that has been overhauled, repaired or otherwise worked on during the performance of the Work Package.
- 5.2.4** Shipyard shall submit a Condition Found Report to the Port Engineer within 24-hours of Sea Trial completion documenting any/all deficiencies identified during sea trials.
- 5.2.5** All deficiencies attributed to Shipyard workmanship shall be corrected prior to redelivery of the vessel.
- 5.2.6** If additional Sea Trials are required due to Shipyard workmanship deficiencies they will be conducted at the Shipyard's expense.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Dock and Sea Trial Reports

6.1.1 Shipyard shall prepare and submit final Dock Trial and Sea Trial reports addressing:

6.1.1.1 Equipment/Systems Tested

6.1.1.2 Test Date/Time

6.1.1.3 Test Results

7.0 NOTES

7.1 None

WORK ITEM 0003 – DELIVERY AND REDELIVERY

1.0 ABSTRACT

This item describes the Shipyard's responsibilities associated with the delivery, care and redelivery of the vessel.

2.0 REFERENCES

2.1 None

3.0 ITEM LOCATION/DESCRIPTION

3.1 General; Entire Vessel

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

5.1 Delivery

5.1.1 The Owner will deliver the vessel to the Shipyard at the previously agreed upon time and location. The Shipyard shall accept custody of the vessel upon delivery.

5.2 Redelivery

5.2.1 Upon completion of successful Dock Trials and Sea Trials the Shipyard shall redeliver the vessel to the Owner. At the time of redeliver the Shipyard shall ensure that the vessel is ready for service in accordance with this work package.

5.2.2 **The areas in which work has been performed on the vessel shall be thoroughly cleaned, free from dirt, debris and garbage. This includes but is not limited to, decks, bulkheads, bilges, deck plates, ladder ways, etc.**

5.2.3 Potable water systems and tanks, **if entered or worked by the Shipyard**, shall be super-chlorinated, drained, replenished and certified fit for consumption prior to dock trials.

5.2.4 Existence of any major uncorrected deficiencies, for which the Shipyard is responsible, shall be sufficient cause for the Owner to reject redelivery of the vessel pending correction of the item(s) in question. Consequential delays in redelivery, as a result of uncorrected deficiencies or unfinished work shall be the Shipyard's responsibility.

5.2.5 All tests and inspections required by this work package shall be completed prior to redelivery of the vessel.

5.2.6 Prior to redelivery of the vessel it must be verified that the vessel is in proper condition for redelivery. A final joint acceptance survey of the vessel will be made by the Port Engineer and Shipyard Representative at least one (1) day prior to the scheduled redelivery.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Potable Water System/Tank Testing Results

6.2 Signed Final Joint Acceptance Survey to include date and time of survey.

7.0 NOTES

7.1 None

WORK ITEM 0004 – GENERAL SERVICES

1.0 ABSTRACT

This item describes the general services that are to be provided by the Shipyard for the duration of the dry docking and repairs.

2.0 REFERENCES

2.1 None

3.0 ITEM LOCATION/DESCRIPTION

3.1 General; Entire Vessel

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

5.1 The Shipyard shall provide estimations for the following services:

5.1.1 Garbage Removal

5.1.2 Gangways

5.1.3 Shore Power Hook Up/Disconnect

5.1.3.1 Daily Usage Rate

5.1.4 Wharfage (please estimate the price/day)

5.1.5 Lay Days

5.1.6 Air and Water Connections

5.1.7 Temporary Lighting

5.1.8 Crane Service

5.1.9 Hazardous Waste Disposal

5.1.10 Scrap Disposal

5.1.11 Port Engineer Office and Utilities

5.1.11.1 Office Space, including but not limited to desk, chair, 120 V outlet
and in a space suitable for administrative work

5.1.11.2 Reliable Internet

5.1.11.3 Printer

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Total usage of shore power for duration of dry docking and repairs

6.2 Hazardous waste disposal receipts

6.3 Scrap disposal receipts

7.0 NOTES

7.1 None

WORK ITEM 0201 – INTSALL MAIN ENGINE CONTROLS

1.0 ABSTRACT

The intent of this work item is to install the main engine gear selector and integrated controls for the new engines.

2.0 REFERENCES

2.1 Main Engine Installation Guide

3.0 ITEM LOCATION/DESCRIPTION

3.1 Location:

3.1.1 Engine Room

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.

5.2 Engine supplier shall supply a mechanical throttle interface with the engines for installation.

5.3 The shipyard shall install the throttle interface and the mounting plate at a location specified by the port engineer.

5.4 The shipyard will need to perform any modifications necessary to interface the new mechanical throttle interface with the existing ZF micro commander actuator. This may include fabricating and fitting a mounting plate for the interface to mount with the speed control actuator.

5.4.1 Linkages and connections shall be made so the actuators are not under excessive strain or subject to binding when being actuated.

5.5 It shall be the shipyards responsibility to run and terminate any mechanical or electrical connection between the throttle interface and the ZF micro commander. These connections shall be run in such a way to avoid kinks, chaffing, sharp turns and in such a way that there is no strain on the cables.

5.6 The shipyard shall terminate the harness on the correct terminals of the ZF micro commander.

5.7 All connections shall be properly terminated and tightened to avoid any strain, ensure electrical connections are secure and to prevent any ingress of moisture or dust.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Shipyard shall perform function test of gear selector and throttle control during sea trial.

7.0 NOTES

7.1 None

WORK ITEM 0202 – INSTALL MAIN ENGINE MONITORING

1.0 ABSTRACT

The intent of this work item is to remove the old monitoring equipment, install new engine monitoring equipment, connect it and prove operation.

2.0 REFERENCES

2.1 Main Engine Installation Guide

3.0 ITEM LOCATION/DESCRIPTION

3.1 Location

3.1.1 Engine Room

3.1.2 Wheelhouse

3.1.3 Upper Wheelhouse

3.2 Description

3.2.1 None

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.
- 5.2 Shipyard shall remove the engine interface boxes or control panels and wiring that is associated with the old engines. Port Engineer shall mark or specify which boxes the shipyard shall remove.
- 5.3 Shipyard shall remove any cables associated with old main engine monitoring or control from the engine to the interface boxes.
- 5.4 Cables from the existing engine interface boxes to the vessels alarm and monitoring system shall be left in place.
- 5.5 Equipment manufacturer shall provide electrical boxes that interface from the new engines (customer interface boxes) to the ships alarm and monitoring systems. The shipyard shall mount these boxes at a location specified by the port engineer. Shipyard shall fabricate brackets to mount these panels as needed.
- 5.6 Shipyard shall use the cables that were left in place from the vessels alarm and monitoring systems to connect to the customer interface box. Termination points shall be specified by Engine Manufacturer.
- 5.7 Shipyard shall remove any control panels that are associated with local engine control and monitoring in the engine room. Cables from the engines to the local engine room panel shall be removed by the shipyard.
- 5.8 Equipment manufacturer shall provide engine control panels and wire harnesses. Shipyard shall mount the engine control panels in a location specified by the port engineer.
- 5.9 Shipyard shall connect and terminate all associated cables and wire harnesses from the engine to the local engine control panel.

- 5.10 Equipment manufacturer will also be providing new displays for the wheelhouse and upper wheelhouse. Shipyard shall modify countertops as needed and mount the engine displays at Port Engineer's specified locations.
- 5.11 Owner shall provide cable to run from remote displays to the local engine room display and control in the engine room. Shipyard shall run the cables and terminate them according to equipment manufactures instructions.
- 5.12 Any cable run that passes through a watertight or fire boundary must be tested to ensure it is leak free. This can be done using a soapy water bubble test. Any deficiency in the boundary will be repaired by the shipyard and respected to the Port Engineers satisfaction.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

- 6.1 Shipyard shall prove proper operation of engine monitoring and alarm system on dock trial and/or sea trial.

7.0 NOTES

- 7.1 None

WORK ITEM 0203 – INSTALL 24 V POWER SUPPLY FOR MAIN ENGINES

1.0 ABSTRACT

The intent of this work item is to install new 24V batteries and power supplies in the engine room to power the new main engine controls.

2.0 REFERENCES

2.1 Main Engine Installation Guide

3.0 ITEM LOCATION/DESCRIPTION

3.1 Location

3.1.1 Engine Room

3.2 Description

3.2.1 None

4.0 OWNER FURNISHED MATERIAL

4.1 24 V Power Supply

4.2 Batteries

5.0 STATEMENT OF WORK REQUIRED

5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.

5.2 Shipyard shall fabricate mount for a 24 V battery bank on the port and starboard sides of the engine room.

5.2.1 Battery bank shall enclose the batteries but should still be able to be opened for service or removal of the batteries

5.3 Shipyard shall fabricate a mount for a 24V power supply for the battery bank and engine control power on the port and starboard sides of the engine room; location of power supply shall be specified by the Port Engineer.

5.4 Shipyard shall run power to the power supplies.

5.5 Shipyard shall run cable from the power supplies to the batteries and to the main engines.

5.5.1 The power supplies shall have the ability and capacity to power a main engine independently and both main engines together. The intent is to allow for crossover operation of both main engines from one power supply in case of failure of one power supply.

5.5.2 Control power shall be run to a 24V breaker box that shall be supplied by the shipyard and installed in a location approved by the port engineer.

5.5.3 This redundancy shall be tested during dock trials and sea trials.

5.6 Shipyard shall ensure cables runs in the engine room shall be properly supported every 18 in at a minimum and protected from chaffing. Shipyard shall fabricate and install cable supports if needed. Power cables shall be run 6 in from control cables if possible. Any crossing of power cables and control cables shall be done at 90 degrees.

5.7 All terminations shall be made by the shipyard using terminals specified by OEM documentation.

5.8 All connections shall be properly terminated and tightened to avoid any strain, ensure electrical connections are secure and to prevent any ingress of moisture or dust.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Shipyard shall prove proper operation of engine monitoring and control

6.2 Shipyard shall prove battery back up system during loss of power

6.3 Shipyard shall prove engine control power can switch over to a single source in case of 24V failure on one source

7.0 NOTES

7.1 None

WORK ITEM 0401 – REMOVE AND INSTALL MAIN ENGINES

1.0 ABSTRACT

The intent of this work item is to rig and remove the existing main engines then rig and install new main engines.

2.0 REFERENCES

- 2.1 Equipment Manufacturer Manual
- 2.2 OEM Lifting Guide

3.0 ITEM LOCATION/DESCRIPTION

- 3.1 Location: Engine Room

4.0 OWNER FURNISHED MATERIAL

- 4.1 None

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.
- 5.2 Shipyard shall confer with the Port Engineer to determine the best lifting path and plan.
 - 5.2.1 Shipyard shall be responsible for reserving a crane rated to safely perform the lift. Shipyard shall provide competent crew to rig, flag and land the engines.
- 5.3 Shipyard shall disconnect all main propulsion equipment, including disconnecting the flywheel from the gearbox. All propulsion equipment removed shall be saved and boxed or palletized.
- 5.4 Shipyard shall disconnect all electrical monitoring and control equipment that are connected to the main engine details of this are covered in work items 0201 and 0202.
- 5.5 Shipyard will work with the Port Engineer to ensure all auxiliary systems are isolated, secured and drained prior to disconnecting them. With auxiliary systems secure, the shipyard shall disconnect all auxiliary systems including but not limited to, air start, air intake, exhaust, lube oil, cooling water and fuel systems.
 - 5.5.1 Any interferences associated with auxiliary systems that may impede the removal of old engines and installation of new engines shall also be removed. This may include but is not limited to pipe hangers, pipe supports, cable trays, cable supports, deck plates and possibly deck frames.
- 5.6 Shipyard shall remove any interferences within the engine room and vessel as a whole that may impede the removal of old engines and installation of new engine. This may include but is not limited to soft patches, ladders, lights, cable transits, exhaust manifolds, pipe runs, etc.
 - 5.6.1 Any item removed shall be done in such a way that it can be installed to its original location and perform original function prior to removal. Any items that can not be removed by unbolting or threading and must be cut shall be done only with the approval of the Port Engineer and must be done at an approved location.

- 5.7 Shipyard shall rig the old engines following the OEM lifting plan and using only approved lifting points. Shipyard shall use rigging and lifting gear that has a current certification and are being inspected with a regular inspection program.
- 5.8 Shipyard shall use or hire a crane with a capacity that exceeds the weight of the engine being lifted. Port Engineer shall approve of the lift plan prior to it beginning. Shipyard shall then remove the old engines and block them appropriately to prevent damage and ensure a stable foundation when engines land on the dock.
- 5.8.1 Owner may provide one or two trucks for the shipyard to land the old engines. These trucks shall deliver the engines to an owner specified location for scrapping.
- 5.9 Owner shall have the new main engines on site ready to lift once the old engines are removed.
- 5.10 New engines shall be rigged by the shipyard using approved lifting points and the OEM rigging plan.
- 5.11 Shipyard shall land and secure main engines so they do not move or shift after being landed. This is not the final resting position of the engine as they will need to be aligned to propulsion equipment.
- 5.12 With the new engines landed and installed the shipyard shall install the soft patch and install all of the interferences that were removed for lifting the main engines.
- 5.13 Shipyard shall be responsible for touching up any paint that was disturbed to ensure it matches the surrounding area.
- 5.14 All auxiliary connections and auxiliary system integration and installation shall be addressed in work item 0402. All new electrical equipment installation and integration shall be addressed in work item 0201, 0202 and 0203.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

- 6.1 Shipyard shall be able to provide inspection certs of all lifting equipment if requested.

7.0 NOTES

- 7.1 None

WORK ITEM 0402 – CONNECT AUXILIARY SYSTEMS TO NEW ENGINES

1.0 ABSTRACT

The intent of this work item is to connect the propulsion equipment and modify the auxiliary systems to fit and connect the new main engines installed in work item 0401.

2.0 REFERENCES

2.1 OEM Main Engine Installation Manual

3.0 ITEM LOCATION/DESCRIPTION

3.1 Location: Engine Room

4.0 OWNER FURNISHED MATERIAL

4.1 None

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.
- 5.2 Shipyard shall provide ducting, flanges and connections to connect the inlet air system from the inlet air filters and original ducting to new inlet air location.
 - 5.2.1 Shipyard shall modify or fabricate any brackets needed to support the inlet air ducting.
- 5.3 Shipyard shall provide ducting, flanges and connections to connect the existing exhaust piping and silencers to the exhaust outlet on the turbochargers on the new main engine.
 - 5.3.1 Shipyard shall modify or fabricate any brackets needed to support the exhaust ducting.
- 5.4 Shipyard shall modify and connect the existing fuel system to the new main engine. The OEM will provide a “stage – 1” fuel filter assembly that shall be plumbed into the system after the water separator filters and before the main engine filters. Shipyard shall provide isolation valves and a bypass of this fuel system to allow for maintenance and repair of this fuel filter assembly. Shipyard shall fabricate any brackets, stands or supports to install this filter assembly at a location specified by the port engineer.
 - 5.4.1 New piping needs to be supported to prevent vibration.
 - 5.4.2 Any fabricated piping shall be pressure tested at 1.5 times the working pressure of the system and must maintain pressure for 5 min with 0 psi drop for it to be accepted. Valves may be pressure tested at 1.5 work pressure at the port engineer’s discretion. Any leaks or deficiencies shall be repaired by shipyard and retested, repaired piping must meet the requirement specified above.
 - 5.4.3 New piping shall be primed and painted to match the existing fuel lines of the vessel.
- 5.5 Shipyard shall modify and connect lube oil piping to the main engine for filling or draining the lube oil. Shipyard shall add any supports needed to ensure that any additional piping is properly supported.
 - 5.5.1 Any fabricated piping shall be pressure tested at 1.5 times the working pressure of the system and must maintain pressure for 5 min with 0 psi drop for it to be

accepted. Any leaks or deficiencies shall be repaired by shipyard and retested, repaired piping must meet the requirement specified above.

5.5.2 New piping shall be primed and painted to match the existing fuel lines of the vessel.

5.6 Shipyard shall modify and connect cooling water connections. Shipyard shall pipe new cooling system to the connections on the keel cooler. Shipyard shall work with port engineer to ensure the flow of the system is correct, valves are installed at proper locations and correct orientation. Shipyard shall ensure that piping system is properly supported to avoid pipe strain and prevent vibration. Shipyard shall install connection points to allow for access of maintenance to the system, the Port Engineer shall specify the location of these connection points. Connection points such as flanges, or thread-o-let connections for gauges shall be correctly selected for system pressure, and fluid type.

5.6.1 Piped connections to the engines shall be connecting with an expansion joint. Expansion joints shall be selected by the Port Engineer and provided by the shipyard.

5.6.2 Any fabricated piping shall be pressure tested at 1.5 times the working pressure of the system and must maintain pressure for 5 min with 0 psi drop for it to be accepted. Valves may be pressure tested at 1.5 work pressure at the port engineer's discretion. Any leaks or deficiencies shall be repaired by shipyard and retested, repaired piping must meet the requirement specified above.

5.6.3 New piping shall be primed and painted to match the existing cooling lines of the vessel.

5.7 Shipyard shall supply valves and gauges for these systems. Gauges shall have a range that is twice the normal working pressure of the system, of a material that is compatible with the fluid being measured and of a connection type appropriate for the system. Port engineer shall have final approval of gauge selection.

5.7.1 Shipyard shall install all gauges on piping and ensure all gauges are leak free during function test.

5.7.2 Shipyard shall supply all gauge certs.

5.8 Shipyard shall prove the integrity, function and leak free operation of all auxiliary systems during dock trials and sea trials. Any deficiencies shall be immediately addressed by the shipyard and must be approved by the Port Engineer.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Shipyard shall prove operation of engines and all engine systems during dock trials and sea trials.

6.2 Shipyard to supply MTRs for all steel used for fabrication

6.3 Shipyard shall supply certifications for gauges

6.4 Shipyard shall supply certification and rating for expansion joints

7.0 NOTES

7.1 None

WORK ITEM 0403 – MODIFY COOLER PIPING FOR NEW ENGINES

1.0 ABSTRACT

The intent of this work item is to split the center engine channel cooler into two separate cooling loops.

2.0 REFERENCES

- 2.1 Channel Cooler Structural Drawings
- 2.2 General Arrangement

3.0 ITEM LOCATION

3.1 Location:

- 3.1.1** Hull
- 3.1.2** Engine Room

4.0 OWNER FURNISHED MATERIAL

- 4.1 None

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.
- 5.2 Shipyard shall ensure that the channel cooler is drained of all possible fluid and is safe for cutting and welding prior to beginning work.
- 5.3 Shipyard shall remove the 6 in schedule 80 crossover piping between the port and starboard portions of the center keel cooler.
 - 5.3.1** With the crossover piping removed the center keel cooler can now be partitioned into a port cooling loop for new port main engine after cooler circuit and a starboard cooling loop for the new starboard main engine after cooler circuit.
- 5.4 Shipyard shall use the 6 in cross over connection and reduce to the required piping size for after cooler loop of the new main engines.
 - 5.4.1** In addition to the crossover piping, the center channel cooler has a connection on the port side of the engine room and a connection on the starboard side of the engine room. These will become the respective outlet connections for the new after cooler cooling circuit. The crossover connection will become the respective inlet for the aft cooler cooling circuit.
 - 5.4.2** Final cooling flow direction shall be determined during installation the after cooler system piping in work item 0401.
 - 5.4.3** The center channel cooler connections on the port side and starboard sides of the engine room shall be modified to ensure proper fit up and connection to the new main engine after cooler circuit piping.
 - 5.4.4** Connections between piping shall be bolted flange connections. Gaskets for these connections shall be supplied by the shipyard.
- 5.5 Prior to start of fabrication, the Port Engineer shall approve routing of the after cooler piping.

5.6 For quoting purposes, shipyard shall use 80 ft of 4 in, schedule 80 ASTM A106 steel for piping and 150#, 4 bolt, carbon steel flanges. Any fittings being quoted shall be socket weld type.

5.6.1 Shipyard shall fit piping so it is able to be removed with bolted flanges and accessible for maintenance.

5.6.2 Shipyard shall install pipe supports or pipe hangers to support the piping, limit vibration of the pipe and prevent any strain or loading on flanged connections.

5.7 After piping fabrication is complete shipyard shall hydro test all piping sections to 1.5 times the working pressure of the system. There shall be a zero psi drop over 5 minutes. Any leaks or deficiencies shall be repaired by the shipyard and pipe shall be re-hydro tested to meet the previously stated standards.

5.8 During final installation, the shipyard shall supply gaskets for the flanges that are properly rated for the pressure, temperature and fluid type. Shipyard shall supply all mounting hardware. Any flange to flange bolted connections shall have a lock washer installed to prevent loosening during normal vessel operations.

5.9 Shipyard shall work with Port Engineer to select and supply flanged expansion joints to make the connection between the engines cooling circuits and newly fabricated after cooler piping to the keel cooler.

5.10 Shipyard shall ensure the final assembly is leak free and address any leaks that are observed during dock trials or sea trials.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 Hydro Test Reports

6.2 Sea Trial Function Test of Cooling Systems

7.0 NOTES

7.1 All dimension, pipe size, thickness, material, etc. shall be verified prior to beginning fabrication.

WORK ITEM 0501 – PAINT SPEC

1.0 ABSTRACT

The intent of this work item is to provide all labor and material to clean, prepare, and coat the vessel's underwater hull and freeboard surfaces. The intent is also to leave good paint intact.

2.0 REFERENCES

- 2.1 Jotspec Technical Specification for Dry Dock
- 2.2 General Particulars Booklet

3.0 ITEM LOCATION/DESCRIPTION

- 3.1 Location: Hull and Freeboard of Vessel

4.0 OWNER FURNISHED MATERIAL

- 4.1 Owner shall furnish all paint associated with this spec.

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall furnish all necessary labor, material, staging, lighting, crane, support services, and equipment to accomplish all work specified in this item. **Shipyard shall verify all surface areas and existing conditions for this work item.**
- 5.2 Shipyard is to price spot preparation using power tools (for pricing assume preparing hull to SSPC-SP-3 standards) and full coating of the following areas:
 - 5.2.1** Underwater Hull to Waterline, Approximately 4900 ft²
 - 5.2.2** Markings Above and Below Waterline, Approximately 1250 ft²
 - 5.2.3** Waterline to Caprail, Approximately 1500 ft²
- 5.3 All paint type, color, thickness, application, dry time, etc., shall be specified by the Jotun paint specification.
 - 5.3.1 In addition to the Jotun paint spec the shipyard must achieve a DFT of 22 mils on underwater hull coating at a minimum.**
- 5.4 The Port Engineer and the Shipyard shall work closely with the Jotun Paint Manufacturer's representative to ensure that all application processes are being adhered to. Jotun Paint Manufacturer's representative shall be present daily to inspect and oversee preparation, application and testing.
- 5.5 Final inspection and acceptance of all work shall be by the Port Engineer. Port Engineer will be assisted in his inspection and acceptance efforts by the Jotun Paint Manufacturer's representative. The Shipyard shall comply with the requirements of the Jotun representative with the final authority still resting with the Port Engineer.
- 5.6 The Shipyard shall prepare a paint report and submit to the Port Engineer within three (3) days of completing the coating application. The Shipyard shall develop a Paint Schedule that documents the paint applied to all areas. The schedule shall include surface preparation, primers, and overcoats. Colors, types, DFT in mils, application method, brand names and manufacturer, and the name of the applying company shall also be included. In addition, the report shall also specifically include the following data:
 - 5.6.1 Date and time of applications.
 - 5.6.2 Temperature, humidity, and dew point, at time of each application.

- 5.6.3 Dry film readings for each coat of paint as required by the manufacturer's representative.
 - 5.6.4 Manufacturer, Product Identification No. and Batch Nos. for each type of paint applied.
 - 5.6.5 Results of chloride tests taken before washing, after washing, and after blasting.
 - 5.6.6 Results of blast profile tests taken after surface preparation
- 5.7 Shipyard shall include the price of tarping, clean-up, disposal and any environmental fees prior to beginning work. Shipyard shall use industry best practice while preparing and coating the hull to have as little environmental impact as possible.
- 5.8 The shipyard shall meet the following requirements prior to beginning any preparation or paint work:
- 5.8.1 If sand blasting is used for paint prep, the Shipyard shall ensure that the vessel's equipment is protected from damage caused by blasting, dust or paint.
 - 5.8.2 Plug open ends of pipes, including sea connections, vents and ducts
 - 5.8.3 Install protective covering on all exposed equipment including transducers, propeller, thrusters, deck machinery, hydraulic hoses, wire ropes, and any other equipment which might be adversely affected by grit and paint from blasting and coating works.
 - 5.8.4 Grease and wrap all valve stems and exposed portions of hydraulic cylinders. Install filters on all air intake vents. Install covers on all tank vents.
 - 5.8.5 In all areas to be abrasive blasted and coated, record all ship's markings, including information, size, and color.
 - 5.8.6 Protective covering shall be inspected at regular intervals but not less than at the start of each work shift. Degraded protective covering shall be repaired prior to the restart of work. Contamination of the vessel and its equipment shall be reported to the Port Engineer immediately. The Shipyard shall be responsible for cleaning the contaminated equipment and showing that the contamination has not caused damage to same. Cost to repair equipment damaged by contamination shall be borne by the Shipyard.
- 5.9 Shipyard shall meet the following requirements at a minimum prior to beginning coating:
- 5.9.1 Surfaces shall be clean, dry, and free of oil, grease or residue from abrasive blasting.
 - 5.9.2 All coatings are to be applied under the direct supervision of the Jotun Paint Manufacturer's representative. No application of coatings shall be made until the prepared surfaces are approved by the coating system manufacturer's technical representative and signed off by him after each inspection. The Shipyard is to arrange for inspections prior to the initial painting and at each over coating. Areas found to contain runs, over spray, roughness, or any other film irregularities shall be repaired or re-coated as directed.

- 5.9.3 Paint material shall be stored within the paint manufacturer's recommended temperature range. When paint is being applied, ensure that the material's temperature is within the manufacturer's recommended range.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

- 6.1 Final Paint Report
- 6.2 Paint Consumption Report

7.0 NOTES

- 7.1 None

WORK ITEM 0601 – DRY DOCKING AND UNDOCKING

1.0 ABSTRACT

The intent of this work item is to dock/undock the vessel and to accomplish repairs as specified elsewhere in this Work Package. The vessel shall be dry docked at the Shipyard facility.

2.0 REFERENCES

- 2.1 – Docking Plan
- 2.2 – Tank Capacity Plan

3.0 ITEM LOCATION

- 3.1 Shipyard Facility

4.0 OWNER FURNISHED MATERIAL

- 4.1 None

5.0 STATEMENT OF WORK REQUIRED

- 5.1 Shipyard shall utilize a certified single section steel or concrete floating dock, marine railway or graving dock that will allow the performance of the items in this Work Package. The dry dock must be certified to lift the vessel according to approved stability and docking calculations.
- 5.2 Shipyard shall provide all labor, material, equipment and services to dock/undock the vessel.
- 5.3 The Shipyard shall erect, set and align blocks in accordance with the provided Docking Plan.
 - 5.3.1** Position blocking to ensure that equipment residing on the surface of or protruding from the hull will not be damaged and will be accessible for removal and repair.
- 5.4 Once the vessel has been delivered to the shipyard it will be the responsibility of the shipyard to move the vessel within the facility. This shall be included in the pricing for this work item.
- 5.5 The Shipyard shall provide the services of qualified divers during the docking operation to inspect and assist in alignment of the vessel for proper placement.
- 5.6 The Shipyard shall retain control of the vessel in the centered position during the entire dewatering/deballasting evolution, as well as during flooding/ballasting operations while undocking to prevent damage to the vessel.
- 5.7 After the vessel is dry docked and the hull still wet, the Shipyard shall wash down the vessel's underwater hull, fittings, and propulsion equipment with clean fresh water to assure the removal of dirt, slime, marine growth and fouling.
- 5.8 Any and all costs to collect, treat and dispose of hull dock wash waste water and associated debris shall be included in this work item.
- 5.9 Undocking shall be at a date and time mutually agreed upon by the Port Engineer and the Shipyard. Before undocking the vessel, ensure that the dry dock is free of all debris, blasting material and that all sea valves and hull penetrations below full load draft are proven watertight by high pressure fresh water hose testing or other means acceptable by the Port Engineer.

- 5.10 Prior to flooding of the dry dock for the undocking evolution, the Shipyard and the Port Engineer shall conduct a final inspection of the vessel to ensure that watertight integrity conditions are satisfied.
- 5.11 After all work has been completed and the Shipyard and Port Engineer have agreed to refloat the vessel the Shipyard shall prepare for undocking. The Shipyard shall start the flooding of the dock and stop flooding after the hull penetrations are submerged, but before the vessel lifts off the blocks. The Shipyard shall visually inspect the interior hull and hull penetrations below the water level with the Port Engineer to ensure watertight integrity of the vessel. Flooding shall continue once watertight integrity has been verified.
- 5.12 In the event that leaks are found during the watertight integrity tests, the Shipyard shall be responsible to cease undocking operations and to restore conditions suitable to accomplish permanent repairs. Undocking may not continue until the Port Engineer is satisfied that the leak(s) have been corrected.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

- 6.1 Docking Plan used by the Shipyard
- 6.2 Watertight Integrity Inspection Sheet

7.0 NOTES

- 7.1 None

WORK ITEM 0602 – REPLACE HULL ANODES

1.0 ABSTRACT

The intent of this item is for the shipyard to replace all of the anodes on the hull of the vessel.

2.0 REFERENCES

2.1 Docking Plan

3.0 ITEM LOCATION/DESCRIPTION

3.1 Location: Hull

3.2 Description: 6” bolt hole centers, AHC-20 anodes

4.0 OWNER FURNISHED MATERIAL

4.1 Quantity of anodes is 48 Six-inch bolt centers.

5.0 STATEMENT OF WORK REQUIRED

5.1 Shipyard shall provide all labor, material and equipment necessary to complete the work as required.

5.2 Shipyard shall remove all of the zinc anodes installed on the hull. Shipyard shall verify the exact number of anodes and size of anodes to be replaced.

5.3 Shipyard shall purchase and replace all anodes with anodes of the same dimension, weight. Anode material will be changed from zinc to aluminum.

5.4 Shipyard shall replace or repair any mounting hardware that is damaged or in poor condition.

5.5 Shipyard shall install all new anodes in the same locations as the anodes that were removed.

5.6 Shipyard shall perform this work to have as little impact on other work as possible.

6.0 PERFORMANCE CRITERIA/DELIVERABLES

6.1 None

7.0 NOTES

7.1 None