AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	Page 1 of 77

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0003	12/22/2006	See Lines	

6. ISSUED BY	CODE 00094	7. ADMINISTERED BY *(If other than Item 6)*	CODE
DOT/Maritime Administration, WR Acquisition Office of Acquisition, MRG-4200,201 Mission Street, Suite 2200 San Francisco, CA 94105-1905			

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and Zip Code)*		
Dale Sirois PACIFIC GULF MARINE, INC. 401 WHITNEY AVE STE 511 Gretna, LA 70056-2504		9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED *(SEE ITEM 11)*
	(X)	10A. MODIFICATION OF CONTRACT/ORDER NO. DTMA8C05013 / PGM13W06012
CODE * FACILITY CODE	(X)	10B. DATED *(SEE ITEM 13)* 03/31/2006

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

See Line Item Detail

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
☐	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
☐	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
☐	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
ü	D. OTHER *(Specify type of modification and authority)* G.11 Task Order - Reimbursement

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Modification is issued for the following reasons:
1. Increase funding and delivery date.
2. Add solicitation as issued.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)* Debra K. Velmere	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. United States of America BY *(Signature of Contracting Officer)*	16C. DATE SIGNED 12/22/2006

Total Funding: $2,363,513.00

FYs	Fund	Budget Org	Sub	Object Class	Sub	Program	Cost Org	Sub	Proj/Job No.	Sub	Reporting Category
See Line Item(s)											

Division **Closed FYs** **Cancelled Fund**

Line Item Number	Description	Delivery Date (Start date to End date)	Quantity	Unit of Issue	Unit Price	Total Cost
CAPE HUDSON Increase Funds Add Solicitation PGM-HUD-0012 PRWRSM060104 0003						
0001	Cost reimbursable items (see Attachment J-9) individually funded via task order Change in Delivery Date, Extended Description Ref Req No: PRWRSM06104	03/31/2007	0.00	LOT	$0.00	$0.00
0001AA	MOD 0001 Change in Delivery Date, Extended Description Ref Req No: PRWRSM06104/0001	03/31/2007	0.00	JOB	$0.00	$0.00
0001AB	MOD 0002 Change in Delivery Date, Extended Description Ref Req No: PRWRSM06104/0002	03/31/2007	0.00	LOT	$0.00	$0.00

Total Funding: $2,363,513.00

FYs	Fund	Budget Org	Sub	Object Class	Sub	Program	Cost Org	Sub	Proj/Job No.	Sub	Reporting Category
See Line Item(s)											

Division **Closed FYs** **Cancelled Fund**

Line Item Number	Description	Delivery Date (Start date to End date)	Quantity	Unit of Issue	Unit Price	Total Cost
0001AC	MOD 0003	03/31/2007	1.00	LOT	$133,000.00	$133,000.00

This is a New Line
Base year 2, Ship group 13, Ship 3 (CAPE HUDSON)
CLIN 0203AE; PROJECT NO. PGM HNY07 1006A

INCREMENTAL FUNDING. PROJECT TOTAL IS $314,000. THIS FY07 PR OF PROJECT PGM HUD07 1006A WILL BE ATTACHED TO FY06 TASK ORDER PGM13W06012/0002. SEE ATTACHED.

Funding Information:
07 - - X303 - 9 - - 33 - - 40HUD0 - 4100 - - 254S - - 0733 - 0761 - - -
133,000.00

Previous Total: $2,230,513.00
Modification Total: $133,000.00
Grand Total: $2,363,513.00
(Includes Discounts)

Distribution: S WONG, K DWYER, K ANTONIADIS

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SECTION A -- SOLICITATION/CONTRACT FORM

A.1 SUMMARY OF CHANGES

The free form item ‘STATEMENT OF WORK has been edited.

SECTION C -- DESCRIPTIONS AND SPECIFICATIONS

C.1 STATEMENT OF WORK

PRWRSM06104/0003

STATEMENT OF WORK
PROJECTS: PGM-HUD-0012 AND PGM-HUD07-1006A

Line Item :001
END OF PERFORMANCE PERIOD IS MARCH 31, 2007

PACIFIC GULF MARINE, INC.

M/V CAPE HUDSON

DRYDOCK AND REPAIR
SPECIFICATION

JUNE 2006

Pacific-Gulf Marine, Inc.
P. O. Box 6479
New Orleans, LA 70174

Revised 22 June 2006
GENERAL CONDITIONS

AND

SPECIFICATIONS

FOR THE DRY DOCKING AND REPAIRS

TO THE

MOTOR VESSEL "CAPE HUDSON"

THESE SPECIFICATIONS are for the dry docking and repairs to the Motor Vessel "CAPE HUDSON".

It is understood by the Contractor that the work herein specified is to be carried out expeditiously in a good and workmanlike manner and completed in all respects, leaving the vessel ready for sea; that material and workmanship used must be of the best quality throughout; that Contractor furnished material must generally conform in size, quality and details to those originally in the vessel; that repairs must, in every respect, be made under the supervision and entire satisfaction of the attending PGM Port Engineer and the Representatives of the Regulatory Bodies.

It is further understood by the Contractor that all materials requiring tests shall be tested in accordance with the rules of the United States Coast Guard, The American Bureau of Shipping and other applicable Bodies and must meet their requirements and that all costs for tests and inspections must be borne by the Contractor.

If any dispute or difference shall arise relating to or concerning these Specifications or the meaning thereof, the Contractor shall perform the disputed work in accordance with the written directions of the PGM Port Engineer without prejudice to the rights of the parties and specifically without prejudice to the rights of the Contractor for reimbursement. It is understood that any disputes arising out of a contract awarded as a result of this solicitation shall be subject to final and binding arbitration at New York in the following manner, and subject to U. S. Law:

One arbitrator is to be appointed by each of the parties hereto, and the third by the two so chosen; their decision or that of any two of them shall be final, and for the purpose of enforcing any award, this agreement may be made a rule of the court. The arbitrators shall be commercial men, conversant with ship repair matters. Such arbitration is to be conducted in accordance with the rules of the Society of Maritime Arbitrators Inc.

Additional costs such as staging, manlifts, crane service, transportation, portable fire extinguishers, fire watches, removal and replacement of interferences and daily removal of all debris caused by the work, etc. required to complete any work as described herein, shall be included in the item quotations forwarded in response to this specification.

Should the Contractor require the removal of any parts of the vessel or fittings, engines, turbines, boilers, fuel oil, stores, outfit, etc., the cost of such removal is to be borne by the Contractor and all such removals must be subsequently replaced and any damage resulting therefrom is to be made good by the Contractor at his expense. Should the Contractor require the removal of dirt, debris, etc., the Contractor shall remove same from the vessel at his expense.

All scrap and Contractor furnished surplus material occasioned by the repairs shall become the property of the Contractor unless otherwise specified herewith. Notwithstanding the foregoing, pumps, turbines, motors and other machinery are to remain the sole property of the Government.

Whenever possible the Contractor shall supply U. S. materials, components and domestic end products. Non-U.S. items can only be supplied when an U. S. equivalent is not available and prior approval from the PGM Port Engineer has been received in writing. Major systems can not be purchased from foreign firms without receipt of a waiver from the Maritime Administration.

Any internal parts specified to be renewed which can be restored to their original condition by fairing, etc., also any parts specified to be removed for fairing which can be faired in place to the satisfaction of the PGM Port Engineer and the Regulatory Bodies will be accepted; on the other hand, any parts broken in removal, or fairing shall be renewed or replaced by the Contractor at his expense.

The Contractor is to fully protect the vessel, PGM and MARAD against any claims for injury to workmen and third parties, also for any damage done to the vessel, her machinery or fittings while the vessel is undergoing repairs. Prior to the awarding of contract, documentation proving the following minimum coverages shall be provided for MARAD's approval;

TYPES OF INSURANCE	MINIMUM COVERAGE REQUIREMENTS
Workman's Compensation including Longshoremen & Harbor Worker's Act coverage Covering all agents, servants, borrowed servants, statutory employees of Contractor for all compensation and other benefits required by applicable state and Federal law or by governmental authority on account of injury, death, sickness or disease	Statutory - no minimum

TYPES OF INSURANCE MINIMUM COVERAGE REQUIREMENTS
Employers Liability - to cover both injury and death resulting from accident, sickness or disease $5 million bodily injury by accident, each accident$5 million bodily injury by disease, each accident$5 million bodily injury by disease in the aggregate
Maritime Employers Liability (Jones Act) to cover both injury and death resulting from accident, sickness and disease
$5 million for each person per occurrence and $5 million in the aggregate
Comprehensive General Liability to include coverage for (but limited to) products and completed operations liability, property damage liability and contractual liability $5 million combined single per occurrence limit for bodily injury and $5 million in the aggregate
Ship Repairers Legal Liability - coverage to be provided under the standard London or American Institute forms or their equivalent
$5 million per vessel, per occurrence or such other amount as may be requested
Pollution - sudden and accidental liability $5 million per occurrence

The Pollution Policy may be a separate policy, but the coverage must be specially shown on the required confirmation of insurance. Such policies shall contain a clause statement that there is no recourse against PGM or the United States of America for payment of premium. Should this contract require towing of the vessel, the towing contractor/subcontractor shall have and maintain total towing liability insurance coverage specifically for all liabilities of hull and machinery, protection and indemnities for the full value of the vessel.

The insurance policies will contain a minimum of thirty (30) days advance notice of cancellation or any non-renewal which is the option of the insurer, said notice of such cancellation or non-renewal is to be provided to Pacific-Gulf Marine, Inc., P. O. Box 6479, New Orleans, LA 70174. On all policies; Pacific-Gulf Marine is to be shown as the primary assured at the address as listed above and the United States of America, U. S. Department of Transportation, Maritime Administration, 400 7th St., SW, Washington DC, 20590 is to be shown as an additional assured.

Any particulars in the Specification for the work involved are given for the guidance of the Contractor, who is however, to take his own particulars and dimensions, and to be responsible for same, as the intent of these Specifications are to renew and restore the vessel generally and specifically insofar as damage is concerned; and to repair the vessel in accordance with the attached Specification.

Should the Owners decide to have the vessel towed to or from the Contractor's facility; it shall be viewed as laid up with a cold plant and no crew and is to be considered a dead ship. The vessel's point of delivery and/or final destination is Pier 50, San Francisco, CA. The Contractor will be liable for the care and custody of the vessel from the time of accepting delivery of the vessel for the initial tow, as evidenced by placement of personnel on board for the tow, first line, or completion of the Certificate of Delivery, until the vessel is secure at its final place of mooring, redelivered to MARAD, and the Certificate of Redelivery Acceptance is completed.

Should the vessel be motored to or from the Contractor's facility; the Contractor will assume responsibility for the vessel when the initial Contractor's personnel boards the vessel at the Contractor's facility or upon the vessel going on to it's own power prior to departure. In either case, the Contractor will be responsible for the vessel the entire time it is in drydock. Certificates of Delivery and Redelivery Acceptance will be completed as appropriate.

The vessel shall be drydocked immediately after arrival at the Contractor's shipyard, unless stipulated otherwise by the PGM Port Engineer or as mutually agreed to between the Contractor and PGM Port Engineer. Unless explicitly agreed in writing, the vessel, once drydocked shall remain on dock and the dock shall remain dry until all underwater items and other items best accomplished in the drydock, are fully completed to the satisfaction of the PGM Port Engineer.

Soonest possible after the vessel's arrival, the Contractor's Representative and his foremen, both night and day shift, shall meet onboard, or as otherwise agreed, in order to be introduced to the PGM Port Engineer and his staff. The Contractor shall present the working schedule, and identify responsible persons for each repair item.

Each day, at a mutually agreed time, the representative of the Contractor shall meet with the PGM Port Engineer and his staff onboard or as otherwise agreed, to present a status report and a working plan for the next 24 hours.

The Contractor shall have one Ship Manager in charge of all work and this Manager is only to attend this vessel.

No tanks, machinery or equipment, opened up for repair or other purposes are to be boxed up or closed until inspection and acceptance by the PGM Port Engineer or his delegate.

All work specified hereafter shall be inspected and approved by the PGM Port Engineer or the person he authorizes.

The PGM Port Engineer may add, cancel or modify individual Specification items in writing as may be required. Any changes to bid prices and time to do the work shall be pursued expeditiously and presented to the PGM Port Engineer within 6 hours of notification of change. Such changes shall be agreed in writing by the Contractor and PGM Port Engineer prior to undertaking the modification. Such agreement shall specifically set forth the change, if any, in the completion of the here under.

PGM reserves the right to perform normal overhauls, repairs and maintenance on deck and in the engine room by using their own crews, while the vessel is at the Contractor's facility.

PGM reserves the right to engage sub-contractors to perform work, furnish services and/or materials not covered by the specifications. The Contractor shall permit employees of such Sub-Contractors access to the shipyard and the vessel for such purpose.

It is understood that time is of the essence in pursuing the repairs specified herein. Should PGM wish to expedite the work through the use of overtime, the PGM Port Engineer shall issue such request in writing to the Contractor as an additional item.

As a condition precedent to any payment to the Contractor, the Contractor shall furnish documentation indicating that the vessel is free of any and all liens (including maritime liens), charges, encumbrances, and claims arising out of the work.

Should PGM within ninety (90) days of the vessel's departure from the Contractor's premises, advise the Contractor in writing of any failure to conform to the standards of the trade and all applicable Regulatory Bodies or defective material or workmanship provided by the Contractor in performance of the work required by the Specification, that was discovered within sixty (60) days of the vessel's departure from the Contractor's premises, such defects shall be corrected by the Contractor at his expense, if practicable, otherwise by MARAD at the Contractor's expenses.

After completion of all work, the Contractor is to supply records in triplicate which shall be presented to the PGM Port Engineer, not later than upon settlement of accounts. The records shall consist of all readings of clearances, calibration reports, application records, reading of measurement and major component repair/renewal records. The Inspection and Repair Record should comprise but not be limited to the following as applicable:

1. Main Engine
2. Tailshaft, stern bearing and propeller
3. Auxiliary Engines and steering gear machinery
4. Deck machinery, ventilation and cargo gear
5. Hull gauging
6. Paint application
7. Rudder and stock
8. Anchor chains
9. Cathodic protection anodes and reference calls
10. Fractures
11. Cargo and ballast piping systems
12. Major steel renewals
13. Auxiliary Boilers, heat exchangers, tube renewals/plug records
14. Electrical inspections
15. Vibration and Thermodynamic analysis.

All quotations must include Contractor's time line schedule (Gantt Chart) of production and repair activities stating number of days required to complete all items as listed in the proposed work specification. A work planning chart including the number of planned shifts per day as well as the daily manning per specification item to accomplish this work must supplied. A detail of Man-hour billing rates for straight time, overtime and shift differentials is to be provided based on skilled and unskilled trades as well as any other specialized trades considered applicable for the items included in this Specification. Saturday, Sunday and Holiday rates are also to be included.

All bids timely received shall be evaluated to determine best value to the owner. Award shall be on this best value basis as determined by PGM. In this regard, the following is a partial, though not all inclusive, listing of the criteria PGM may consider in choosing a Contractor;

· the extended total of the quoted prices as found on the Contractors tender

- the completeness of the tender
- the past performances of the Contractor
- the total value of the final product
- the availability of the Contractor's facility
- the time quoted for completion of items included in the Specification
- the timeliness of responses to pricing and clarification requests
- geographic location and resultant diversion or additional cost to MARAD if any
- any alternative proposals submitted by offerors

PGM reserves the right to require bid, payment, or performance bonds in instances where, in the judgment of PGM Management, circumstances exist that would justify the requiring of such bonds.

SPECIAL NOTE: The Contractor must furnish individual costs in the tender for each work item contained in the attached specification using the Quote Sheet provided with this Specification Package. Additionally, the Contractor must advise of any anticipated Holidays occurring during the expected contract period.

Notice of General Precaution
The Contractor shall provide continuously adequate protection of the work, Government property and adjacent property, and take all necessary precautions to free the work place from recognized hazards which are likely to cause death, illness, or injury to persons or damage to property.

The Contractor shall cause all its employees, subcontractors, agents, and others under the contractor's control boarding the vessel, or performing work in connection herewith, to comply with all applicable health, safety, labor and environmental laws, ordinances, rules and regulations. This shall include, but not be limited to, applicable standards of United States, the United States Coast Guard, Local and Municipal Authorities and Pacific-Gulf Marine, Inc. It should be noted that the vessel in question is a Public Vessel, therefore in addition to normal commercial practices, the Contractor must attest to its compliance with the Federal Acquisition Regulations Flow Down Clauses as appearing in an attachment (1) appended hereto.

Pacific-Gulf Marine, Inc. shall not be required to police contractors to comply with any of the fire, health, safety, labor or environmental rules, laws, regulations, or orders generally referred to herein and shall not establish or confirm any regulations, or orders.

The safe, proper and lawful handling, storage, removal and disposal of hazardous materials, asbestos, and hazardous, regulated and special waste is the responsibility of the Contractor. The Contractor must determine for itself whether work specified in this specification requires the removing, storage, handling or disposal of hazardous material, special, regulated or hazardous waste and include the price in the proposal. The Contractor shall be considered the generator and shall provide the Port Engineer all documentation pertaining to the sampling, analysis and disposal of all wastes generated during this contract.

All confined spaces, tanks, vessels, strainers, etc., with limited natural ventilation are to be provided with forced ventilation prior to entry. These spaces must be certified Safe for Workers by the marine chemist before entry. If hot work is to be performed, the marine chemist shall certify that the space is Safe For Hot Work as covered elsewhere in this specification.

Contractor shall furnish and maintain sufficient temporary lights to insure the affected spaces are adequately lit, providing a safe effective working environment.

DEFINITIONS:
The following terms shall have meanings as listed below throughout the General Conditions and the Specifications for the Drydocking and Repairs to the M/V "CAPE HUDSON";

- "AS ORIGINAL" means a condition meeting the original system and manufacturer's design.
- "AS APPROVED" or "TO THE APPROVAL" or "FOR APPROVAL" or "AS DIRECTED" or "AS REQUIRED" are used without further qualification, indicating the decision of the PGM Port Engineer is required. Where an item is required to be submitted for approval, work shall not proceed until notification of approval is received. In the event the item is not approved, rationale will be provided and work shall not proceed until a satisfactory and mutually agreeable resolution has been resubmitted and approved.
- "CFE" and "CFM" identify Contractor Furnished Equipment and Material and are used interchangeably.
- "CONTRACTOR" identifies the shipyard or topside repair company holding the primary contract for the work supplied in this Specification.

· "DETACH" or "DISCONNECT" mean to disconnect all attachments to the unit to enable the unit to be moved. All attachment points shall be tagged, identified, blanked and protected to facilitate reinstallation. Work items do not necessary identify interferences and the Contractor is responsible for the identification and resolution of interferences affecting a detachment and subsequent movement.

· "GOOD MARINE PRACTICE" means construction to soundly conceived and engineering detailed working plans, prepared by the Contractor, incorporating the specified components and utilizing recognized shipbuilding construction and testing methods to ensure that the completed ship conforms to specification requirements. Inspection by the PGM Port Engineer is for the purpose of verifying the proper function of the Contractor's quality assurance measures and is not considered a substitute for in-process control of quality by the Contractor.

· "GFE" or "GFM" identify Government Furnished Equipment and Material and are used interchangeably.

· "GOVERNMENT" or "MARAD" mean the U. S. Government, including the U. S. Maritime Administration or its authorized representative.

· "INSTALL" or "EXTEND" or "MODIFY" mean that the Contractor shall provide the piece of equipment, material or system to be installed and shall provide the materials, structural supports and labor to attach, connect and test the equipment or systems to effect a finished fully operational installation complete in all aspects.

When new material or equipment is not specified by type, the material or equipment shall be identical to the existing. When "install" is used with reference to GFE, all conditions of the above definition except the requirement to provide the specific piece of equipment are applicable.

Work items do not necessarily identify interferences and the Contractor is responsible for the identification and resolution of interferences affecting the installation by temporarily removing, reinstalling or relocating interferences. The Contractor shall temporarily remove, permanently relocate, alter, and reroute all interferences, including but not limited to ductwork, piping, wireways, fixtures, insulation, joiner linings, equipment, furniiture, etc. to facilitate fully operational installations and modifications covered by this Specification. In the event that piping, ductwork, equipment, joiner linings, etc., must be temporarily removed to facilitate new or modified work, the Contractor shall subsequently reinstall same in an "as original" condition.

· "INTERFERENCE" means that a pipe system, ductwork, equipment, joiner bulkhead or lining, wireway, structural member, access opening, or other object(s), equipment, system, or components that must be removed and reinstalled, relocated, modified, or designed around to facilitate the repair, or installation of new or modified equipment or systems.

· "LABOR AND MATERIALS" means labor, material, plant facilities, supervision, services, equipment and all other resources required to accomplish the specified work.

· "MANIFESTS" are the official shipping document forms originated and signed by the generators, transporters, and operators of the hazardous waste disposal facility as required by Federal, State and Local Authorities.

· "MODIFY" means to provide materials, services, and labor to change or alter the item or system resulting in a finished and fully operational modified installation complete in all respects. The term "MODIFY" implicitly includes all requirements of "REMOVE AND INSTALL".

· "OFE" or "OFM" identify Government Furnished Equipment and Material and are used interchangeably with "GFE" or "GFM".

· "OR EQUAL" means that components or equipment shall be equivalent in terms of performance, services required, compatibility with interrelated systems and arrangements and supportability over the service life of the components or equipment. In the case of component or equipment substitution for those components or equipment noted on the Contract Guidance Drawings or Specification, the Contractor shall submit a written request delineating the design and the performance data on both the specified and substituted piece of equipment for PGM Port Engineer approval and if approved, the Contractor shall take full contractual and technical responsibility for ensuring installation of components or equipment's or both and compatibility with interrelated systems.

· "REFURBISH" means to detach, temporarily remove, disassemble, clean, reassemble the unit, equipment or system using new screws, bolts, gaskets and replacement parts and to reinstall and test the unit, equipment or system to demonstrate proper function to the manufacturer's tolerances. The reinstalled refurbished unit, equipment or system shall be fully operational and complete in all aspects.

· "REGULATORY BODY" or "REGULATORY BODY REQUIREMENTS" mean the American Bureau of Shipping or a Federal or International Regulatory Agency or an organization which is authorized by the agency to perform delegated regulatory functions on its own behalf.

· "REINSTALL" means that the Contractor shall provide all material and labor to install a piece of equipment, material or system after the equipment, material or system was temporarily removed, relocated, modified, or refurbished.

· "RELOCATE" means to provide all labor, material to detach the unit, equipment, or system and to reinstall the same unit, equipment, or system at a new or modified location.

· "REMOVE" or "RIP OUT" means to provide all labor and materials to disconnect, detach, and transfer the unit, equipment, materials, system in its entirety off the ship. All removed materials shall be disposed of in accordance with the PGM Port Engineer's

directions. Part of removal process is to blank openings, remove brackets, hangers, foundations, etc. and to restore all temporarily removed items including re-insulation and paint touch up to "as original" condition.

· "REMOVE AND REPLACE INTERFERENCES" shall be construed to mean that the Contractor shall provide all labor, material and equipment necessary to remove, modify if required, material and equipment that cause interference in the way of intended installation, or removal path of any equipment or component, and replace or reinstall in the "as original" condition. The specific Specification items do not necessarily identify interferences to be resolved. The Contractor shall be totally responsible in the performance of the Specification for the identification and resolution of interferences necessary to complete the work required by this Specification. All open ends left as a result of these removals shall be suitably protected to prevent any and all contaminants from entering the system or piece of equipment.

· "REPLACE" or "RENEW" means to remove the existing unit, equipment, or systems, including all interferences and to install a new unit, equipment or system which is either identical to or equal to that which was removed; the installation shall include at a minimum all hook-up, supports, and adapters which are required to effect a fully operational installation complete in all respects.

· "TAG OUT" means a procedure to both notify personnel that tagged-out equipment, components, or systems are either isolated or not in a normal operating condition, and is done as a means to prevent injury to personnel, improper operation, or damage to tagged-out equipment, components or systems.

· "TEMPORARY REMOVAL" or "TEMPORARY REMOVE" means to provide all labor and materials to disconnect and remove the unit, equipment or system from its initial location and to reinstall the same unit, equipment, or system whether in the same location or elsewhere on the ship as described in the Specification.

· "UPGRADE" means to increase the capability of the item to the current state of practice at the time the work is accomplished.

ATTACHMENT 1

FLOW DOWN CLAUSES

NOTE: FOR EACH SOLICITATION ISSUED OR CONTRACT AWARDED THE FOLLOWING CLAUSES WILL APPLY.

FAR CLAUSES:

FAR 52.222-26 EQUAL OPPORTUNITY (E. O. 11246)

FAR 52.222-35 AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS (38 U.S.C. 4212(a))

FAR 52.2222-36 AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (29 U.S.C. 793)

VESSEL PARTICULARS

Owner: United States Department of Transportation400 Seventh Street, S.W.Washington, DC 20590
Ship Manager: Pacific-Gulf Marine, Inc.P. O. Box 6479New Orleans, LA 70174

Vessel Particulars

Type: Ro/Ro Cargo Vessel
Building Yard: Kaldnes Mek Verksted A/S
Tonsberg, Norway
Year Built: May 1979
Hull Number: 212
Class: American Bureau of Shipping
Class ID: ABSID 7914866
Official Number: D901l27
IMO Number: 7704930

Dimensions:

Length Overall 228.50 m
Length Between Perp. 210.00m
Breadth Molded 32.36 m
Depth Molded to Upper Deck 20.20 m
Draft on Summer Freeboard 10.80 m

Tonnages:

	Gross	Net
International	21,976 mt	12,006 mt
Suez Canal	42,925 mt	34,331 mt
Panama Canal	43,505 mt	33,860 mt

Displacements:

Loaded 51,810 mt
Lightship 20,159 mt
Deadweight 31,561 mt

Machinery Particulars

Main Engine

1 Akers/B & W Diesel Engine, Type 9K90GF 2-Stroke Turbocharged
900 mm bore
1,800 mm stroke
Continuous Output - 20,520 kw (27,900 BHP) at 110 RPM
Max. Continuous Output - 22,580 kw (30,700 BHP) at 114 RPM

Machinery Particulars

Auxiliary Engines

Diesel Generators:
2 MAK Diesel Engines, Type 8M453AK
320 mm bore
420 mm stroke
Max. Continuous Output @ 600 RPM - 2,200 kw
2 Generators - NEBB - 2,000 kw, 2,500 kva, 450 V, 60 Hz

2 MAK Diesel Engines, Type 6M453AK
320 mm bore
420 mm stroke
Max. Continuous Output @ 600 RPM - 1,650 kw
2 Generators - NEBB - 1,550 kw, 1,938 kva, 450 V, 60 Hz

1 Emergency Diesel Generator 155 kw/194 kva @ 1,800 RPM, 450 V, 60 Hz

Propeller

Manufacturer: Theodor Zeise
5 Blades
Diameter: 6,700 mm
Weight: 34,568 kg

Propeller Nut: Pilgrim type 3-Doncasters Moorside Ltd
Outer Diameter: 920mm

Bow and Stern Thrusters

Manufacturer: AM.Liaaen - Aalesund, Norway
Series B-48 (Stern) B-49 (Bow)
Dia 2440 rpm, 260 RPM
Bow Thruster Motor:NEBB Type QRV 710 db8 1320 kW 895 RPM
Stern Thruster Motor:NEBB Type QFV 560 bd8 1320 kW 890 RPM

Steering Machinerv

1 Steering Gear Electric Hydraulic type PORSGRUNN 550-140

Deck Machinery

Windlass and Mooring Winches of NORWICH make:
1 Comb. windlass/auto mooring winch. ... 20 t.pull at 30 m/min
4-20 t. auto mooring winch. 20 t.pull at 30 m/min
4-12 t. auto mooring winch. 12 t.pull at 30 m/min

Ramp Winches

Manufacturer - AB. Lidansv Motorverkstad
2-Hydraulic Ramp Winches, type WI self tensioning .. 25t pull at 22 m/min
2 Hydraulic Ramp Winches type W2 self tensioning ... 9t pull at 11 m/min

Cargo Deck Crane

Aker-Norway 40 ton Capacity

Exhaust Gas Economizer

Manufacturer Aalborg Verft A/S
Type AV-6
Capacity 3000 kg/h
Working Press 6 bar

Auxiliary Boiler

Oil Fired
Manufacturer Aalborg Verft A/S Type AQ 12
Capacity 3000 kg/h

Tank Particulars

WATER BALLAST TANKS (100% Full- Sp. Gr. 1.025)

Tank	Frames	Cu.M.	Tons at l000kg	
Fore Peak Tank	237-ST	918.9	941.8	
Fwd Lower Tank	202-218	678.2	695.1	
No.2 DB Ballast Tank P	132-164	251.5	257.5	
No.2 DB Ballast Tank S	132-164	241.5	247.5	
No.3 DB Ballast Tank P	98-128	519.9	532.8	

No.3 DB Ballast Tank S	98-128	519.9	532.8	
No.4 DB Ballast Tank C	64-%	273.0	279.8	
No.4 DB Ballast Tank C	64-%	226.8	232.4	
No.1 Lower Wing Tank P	181-202	320.5	338.5	
No 1 Lower Wing Tank S	181-202	320.5	338.5	
No.2 Lower Wing Tank P	146-178	304.7	312.3	
No.2 Lower Wing Tank S	146-178	295.2	302.5	
No.3 Lower Wing Tank P	110-142	284.2	291.3	
No.3 Lower Wing Tank S	110-142	272.9	279.7	
No.4 Lower Wing Tank P	68-104	224.3	229.9	
No.4 Lower Wing Tank S	68-104	296.6	304.0	
No.1 Upper Wing Tank P	184-237	734.4	752.7	
No.1 Upper Wing Tank S	184-237	750.3	769.0	
No.2 Upper Wing Tank P	156-176	132.7	136.0	
No.2 Upper Wing Tank S	156-176	130.8	134.0	
No.3 Upper Wing Tank P	112-140	177.2	181.6	
No.3 Upper Wing Tank S	112-140	173.3	177.6	
No.4 Upper Wing Tank P	68-98	177.8	182.2	
No.4 Upper Wing Tank S	68-98	185.6	190.2	
Aft Peak Tank	1-17	771.9	791.1	
TOTAL WATER BALLAST			9,102.0	9,412.1

FRESHWATER TANKS (100%- Sp. Gr. 1.000)

Tank	Frames	Cu.M.	Tons at l000kg	
Fwd. Upper Side Tank P	202-218		287.2	287.2
Fwd Upper Side Tank S	202-218		287.2	287.2
Feed Water Tank 31-34	35.2	35.2		
TOTAL FRESH WATER		609.6	609.6	

Tank Particulars

FUEL OIL TANKS (98% Full- Sp. Gr. 0.95)

Tank	Frames	Cu.M	Tons at 1000kg	
Fore Deep Tank P	218-231		570.0	541.5
Fore Deep Tank S	218-231		579.2	550.2
No.1 DB Tank P	166-202	420.7	399.6	
No.1 DB Tank S	166-202	457.2	434.3	
No.2 DB Center Tank P	130-166	562.7	534.5	
No.2 DB Center Tank S	130-166	517.0	491.1	
No.3 DB Center Tank P	96-130	285.5	271.2	
No.3 DB Center Tank S	96-130	321.9	305.8	
HFO Settling Tank P	20-28	63.0	59.8	
HFO Service Tank P	28-35	59.0	56.0	
No.5 DB Wing Tank FO Sludge P	35-64	200.0	190.2	
No.5 DB Wing Tank FO Overflow Drain S	35-64	186.3	176.9	
TOTAL FUEL OIL		4,222.5	4,011.3	

DIESEL OIL TANKS (100% Full- Sp. Gr. 0.85)

Tank	Frames	Cu.M.	Tons at 1000kg
No.4 DB Wing Tank P	64-94	398.7	338.8
No.4 DB Wing Tank S	64-94	398.7	338.8
DO Settling Tank P	20-24	26.3	22.3

DO Service Tank P	24-27	22.6	19.2
TOTAL DIESEL OIL		846.30	719.10

Tank Particulars

OTHER TANKS 100% FULL

Tank	Frames	Cu.M	Tons at 1000kg	
Lube Oil Sump - Center	35-61	72.3	N/A	
Lube Oil Tk 1 P	56-61	21.2	N/A	
Lube Oil Tk 2 P	56-62	21.2	N/A	
Gen. L.O. Storage 1 P	56-62	17.6	N/A	
Gen. L.O. Storage 2 P	56-62	16.7	N/A	
Cyl. Storage 1 P	56-62	28.6	N/A	
Cyl. Storage 2 P	56-62	28.2	N/A	
Gen L.O. Drain Tank S	27-31	4.9	N/A	
Bilge Tank C	20-31	86.8	N/A	
Bilge Water S	60-64	31.4	N/A	
F.W. Drain Tank P	62-64	10.0	N/A	
Stern Tk F.W. Cool C	7-20	73.7	N/A	
Sewage Tank P	39-40	21.1	N/A	
Sewage Tank S	39-40	19.9	N/A	
Separated Oil P	35-36	9.5	N/A	
Blended Oil Tank P	27-31	35.5	N/A	
D.O. For Forklift S	9-13	26.7	N/A	

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0113 Deck Protection
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0115 Shipboard Access and Security
0116 Cleaning Engine Room Bilges
0117 Chemist Certificate
0118 Hazardous Waste Management
0119 Production Control

INTENT

Provide private office, equipment and supplies for PGM and Owner's personnel during the contract period.

ITEM LOCATION/DESCRIPTION

Provide a 400 square foot private office, or equal, for the use of PGM and Owner's personnel, exclusive from contractor personnel. The office shall be accessible 24 hours a day and seven days a week and shall include electricity and running water. The office is to be located close by the vessel and shall be outfitted two days prior to the vessel's arrival at the Contractor's facility, for the duration of the contract, and for three days after the vessel departs the Contractor's facility with the following:

1. Four (4) desks with chairs. The Secretary's desk to be suitable for use as a computer work station. There shall be sufficient surface area to allow for the use of the desk with the computer, screen, keyboard and printer in place.

2. Four (4) side chairs

3. One (1) Refrigerator (Nine cubic feet capacity-minimum)

4. One (1) Coffee Maker w/supplies (coffee, sugar, creamer)

5. One (1) Office copying machine capable of copying legal size, letter size and 11 in. x 17 in. paper with reduction and enlargement modes, sort, document feeder and duplex modes.

6. One (1) Electronic desk calculator with tape printout.

7. Operating climate control system(s) sufficient to maintain seventy-five degrees throughout the office.

8. Office supplies for four persons and equipment. Refer to required supplies list in section 7.1 of this item.

9. One (1) Wall Clock

10. One (1) Electronic Date/Time stamp

11. Reserved parking spaces for five cars in the immediate vicinity of the office.

12. Private toilet facilities integral to or in the immediate vicinity of the office for use only by the PGM and Owner's staff.

13. Janitorial services on a nightly basis to clean toilet facilities and office.

14. Sufficient electrical outlets placed conveniently to the desks for connecting desk equipment, computers (four (4) total), copy machine, calculators, etc. Six (6) each multiple (approximately seven outlets) outlet strip surge protectors with phone line protection and a 4 ft. power cord are to be provided.

15. One (1) plain paper facsimile machine with dedicated phone line. This machine must be capable of a minimum of fifteen (15) sheet auto document feed.

16. Sufficient lighting for accomplishment of normal office work.

17. Two (2) Legal File cabinets (four drawers with locks and keys)

18. Five (5) Sets of keys for all doors on trailer

19. Provide services of an overnight mail or courier service. Assume for bidding purposes, two envelopes per week.

20. One (1) cold bottle water dispenser with a minimum of twenty gallons of bottled water supply per week.

21. Four (4) telephone lines for office use with unlimited local phone service. Provide four telephones with speakers for conference calls. Service shall be on a twenty-four (24) hour-a-day basis. One (1) phone shall be equipped with an up-to-date answering machine. Allow one-thousand dollars ($1,000.00) in long distance charges for bidding purposes. Actual charges will be paid at cost, and the Contract value adjusted accordingly. Contractor shall submit original invoice to the PGM Port Engineer.

22. A central phone station shall be supplied where the office assistant can answer and transfer incoming and outgoing calls. Additionally, install automatic roll-over from the subordinate lines to the main telephone number.

23. One (1) telephone with land based service restricted to local use only, to be installed on the ship in the engine room at the maneuvering desk.

24. Contractor shall provide one (1) land based telephone service aboard the vessel in a protected enclosure at or near the gangway. This telephone to be restricted to local business calls only, provided all necessary parties listed in paragraph 25 below are reachable without toll charges.

25. All PGM Office and vessel telephones shall be equipped with instructions in English for effecting emergency procedures which shall also be clearly posted in the immediate vicinity of the telephone. These instructions shall include day and night telephone numbers of the Contractor's Senior Officials, Ship Supervisor, Gatehouse, Security Office, Safety Office, Ambulance, Fire Fighting Departments, Local Police Departments and PGM Port Engineer.

26. Two (2) IBM compatible Pentium IV computers, 800 MHz or higher with a minimum of 128 MB 100 MHz SDRAM, 256 Kb Pipeline Burst Cache, 1.44 Disk Drive, 1.2 Gigabyte hard drive, internal CD-RW Drive, with ten CDR disks, 1.2 Gigabyte Tape Back-up System with three (3) tapes, 56.6 v.90 Fax/Modem, Mouse and Mouse Pad, Keyboard and 17" Super VGA Monitor, .25 mm 1280 x .1024. Two Hewlett Packard LaserJet 1200s.

27. The following software with documentation and manuals (to be loaded on each computer, software to be per computer and is to be properly registered to PGM and becomes the property of PGM):

Microsoft Windows XP Professional
Microsoft Office 2003, Professional
Microsoft Project 2003
WinZip 8.0
Adobe Acrobat Standard

Contractor shall provide unobstructed access by PGM and Owner's personnel to the vessel, office, and other areas of the Contractor's facility where planning or vessel component repairs are taking place on a twenty-four hour, seven day week basis for the duration of the contract. There shall be no requirement for PGM or Owner's personnel to sign waivers of liability.

The Contractor shall provide and install signs mounted to office facilities which reads: "PGM Personnel Only - Off Limits to Contractor Personnel"

PERFORMANCE CRITERIA/DELIVERABLES

Timely and complete supply of office space, equipment and supplies as described and listed in this item. Required office supplies list:

Description	Quantity
Copy Paper, better grade, 8-1/2" x 11"	3 cases
Copy Paper, better grade, 8-1/2" x 14"	5 packages
Copy Paper, better grade, 11" x 17"	1 package
Lined pads, white, letter size	10 each
Lined pads, yellow, letter size	10 each
Memo pads, 2-1/2" x 5"	5 each
Paper clips, standard	1 box
Paper clips, jumbo	1 box
Binder clips. small	1 box
Binder clips, medium	1 box
Binder clips, large	1 box
Push points	1 box
Retractable ball point pens, inexpensive, medium point, black	1 box
Retractable ball point pens, inexpensive, medium point, blue	5 each
Retractable ball point pens, inexpensive, medium point, red	5 each
Mechanical pencils, 5 mm lead	5 each
Mechanical pencil leads, 5 mm	1 package
Magic Markers, black	5 each
Bullet point markers, black	2 each
Liquid Paper, white	3 each
Dryline Correction Film, 1001-0720	2 each
Hanging file folders, legal size	6 boxes
Manila Folders, legal size	1 box
Clasp envelopes, 10" X 13", brown	20 each
4" D-ring view binders	12 each
1-1/2" view binders	6 each
1" view binders	6 each
Self-inking stamp, faxed	1 each
Self-inking stamp, original	1 each
Self-inking stamp, copy	1 each
Self-Inking stamp COMPLETE (open face letters ½" x 4")	1 each
Staplers, with staples	3 each
Scotch Tape dispensers, with tape	3 each
Three hole punch, large hole (3/16"), 14 - 30 sheet capacity	1 each
Avery Multipurpose Labels, 2" x 4", #0700-2771	1 package

Description	Quantity
CD-R recordable compact disks 50 pack	1 each
Paper cutter (to cut legal size)	1 each
Scissors	2 pair
Staple remover	3 each
High lighters, assorted colors	8 total
Reinforcing holes	1 package
Cork Bulletin Board	1 each
Rulers, 12 and 15 inch	2 each
Erasable scheduling calendars, 30 day	2 each
Dry markers, assorted colors with eraser, for above	1 set
Back-up UPS, 450 VA, 15 minute minimum usage	2 each
Write-On Dividers with Erasable Tabs, White, Avery #23075, 5 per package	20 packages
Laser Labels, 1/2" x 1-3/4", Avery #5257, White	1 box

NOTES

None.

INTENT

This item describes the general towing requirements to and from the Contractor's facility.

WORK DESCRIPTION

The Contractor shall accept the vessel at its present location (Pier 50, San Francisco, Ca.) and tow the vessel to the Contractor's facility, securing it safely in the drydock as covered elsewhere in this specification. Upon completion of all items included in this specification, and any approved growth, the Contractor shall tow the vessel back to her berth (Pier 50, San Francisco, Ca.) to be moored outboard of the CAPE HUDSON where the vessel will be redelivered.

For purposes of these tows, the vessel is to be considered a completely "DEAD SHIP" at all times.

Confirm the installation of, or install as necessary, shaft lock and rudder lock to meet the requirements of the towing underwriter.

Provide sufficient number of tugs of adequate size and horsepower, all Pilots and towing equipment (chain bridle, shackles, cables, emergency towing cable, necessary battery powered lights, safety and boarding equipment, shaft and rudder locks) necessary to effect a safe tow.

Provide all line handling and riding crews required onboard the vessel and ashore to adequately handle lines, gangway, navigation and safety responsibilities during departures, while in transit and upon arrival at the Contractor's facility and the vessel's lay berth.

Riding crew shall be of sufficient size to ensure all requirements of the towing surveyor, pilots and regulatory agencies are met. The riding crew shall be provided with three portable radio transceivers capable of transmitting and receiving on all standard VHF marine frequencies. One riding crew member with a radio shall be stationed at vessel's bow, one at stern, and one with attendant alongside the pilot on the bridge or as directed by the pilot.

Line handling and riding crew to be outfitted with all equipment and tools deemed necessary in accordance with USCG, ABS and MARAD Regulations as well as personal safety equipment to include, at a minimum, safety shoes, hard hat, life preserver, flashlight and gloves suitable for handling wire rope and mooring lines. NOTE: The riding crew is NOT to use vessel's heads, sinks or showers.

Provide sufficient food, water and portable sanitary facilities for all of the riding crew and pilot. All rubbish, trash and garbage generated during the tow, as well as the sanitary facilities shall be removed from the vessel within twenty-four (24) hours of arrival at Contractor's facility.

Riding crew onboard to be available for immediate action at all times to perform all duties in support of the Pilot and tugboats. Furnish necessary transportation (water taxis, vehicles, etc.) to pick up riding crew for their return to their point of engagement.

Provide the services of a qualified Marine Surveyor, approved by the PGM Port Engineer and the towing underwriters to survey the vessel and to certify the adequacy of the vessel condition for the tows, the towing arrangement and all tugboats utilized for the tows. A survey report attesting to the suitability of the above shall be submitted to the PGM Port Engineer not less than forty-eight (48) hours prior to the commencement of tow. Properly completed towing calculations in support of this statement of suitability must be included in this survey report.

Provide all services required to prepare the vessel for towing in compliance with the recommendation of the above mentioned Marine Surveyor and the PGM Port Engineer. Any measurements necessary to prepare the ship for safe towage shall be the Contractor's responsibility and shall be accomplished at his expense.

Contractor shall furnish total insurance coverage specifically for all liabilities of hull and machinery, protection and indemnities (towing liability insurance) as described in the GENERAL & ADMINISTRATIVE REQUIREMENTS of this Specification.

Insurance documents are to be provided to the PGM Port Engineer prior to commencement of any work.

Contractor to obtain all certificates for all tows, towing certificates, permits, loadline exemptions, equipment testing, proof of insurance and supply copies to PGM Port Engineer 48 hours prior to tow.

PERFORMANCE CRITERIA/DELIVERABLES

Contractor shall provide proof of Towing Liability Insurance prior to the commencement of any work on board the vessel or at the Fleet.

Contractor shall provide towing certificates, permits, loadline exemptions and towing calculations 48 hours before the tow.

Contractor shall fax vessel departure report with ETA, position reports with updated ETA's and the arrival report as noted below.

NOTES

If an emergency situation arises the below parties are to be notified directly via telephone with a follow-up fax detailing the situation.

PORT ENGINEER:
Dan Perry Office # (510) 749-0903
Fax # (510) 749-8351
Cellular # (510) 786-7323

PGM:
Bill Richards Office # (504) 362-8121
Fax # (504) 364-6484
Cellular # (504) 289-2517

PGM:
Dale Sirois Office # (504) 362-8121
Fax # (504) 364-6484
Cellular # (504) 289-4511

PGM:
Rich Boyer Office # (504) 363-8121
Fax # (504) 364-6484
Cellular # (504) 289-2142

Towing Contractor shall transmit via fax to the above listed fax numbers the notification of departure and ETA within one (1) hour of vessel leaving the Fleet, a position report and updated ETA every six (6) hours while in transit and arrival details within one (1) hour of arrival at the Contractor's facility.

Vessels mooring lines shall not to be used for towing or mooring.

The vessel is to be moored outboard of the CAPE HORN on her return to pier 50.

INTENT

This item describes the gangway requirements at the Contractor's facility.

WORK DESCRIPTION

Gangways

Contractor to set up a minimum of one (1) safe, lighted gangway complete with handrails and safety net for movement of personnel to and from vessel. The Contractor is to disconnect and reconnect gangway(s) and safety net(s) for each vessel movement and disconnect and remove prior to departure.

Any additional gangways required by the Contractor or any local, state or federal agency are for the account of the Contractor.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

The vessel's gangways and nets are not to be used without expressed written permission.

INTENT

Provide quote for wet berthage, tugs and pilots for shifting and general services to the ship.

REFERENCE

General Arrangement.

WORK DESCRIPTION

Wet Berth

Provide a suitable berth where ship may lie safely afloat if required during this contract and where Contractor's personnel can perform all work specified in the Items of these Specifications or additional work found necessary which can be accomplished during ship's contract availability. Contractor shall supply mooring lines. Ship's mooring lines are not to be used. Soundings at berth will be required prior to vessel's arrival with a minimum of 4 feet clearance from keel at lowest tide.

Tugs and Pilots

Contractor shall provide tugs of adequate number and horsepower, as well as all pilots for arrival, departure and as required to shift the vessel for performance of work during the contract period and shall provide labor both on board and ashore to handle lines and gangway for all moves.

Services

Provide shore power, fresh water, security services, fire protection, garbage and debris removal, sanitary facilities, deck protection, gangways, compressed air and telephones as described in the services section of this specification.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

This item is for the Contractor's account and the Contractor shall proved an Item Price on the quote sheet to cover this item. Additional options may be exercised for the Owner's account and therefore some unit prices are being requested.
INTENT

The intent of this item is to connect the vessel's sewer system overboard to a shore sewage disposal system during drydock period while crew is living aboard.

REFERENCE

Docking Plan.

WORK DESCRIPTION

Provide hoses and fittings, make all connections, disconnections and reconnections, and remove and replace all piping, valves, fittings and equipment required to connect the vessel's sanitary system discharge to a Contractor-furnished sewage holding tank or a shore side sewage disposal system. This is required for removal of sanitary waste from the vessel on a 24-hour/day basis for the entire time that the ship is at the Contractor's facility. Sanitary waste shall be disposed of by the Contractor at his expense in accordance with all Federal, State and Local regulations.

It is to be noted that the vessel's ten man Reduced Operating Status (ROS) crew will be living and working onboard the vessel throughout the duration of the repair contract. The Contractor shall respect this condition and shall not enter the accommodation or other such non-working area without the prior approval of the PGM Engineer. The Contractor will accordingly not be allowed to use the vessel's facilities (offices, toilets, etc.)

The Contractor shall provide and maintain portable toilets on board the vessel for use by Contractor personnel. Vessel facilities will be off-limits to Contractor or their Sub-contractor's personnel. It is to be noted that the Contractor will not be allowed to use any office space that exists on the vessel.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

None.

INTENT

This item describes the requirements for shore power to be supplied to the vessel while she is drydocked and/or berthed at the Contractor's facility.

WORK DESCRIPTION

Upon arrival, the Contractor shall provide a reliable source of power at a minimum capacity of 800 Amps of electrical power at 440 volts AC, 3 phase, 60 Hz. The Chief Engineer is to witness initial (at startup) and final (at project completion) power meter readings. The Contractor's personnel shall connect the electrical power at the shore connection. The Contractor's shore power breaker shall be equipped with single phase and low voltage protection device(s). All electrical cables utilized shall be in good material condition, free of tears, cracks, or poorly repaired insulation. Cables that are spliced shall be insulated in accordance with current IEEE codes

The ship is equipped with a total of three (3) U.S. Navy Standard Shore Power Receptacles, 400 amps each (MIL-C-24368/2). Contractor shall furnish two (3) 400 amp compatible shore power plugs (MIL-C24368/1) connected to its shore power cable for connecting the shore power supply directly through the ship's shore power connectors located at 5 Deck, starboard side aft.

Electrical shore power shall be supplied to the ship through Contractor provided circuit breakers, of the appropriate capacity, installed on the pier between the ship and the pier side connection. Power usage meters will be provided which measures the power consumed by the vessel. The Contractor is to provide more than one meter if required for multiple lines. The Vessel's Chief Engineer shall witness the initial and final meter readings. Daily readings are to be logged and provided to the PGM Port Engineer at the completion of the contract.

The Contractor shall maintain AC power continuously at a maximum of 450 volts and a minimum of 420 volts during the entire availability the ship is on shore power. The Contractor shall provide and install a voltage recording device and continuously record the voltages at the shore power to ship connection. The chart recordings shall be delivered to the PGM Port Engineer on a weekly basis.

The Contractor is to disconnect and reconnect shore power for each vessel movement and disconnect prior to departure.

PERFORMANCE CRITERIA/DELIVERABLES

The Contractor is to provide power meter readings at the start and at the end of this drydock project on all meters if more than one is utilized.

The Contractor is to provide the voltage recording chart to the PGM Port Engineer weekly.

NOTE

1 Plug/Receptacle per Phase.

The Chief Engineer is to witness initial (at start) and final (at end) power meter readings on all meters if more than one is utilized.

Power usage meters to measure shore power to vessel only. No Contractor power usage to pass through these meters.

INTENT

This item describes the minimum requirements for fire protection while the vessel is at the Contractor's facility.

REFERENCE/ENCLOSURES

National Fire Protection Association, Standard for Fire Protection of Vessels during Construction, Repair and Lay-up, NFPA 312.

ITEM LOCATION/DESCRIPTION

Location: Throughout the vessel

Quantity: Approximately 500 meters of 1-1/2 inch fire hose plus Contractor determined length of 2-1/2 inch supply hose connected to a 24-hour pressurized shore based water source.

WORK DESCRIPTION

Fire Protection

Contractor shall comply with the National Fire Protection Association, Standard for Fire Protection of Vessels during Construction, Repair and Lay-up, NFPA 312.

Furnish and connect fire protection to vessel as follows:

One (1) 2-1/2 in. fire hose, run to main deck of vessel at ship's mid length; fitted with a manifold equipped with quick closing valves and four (4) 1-1/2 inch fire hoses of sufficient length to reach the far extremes of the vessel, one run forward, one run aft, one run to lower engine room and 1 run to lowest cargo deck. One all purpose nozzle is to be attached to the bitter end of each hose. Shore connection to be of sufficient capacity to provide a minimum of 400 GPM through the 2-1/2 inch hose. The on deck manifold is to be kept charged at full pressure at all times. DO NOT USE vessel's fire main system. Contractor shall provide competent fire watch and additional extinguishers, as necessary, in areas adjacent to burning and welding operations while same are in progress.

Provide eight (8) clearly marked, multipurpose A, B, C fire extinguishers (fully charged) with brackets temporarily mounted at the following Engine Room locations:

- Outside Each Engine Control Room Door (2)
- Outside Purifier Room
- Outside Engine Room Boiler Flat, 5th Dk.
- Outside Each (2) Engine Room Generator Flat
- Lower Engine Room Forward
- Lower Engine Room Aft

The necessary hose(s) are to be disconnected and reconnected for all vessel movements, with final disconnecting and equipment removals to take place immediately prior to the vessel leaving the Contractor's facility.

The Cable(s) and Hose(s) going through watertight and fire doors are to be disconnected during the off shifts.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

DO NOT USE Vessel's Fire Extinguishers or Fire Main Systems!

The Cable(s) and Hose(s) going through watertight and fire doors are to be disconnected during the off shifts.

INTENT

This item describes the requirements for potable and fresh water to be supplied to the vessel.

REFERENCES/ENCLOSURES

Capacity tables.

ITEM LOCATION/DESCRIPTION

Drinking Water: One (1) Cooler placed in the Chief Engineers Conference Room.

Potable Water: Shore Filling Connection

Fresh Water or Salt Water:One (1) A/C Cooling Water Supply Connection.
One (1) A/C Cooling Water Discharge Connection.
Description:

Provide drinking water on arrival. Provide potable fresh water for the potable tanks when directed by the PGM Port Engineer.

WORK DESCRIPTION

Provide the necessary labor, equipment and materials to provide drinking water for PGM Personnel, Regulatory Body Personnel and sub-contractors throughout the period of this contract and later disconnect and remove. One (1) bottled water cooler, or equal. Sufficient extra water and cups are to be provided to insure that there is a continuous supply. Waste containers are to be provided for discarded cups.

Provide hoses and fittings, make all connections, disconnections and reconnections, and supply all potable water required for vessel sanitary and culinary purpose via hoses fitted with breaker /back flow preventers to fill potable water tank.

Prior to redelivery of the ship, the Contactor shall fill the ship's potable water tanks. Approximately 250 tons of potable water will be required. This amount is in addition to the aforementioned requirements.

Upon arrival, provide all hoses and fittings, make all connections, disconnections and reconnections, to supply and discharge cooling water to the vessel's salt water cooling systems for the air conditioning systems.

The supply connection will be made via hose connections to the vessel's salt water cooling system in the A/C machinery room. The Contractor shall provide all necessary fittings and shall remove piping as necessary to make the temporary connection. The exact location of the connection will be determined by the PGM Engineer.

The overboard discharge connection will be made via hose connections to the vessel's salt water cooling system in the A/C machinery room. The Contractor shall provide all necessary fittings and shall remove piping as necessary to make the temporary connection. The exact location of the connection will be determined by the PGM Engineer.

The temporary cooling water lines shall be maintained at 50-psig water pressure at the outlet /discharge end at a minimum water/flow rate of 90 cubic meters/hour.
When the requirement for the temporary cooling water has ended, the Contractor shall restore the salt water cooling system to its original state.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

Contractor shall perform all connections and disconnections.

INTENT

This item describes the requirements for the supply of dry compressed air for ship's force or sub-contractor's use.

REFERENCE/ENCLOSURES

None.

ITEM LOCATION/DESCRIPTION

Location/Quantity

Minimum 100 psig.

WORK DESCRIPTION

Compressed Air:

Provide 100 psig dry compressed air at 200 CFM for Owner's use only, on a daily basis. The Contractor's personnel shall furnish, connect and disconnect all valves, fittings and hoses required. Do not tie into ship's compressed air piping system.

Contractor shall disconnect and reconnect all air lines for all movements of the vessel while at the Contractor's facility.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

This item is optional and is not to be considered released without written authorization from the PGM Port Engineer.

INTENT

This item describes the requirements for the pumping and disposal of accumulated waste oil and bilge water.

REFERENCE/ENCLOSURES

None.

ITEM LOCATION/DESCRIPTION

Throughout the vessel.

WORK DESCRIPTION

Vessel is currently maintained with all tanktops, drainwells and machinery space bilges in a dry condition. Such areas will be jointly surveyed by the Contractor and PGM Port Engineer upon acceptance of vessel by Contractor. Any areas that require liquid removal at commencement of this contract will be handled by a separate delivery order. From then until the completion of the contract, the Contractor is responsible for maintaining all spaces dry.

The Contractor shall provide all necessary labor, pumps, hoses, fitting, containments and transportation to accomplish removal of any and all accumulated liquids from these spaces and dispose of same in accordance with all Federal, State and Local Liquid Waste Handling Regulations.

Areas to be checked include bilges, tank tops and decks throughout vessel.

Any liquids generated by the ship's force or Owner's sub-contractors will be disposed of under a separate delivery order. The Contractor is to provide a separate price sheet denoting the costs of disposal of the ship's force generated liquids.

PERFORMANCE CRITERIA/DELIVERABLES

Vessel to be maintained dry at all times and confirmed to be clean and dry upon departure from contractor facility.

NOTES

None.

INTENT

This item describes the requirements for the removal of debris and garbage and the high pressure washing of the weather decks of the vessel prior to the vessel's departure from the Contractor's facility.

REFERENCE/ENCLOSURES

None.

WORK DESCRIPTION

Vessel will be delivered to Contractor at a place yet to be determined in a clean and orderly condition in way of interior spaces, machinery spaces, cargo holds and exterior decks. A joint inspection of these spaces will be carried out prior to tow Contractor's facility and condition of same agreed in writing by Contractor and the PGM Port Engineer. It will be the Contractor's responsibility to maintain these areas on a daily basis in this condition during the contract period, conducting cleaning as well as the removal and disposal of all debris generated as a result of work contained herein. Upon completion of all work under this contract, a final joint inspection of these spaces will be carried out and agreed by the same representatives as stated above. Any discrepancies noted in this final survey are to be corrected by Contractor at his expense.

Furnish labor, equipment and two containers, one for Hazmat and one for non Hazmat, on board the vessel to receive and retain all waste material generated by Contractor's and Owner's activities throughout the contract period. Containers are to be checked on a daily basis and debris not allowed to accumulate. Empty the containers whenever the containers are full, or at the Contractor's convenience. Disposals to be in accordance with all local, state and federal regulations. Disposal paper work to be provided to the PGM Port Engineer prior to payment of final invoice. All containers are to be removed from the vessel prior to the vessel's departure from the Contractor's facility.

The ship's force and/or Owner's sub-contractors shall not place any hazardous materials in the containers provided as a part of this item. Any such waste will be disposed of by a separate delivery order.

Upon completion of the drydocking and repairs, and just prior to vessel departure, carry out a fresh water wash at hydrant pressure of all the weather decks. Prior to the fresh water wash, all local areas of grease/oily contamination are to be degreased and resulting waste removed to allow for proper disposal, as noted elsewhere within this Specification. Remove any stoppers previously placed in deck drain openings and prove all weather deck scuppers and drains clear at this time.

PERFORMANCE CRITERIA/DELIVERABLES

Decks to be cleaned to allow for inspection by PGM Port Engineer prior to gangway removal.

Disposal paperwork to be provided to the PGM Port Engineer prior to payment of final invoice.

NOTES

None.

INTENT

This item describes the requirements for providing portable toilets for ship's force and Owner's personnel use and the maintenance of cleanliness of the toilet and shower facilities during the contract period.

ITEM LOCATION/DESCRIPTION

Location/Quantity

House Area, Two (2) Portable Toilets (minimum).

WORK DESCRIPTION

Contractor or sub-contractor personnel shall not use shipboard toilet and shower facilities. The Contractor shall provide and install signs to this effect.

The Contractor shall take appropriate measures to ensure that his personnel comply with all posted notices.

The Contractor is to provide two (2) portable toilets for the use of PGM Personnel, Regulatory Body Personnel, Contractor Personnel, and Sub-Contractors on board the vessel throughout the period of this contract. The units are to be located as designated above or as otherwise mutually agreed on by the Contractor's Representative and the PGM Port Engineer.

Units to be kept clean and supplied by daily maintenance, and are to be pumped and serviced as necessary. Units are to be removed from the vessel prior to the freshwater washing of the weather decks as noted in Item 0111.

This is an option item and can be canceled when mutually agreed on by the Contractor's Representative and the PGM Port Engineer.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

Contractor or sub-contractor personnel shall not use shipboard toilet and shower facilities. The Contractor shall provide and install signs to this effect.

INTENT

This item describes the requirements for the deck protection of the vessel during and after the completion of the drydocking and repairs included in this specification.

REFERENCE/ENCLOSURES

None.

WORK DESCRIPTION

Immediately upon arrival at Contractors yard and prior to workers on board, contractor to lay a protective coating of "Polyback Traffic Mat" or equal, in all areas of the superstructure where work is to be performed and in the following areas: all passageways of the 5th deck, Conference room, ballast control room, Chief Mates Office and Chief Engineer's Office. Protective coverings are to be taped

and maintained until completion of contract. The Contractor shall provide labor and material to repair, and maintain the deck coverings in all applicable areas of the super structure. The protective coverings must remain securely and neatly taped and maintained throughout the duration of the contract. At the completion of the contract and upon approval from Owner's Representative, the Contractor shall remove all deck coverings throughout the ship. The Contractor shall wash, strip, wax and polish the passageways on the 5th deck, including Conference room, Ballast control room, Chief Mates Office, and Chief Engineer's Office.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

None.

INTENT

This item describes the requirements for maintaining temporary lighting.

STATEMENT OF WORK REQUIRE

Supply, maintain and remove on completion, temporary lighting to provide sufficient lighting levels to ensure safe working environment in tanks, voids and other poorly lit or unlit spaces.

PERFORMANCE CRITERIA/DELIVERABLES

Not applicable.

NOTES

None.

INTENT

This item describes shipboard access control, shipboard security, gangway, guard requirements and roving fire/flooding watch.

WORK DESCRIPTION

Contractor shall furnish twenty-four (24) hour services of bonded, uniformed security guards stationed at the vessel's gangway, assigned in three (3) shifts of eight (8) hours each from vessel's arrival at Contractor's facility throughout the complete contract period. Guards to be instructed that Contractor's personnel are forbidden access to any part of the vessel unnecessary for completion of Items herein, except under emergency conditions (such as fire, storm, etc.). Security guards are to keep a log book which contains a complete record of the number of Contractor's personnel aboard the vessel per shift, as well as the name and signature of all visitors. This daily log shall be maintained for all personnel. ALL persons shall be logged in and out. The log shall contain blocks for the printed name, organization represented, employee number, time onboard, time departed, and signature of visitor. The log shall also contain a section for the roving watch to sign in on an hourly basis and a comments section for his findings. A new page shall be started for each new day starting at 0001 hours.

Prior to the commencement of the performance period, within five days after award, the Contractor shall deliver to the PGM Port Engineer a list of all Contractor and subcontractor (including Contractor furnished tech reps) personnel who will be involved in the performance of the contract.

The guards shall insure only authorized persons are allowed onboard, this to include Owner's Representatives, contractor workers, subcontractor workers, Owner Furnished Technical Reps, and visitors. Contractor shall provide to the security guard, prior to the start

of each shift, a list of all workers and other known persons allowed onboard. ONLY these persons listed shall be allowed access to the ship.

Prior to the commencement of each weekend and unscheduled overtime shift, the Contractor shall provide the PGM Port Engineer a list of all Contractor and subcontractor (including contractor furnished tech reps), personnel scheduled to work each shift.

The PGM Port Engineer shall furnish to the Contractor a list of all Owner Furnished Technical representatives and any other known visitors for each day.

The PGM Port Engineer may deny access to the ship by Contractor personnel if the personnel list as required is not delivered to the PGM Port Engineer.

The Security Guard shall be required to inspect all packages, suitcases, briefcases, boxes, tool bags going onboard or ashore for suspicious looking devices, weapons, explosives, government property and property of the crew, or material not related to the work in progress.

Roving fire and flooding watch; Contractor shall furnish twenty-four (24) hour services of bonded, uniformed security guards, assigned in three (3) shifts of eight (8) hours each from vessel's arrival at Contractor's facility throughout the complete contract period. Each hour the roving fire and flooding watch shall make
a round to of all unlocked machinery spaces from the engine room 5 deck fidley, to the lower engine room tank top deck plates, including auxiliary engine rooms,
auxiliary machinery spaces, and purifier rooms. The machinery space round shall
also include the A/C hydraulic room, refrigeration room and forward emergency fire pump room. The hourly round shall include the main deck from bow to stern and all cargo spaces. The roving watch shall report to the gangway guard on an hourly basis and have his findings be logged in the security log on an hourly basis.

The Roving watch shall be in continuous contact with the security guard by radio.

PERFORMANCE CRITERIA/DELIVERABLES

The original Security Logs to be provided to the PGM Port Engineer daily.

NOTES

The PGM Port Engineer may designate the Vessel Security Officer to ensure
proper rounds are made and the security log book is being properly maintained.

INTENT

This item describes the removal of all Contractor generated waste; including oil, debris and liquids, from the engine room bilges.

REFERENCES/ENCLOSURES

None.

ITEM LOCATION/QUANTITY

Machinery spaces, lower level.

One (1) set of engine room bilges in their entirety.

WORK DESCRIPTION

Prior to beginning any work in the engine room, the PGM Port Engineer and the Contractor's Project Manager will perform a joint inspection of the engine room and bilges and will mutually agree on the cleanliness of same. This agreed condition will be the baseline for this item. The Contractor is to redeliver the vessel in a like or better condition.

Upon completion of the engine room space related repairs and inspections, the entire engine room bilge/tanktop is to be thoroughly cleaned of all Contractor generated waste, debris and liquids.

While employing proper safety procedures, remove a sufficient number of deck plates to allow for access to the tank top for cleaning and inspection.

After verification that all trash and loose materials, and liquids have been removed the PGM Port Engineer shall be notified and mutual inspection of these areas is to be scheduled. Upon acceptance the removed deck plating is to be reinstalled and secured as originally found. Should their be contamination of the bilges by Contractor generated materials remaining after the initial cleaning the bilges may require a more thorough cleaning to return the engine room bilges to the as delivered condition, the Contractor may use high pressure water/hot water/chemicals, as necessary, to remove all residue. Chemicals are to be pre-approved by PGM's Port Engineer or PGM's designated representative to ensure compatibility with the manufacturer's guidelines for the use of the Oily Water Separator. Protection for any overspray shall be provided. Any oversprayed areas are to be restored to original condition prior to pressure washing.

All byproducts of the cleaning process are to be removed from the vessel and disposed of as per all Federal, State and Local regulations. The bilges are to be left as found at the time of delivery to the Contractor.

PARAGRAPH DELETED.

Upon completion of cleaning the Engine Room Bilges the PGM Port Engineer shall inspect the bilges for satisfactory removal of debris, oil and dirt contamination.

PERFORMANCE CRITERIA/DELIVERABLES

Contractor and PGM Port Engineer/Chief Engineer mutual survey upon arrival at shipyard.

PGM Port Engineer/Chief Engineer inspection prior to commencing pressure washing.

PGM Port Engineer/Chief Engineer inspection at completion of item.

NOTES

Note that there is a scheduled maintenance item for cleaning of the engine room bilges at the vessel's layberth that is to be completed prior to the beginning of this contract.

The Vessel is to be completely dry at completion of this item.

INTENT

This item describes the requirements for the Chemist Certificate(s) and Competent Person Logs.

WORK DESCRIPTION

Upon the vessel's arrival at Contractor's facility, the Contractor shall furnish the services of a Certified Marine Chemist to inspect the vessel and test all tanks, compartments and void spaces to be opened or entered as a result of work and regulatory inspections or repairs specified herein. All tanks, compartments and void spaces must be certified "Safe for Men - Safe for Entry" whenever access is required and "Safe for Hot Work" anywhere hot work may be required.

Certificates shall be issued only by a certified Marine Chemist and maintained by the Marine Chemist or a "Competent Person" as defined by the USCG Regulations. Portable Firefighting equipment (CO2 Bottles, Water Cans, and Dry Chemical Extinguishers) shall be provided while burning and welding. Ship's extinguishers shall not be used. Any charges for additional Certificates required due to the Contractor's inability to maintain the Certificated status are for the Contractor's account.

Contractor shall provide all portable blowers and ducting for ventilation as required by Chemist Certificate to ensure the safety of Contractor's and Owner's assigned working personnel during the contract period and for inspection of tanks by regulatory bodies.

PERFORMANCE CRITERIA/DELIVERABLES

Marine Chemist's and competent person's reports to be provide to the PGM Port Engineer daily.

NOTES

Marine Chemist's Certificates are to be properly posted. Copies of the Marine Chemist's Certificates and Contractor's Competent Person's daily checks to be provide to the PGM Port Engineer on a daily basis.

INTENT

This item describes the requirements for the Contractor to remove any hazardous wastes generated during the performance of this Specification.

REFERENCES

Resource Conservation and Recovery Act (RCRA)

Applicable Hazardous Waste Manifest Form

Contractor's Hazardous Waste Management Plan

All Applicable Federal, State and Local Regulations

WORK DESCRIPTION

For the purposes of this contract any asbestos, chemicals or other hazardous materials used during or created as a result of this contract and/or designated to be removed from the vessel for disposal or requiring clean-up shall be considered generated by the Contractor and the Contractor shall make any necessary adjustments for same in the pricing of the respective item(s). All hazardous/special/regulated waste manifests shall show the Contractor as the generator of any such waste being manifested.

The Contractor shall provide all Material Safety Data Sheets (MSDS) as required for products needed to carry out specified items. Material Safety Data Sheets are to be made available for inspection by interested parties upon request and one (1) clear copy of each submitted by Contractor to the PGM Port Engineer at the conclusion of the contract period.

Identify waste by methods described below. Submit a Hazardous Waste removal report to the PGM Port Engineer no later than twenty-four (24) hours prior to the removal of hazardous/special/regulated waste. Report to include, at a minimum:

· Type of waste, including sufficient documentation (analytical results) to certify its status as a hazardous/special/regulated waste

· Quantity of waste to be removed under this report

· Identification of subcontractors or shipyard departments responsible for removal, transportation and disposal of the waste covered under this report

Remove, handle, store, transport, and dispose of all hazardous/special/ regulated waste identified in accordance with all applicable federal, state, and local laws, codes, ordinances, and regulations and in accordance with references listed above.

Ensure that transportation of hazardous waste is accomplished only by haulers registered to perform such transportation with cognizant Federal, State and Local Agencies.

Transport hazardous waste to a site authorized (permitted) by cognizant Federal, State, and Local Agencies to accept the identified waste.

PERFORMANCE CRITERIA/DELIVERABLES

The Contractor shall be required to submit a Hazardous Waste Management Plan as soon as possible after the award of the contract, but in any case prior to the handling of any hazardous/special/regulated waste or materials. This plan shall, at a minimum, include the following;

· Identify key shipyard personnel associated with sampling, testing, removing, handling and disposing of hazardous/special/regulated wastes. This should include subcontractors responsible for sampling, testing, removing, storing, transporting, recycling, reclaiming or otherwise disposing of hazardous waste. All permits or other applicable credentials associated with safe and proper disposal of hazardous waste should be included. If a hazardous waste subcontractor is changed for any reason, the Hazardous Waste Management Plan must be amended prior to the new subcontractor beginning work on the vessel.

· Identify all local, state, and federal agencies associated with the disposal of hazardous/special/regulated waste.

· Outline procedures used by the facility to accomplish removals, handling, storage and disposal of hazardous/special/regulated wastes in accordance with local, state and federal requirements.

· Describe all steps to be taken to reduce the volume and toxicity of hazardous waste generated during the performance of this contract.

Submit Final hazardous waste report no later than ten (10) working days after ship redelivery. The report shall include a summary of the quantity of hazardous/special/regulated waste removed from the vessel during performance of the contract, including breakdown by type of waste and generator assignment. A copy of all completed waste manifests and applicable trip tickets is to be provided as part of this report as well as all analytical data associated with the waste streams. The Contractor shall provide an assessment of his performance with regards to the Contractor's Hazardous Waste Management Plan.

The Hazardous Waste Management Plan must be reviewed and approved by PGM prior to any work being undertaken at the Contractor's facility.

NOTES

Nothing contained in this work item shall relieve the Contractor from complying with all applicable Federal, State, and Local Laws, Codes, Ordinances and Regulations, including the obtaining of licenses and permits in connection with hazardous waste handling and disposal in the performance of this contract.

Material is to be determined to be hazardous by;

· Chemical Analysis, or

· Reference to the Applicable Material Safety Data Sheet (MSDS), or

· Application of inherent knowledge of the hazardous characteristics of the waste in light of the materials or the process used.

INTENT

This item describes the requirement for production control planning, documentation and monitoring that will be required prior to the issuance of a contract and through the completion of said contract.

WORK DESCRIPTION

Production Schedule

The Contractor shall develop a logical, detailed project schedule using current project management software (Microsoft Project, Primavera SureTrak or equal).

The Contractor shall use an appropriate work breakdown structure with primary work divisions (summary task) supported by line item (activity task) of sufficient detail (such as design, procurement, rip out, fabrication, install and test) to track progress of the project.

Separate line items for materials and subcontractors are mandatory for each primary work division.

The Contractor shall include scheduled milestones for required ABS and regulatory body inspections as well as for inspection by the PGM Port Engineer specifically called out in the contract.

The Contractor shall assign estimated man loading for each line item (except materials) for the purpose of project manning requirements.

Ten (10) working days prior to the commencement of the tow, the Contractor shall submit two (2) printed copies of the Production Gantt (bar) Chart, Production Cumulative Manning Curve and Manning Level Table and one (1) electronic copy of the schedule for approval. The electronic copy shall be compatible with Microsoft Project or Primavera SureTrak Project Planner. PGM reserves the right to review the Contractor's project schedule and manning projection. PGM will require Contractor justification for work sequences, start and completion dates, and manpower loading or anywhere these items appear unrealistic. If PGM still finds portions of the documents to appear unrealistic, the Contractor shall have 24 hours to modify the items in question and resubmit for approval.

Upon resolution of outstanding comments concerning the Production Gantt Chart, Manning Curves and Manning Level Table the Contractor shall save the schedule and manning information in the project management software to be used as the project baseline. If no comments are received within seven (7) working days of receipt of the materials, the original submission shall be considered approved and shall be saved as the project baseline.

In addition to daily verbal up-dates at the PGM/Contractor progress meetings, the production schedule shall be amended weekly for the entire performance period of the contract, including any contract extensions, to incorporate all added or deleted work, changes in work sequences or manning levels. This updated Production Schedule is to be delivered within ten (10) working days of the completion of the contract.

Production Gantt (bar) Charts

The production Gantt chart shall clearly indicate planned start date, planned completion date, float and projected manning for each line item.

The "X" axis of the Production Gantt Chart shall be subdivided by days.

The Production Gantt Chart shall have a title block and chart key. The title block shall at a minimum contain vessel name, contract number and chart date.

Based on the amended schedule (as noted above), two (2) copies of a revised Production Gantt Chart shall be submitted weekly. The revised chart shall indicate deviations from the baseline (slip). Each line item shall be legibly marked to indicate current percent complete for that line item.

Production Cumulative Manning Curve

Based on the man loading information assigned to each line item of the production schedule, the Contractor shall produce and submit Production Cumulative Manning Curve. The curve shall plot the planned (baseline) and actual manning level versus time.

The "Y" axis shall be subdivided in man-hours. The "X" axis shall be subdivided by daily increments.

On weekly basis, the actual cumulative man-hours shall be plotted against the planned (baseline) estimate.

Manning Level Table

Based on man loading information assigned to each line item of the production schedule, the Contractor shall produce and submit a Manning Level Table. The table shall list each line item and shall be subdivided to show number of personnel by craft. The table shall include summary columns or rows that show total man-hours of each line item and a separate column or row that shows the total daily man-hours for all line items.

The Manning Level Table shall be revised bi-weekly to show actual man-hours expended on each line item per day.

PERFORMANCE CRITERIA/DELIVERABLES

Pre-tow and work commencement plans approval and weekly or bi-weekly updates, as described above.

NOTES

None.
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INTENT

The intent of this item is to describe the requirements of the Contractor to drydock the vessel in order to complete the repairs and inspections described in this specification and any subsequent delivery orders.

WORK DESCRIPTION

Provide the necessary labor (including linehandlers), equipment, materials, tugs and pilots, lines and/or wires to drydock, fleet and undock the vessel for the purposes of accomplishing items in this work package, to enable the survey and inspection of the underwater portions of the vessel, and to enable the survey and inspection of the vessel's propeller, rudder and other related appurtenances. The drydock shall be a single unit and of a length equal to or greater than the length of the vessel overall. Provide prior to drydocking the vessel a current NAVSEA or commercial drydock certification stating the lifting limit (vessel displacement) of the drydock.

Erect, set and align the drydocking blocks in accordance with the vessel's docking plan. Position the blocking so that the propeller, rudder and other vessel equipment on the surface of, or protruding from, the vessel's hull will not be damaged and will be accessible for removal and repairs. The minimum height of the keel blocks shall be sufficient to allow for proper inspection and completion of all work items contained herein. The Contractor shall position the drydock blocks to accomplish survey and inspection of all docking plugs, fathometer diaphragms and all other underwater appurtenances. The Contractor shall position the drydock blocks so that the previously blocked areas of the hull are exposed to the maximum extent possible.

The drydock docking blocks and positioning shall be sufficient to allow support of the weight of the vessel and be in good condition without excessive checking. Blocks are to be capped with new or good condition soft blocks to be dogged or lagged together.

The Contractor shall hold a docking/undocking conference at least one (1) day prior to the docking or undocking of the vessel. This conference shall be attended by the PGM Port Engineer, the Contractor's Dock Master and other interested parties. All details of the docking/undocking evolution, including time of activity, number of tugs, changes to ballast state, etc., are to be discussed and agreed at this conference.

There are four sets of main engine crankshaft deflections required to be taken at various times throughout this project as follows. This is a very important item and the Contractor is to ensure that the deflections are taken in a timely manner as detailed below.

Crankshaft deflections: Four (4) cold engine deflection sets shall be taken.
1) Prior to dry docking, vessel free floating.
2) Lifted in dry dock, prior to any shaft and bearing work.
3) Lifted in dry dock, after all shaft and bearing work is completed.
4) After dry docking, with the vessel free floating.

A copy of each set of deflections is to be provided to the PGM Port Engineer immediately upon completion. The final set of readings is to be included in the final drydock report.

Sound all of the vessel's tanks when the vessel arrives at the Contractor's facility. All tanks shall be sounded prior to the vessel entering into the drydock and the tanks shall also be sounded at twenty-four (24) hours prior to departure from the Contractor's facility. Present three (3) typewritten copies of each sounding report and the current drydocking block diagram to attending Owner's Representative. Sounding tables are available on board and a sounding form is attached.

Furnish the services of a Naval Architect to verify vessel's longitudinal center of gravity (L.C.G.) prior to vessel entering the drydock. Ballast and/or de-ballast the vessel as may be required prior to placement on the drydock.

The Contractor shall complete a Drydock Report (including an updated blocking plan) and submit it to the PGM Port Engineer. A complete description of underwater hull coating and underwater hull markings are to be attached. A copy of the form is attached.

Provide all of the labor, equipment and materials required to wash with fresh water the vessel's underwater hull and appurtenances immediately after the drydock is drained.

Provide all of the labor, equipment and materials including, but not limited to, staging, portable lifts and lighting required to assist the attending regulatory body surveyors and inspectors in all required surveys and inspections of the vessel's load line, underwater hull and appurtenances, propeller, stern tube, rudder and other docked parts of the vessel.

The Contractor shall undock the vessel upon completion of all items requiring the drydocking of the vessel in the Work Package.

PERFORMANCE CRITERIA/DELIVERABLES

All ABS inspection provided to the contractor (Originals)
Updated Blocking Plan
Drydock Report
Completed item sign-off sheet
Drydock Certificate

REFERENCES

Docking Plan
Underwater Road Map Sheets 1 & 2

NOTES

Vessel shall have exclusive use of graving/floating dock.
No fuel is to be required to be removed from the ship for drydocking.

INTENT

The intent of this item is to conduct an inspection of the rudder condition for regulatory body survey.

WORK DESCRIPTION

Preparations:

Furnish and erect staging to facilitate access to the rudder for examination. Remove vent and drain plugs from the rudder and drain all water and preservative from within. The Contractor shall collect and dispose of all drained liquid in accordance with all Local, State and Federal government regulations.

Furnish and connect a steam supply to the rudder vent connection and steam out the rudder internals. Continue steaming out until clear condensate is observed draining from the rudder.

Collect and dispose of all drained liquid (including preservatives) and condensate in accordance with all Local, State and Federal regulations.

Provide the services of Certified Marine Chemist to check the rudder and issue gas free certificate certifying the rudder and surrounding areas to be "Safe for Hot Work."

Rudder Examination:

Remove all inspection covers in way of rudder's pintle bushing and steadiment bearing and their respective securing nuts. Remove tallow or other preservatives. Clean all parts for inspection.

Take and record upper and lower pintle and steadiment bearing clearance in the presence of the PGM Engineer, ABS Surveyor, and USCG Inspector. Clearance shall be taken at four (4) points of bushing periphery, spaced 90-degrees apart.

Check keepers on pintle nuts and ensure nuts are secured. Examine hydraulic nut on stock and ensure it is secured.

Upon completion, refill cavities with tallow or compatible preservative and reinstall all inspection covers by welding.

Provide three (3) typewritten copies of rudder clearance readings to the PGM Engineer.

Rudder Post Stuffing: Box Inspection:

Disconnect and remove the rudder post stuffing box gland and remove all packing and seals. Clean and examine the rudder stock sleeve and post bushing.

Measure and record the rudder stock bushing clearance at four (4) points, 90-degrees apart as done with the pintle. Prepare and submit four (4) copies of a typewritten report of clearances to the PGM Engineer.

Reassemble the stuffing box assembly with new Contractor-furnished packing and seals.

Survey:

Thoroughly examine the rudder in the presence of the PGM Engineer, ABS Surveyor and USCG Inspector. Contractor shall ensure that sufficient staging is in place in order to conduct a safe and thorough inspection. Mark any defects found. Examination shall include the following:

All accessible areas of the rudder. (Rudder fairwater plates shall be removed to facilitate access)

Pintles
Gudgeon
Carrier bearing
Steady bearing
Rudder post seal assembly
Rudder stock and sleeve
Rudder stock bushing Pintle bushings

Rudder Test:

Furnish and install air hoses and fittings to accomplish an air test on the rudder. Test pressure shall be 1.5 psig. The testing apparatus shall be set-up such that there are two (2) connections, one for applying air to the rudder and the second for releasing air pressure. The test pressure gauge shall be in current calibration and shall be installed at the outlet connection. Additionally, a relief valve or V-tube shall be installed as part of the test rig to prevent accidental over pressurization of the rudder. The rudder shall be proven tight by holding the test pressure for 10 minutes with the air supply cut-off and with no pressure drop. Air test shall be witnessed by the PGM Engineer and regulatory bodies. Furnish a copy of the test results to the PGM Engineer upon completion.

Rudder Restoration:

At the completion of tests, furnish rust preventative compound/float coat. Fill the rudder to completely coat all the internal surfaces. Drain the compound from the rudder. Collect and dispose of the compound in accordance with current Local, State and Federal regulations. Reinstall the rudder vent and drain plugs, access and fairwater plates. Remove all the staging and equipment connected with this Item and leave rudder in a ready to use condition.

PERFORMANCE CRITERIA/DELIVERABLES

Pintle and steadiment bearing clearances
Rudder stock bushing clearances
Rudder pressure test

REFERENCES

Drawing- Arrangement of Rudder Pintles
Drawing- Mounting of Rudder and Propeller

NOTES

The rudder exam shall proceed immediately after vessel is on dock.

INTENT

The intent of this item is to clean the vessel's propeller, to remove it from the tailshaft, and to perform non-destructive testing as required by ABS.

WORK DESCRIPTION

Note: No grit blasting is to be done while removing or reinstalling the propeller, tailshaft, or seal. If grit blasting is to be done while the tailshaft is drawn, the Contractor must furnish and install blanks and coverings to protect tailshaft and bearing from contamination and damage.

This item is not to begin until the initial set of weardown readings as described in Item 0204 are completed,

Provide the necessary labor, equipment, services, and materials to erect staging around the propeller, as necessary, and remove same when work is completed.

All work shall be completed under the direction of an approved propeller repair facility representative.

Propeller Cleaning:

Contractor shall furnish all necessary labor, material, equipment, and staging to clean the main propulsion propeller of all marine growth.

After the completion of the cleaning, the propeller (blades and non-coated propeller surfaces) shall polished to a Rupert grade "B" using 3M polishing discs or equivalent. Use of grit, wire brush tools, or abrasive grinding tools will not be allowed.

Propeller Nut:
Pilgrim Type 3-Doncasters Moorside Ltd. Outer Diameter: 920mm

Propeller:
Manufacturer: Theodor Zeise No. of Blades: 5
Diameter: 6,700 mm Weight. 34,568 kg

Propeller Removal:

Remove the fairwater cap, rope guard, and any interferences in preparation for rudder removal.

The hydraulic propeller nut is to be removed in accordance with the manufacturer's instructions.

Contractor shall furnish hydraulic equipment to remove propeller nut.

Template the position of the propeller hub on the shaft prior to removal.

Furnish and install rigging to support the propeller, jump the propeller, and hang it off securely from the ship on pad eyes.

CAUTION: Do not use flame heat on propeller hub in order to release it. Propeller requires hydraulic jack for pressurizing of hub for removal and reinstallation.

Rig the propeller clear of the shaft a sufficient distance to allow for inspection and testing of the taper, and the removal and reinstallation of the after Tailshaft seal assembly, etc.

Propeller Installation:

After the reinstallation of the outboard seal assembly as described in Item 0206, rig the propeller in place and reinstall on a new Contractor-furnished 0-ring.

Use template as reference to locate propeller on the shaft.

The propeller to tailshaft fit shall be checked to ensure a minimum 85% contact prior to final draw up of propeller.

Following confirmation of proper fit, reinstall hydraulic nut to the proper tightness, as per the manufacturer's instructions.

Refitting of the propeller shall be completed in the presence of the PGM Engineer and the ABS Surveyor. Provide reinstallation report.

Reinstall fairwater cap using a new Contractor-furnished gasket.

Fill with tallow or equal.

Upon completion of the reinstallation of the outboard and inboard stern tube seals the stern tube lube oil system and stern tube seals are to be tested as described in the stern tube seal overhauls as found in Item 0206.

Reinstall the rope guard and any interferences.

Rope guard shall be prepared and coated in accordance with underwater hull paint specifications.

PERFORMANCE CRITERIA/DELIVERABLES

Following completion of testing, a complete report of the testing, including all readings and findings, shall be submitted to the PGM Engineer in three (3) typewritten copies.

Re-installation report.

REFERENCES

Drawing- Propeller Nut
Drawing- Mounting of Rudder and Propeller

NOTES

Filling of the stern tube lube oil system is to be coordinated with the forward stern seal assembly overhauls as described in Item 0206.

INTENT

The intent of this work item is to take and record two sets of stern tube bearing wear down readings at the tailshaft outboard seal housing.

IDENTIFICATION

Stern Tube Seal
Simplex - Compact Type Size 800
Mfg - Howaldswerke-Deutsche Werft

Stern Tube Bearing
Mfg: Railko Ltd., Loudwater, England
Type: WA 80 H

WORK DESCRIPTION

Immediately upon drydocking, erect staging around the stern tube area to provide suitable access to safely perform taking wear down readings.

Refer to Item 203 for rope guard. Open the vent and the drain plug on the tailshaft aft seal box. Drain oil to a container. The oil will either be disposed of by the Contractor or retained as a sample as directed by the PGM Engineer. If disposed of, disposal will be in accordance with all Federal, State, and Local regulations.

Assist the Chief Engineer in using the vessel's wear down gauge. Take and record the tailshaft wear down readings on top and on bottom in presence of the ABS Surveyor, USCG Inspector, PGM Engineer and MARAD Surveyor. Reinstall the removed plugs. The Chief Engineer shall record the reading on the record card maintained in the wear down gauge case.

Upon completion of propeller, stern tube, shaft seal and tailshaft items another set of wear down readings are to be taken as described above.

The wear down gauge is to remain in possession of the Chief Engineer.

All wear down readings are to be included in the final Drydock Report.

Refer to item 204 for rope guard Refit. Coat any disturbed areas in accordance with the vessel's underwater hull painting system.

PERFORMANCE CRITERIA/DELIVERABLES

Two sets of tailshaft wear down readings.

REFERENCES

Drawing- Stern Tube Arrangement

NOTE

The taking of wear down readings shall be performed as soon as possible after the vessel is on dock but before any drive train disconnects or removals and again at the completion of all propeller, seal, and tailshaft related items. Results of such readings shall be included in the final drydock report.

INTENT

The intent of this work item is to draw inward and remove the tailshaft from stern tube. Clean and prepare for regulatory body inspection. After the inspection is completed, reinstall the tailshaft. The work specified within the work item shall be performed under the supervision of Contractor-furnished manufacturer's service engineers.

IDENTIFICATION

Fwd-Intermediate Shaft: 9,830 mm length X 578 mm dia.
Mid-Intermediate Shaft: 5,000 mm length X 578 mm dia.
Tailshaft: 9,933 mm length X 728 mm dia

Propeller
Manufacturer: Theodor Zeise
No. of Blades: 5
Diameter: 6,700 mm

Weight. 34,568 kg

Propeller Nut
Pilgrim Type 3-Doncasters Moorside Ltd.
Outer Diameter: 920mm

Stern Tube Seal
Simplex - Compact Type Size 800
Mfg: Howaldswerke-Deutsche Werft

Stern Tube Bearing
Mfg: Railko Ltd., Loudwater, England
Type: WA 80 H

WORK DESCRIPTION

All work shall take place under the direction of Contractor-provided manufacturer's service engineers for the affected equipment.

All materials and lifting gear shall be Contractor-furnished.

Build and/or modify staging around the vessel's stern area to provide for the work on propeller, rudder, and tailshaft detailed in this item.

NOTE: Staging for other work in stern area is specified in other items of this specification. Do not duplicate.

Install lifting pad-eyes on the hull and in the vessel as necessary for removing the propeller, rudder, and shafting for drawing the tailshaft inward for inspection. Rig Install Contractor-furnished lifting gear/equipment as required.

Prior to the use of lifting pad-eyes, clean and inspect all new and existing lifting pad-eyes. Check/inspect welds with nondestructive testing (NDT). If any crack or flaw is found, remove the defects and repair the weld.

Provide suitable oil containers under the stern tube and rudder to catch any draining oil. Dispose of all oil/oily water in strict compliance with current Federal, State, and Local regulations.

Nylon straps shall be used in lieu of wire slings for all tailshaft work in order to avoid rigging damage on the tailshaft.

Any grit blasting and painting shall be terminated while removing or reinstalling the propeller, tailshaft, or seals. All components shall be fully protected at all times from blasting and painting work, such as covering of stern tube while work is not in progress.

Alignment Check Prior to Shafting Disassembly:

Prior to disassembly of the shafting system, the propeller, and the rudder, a check shall be made of the condition of the propulsion shafting system. The Contractor shall determine the bearing reactions and loads for two (2) line shaft bearings and measure the crankshaft deflections of the main engine. The checking of the main engine crankshaft deflections is covered in Item 0201 and the costs of the deflections noted here are not to be duplicated.

Crankshaft deflections related to this item: Two (2) cold engine deflection sets shall be taken wit the vessel:

1) Lifted in drydock, prior to any shaft and bearing work.
2) Lifted in drydock, after all shaft and bearing work is completed.

As noted in Item 0201, a report deflection report shall be provided to the PGM Port Engineer immediately after each set of deflections is taken.

Tailshaft Removal:

During rigging operations, it is most important to keep the shafting fully supported from both ends and level to avoid damage to bearings. All bearings including the stern tube bearings must be kept under constant watch to ensure they are not placed under excessive or abnormal force.

After the propeller has been removed, the following procedures shall be followed in order to rig the tailshaft into the engine room for inspection.

NOTE: The following procedures are for guidance purposes only and shall not be construed as actual or determining the chain of events or the actual work necessary to complete this specification item.

All interferences to be removed and later reinstalled as original.

Contractor shall reinstall all interferences removed.

Contractor to unbolt and rig clear two (2) line shaft bearing covers, including any appendages (thermocouples, cooling lines, etc.), out of the way in a clear area of the engine room.

Place on wooden pallets and cover with a suitable protective material during the course of this work item.

The mid-intermediate and fwd-intermediate shafts shall be unbolted and raised by chain falls straight up until they clear the line shaft bearing pedestals. Once fully clear of the bearings they shall then be rigged out of the way.

Care shall be taken to label all bolts to ensure that they are returned to their original locations and radial position relative to the shaft.

NOTE: No hammering on shaft coupling bolts will be allowed.

The mid and fwd-intermediate shafts shall be temporarily stored in a secure location in the engine room in order to prevent any damage to the shafting.

The line shaft pedestals shall be properly covered to prevent damage during the course of this work item.

The tailshaft shall then be drawn into the engine room using mounted trolleys located on board the vessel.

NOTE: Extreme care shall be taken to support the full weight of the shaft, both inside and out, during the entire course of this evolution.

The tailshaft shall be temporarily stored in a secure location in the engine room in order to prevent any damage to the shafting.

Tailshaft and Stern Tube Bearing Survey:

Clean and prepare all coupling bolts for inspection. Provide the services of qualified NDT technicians to perform dye penetrant testing of all coupling bolts.

Testing shall be completed in the presence of the PGM Engineer and the ABS Surveyor. Provide results of the testing to the PGM Engineer.

The forward and aft stern tube bearing are to be cleaned and prepared for inspection. Take measurements of the forward and aft stern tube bearing on inside diameters and of the corresponding areas on the propeller shaft on outside diameters.

On the forward/inboard bearing, the measurements shall be take in three (3) longitudinal locations (forward, center and aft) with two (2) readings (top to bottom and port to starboard side) at each location.

The aft/outboard bearing shall be measured in five (5) longitudinal locations (from forward to aft) with two (2) readings (top to bottom and port to starboard side) at each location.

Prepare and submit the readings in report form to the PGM Port Engineer prior to the joint surveys/inspection with ABS, USCG and PGM Engineer. The Contractor shall make arrangements/coordinate with ABS, USCG, and the PGM Engineer for the joint surveys/inspection.

Provide a full report on tailshaft and stern tube bearing condition to the PGM Engineer. This shall be provided in three (3) typewritten copies.

Tailshaft Installation:

Following satisfactory inspection and acceptance, the tailshaft is to be reinstalled.

NOTE: Extreme care shall be taken to support the full weight of the shaft, both inside and out, during the entire course of this evolution. Rig the tailshaft into the stern tube using Contractor furnished materials and lifting gear.

The inboard stern tube seal assembly shall be installed on the tailshaft prior to the reinstallation of the tailshaft as covered by separate specification item.

During reinstallation of the tailshaft, it is of extreme importance to maintain the shaft on a level plane throughout rigging operations. This is necessary to avoid damage to either the forward or aft stern tube liners and bearing surfaces. Constant checking shall be maintained to ensure that the shaft is not placing undue force on the stern tube liners or bearing surface.

Verify that the shaft is fully seated in the liners and that it does not have an abnormal attitude.

When the tailshaft is seated in a satisfactory position, the intermediate shafts shall then be lowered back into position and bolted to their corresponding shafts.

The outboard tube seal assembly shall be installed as covered by separate specification item.

Fill the stern tube with vessel-furnished new oil. Test the stern tube oil seals with ship's head tank pressure.

Reassemble the two (2) line shaft bearings and associated appurtenances.

Reinstall and restore to original all removed interferences.

THE REPORT SHALL BE SUBMITTED PRIOR TO REFLOODING THE DRYDOCK.

Alignment Check Following Shafting Reassembly:

Following reinstallation of the complete shafting system, the propeller, and the rudder, a check shall be made of the condition of the propulsion shafting system. The Contractor shall determine the bearing reactions and loads for two (2) line shaft bearings and shall measure crankshaft deflections of the main engine. The Contractor shall make adjustments necessary to bring the shafting system within original tolerance.

A report of findings and corrections shall be provided to the PGM Engineer in three (3) copies.

Completion:

Following satisfactory tests and acceptance, remove all rigging gear and equipment from the work areas. Crop and remove all the Contractor-installed lifting padeyes. Grind all disturbed areas smooth. Fully coat all the affected surfaces in accordance with paint system specified under "Hull Cleaning and Painting" detailed elsewhere in this specification package.

This is an optional item, see note below.

PERFORMANCE CRITERIA/DELIVERABLES

Alignment check prior to disassembly
Tailshaft and stern tube bearing report
Tailshaft weardown readings
Alignment check following reassembly
Main engine deflections, 4 sets.

REFERENCES

Drawings-
Stern Tube Arrangement
Shafting Arrangement
Arrangement of Propeller Shaft Withdrawal
Propeller Shaft

NOTE:

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203) and the Weardown Readings Item (0204). Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

STERN TUBE OIL SEAL, OUTBOARD, WORKSHOP OVERHAUL (A)

INTENT

The intent of this work item is to overhaul the outboard stern tube oil seal assembly in conjunction with the work Item 0203 entitled "Propeller Cleaning, Removal and Testing." All work specified within this work item shall be under the direct supervision of a Contractor furnished manufacturer's service engineer.

IDENTIFICATION

Stern Tube Seal
Simplex - Compact Type Size 800
Mfr - Howaldswerke-Deutsche Werft

WORK DESCRIPTION

This work Item shall be worked in conjunction with the separate work Item 203 entitled "Propeller Cleaning, Removal and Testing" detailed elsewhere in this specification.

The outboard seal will be updated to the latest version of a Simplex Compact Seal, size 800. The seal box and fit up will remain as the original.

All work shall take place under the direction of a Contractor furnished manufacturer's service engineer.

All seal components will be Owner furnished.

All other material shall be Contractor furnished.

Once the propeller is rigged clear of the tailshaft, remove the oil seal box off the stern tube and dray to a Contractor provided shop for overhaul.

Outboard Seal Removal and Inspection:

Loosen the chrome steel liner and fasten to the seal casing by means of the mounting straps. Remove the casing from the stern tube flange. Place protective covering over the casing to stern tube mating flange. Remove the sealing from the propeller shaft being careful not to damage the seal or the shaft during the process.

After the liner and seal is removed from the stern tube, transport the seal box to the Contractor's workshop for overhaul. Completely disassemble the oil seal box. Clean the seal box and layout all parts removed from the seal box for inspection. When authorized by the OEM Technical Representative, these parts are to be properly disposed of.

Prepare and submit condition report to the PGM Port Engineer.

NOTE: Following satisfactory inspection and acceptance, reassemble the oil seal box with Owner furnished new seal parts, including a new liner. After pressure testing seal box install the transport straps and cover the seal box with protective material and prepare for reinstallation.

Outboard Seal Reinstallation:

Installation will be in the reverse order of the dismantling process. Fit the seal assembly, with mounting straps, over the shaft making sure not to damage the new seals. The flange gaskets for the seal casing to stern tube joint and liner to shaft joint must be in place at this time. Ensure that the shaft is clean. Fix the seal casing to the stern tube with new gasket. The holes for measuring the bearing clearance must point vertically up and down and line up with the removable plugs used for measuring bearing wear.

Loosen and remove the mounting straps. Affix the chrome liner to the shaft with new gasket. Lockwire the casing and the liner screws/bolts using stainless steel wire. Check parallelism between the liner flange and the casing by using calipers. Contractor to check the run out of the seal liner.

Seal Pressure Tests:

Conduct a system pressure test to ensure seals to be properly installed and working. On the outboard seal, remove the oil fill, vent and drain plugs (3 total) on the seal casing. On the inboard seal, slacken the oil drain line at the bottom of the casing. Fill the stern tube using vessel-furnished new oil making sure to remove all air from the system. The seal shall remain under standing head pressure for a period up to four (4) hours. If leakage is found, the source of the leakage shall be identified, corrected, and retested. If no leakage is found, install the outboard seal drain plug. Fill the oil seal through the fill connection using new oil. Tighten the fill and vent plugs. Refit the inboard seal drain line. Fill the forward seal oil system and receiver with new oil. After satisfactory testing of the seal tightness, Contractor to drain oil and dispose of in accordance with all Federal, State, and Local Regulations. Fill forward seal cavity with vessel supplied oil.

Note that this item is included in all shaft seal items and is to be quoted as a separate item so as to prevent duplication of costs. Do not include this cost in any seal renewal item.

PERFORMANCE CRITERIA/DELIVERABLES

Prepare and submit condition report to the PGM Port Engineer.

REFERENCES

Drawing- Stern Tube Arrangement

NOTES

Pressure test seal box prior to reinstallation as per the instructions of the OEM technical representative.

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203) and the Weardown Readings Item (0204). Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

Portions of Item 206 will be completed depending on the requirements of Class and any discrepancies discovered once the vessel is dry. Either Item 206A or 206C and either 0206B or 0206D will be completed. Item 0206E covers the travel, lodging and expenses for the Contractor Furnished OEM Technical Representative and this Item will be completed. It should be understood that both seal boxes will be overhauled.

STERN TUBE OIL SEAL, INBOARD, WORKSHOP OVERHAUL (B)

INTENT

The intent of this work item is to overhaul the inboard stern tube oil seal assemblies in conjunction with the work item 205 entitled "Tailshaft Survey." All work specified within this work item shall be under the direct supervision of a Contractor furnished manufacturer's service engineer.

IDENTIFICATION

Stern Tube Seal
Simplex - Compact Type Size 800
Mfr - Howaldswerke-Deutsche Werft

WORK DESCRIPTION

This work Item shall be worked in conjunction with the separate work Item 205 entitled "Tailshaft Survey" detailed elsewhere in this specification.

The inboard seal will be updated to the latest version of a Simplex Compact Seal, size 800. The seal box and fit up will remain as the original.

All work shall take place under the direction of a Contractor furnished manufacturer's service engineer.

All seal components will be Owner furnished.

All other material shall be Contractor furnished.

Once the tailshaft is rigged out of the way, remove the oil seal boxes off the stern tube and dray to a Contractor provided shop for overhaul.

Inboard Seal Removal and Inspection:

Loosen the chrome steel liner and fasten to the seal casing. Loosen and remove the two-piece clamp ring that normally secures the liner to the shaft. Disconnect the oil supply and drain lines. Remove the casing from the stern tube flange. Remove the sealing from tailshaft being careful not to damage the seal or the shaft during process.

After the liner and seal is removed from the stern tube, transport the seal box to the Contractor's workshop for overhaul. Completely disassemble the oil seal box. Clean the seal box and layout all parts removed from the seal box for inspection. When authorized by the OEM Technical Representative, these parts are to be properly disposed of.

Prepare and submit condition report to the PGM Port Engineer.

NOTE:
Following satisfactory inspection and acceptance, reassemble the oil seal box with Owner furnished new seal parts, including a newliner. After pressure testing seal box install the transport straps and cover the seal box with protective material and prepare for reinstallation.

Inboard Seal Reinstallation:

The shaft must be cleaned and kept perfectly clean to avoid damage to the seal assembly. The inboard seal casing is to be fixed onto the stern tube using new gasket. Slide a new O-ring over the shaft to the liner. Re-secure the two-part clamp ring to the shaft while ensuring it to be parallel to the casing. Release the chrome steel liner from the casing and screw it to the clamp ring in order to press the rubber ring into the bevel in the liner. Refit the oil supply piping. Check parallelism between the liner flange and the casing by using calipers. Contractor to check the run out of the seal liner.

Seal Pressure Tests:

Conduct a pressure test to ensure seals to be properly installed and working. On the outboard seal, remove the oil fill, vent and drain plugs (3 total) on the seal casing. On the inboard seal, slacken the oil drain line at the bottom of the casing. Fill the stern tube using vessel-furnished new oil making sure to remove all air from the system. The seal shall remain under standing head pressure for a period up to four (4) hours. If leakage is found, the source of the leakage shall be identified, corrected, and retested. If no leakage is found, install the outboard seal drain plug. Fill the oil seal through the fill connection using new oil. Tighten the fill and vent plugs. Refit the inboard seal drain line. Fill the forward seal oil system and receiver with new oil. After satisfactory testing of the seal tightness, Contractor to drain oil and dispose of in accordance with all Federal, State, and Local Regulations. Fill forward seal cavity with vessel supplied oil.

Note that this item is included in all shaft seal items and is to be quoted as a separate item so as to prevent duplication of costs. Do not include this cost in any seal renewal item.

PERFORMANCE CRITERIA/DELIVERABLES

Inboard seal and line condition report.

REFERENCES

Drawing-Stern Tube Arrangement.

NOTES

Pressure test seal box prior to reinstallation as per the instructions of the OEM technical representative.

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203) and the Weardown Readings Item (0204). Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

Portions of Item 206 will be completed depending on the requirements of Class and any discrepancies discovered once the vessel is dry. Either Item 206A or 206C and either 0206B or 0206D will be completed. Item 0206E covers the travel, lodging and expenses for the Contractor Furnished OEM Technical Representative and this Item will be completed. It should be understood that both seal boxes will be overhauled.

STERN TUBE SEAL, OUTBOARD, IN-PLACE OVERHAUL (C)

INTENT

The intent of this work item is to overhaul the outboard stern tube oil seal assembly in place. All work specified within this work item shall be completed under the direct supervision of a Contractor furnished manufacturer's service engineer.

IDENTIFICATION

Stern Tube Seal
Simplex - Compact Type Size 800
Mfg - Howaldswerke-Deutsche Werft

WORK DESCRIPTION

Outboard Seal Overhaul:

The outboard seal will be updated to the latest version of a Simplex Compact Seal, size 800. The seal box and fit up will remain as the original.

All work shall take place under the direction of a Contractor furnished manufacturer's service engineer.

All seal components will be Owner furnished.

All other material shall be Contractor furnished.

Disassemble the seal in place, remove the seal components including the liner for inspection. When authorized by the OEM Technical Representative, these parts are to be proper disposed of.

Following satisfactory inspection and acceptance, reassemble the oil seal box with Owner furnished new seal parts, including a new liner.

Inboard Seal Reinstallation:

The shaft must be cleaned and kept perfectly clean to avoid damage to the seal assembly. The seal casing is to be fixed onto the propeller using new gasket. Slide a new O-ring over the shaft to the liner. Re-secure the liner to the propeller while ensuring it to be parallel to the casing. Re-secure the seal box to the stern tube using a new gasket. Check parallelism between the liner flange and the casing by using calipers. Contractor to check the run out of the seal liner.

All fasteners shall be lockwired using Contractor-furnished stainless steel wire with a gauge as per the instructions of the manufacturer's service engineer.

Seal Pressure Tests:

Conduct a system pressure test to ensure seals to be properly installed and working. On the outboard seal, remove the oil fill, vent and drain plugs (3 total) on the seal casing. On the inboard seal, slacken the oil drain line at the bottom of the casing. Fill the stern tube using vessel-furnished new oil making sure to remove all air from the system. The seal shall remain under standing head pressure for a period up to four (4) hours. If leakage is found, the source of the leakage shall be identified, corrected, and retested. If no leakage is found, install the outboard seal drain plug. Fill the oil seal through the fill connection using new oil. Tighten the fill and vent plugs. Refit the inboard seal drain line. Fill the forward seal oil system and receiver with new oil. After satisfactory testing of the seal tightness, Contractor to drain oil and dispose of in accordance with all Federal, State, and Local Regulations. Fill forward seal cavity with vessel supplied oil.

Note that this item is included in all shaft seal items and is to be quoted as a separate item so as to prevent duplication of costs. Do not include this cost in any seal renewal item.

PERFORMANCE CRITERIA/DELIVERABLES

Outboard seal and liner condition
Manufacturer's service engineer report

REFERENCES

Drawing-Stern Tube Arrangement

NOTES

Pressure test seal box prior to reinstallation as per the instructions of the OEM technical representative.

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203) and the Weardown Readings Item (0204). Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

Portions of Item 206 will be completed depending on the requirements of Class and any discrepancies discovered once the vessel is dry. Either Item 206A or 206C and either 0206B or 0206D will be completed. Item 0206E covers the travel, lodging and expenses for the Contractor Furnished OEM Technical Representative and this Item will be completed. It should be understood that both seal boxes will be overhauled.

STERN TUBE OIL SEAL, INBOARD, IN-PLACE OVERHAUL (D)

INTENT

The intent of this work item is to overhaul the inboard stern tube oil seal assemblies in place. All work specified within this work item shall be completed under the direct supervision of a Contractor furnished manufacturer's service engineer.

IDENTIFICATION

Stern Tube Seal

Simplex - Compact Type Size 800
Mfg - Howaldswerke-Deutsche Werft

WORK DESCRIPTION

The forward seal will be updated to the latest version of a Simplex Compact Seal, size 800. The seal box and fit up will remain as the original.

All work shall take place under the direction of a Contractor furnished manufacturer's service engineer.

All seal components will be Owner furnished.

All other material shall be Contractor furnished.

Disassemble the seal in place, remove the seal components including the liner for inspection. When authorized by the OEM Technical Representative, these parts are to be properly disposed of.

Following satisfactory inspection and acceptance, reassemble the oil seal box with Owner furnished new seal parts, including a new liner.

Inboard Seal Reinstallation:

The shaft must be cleaned and kept perfectly clean to avoid damage to the seal assembly. The seal casing is to be fixed onto the propeller using new gasket. Slide a new O-ring over the shaft to the liner. Re-secure the liner to the propeller while ensuring it to be parallel to the casing. Re-secure the seal box to the stern tube using a new gasket. Check parallelism between the liner flange and the casing by using calipers. Contractor to check the run out of the seal liner.

All fasteners shall be lockwired using Contractor-furnished stainless steel wire with a gauge as per the instructions of the manufacturer's service engineer.

Seal Pressure Tests:

Conduct a system pressure test to ensure seals to be properly installed and working. On the outboard seal, remove the oil fill, vent and drain plugs (3 total) on the seal casing. On the inboard seal, slacken the oil drain line at the bottom of the casing. Fill the stern tube using vessel-furnished new oil making sure to remove all air from the system. The seal shall remain under standing head pressure for a period up to four (4) hours. If leakage is found, the source of the leakage shall be identified, corrected, and retested. If no leakage is found, install the outboard seal drain plug. Fill the oil seal through the fill connection using new oil. Tighten the fill and vent plugs. Refit the inboard seal drain line. Fill the forward seal oil system and receiver with new oil. After satisfactory testing of the seal tightness, Contractor to drain oil and dispose of in accordance with all Federal, State, and Local Regulations. Fill forward seal cavity with vessel supplied oil.

Note that this item is included in all shaft seal items and is to be quoted as a separate item so as to prevent duplication of costs. Do not include this cost in any seal renewal item.

PERFORMANCE CRITERIA/DELIVERABLES

Inboard seal and liner condition
Manufacturer's service engineer report

REFERENCES

Drawing- Stern Tube Arrangement.

NOTES

Pressure test seal box prior to reinstallation as per the instructions of the OEM technical representative.

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203) and the Weardown Readings Item (0204). Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

Portions of Item 206 will be completed depending on the requirements of Class and any discrepancies discovered once the vessel is dry. Either Item 206A or 206C and either 0206B or 0206D will be completed. Item 0206E covers the travel, lodging and expenses for the Contractor Furnished OEM Technical Representative and this Item will be completed. It should be understood that both seal boxes will be overhauled.

STERN TUBE OIL SEAL OVERHAUL (E)

STERN TUBE SEAL TECHNICAL REPRESENTATIVE EXPENSES

INTENT

The intent of this item is provide the Contractor with a vehicle to cover travel, lodging and other expenses of the Contractor Furnished OEM Technical Representative.

IDENTIFICATION

Stern Tube Seal
Simplex - Compact Type Size 800
Mfg - Howaldswerke-Deutsche Werft

WORK DESCRIPTION

This item is intended to cover the travel, lodging and other expenses of the Contractor Furnished OEM Technical Representative.

These costs are not to be duplicated elsewhere under other related items.

The labor of the Contractor Furnished OEM Technical Representative is to be included in the specific items he will address as described elsewhere in this item.

PERFORMANCE CRITERIA/DELIVERABLES

None

REFERENCES

None.

NOTES

Although certain items related to the tailshaft may be cancelled portions of Item 206 will be completed depending on the requirements of Class and any discrepancies discovered once the vessel is dry. Either Item 206A or 206C and either 0206B or 0206D will be completed. Item 0206E covers the travel, lodging and expenses for the Contractor Furnished OEM Technical Representative and this Item will be completed. It should be understood that both seal boxes will be overhauled.
INTENT

The intent of this item is to replace the vessel's stern tube bearing with an Owner-furnished new one. All work specified within this work item shall be under the direct supervision of a Contractor-furnished manufacturer's service engineer and shall be completed in accordance with ABS requirements.

IDENTIFICATION

Stern Tube Bearing
Manufacturer - Railko Limited
Type - CY160LS
Diameter - 730 mm nominal
Length - 1455 mm total

WORK DESCRIPTION

This work item shall be worked in conjunction with the separate Item 205, Tailshaft Survey detailed elsewhere in this specification.

All work shall take place under the direction of a manufacturer's service engineer. Contact information for the manufacturer is as follows:
Railko Limited Loudwater High Wycombe Buckinghamshire England
HPlO 9QU

ATTN: Bob Baker Phone: 44-1628-524901 Fax: 44-1628-810761

The new stern tube bearing will be Owner-furnished.

With the exception of the bearing, all labor, materials, equipment, and parts shall be Contractor-furnished.

Bearing Removal:

The tailshaft will be in a removed state as covered by separate work item 205.

Contractor shall remove the fixture (retaining) ring at the stern of the stern tube bush by unbolting and removing.

Contractor shall remove the stern tube temperature sensor and associated tubing.

The stern tube bearings shall be pushed out of the stern tube bush.

The bearing is in three (3) pieces. Each section will have a dimension of approximately 823 mm OD x 723 mm ID x 525 mm long.

The Contractor shall dispose of the removed stern tube bearings in accordance with all Federal, State, and Local regulations.

All material, with the exception of Owner-furnished liners (if required), will be Contractor-furnished.

The Contractor shall thoroughly clean the stern tube bushing area in preparation for installation of the new bearings.

New Bearing Machining:

The new Owner-furnished bearing will be supplied in three (3) sections as follows. Each section will have a dimension of approximately 823 mm OD x 723 mm ID x 525 mm long.

The bearing sections are being provided semi-finished. The bearings as supplied are oversize on the outside diameter, undersize on the inside diameter, and longer than required. The Contractor shall perform all work necessary to final machine the bearings.

The Contractor shall take accurate measurements of the stern tube bush diameter. Measurements shall be taken a minimum of three (3) locations on the diameter at nine (9) locations along the length of the bearing.

Measurements shall be taken under the direction of the manufacturer's service engineer.

Based upon the measurements taken, the bearing sections shall be finish machined.

Inside diameter, outside diameter, wall thickness, and length shall be as specified by the manufacturer's service engineer. Note that bearings will be machined for an interference fit.

Inside and outside diameters shall be machined at the same machine setting to ensure bearing concentricity.

Contractor shall machine grooves for pipe work and temperature sensors in accordance with the directions of the manufacturer's service engineer.

Approximate final dimensions to be an inside diameter of 730.5 mm with outside dimensions of 812 mm, 814 mm, and 816 mm respectively for each section. Approximate length of each section to be 485 mm.

These are approximations only. Contractor shall be fully responsible for final machining to finish dimensions specified by the manufacturer's service engineer.

Bearing Installation:

Bearing sections shall be transported to the vessel for installation in the stern tube bush.

Installation of the bearing sections shall be performed under the direct supervision of the manufacturer's service engineers.

The bearing sections shall be press fit into the stern tube bush in sequence.

Press fitting shall be performed using evenly applied hydraulic pressure.

Contractor shall record force required for press fit.

All removed pipes and temperature sensors shall be reinstalled as per original. All temperature sensors shall be tested prior to reinstallation of tailshaft.

Following completion of installation, the bearing shall be measured on its inside diameter.

On each section (three (3) total), the measurements shall be take in three (3) longitudinal locations (forward, center and aft) with two (2) readings (top to bottom and port to starboard side) at each location.

Following confirmation of satisfactory bearing measurements by the manufacturer's service engineer, the fixture ring shall be refitted and fasteners shall be reinstalled.

The tailshaft will be installed under separate Item 205 - Tailshaft Survey.

Following installation of the tailshaft, the Contractor shall measure and record shaft to bearing clearance by use of feeler gages.

Following completion of work, the manufacturer's service engineer shall submit a report of work performed, including details on all measurements and clearances taken. This shall be furnished to the PGM Engineer in three (3) typewritten copies.

PERFORMANCE CRITERIA/DELIVERABLES

Manufacturer's service engineer report

REFERENCES

Drawing-
Stern Tube Arrangement
Aft Peak Bulkhead and Stern Tube Connection

NOTES

Due to the uncertainties of the necessity of completing all the Tailshaft related items other than the Propeller Item (0203), Items 0204-0207 are optional and are only to be started when so advised in writing by the PGM Port Engineer.

INTENT

The intent of this item is to open the sea valves and overboard discharge valves for overhaul and regulatory body survey.

VALVE LIST

Contractor shall provide all labor, material and equipment necessary to complete a thorough survey and overhaul of the following sea valves and overboard discharge valves.

ITEM	QTY	SERVICE	SIZE	TYPE	LOCATION
1	1	Ballast Suction	500 mm	Angle Globe	Engine Room
2	1	Ballast Overboard	500 mm	Butterfly	Engine Room
3	1	Main S.W. Cooling High Suction	500 mm	Globe	Engine Room
4	1	Main S.W. Cooling Low Suction	500 mm	Angle Globe	Engine Room
5	1	Main S.W. Cooling Overboard	500 mm	Butterfly	Engine Room
6	1	Bilge Pump Overboard	200 mm	Angle Globe	Engine Room
7	1	OWS Overboard	60 mm	Globe	Engine Room
8	1	Fire Pump, Low Suction	150 mm	Angle Globe	Engine Room
9	1	Fire Pump, High Suction	150 mm	Globe	Engine Room
10	1	A/C Plant S.W. Cooling	125 mm	Angle Globe	Engine Room
11	1	Reefer Plant S.W. Cooling	50 mm	Angle Globe	Engine Room
12	1	A/C Plant S.W. Overboard	125 mm	Angle Globe	Engine Room
13	1	Serck Evap. Suction	100 mm	Angle Globe	Engine Room
14	1	Serck Evap. Overboard	80 mm	Angle Globe	Engine Room
15	1	Alfa-Laval Evap. Suction	100 mm	Globe	Engine Room
16	1	Alfa-Laval Evap. Overboard	100 mm	Globe	Engine Room
17	1	R.O. Pump Suction	60 mm	Globe	Engine Room
18	1	Emergency Bilge Suction	500 mm	Angle Globe	Engine Room
19	1	Emergency Fire Pump Suction	150 mm	Gate	FWD Bow-Thruster Space
20	3	Sea Chest Vent	50 mm	Angle Globe	Engine Room
21	1	Sea Chest Vent	50 mm	Angle Globe	FWD Bow-Thruster Space
22	3	Sea Chest Steam Out	15 mm	Angel Globe	Engine Room
23	2	Sea Chest Steam Out	15 mm	Angle Globe	FWD Bow-Thruster Space
24	1	Boiler Blowdown Overboard	25 mm	Globe	Engine Room
25	1	Drain Cooler Overboard	100 mm	Globe	Engine Room
26	2	Sewage Overboard	150 mm	Globe	Engine Room
27	2	Drain Overboard	150 mm	Swing Check	Engine Room
28	1	Reefer Chamber Overboard	100 mm	Swing Check	Engine Room
29	1	Galley Overboard	100 mm	Swing Check	Engine Room
30	1	Deck 3 Drain Overboard	200 mm	Swing Check	Engine Room
31	1	Deck 4 Scupper Overboard	80 mm	Swing Check	Engine Room
32	1	Hospital Overboard	65 mm	Swing Check	Engine Room
33	1	Pool Drain	80 mm	Swing Check	Engine Room
34	1	Draft Gauge	40 mm	Gate	Engine Room
35	2	Draft Gauge	40 mm	Gate	Mid-ship
36	1	Draft Gauge	40 mm	Gate	FWD Bow-Thruster Space

WORK DESCRIPTION

Valve Removal:

Furnish labor, material, and equipment and remove and reinstall interferences as required in order to accomplish this work item for all valves listed in table above.

Prior to disassembly of the valves, the Contractor shall test all remote air operated valves with the ship's force operating the actuators.

Contractor shall make a condition report of all defects found prior to further work on the valves.

After completion of pre-testing, the Contractor shall disconnect and remove all of the remote control air tubing and air actuators from the sea valve stems and place in a safe location for reinstallation.

All actuating lines shall be marked so that the fittings and lines can be matched up correctly upon reinstallation of the valves.

All valves shall be completely disassembled.

All parts shall be cleaned and presented to the PGM Engineer, ABS Surveyor, and USCG Inspector for inspection

The Contractor shall prepare and submit a condition report of the valves' as-found condition to the PGM Engineer prior to the commencement of valve reassembly

Valve Overhaul:

Overhaul all pneumatic valve actuators.

Disassemble actuators. Clean all parts and examine for wear and defects.

Contractor shall submit a condition report for required parts renewals.

Reassemble actuators, lubricate and restore to operating condition all parts forming the valve actuator mechanisms.

Clean all valve parts free of scale, sea growth, and verdigris.

Scrape and file bonnet flange faces to restore proper sealing surface for reassembly.

Straighten and polish valve stems.

Clean and chase all valve stem threads and those of bonnet yokes, valve disc nuts, and valve discs.

Restore valve seating surfaces.

Valve seats, discs, and gates on all valves under 16-inches shall be lapped to have a true, smooth, concentric sealing surface.

Gate and check valves 16-inches and a larger shall be hand dressed to have a true, smooth, concentric sealing surface.

Globe valves 16-inches and larger shall be lapped to a true, smooth, concentric sealing surface.

Prove fit to the PGM Port Engineer, ABS Surveyor, and USCG Inspector by the blue transfer method.

For globe valves, transfer line shall consist of 360 degrees contact of uniform width covering one-third of the seating surface within the lower half of the disc seating surface.

For gate valves, transfer line shall consist of 360 degrees contact of uniform width within then center 50 percent of the gate seating surface.

Ensure gates have clearances between bottom of gate and valve bottom when valve is in a tight closed position. Demonstrate clearance to the PGM Engineer.

Butterfly Valves, shall be completely rebuilt: replacing seats and shaft seals. Shaft pin for butterfly disk shall be stainless steel. Optionally the valves may be replaced if they are approved by the PGM Port Engineer.

Condition of the above shall be reported to the PGM Engineer in a condition report.

Note that valves of two (2) inches or less in size may be replaced in lieu of overhaul. This will be done only after obtaining specific approval from the PGM Engineer. New valves shall be equivalent to existing valves and meet all regulatory requirements. Valves shall be proposed to and approved for use by the PGM Engineer, ABS Surveyor, and USCG Inspector.

New valves shall be installed on new Contractor- furnished gaskets, packing, and flange bolts.

NOTE: In the event this option is pursued, this shall be completed at no additional cost.

Valve Reassembly and Acceptance:

After acceptance of valve condition and seating surface fit, all valves shall be reassembled.

Coat valve body interiors with two (2) coats of Apexior #3 or equal.

All valve stems and threaded connections shall be lubricated with anti-seize lubricant.

Valves shall be reassembled using new Contractor-furnished gaskets and metric fasteners.

Monel fasteners shall be used on bronze valves and 316 stainless steel fasteners shall be used on steel valves.

Reinstall valves actuators and reconnect all air actuator tubing. Conduct a thorough testing of the installed valves in the presence of the PGM Engineer and Chief Engineer.

Prior to undocking, all sea valves installed/worked on shall be closed. During flooding of drydock, when water level is above sea valves, but prior to vessel's becoming fully afloat, all sea valves that have been installed/worked on shall be operated and inspected, checking valve stem packing, flanges, bonnets and valve bodies for leaks. Overboard discharge valves at or above the foregoing water level may be hose tested from their shell openings. Correct any deficiencies found.

If it is necessary to bring the vessel back on drydock to correct any deficiencies found as a result of work performed on the sea valves by the Contractor, the cost of re-docking the vessel shall be borne by the Contractor.

PERFORMACNE CRITERIA/DELIVERABLES

Valve and connections condition reports. Valve report is to include all valves changed and/or repaired.

REFERENCES

Underwater Road Map & Shell Blanks, Drawing Number 7553-160

NOTES

None.

INTENT

The intent of this specification is to open and remove the four (4) sea chest strainer plates while the ship is on drydock, to clean and paint to the first sea valve all suction and overboard lines, and to perform non-destructive testing on the sea chests and valve spool pieces to meet regulatory requirements..

IDENTIFICATION

Sea Chests as follows.
1- Sea Water Cooling, High Suction at Fr. 60-61, Port
2- Sea Water Cooling, Low Suction at Fr. 52-59, Port
3- Sea Water Cooling, Low Suction at Fr. 60-61, Port
4- Emergency Fire Pump Suction at Fr. 226-229, Port Forward

WORK DESCRIPTION

Sea Chest Cleaning:

Immediately upon drydocking, erect staging to provide suitable access to the sea chests.

Remove the sea chests strainer plates listed above.

Prior to high pressure washing, blank off hull penetrations if the skin valves have been removed. If the skin valves are in place they are to be verified to be closed.

Thoroughly clean all spool pieces to the first sea valve by high pressure water. WORDING REMOVED. Ensure all marine growth and loose paint is removed.

Sea Chest Inspection:

Provide staging to allow for thorough, close-up inspection of the sea chests by ABS, USCG, PGM Port Engineer and any other interested parties.

Perform ultrasonic testing (UT) at each sea chest and spool piece connection as directed by ABS or USCG.

Allow for (10) UT readings in each sea chest. Readings shall be taken at locations directed by the Regulatory Body personnel or the PGM Port Engineer.

Furnish a rough draft of the UT results to the PGM Engineer immediately upon completion on a daily basis.

Sea Chest Painting:

Following the inspection and acceptance by the PGM Engineer, ABS, and USCG, thoroughly clean the sea chests and remove any contaminated material on the surfaces resulting from inspection, such as foot prints and marks. All prepared surfaces, including strainer plates and spool pieces to the first valve, shall be fully coated in accordance with the paint system specified under "Hull Cleaning and Painting" detailed elsewhere in this specification.

If the sea chest strainer plates are not hinged, they shall be modified as required for UWILDS. This modification, if required, will be covered under a separate delivery order. The Contractor is to provide a condition report with a proposal for the modifications of the strainer plates within two days of removal of the strainer plates. Strainer plate modifications if required shall be approved by the ABS surveyor and the PGM engineer.

Following acceptance of the coating by the PGM Engineer and following the completion of all work to be completed in the sea chests, reinstall the removed sea chest strainer plates with new stainless steel fasteners and locks.

PERFORMANCE CRITERIA/DELIVERABLES

NDT report

Strainer plate hinge condition report and proposal, if plates not already hinged.

REFERENCES

Underwater Road Map & Shell Blanks, Drawing Number 7553-160

NOTES:
If the sea chest strainer plates are not hinged, they shall be modified under a separate delivery order.

Reference the Hull Anode Item (0211) to ensure all sea chest related items are complete prior to reinstalling the strainer plates.

INTENT

The intent of this item is to service to the vessel's underwater hull cathodic protection system while on drydock. Work shall be performed by a manufacturer's service engineer.

IDENTIFICATION

Cathodic Protection System
Manufacturer- Wilson Walton International, Inc.
Type- Impressed Current Cathodic Protection (ICCP) Aquamatic III

WORK DESCRIPTION

ICCP System Servicing:

Arrange for and provide the services of a manufacturer's service engineer(s) to service, inspect, and make corrective actions on deficiencies found to place the vessel's Impressed Current Cathodic Protection (ICCP) system in good operational condition.

All work shall take place under the direct supervision of the manufacturer's service engineer.

The manufacturer's service engineer shall submit a report of all work done within two (2) days of completion of work. This report shall be provided the PGM Engineer in four (4) typewritten Copies.

Manufacturer's contact information is as follows:

Wilson Walton International, Inc. 66 Hudson St. Hoboken, NJ 07030
ATTN: Michael Long Phone: (201) 795-2044 Fax: (201) 795-3805

Provide labor, material, equipment and staging to assist the manufacturer's service engineer(s) to service, inspect, and correct deficiencies as found on the permanent hull mounted Impressed Current Cathodic Protection (ICCP) system.

The manufacturer's service engineer shall report to the PGM Engineer on a daily basis. When the job is complete, the service engineer shall prepare and submit a complete service report to the PGM Engineer.

The entire ICCP system shall be serviced. This includes but is not limited to the following components:

150 Amp Anodes, 75 Amp Anodes, forward and aft Reference Electrodes, propeller shaft slipring, bonding cable between rudder stock and ship's structure, 300 Amp and 150 Amp power units, main computer controller unit, data logger, etc.

The Aquamatic computer controlled power supplies shall be serviced. The units shall be shut down and secured. Electrical inputs to the units shall be secured by pulling fusing and/or opening circuit breakers. The units shall be locked out/tagged out. All dust accumulation in the units shall be cleared with dry, clean compressed air. All wire connections shall be checked to ensure that they are tight and free of corrosion. Louvers and air-flow openings are to be checked for obstructions. Following inspection and service, the units shall be restored to operating condition.

The hull penetrations of the anodes and reference cells shall be checked. The cofferdam lids are to be opened when the vessel is on drydock. In the event water is found inside the cofferdam, the source of this water shall be determined and the leak rectified. Ensure that all cable connections are in good physical condition and free of corrosion. Restore the cofferdams, replacing gaskets and fasteners as required.

The hull mounted anode and reference cells shall be inspected while on drydock. This will require fitting staging in four locations. Cells are to be checked for cracks or excessive wear.

The shaft grounding assembly shall be serviced. The slip ring and brush assembly shall be cleaned and serviced. Spring tension shall be adjusted to avoid excessive wear.

The rudder stock bond shall be checked. The flexible cable shall be checked to confirm that it has not suffered any mechanical damage and that there remains good continuity (less than one ohm) between the vessel's hull and the rudder stock. Check for worn or frayed ends.

The dielectric shields surrounding around each of the anode and reference cells shall be refurbished to return them to original specifications. Place protective covering over the anodes. Remove all the dielectric shield material/coating around each anodes and reference electrodes. Prepare the disturbed surfaces with abrasive blasting to a surface preparation standard of SSPC-SPI0 (Near White Blast). Approximate area surrounding each 150 Amp anode is 10'6" x 18'6" and surrounding each 75 Amp anode is 4'0" x 8'6". Once the prepared surfaces has been inspected and approved by the manufacturer's service engineer and the PGM Engineer, apply new dielectric shield material/coating to cover the prepare surfaces in accordance with the manufacturer's standard specification. This requires that the material be applied to a thickness of 1/4-inch (6 mm). Remove all trapped air. Following completion of work, demonstrate to the manufacturer's service engineer and the PGM Engineer for acceptance.

Following completion of all work, the manufacturer's service engineer(s) shall leave the system ready for operation.

PERFORMANCE CRITERIA/DELIVERABLES

Manufacturer's service engineer report

REFERENCES

None.

NOTES

Cells shall be protectively covered during underwater hull coating. Protective covering shall be removed prior to re-floating by the dry dock.

INTENT

The intent of this work item is to crop and remove all installed zinc anodes on the underwater hull areas, including bow and stern thruster tunnels, sea chests, rudder and stern frame. Contractor shall then renew all existing zinc anodes on the vessel's hull using new weld strap type anodes to be located in the same positions.

IDENTIFICATION

Sixty (60) 15 kg zinc anodes total

WORK DESCRIPTION

Zinc Anode Removal:

Immediately upon drydocking, erect staging or spot equipment such as man lifts, scissor lifts or other gear of similar nature to provide suitable access to the affected areas.

Contractor shall make all areas affected by this item "Safe For Hot Work" prior to start of this item.

Crop and remove all zinc anodes currently installed on the ship's underwater hull areas including sea chests, bow and stern thruster tunnels, rudder and stern frame.

Remove all mounting straps and other raised surfaces.

Grind all disturbed areas to a smooth surface.

Zinc Anode Renewal:

Renew sixty (60), 15 kg zinc anodes in the sea chests, stern frame, rudder, stern tube area, and bow and stern thruster tunnels.

The new zinc anodes shall be composed of low-iron special high grade zinc, equal to Specification MIL-A-18001, with the following characteristics:

Cast-in steel straps for attaching to the hull structure by welding are to be bent to fit contour of hull.

The zincs shall be located and welded to the hull as per existing, except where otherwise directed by PGM Engineer.

The zincs shall be set down and embedded in zinc oxide paste and left unpainted.

Following welding to the hull, the zinc straps and all disturbed surfaces shall be cleaned, prepared, and painted in accordance with the underwater hull coating system as specified under separate Work Item entitled "Hull Cleaning and Painting" detailed elsewhere in this specification.

Upon acceptance of the installation and coating by the PGM Engineer, remove all access equipment.

PERFORMANCE CRITERIA/DELIVERABLES

None.

REFERENCES

None.

NOTES

None.

INTENT

The intent of this work item is to range the port and starboard anchors and chains for Regulatory inspection and along with the spare anchor for coating and/or marking.

IDENTIFICATION

Anchors and Chains
Manufacturer - Not Available
Anchor Type - Stockless
Anchor Weight - 11,600 kgs, each
Chain Size - 84 mm
Chain Grade- U3
Quantity- Three (3) anchors (including one spare)
Thirteen (13) shots of chain port
Twelve (12) shots of chain stbd

WORK DESCRIPTION

Range, Shift, Gauge Anchor Chains:
Open the manholes on the port and starboard chain lockers for access.

Range the port and starboard anchor chains. If directed, disconnect the bitter ends from the breakaway fittings and lower the bitter ends to the dock floor. The bitter ends are not to be disconnected without written authorization from the PGM Port Engineer.

Wash down the chains and anchors to remove all mud, loose debris and salts.

Gauge the anchor chains as required by the ABS Rules. Inspect chains for loose studs, abnormal wear, damage, deteriorated connecting links or missing plugs. Inspect the anchors for bends, deteriorated crown pin, worn or otherwise deteriorated anchor shackle or shackle pin, etc.

Submit to the PGM Port Engineer a rough draft of the final report consisting of the gaugings and any significant observations on a daily basis. Repairs found to be necessary as a result of the inspections will be dealt with separately. The final report is to be included in the drydock report with a copy provided to the ABS surveyor and PGM Port engineer within 2 days of completion of the gaugings.

If directed by the PGM Engineer, disconnect the first shot of both the port and starboard chains from the anchor swivels/swivel forerunners and the second shot of chain by disassembling the joining shackles. Connect the second shot of chain, port and starboard, to their respective swivels/swivel forerunners. Shift the removed first shots of chain and connect same to the original bitter end of their respective chains. The PGM Engineer is to witness the refitting of joining shackles and the pouring of "leads" in conjunction with this item.

The exchange of chain sections is an optional item and shall not be started without written authorization of the PGM Port Engineer.

Present chain for inspection to the PGM Engineer, ABS, and USCG.

Anchors and Chains Blasting and Painting:

All painting is subject to inspection and approval of Owner Supplied coating representative.

Use a high pressure wash at 3,000 psi (nozzle pressure) to prepare all surfaces of the chains, spare anchor, and the port and starboard anchors for coating. Turn the chains and anchors as necessary to ensure that all surfaces are blasted.

Surface preparation of the anchors and chains shall be inspected and approved by the PGM Port Engineer prior to the application of any coatings.

Ensure the following conditions are met prior to painting:

Surfaces shall be clean, dry, and free of oil, grease or residue from abrasive blasting.

Air and metal surface temperatures shall be within the range published by the paint manufacturer.

The ambient air and metal temperatures must register at least 5 degrees F. above the dew point temperature.

The relative humidity shall be no higher than 80 percent.

No coating shall be applied at temperatures below 35 degrees F. without prior written approval of the PGM Engineer.

Painting shall not be performed between the hours of 1900 and 0800 without prior written approval of the PGM Engineer.

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

All coatings shall be MARAD approved in accordance with MARAD Coating Guidelines (Latest Revision).

Prior to any coating work, the work area in which the anchor and chains are to be painted shall be thoroughly cleaned to prevent any undue contamination.

Apply one (1) spot of primer coat of inorganic zinc silicate or surface tolerant epoxy to all exposed metal.

Following priming, the anchor chains shall then be coated with two (2) full coats of surface tolerant black epoxy, approved in accordance with the MARAD Coating Guidelines (Latest Revision). The anchors shall be coated with one full base coat of surface tolerant epoxy anti-corrosive and one full topcoat, color to match the freeboard.

In addition, the last and next to last shots of chain shall be top coated as follows when the second coat of epoxy is tacky.

The last shot of chain port and starboard shall be painted bright red.

The next to last shot of chain port and starboard shall be painted bright yellow.

Shots of chain shall be marked as follows:
Detachable links shall be painted red, white or blue in a repetitive sequence: 15 fathoms, red; 30 fathoms, white; 45 fathoms, blue; 60 fathoms, red, and so on.

Links on either side of the detachable link shall be painted white, as follows:
At 15 fathoms, one link on each side of the detachable link shall be painted. At 30 fathoms, two links on each side of the detachable link shall be painted. The remaining detachable links follow the same progression.

Shots of chain shall also be marked with wire as follows:
At 15 fathoms, 1 turn of wire shall be placed on the first stud on each side of the detachable link. At 30 fathoms, 2 turns of wire shall be placed on the second stud on each side of the detachable link. The remaining detachable links follow the same progression.

Cleaning and Coating of Chain Lockers:

Open out eductor space, remove and dispose of all mud, scale, debris, and dirt. For bidding purposes use 5 tons of waste for disposal. Clean out all drains and test the water removal system. Clear obstructions as necessary.

Prove chain locker eductor fully operational to ABS, USCG, and PGM Port Engineer. Prior to closing the eductor space, present to the PGM Port Engineer for final acceptance.

Close up the space on new gaskets and new stainless steel metric fasteners.

Stage chain lockers for hydroblasting with high pressure water blaster.

Close freshwater high pressure wash at 3,000 psi (nozzle pressure) all surfaces of both chain lockers above and below gratings to clean surface, including the gratings. Remove all grit, rust, and all other contaminants and prepare blasted surfaces for coating. After inspection and acceptance of blasting apply one (1) coat of surface tolerant epoxy (black). DFT to be 8.0 mils minimum.

PGM Engineer is to approve final coating prior to stowing chains.

Staging shall be removed and gratings shall be replaced after final acceptance of coated surfaces.

Anchors and Chains Refitting:

With all anchor, chain, and any chain locker work and coating complete, provide rigging services to restore the spare anchor to its original position and the anchor chains onto the vessel and wildcat.

If disconnected earlier in this item, refit the bitter end to the breakaway fitting. Ensure that there are no twists in the chain, either between the bitter end and the wildcat or between the wildcat and the chain stopper.

Contractor shall ensure that the chain sits properly in the chain stoppers. If they don't Contractor shall recommend an appropriate repair, which will be the subject of a separate delivery order.

Clean and touch-up chain locker coatings disturbed by this work. Remove all rigging gear and debris. When approved by the PGM Engineer, heave-in the anchor chains and bring the anchors home.

Demonstrate the proper operation of the chain stoppers and demonstrate that the chain lays properly when being stowed and when fully stowed.

Close the access manholes on the chain lockers using new gaskets and renewing all Fasteners. Clean and touch-up disturbed surfaces.

All debris generated in the performance of this item, whether solid or liquid, shall be disposed of in accordance with all Federal, State and Local regulations.

PERFORMANCE CRITERIA/DELIVERABLES

Chain gauging reports; rough drafts on a final basis, final report to ABS and PGM Port Engineer and to be included in the final drydocking report.

REFERENCES

MARAD Coatings Guidelines.

NOTES

Replace fasteners used to stow spare anchor.

Individual line items will be inserted on the quote sheet for disconnecting and later reconnecting the bitter end and for the exchange of sections of chain.

INTENT

The intent of this work item is to clean, inspect, and overhaul the vessel's bow and stern thrusters. Assist the manufacturer's service engineer in performing inspection, overhaul, and operational checks. All work shall be performed under the direction of a Contractor-furnished manufacturer's service engineer.

IDENTIFICATION

Bow Thruster:
Manufacturer- A.M.Liaaen, Aalesund, Norway
Type - TT 92/68 - 250
Installation No. - AMLB 50
Propeller Output - 1,800 HP @ 258 RPM
Propeller Dia. - 2,440 mm
No. of Blades - 4
Motor - NEBB; Type QRV 710 db8; 1320 KW; 895 RPM

Stern Thruster:
Manufacturer- A.M.Liaaen, Aalesund, Norway
Type - TT 25/68 - 250
Installation No. - AMLB 51
Propeller Output -1,800 HP @ 258 RPM
Propeller Dia. - 2,440 mm
No. of Blades - 4
Motor - NEBB; Type QFV 560 bd; 1320 KW; 890 RPM

WORK DESCRIPTION

Bow and Stem Thruster Inspection:

All work shall take place under the direction of a Contractor-provided manufacturer's service engineer.

The manufacturer's service engineer shall provide a complete report on work performed within two (2) days of completion of work. The report shall be provided to the PGM Engineer in four (4) typewritten copies.

All seals and gaskets required for the overhaul of the thrusters shall be Contractor-furnished.

All parts which are found to require replacement during the course of the thruster inspections shall be subject of a delivery order.

Immediately upon drydocking, erect staging to provide suitable access to perform the cleaning, inspection, and overhaul of the bow and stern thrusters.

High pressure water blast at 3,000 psi (nozzle pressure) the entire surface on the bow and stern thruster blades, hubs, support frames, and tunnels. Remove all marine growth, salt deposits, loose paint, rust, and contaminants. Prepare the tunnels and painted surfaces to SSPC-SPIO (Near White Blast) or HB2.5. Recoating is covered under a separate work Item entitled "Ship's Hull Cleaning and Painting" detailed elsewhere in this specification package.

Thoroughly clean the bow and stern thrusters to remove all marine growth to the satisfaction of the manufacturer's service engineer and the PGM Engineer. The blades and non-coated hub body surfaces shall be polished using 3M polishing disc or equivalent. Grit, wire brush tools, or abrasive grinding tools will not be used.

The blades and non-coated hub body surfaces shall be polished to a Rupert Scale grade "B."

Provide assistance to the manufacturer's service engineer(s) in completing a survey on both bow and stern thrusters.

Inspect thrusters with hydraulic systems pressurized to determine if seals are leaking. The blades shall be cycled from full ahead to full astern and back again a sufficient number of times to permit a thorough inspection of the propeller hub and all blades for hydraulic leaks and to verify proper operation.

Check that the bearing, gearing, etc. move freely by manually rotating the blades.

Measure all thruster clearances. Check the backlash and the axial clearance of each blade.

Check the pinion shaft axial clearance.

Check thrust bearing clearance

Drain, collect and flush the complete oil system. Contractor shall dispose of all waste generated from this item in accordance with all Federal, State and Local Regulations.

Obtain oil samples from the hydraulic tanks and from the thrusters. Contractor shall send these samples for testing if directed by the PGM Engineer. Provide a report on the results of the oil analysis.

Immediately following completion of the thruster survey, the Contractor shall submit a condition report outlining the as-found condition of the thrusters and the required repairs.

Renew Thruster Seals:

Contractor shall remove all interferences required to disassemble the drive shafts of both the stern and bow thrusters.

Clean all surfaces and provide a condition report of findings to the PGM engineer.

Contractor shall provide new and install drive shaft seals in both the stern and bow thrusters.

Contractor shall renew all propeller blade seals.

Following completion seal replacement and when the thrusters are fully reassembled, renew all oil with vessel-furnished oil.

Perform a pressure test on the thrusters for checking of seal condition after the new seal installation. The hydraulic system is to be pressurized. The thruster blades are to be cycled from full port to full starboard and back again a sufficient number of times to permit a thorough inspection in way of the hub and all blades for hydraulic leaks and to verify proper operation.

Operationally check the hydraulic and control system from all control stations.

Verify the blades' pitch to agree with the markings on the scale of the indicator rod.

Lubricate the drive motor. Grease the transmission and intermediate shafts.

Following completion of all testing and verification of satisfactory repairs, remove all staging and leave thrusters in a condition ready for use.

PERFORMANCE CRITERIA/DELIVERABLES

Manufacturer's service engineer report
Oil analysis results
Thruster condition report

REFERENCES

Thruster Component and Systems Drawings Provided by PGM Engineer

NOTES

All blasting and polishing shall be completed prior to opening the thrusters for seal changes, inspection and service.

Rolls-Royce is the current OEM for this equipment.

INTENT

The intent of this item is to service and upgrade the vessel's marine growth prevention system while on drydock. Work shall be performed by a manufacturer's service engineer.

WORK DESCRIPTION

Marine Growth Prevention System Servicing:

Arrange for and provide the services of a manufacturer's service engineer(s) to service, inspect, and make corrective actions on deficiencies found to place the vessel's Anfomatic Marine Growth Prevention System in good operational condition.

All work shall take place under the direct supervision of the manufacturer's service engineer.

The manufacturer's service engineer shall submit a report shall work done within two (2) days of completion of work. This report shall be provided the PGM Engineer in three (3) typewritten copies.

Manufacturer's contact information is as follows:

Wilson Walton International, Inc. 66 Hudson St., Hoboken, NJ 07030
ATTN: Michael Long Phone: (201) 795-2044 Fax: (201) 795-3805

Provide labor, material, equipment and staging to assist the manufacturer's service engineer(s) to service, inspect, and correct deficiencies as found on the permanent mounted Anfomatic Marine Growth Prevention System.

The manufacturer's service engineer shall report to the PGM Engineer on daily basis. When the job is complete, the service engineer shall prepare and submit a complete service report to the PGM Engineer.

The entire Anfomatic system shall be serviced including:

High and low sea suction anodes (six (6) pairs - twelve (12) total), power unit, control panel, cabling, junction boxes, etc.

The Anfomatic power supply, control panel, and junction boxes shall be serviced. The units shall be shut down and secured. Electrical inputs to the units shall be secured by pulling fusing and/or opening circuit breakers.

The units shall be locked out/tagged out. All dust accumulation in the units shall be cleared with dry, clean compressed air. All wire connections shall be checked to ensure that they are tight and free of corrosion. Louvers and air-flow openings are to be checked for obstructions. Following inspection and service, the units shall be restored to operating condition. The hull penetrations and mounting bosses of the anodes shall be checked from both inside and outside of the ship while on drydock.

The Contractor shall procure and renew all twelve (12) Anfomatic system anodes.

Two (2) anodes are located in each of the engine room sea chests.

Anodes shall be replaced with Wilson Walton Clearflo type anodes.

Anodes include six (6) total copper alloyed anodes and six (6) total ferrous alloyed anodes, all complete with cofferdams and mounting bosses (rings).

Size of each anode is 4.75-in x 30.0-in.

New anodes shall be installed in their respective mounting bosses using new Contractor-furnished stainless steel fasteners with antiseize compound applied. Anodes shall be connected electrically to the system.

When the vessel is re-floated, Contractor shall ensure that no leaks exist in way of the anodes/hull penetrations/mounting bosses.

Anfomatic System Setting and Testing:

The setting and testing of the Anfomatic system shall be performed following re-floating of the vessel and with the vessel waterborne.

The manufacturer's service engineer shall perform a full function test of the Anfomatic system.

The manufacturer's service engineer shall adjust the settings on the system to ensure optimum performance.

Note that the vessel maintains two settings on the system - either in-port or underway. Following completion of work the system shall be left on the in-port setting. The manufacturer's engineer shall ensure the system works in both modes and that the ship's staff is fully trained on how to make the appropriate adjustments.

Following completion of all work, the system shall be left in operation.

PERFORMANCE CRITERIA/DELIVERABLES

Manufacturer's service engineer report

REFERENCES

None.

NOTES

None.

INTENT

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 to leave good paint intact, spot blast, sweep to allow for suffice preparation. This work is to be accomplished in accordance with the requirements of the specified painting system manufacturer and the MARAD Coating Guidelines (Latest Revision).

General: Furnish necessary labor, material, staging, crane services, and equipment to accomplish all work specified in this item. Contractor shall verify all surface areas and existing conditions for this work item. Contractor's tender shall be a firm fixed price, all inclusive, for the work incorporated herein.

REFERENCES

MARAD Coating Guidelines (Latest Revision).

SSPC, Steel Structures Painting Manual, Volume 1 and 2.

International Paints Hydroblasting Standards (3/HS/6/95).

Paint Selection and Supply:

All paints required under this work item shall be Contractor-furnished.

Paint type and dry film thickness (DFT) shall be in accordance with the requirements of manufacturer and the MARAD Coating Guidelines (Latest Revision).

The present paint system on the hull of the M/V Cape Hudson is "Jotun." To maintain compatibility due to the required blasting and coating requirements, the Contractor shall use a "Jotun" paint coating system in this application.

Surface Preparation Method Selection and Standards: The method of surface preparation can be either by abrasive blasting or ultra high pressure hydroblasting. The method to be used shall be proposed in the Contractor's original offer. Final approval for the selected method shall be solicited from and granted by the PGM Engineer prior to the commencement of work. Notwithstanding the method selected, the degree of surface preparation shall comply with the referenced standards. In the event hydroblasting is used, light flash rusting shall be the only acceptable degree of flash rusting. Also when hydroblasting is used, the first coat of paint will always be a surface tolerant epoxy. This might replace a zinc rich epoxy which would otherwise be used in some locations. Any such instances of coating system deviations shall be approved by the PGM Engineer in conjunction with the recommendations of the paint manufacturer's representative.

Manufacturer's Representative: The Contractor shall obtain and provide the services of a manufacturer's representative for the painting system being applied. The Manufacturer's representative shall report to the PGM Engineer on a daily basis, each and every day in which any work is accomplished. The representative shall submit daily written progress reports to the PGM Engineer. The Contractor is required to comply with the direction and recommendations of the manufacturer's representative. The manufacturer's representative will be in attendance for the duration of all blasting and painting work. The representative will submit a final comprehensive report upon completion of all coating works.

Inspection and Acceptance: Final inspection and acceptance of all work shall be by the PGM Engineer. Work shall be presented to and accepted by the PGM Engineer after surface preparation, prior to initial coating, and after each coat. It should also be anticipated that the PGM Engineer might be assisted in his inspection and acceptance efforts by an Owner-arranged coatings consultant. The Contractor shall comply with the requirements of any such consultant with the final authority still resting with the PGM Engineer.

Technical Documentation: The Contractor shall prepare a paint report and submit same to the PGM Engineer within three (3) days of completing the coating application. The Contractor 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:

1. Date and time of applications.

2. Temperature, humidity, and dewpoint, at time of each application.

3. Dry film readings for each coat of paint as required by the manufacturer's representative.

4. Manufacturer, Product Identification No. and Batch Nos. for each type of paint applied.

5. Results of chloride tests taken before washing, after washing, and after blasting.

6. Results of blast profile tests taken after surface preparation.

Blasting and Painting Conference:

Prior to the commencement of any blasting or coating work, a meeting shall be held with the PGM Engineer, the paint manufacturer's representative, Contractor personnel, and any subcontractor involved in the pre-cleaning, blasting and coating functions. It is incumbent upon the Contractor and its subcontractors to have a clear understanding of the following and so describe to the PGM Engineer.

1. How surfaces shall be pre-cleaned and blasted.

2. How the coating products are to be handled before mixing and during mixing.

3. The induction time required after mixing.

4. How the various coating materials shall be applied. Painters must be able to produce uniform and proper film thicknesses without runs, sags, pin holing, or other defects. Improperly applied paint shall be blasted off and the affected areas shall be properly recoated at Contractor's expense. All imperfections shall be power sanded and the removed paint system shall be replaced to meet original paint specifications.

5. The minimum and maximum overcoat times for each product shall be adhered to as required by the manufacturer of the selected coating system.

6. Measurement of wet film and dry film thicknesses during the course of the coating works to ensure proper amounts of paint being applied.

7. Coordination and timing with other drydock jobs including propeller, tailshaft, rudder, and thruster work. Timing of these jobs shall be arranged so that no blasting or coating work is taking place while any of these items are exposed.

The Contractor shall present a coating work schedule to the PGM Engineer for review and comment. This coating work schedule will be submitted along with but in addition to the initial production schedule required for the entire work package. After review and discussion of any comments, a final blasting and coating schedule will be provided to the PGM Engineer at the conference. The Contractor shall strictly adhere to this final schedule.

NOTE: that the Contractor must factor in the seasonal affects of weather on surface preparation and on the curing rate of the coatings being used.

General Work Requirements and Preparations:

1. Paint manufacturer's recommendations regarding surface preparation, paint application, and drying times are to be strictly adhered to.

2. The price for blasting shall include proper clean-up and disposal of all grit and all other generated wastes in accordance with the requirements of all Federal, State, and Local regulations.

3. Painting works and selected products will filly comply with all current regulation dictating the use and application of marine coatings. The price for disposal of any refuse associated with painting shall be included in this item and shall be completed in accordance with all Federal, State, and Local regulations.

4. Specification items include staging, lighting, cranes, and all support services necessary to complete blasting, coating, and subsequent inspections.

5. Grit used for blasting and sweeping shall be new, dry, silicon-free, and capable of meeting the conditions specified.

6. Compressed air for blasting and painting shall be oil-free and dry.

The drydock shall be kept drained from water accumulations during periods of blasting and coating. Spent blasting grit shall be removed from the drydock on a continuous basis. This grit shall be removed PRIOR to coating applications to prevent any undue surface contamination.

All overboard discharges and drains must be plugged or piped to lead all discharges away from the hull. These shall be removed upon completion of hull coating work. Note that it may be required to lead drains directly to the drydock floor in the event that wind or other conditions make this necessary to prevent water contact with the hull.

Prior to initiating blasting and coating, the Contractor shall ensure that the vessel's equipment is protected from damage caused by blasting, dust or paint. Measures to be taken include, but are not limited to, the following:

1. Plug open ends of pipes, including sea connections, vents and ducts.

2. Install protective covering on all exposed equipment including impressed current anodes, reference cells, transducers, propeller, exposed shafting, thrusters, rudder pintle access and rudder stock, deck machinery, mooring lines, hydraulic hoses, wire ropes, and any other equipment which might be adversely affected by grit and paint from blasting and coating works.

3. Grease and wrap all valve stems and exposed portions of hydraulic cylinders. Install filters on all air intake vents. Install covers on all fuel tank vents.

4. In all areas to be abrasive blasted and coated, record all ship's markings, including information, size, and color.

5. Overboard discharges for services which cannot be secured, such as refrigeration cooling water overboard, shall be carried off by means of temporary scuppers, hoses, etc., in order to prevent recontamination of the hull after surface preparation.

6. Reference item 218, installation of scupper extension base rings shall take place during the Blasting and Coating.

7. 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 verbally reported to the PGM Engineer immediately upon its discovery to be followed by a written report within four (4) hours of the verbal notification. The Contractor 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 Contractor.

All coatings are to be applied under the direct technical supervision of the manufacturer's representative. No application of coatings shall be made until the prepared surfaces are approved by the coating system manufacturer's representative and signed off by him after each inspection. The Contractor 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.

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.

Ensure the following conditions are met prior to painting:

1. Surfaces shall be clean, dry, and free of oil, grease or residue from abrasive blasting.

2. Air and metal surface temperatures shall be within the range published by the paint manufacturer.

3. The ambient air and metal temperatures register at least 5 degrees F. above the dewpoint temperature.

4. The relative humidity is no higher than 80 percent.

5. No coating shall be applied at temperatures below 35 degrees F. without prior written approval of the PGM Engineer.

6. Painting shall not be performed between the hours of 1900 and 0800 without prior written approval of the PGM Engineer.

7. My over spray shall have been removed prior to the application of the next coat of paint in the system.

Application instructions of the painting system manufacturer are to be closely followed. Paint must be completely mixed prior to and during application to ensure all solids are in full suspension. Mixing of paints will take place in a clean, grit free area. Under some special circumstances only, a small amount of thinner may be added (up to 5% max.), but only with the express written permission of the manufacturer's representative and on a case by case basis. Thinning shall only be done in accordance with and under the supervision of the manufacturer's representative.

In the event that the prepared surface "blooms" with rust beyond the minimum specified surface preparation, this area shall be re-blasted prior to any paint application. Any such work required will be for the Contractor's account.

Sufficient drying time, as set forth by the manufacturer, shall be allowed between coats to ensure proper adhesion of subsequent coats.

Each undercoat shall be of sufficiently different color to make inadequate coverage readily apparent.

Any painting done in the area from the deep load line to rail must be completed before applying any antifouling coatings onto the underwater area. If spray painting in the area from the deep load line to the rail is done, over spray must be kept to a minimum, and any over spray attaching onto the cleaned underwater surface must be removed.

All paint application procedures shall be in accordance with the requirements of the manufacturer and the MARAD Coating Guidelines (Latest Revision).

Chloride tests (the number of which shall be specifically determined by the paint manufacturer's representative) shall be taken before water washing, after water washing, and after blasting.

Blast profile tests (the number of which shall be specifically determined by the paint manufacturer's representative) shall be taken after blasting.

QUOTE CALCULATION INFORMATION:

The total areas as noted below are approximate, but are based on totals from previous drydockings. All hull openings including, but not limited to the stern ramp access and bow and stern thruster tunnels are considered to be included in this total area and shall be properly prepared and coated along with all other portions of the underwater hull. The total areas are not negotiable, and the Contractor shall provide a fixed price for the completion of this work including but not limited to all cost of labor, materials, equipment and services, including clean-up and waste disposal necessary to accomplish this item. If in the opinion of the Contractor the quoted area is incorrect then it shall be the responsibility of the Contractor to make adjustments to his fixed price as he sees fit to allow for any variance he estimates.

The only portion of this item subject to negotiation will be the total area of spot preparations (degreasing, abrasive sweep, and abrasive blast) which shall be presented as a percentage of the total area, and which shall be negotiated and agreed in writing with the PGM Port Engineer, prior to the commencement of any work and based upon the unit prices provided in response to this quotation (note: unit prices for spot blast and abrasive sweep must include the application of the specified spot coats necessary to restore the underlying coating system as detailed in the below paint schedule).

The Contractor must take care to include in his pricing all cost associated with this item including all full coats as required by this specification..

WORK DESCRIPTION

Keel to LLL (Bottom) Surface Preparation: Total area 105,000 square feet.

1. The bottom area to be dealt with extends from the keel to the light load line (approx. 6 meters ABL).

2. Scrape by hand any areas of hard fouling.

3. Solvent clean areas contaminated with grease or oil to SSPC-SP1 (Solvent Clean).

4. High pressure water blast at 3,000 psi (nozzle pressure) the entire underwater hull surface from keel to light load line. Remove all marine growth, salt deposits, loose paint, rust, and contaminants. This water blasting will be worked in conjunction with Item 201 - Drydocking in order not to duplicate effort.

5. An Inspection Team composed of the PGM Engineer, the Paint Manufacturer's Representative, PGM Paint Inspector(s), MARAD Surveyor and the Contractor's Representative shall make a joint inspection of the underwater hull to identify areas of bare metal, blistered, cracked, peeling or otherwise deteriorated paint. Areas thus identified shall be spot abrasive blasted to SSPC-SP1O (Near White Blast) or I-1B2.5. Approximately 25,000 sq. ft. of the underwater area is to be spot abrasive blasted. The edges of the spot abrasive blasted areas shall be feathered-in to a sound edge.

6. The entire bottom area shall be blown down with dry compressed air to remove all grit material remaining from blasting.

LLL to DLL (Boottop) Surface Preparation: Total area 20,200 square feet.

1. The boot top area to be dealt with extends from the light load line (approx. 6 meters ABL) to the deep load line (approx. 10 meters ABL) plus six inches above and below.

2. Scrape by hand any areas of hard fouling.

3. Solvent clean areas contaminated with grease or oil to SSPC-SP1 (Solvent Clean).

4. High pressure water blast at 3,000 psi (nozzle pressure) the entire boottop surface from light load line to deep load line. Remove all marine growth, salt deposits, loose paint, rust, and contaminants. This water blasting will be worked in conjunction with Item 201 - Drydocking in order not to duplicate effort.

5. Blast the entire boot top of the vessel to a surface preparation standard of SSPC-SPIO (Near White Blast) or HB2.5.

6. The entire boot top area shall be blown down with dry compressed air to remove all grit material remaining from blasting.

DLL to Top of Deck Rail (Freeboard) Surface Preparation: Total area 61,250 square feet.

1. The freeboard area to be dealt with extends from the deep load line (approx. 10 meters ABL) to the deck rail. This area includes the vertical surfaces to the deck edge, the tops and outer surfaces of all bulwarks and fan houses, the stern area including transom and stern door and frame and the stern area to 6 Deck.

2. Solvent clean areas contaminated with grease or oil to SSPC-SP1 (Solvent Clean).

3. High pressure water blast at 3,000 psi (nozzle pressure) the entire freeboard surface. Remove all salt deposits, loose paint, rust, and contaminants.

4. An Inspection Team composed of the PGM Engineer, the Paint Manufacturer's Representative, PGM Paint Inspector(s), MARAD Surveyor and the Contractor's Representative shall make a joint inspection of the freeboard to identify areas of bare metal, blistered, cracked, peeling or otherwise deteriorated paint. Areas thus identified shall be spot abrasive blasted to SSPC-SP1O (Near White Blast) or HB2.5. Approximately 15,000 sq. ft. of the freeboard area is to be spot abrasive blasted. The edges of the spot abrasive blasted areas shall be feathered-in to a sound edge.

5. Expended blast grit which remains on the upper decks shall be removed within twenty-four hours of blasting to avoid ingress into accommodation and machinery spaces and to avoid blowing onto hull surfaces to be painted.

6. The entire freeboard area shall be blown dry with dry compressed air to remove all grit material remaining from blasting.

Keel to LLL (Bottom) Coating: Total area 105,000 square feet.

The spot abrasive blasted areas shall be spot coated with two (2) coats of epoxy anticorrosive.

- First coat shall be Jotun Primastic Universal at 4.0 mils DFT.

- Second coat shall be Jotun Safeguard Tar free Epoxy at 4.0 mils DFT.

When applying the spot coats, care shall be exercised to ensure that epoxy is not applied over existing antifouling coatings. Such overcoating, if done, will cause failures in the paint system

When the second coat of epoxy is sufficiently cured, apply a spot coat of Jotun Hydroclean A/F antifouling at 2.0 mils DFT.

When all of the new spot coat paint is sufficiently cured and approved by the PGM Engineer, the entire bottom surface shall then be evenly applied with two (2) coats of tin free ablative antifouling, Jotun Hydroclean A/F. The DFT of each coat shall be a minimum of 4.0 mils DFT. The finish coat shall be dark red in color.

The coating shall be applied in accordance with the MARAD Coating Guidelines (Latest Revision).

Paint will be applied in accordance with the following general schedule of Jotun paint:

-1st Spot Coat - Primastic Universal @4.0 mils DFT

-2nd Spot Coat - Safeguard Tar free Epoxy @ 4.0 mils DFT

-3rd Spot Coat - Hydroclean A/F @ 2.0 mils DFT

-1st Full Coat - Hydroclean A/F @4.0 mils DFT

-2nd Full Coat - Hydroclean A/F 4.0 mils DFT

LLL to DLL (Boottop) Coating: Total area 20,200 square feet.

The entire boottop surface shall be evenly applied with three (3) coats, one (1) coat of epoxy primer, one (1) additional coat of epoxy, and one (1) coat of urethane. Top coat of urethane shall be black in color.

The coating shall be applied in accordance with the MARAD Coating Guidelines (Latest Revision).

Paint will be applied in accordance with this general schedule:

-1st Spot Coat-Zinc Rich Epoxy 13F83 @5.0 mils DFT

-2nd Spot Coat - Primastic Universal Alum. RT @ 5.0 mills DFT

-3rd Coat - Hardtop AS @2.0 mils DFT

A primer coat may be used at the Contractor's discretion. This coat can be applied immediately following blasting to prevent "losing" the surface preparation. This primer will be used only with the approval of the paint manufacturer's representative and the PGM Engineer. The primer must be filly compatible with the selected paint system. In the event that the Contractor opts to use this primer for purposes of expediting the blasting and coating works, all associated costs will be borne by the Contractor.

When applying the anti-corrosive, care shall be exercised to ensure that epoxy is not applied over any existing antifouling coatings in way of the underwater hull. Such overcoating, if done, will cause failures in the paint system.

DLL to Top of Deck Rail (Freeboard) Coating: Total area 61,250 square feet.

The freeboard surface shall be evenly applied with two (2) spot coats of epoxy primer and one (1) fill top coat of urethane. Top coat of urethane shall be haze gray in color, Conforming to No. 26270 of Federal Standard No. 595a.

The spot abrasive blasted areas of the freeboard shall be spot coated with
two (2) coats of epoxy anticorrosive.

- First coat shall be Jotun Epoxy 13F83 at 5.0 mils DFT.

- Second coat shall be Jotun Primastic Universal Alum. RT at 5.0 mils DFT.

When applying the spot coats, care shall be exercised to ensure that epoxy is not applied over any existing antifouling coatings in way of the underwater hull. Such over coating, if done, will cause failures in the paint system.

When all of the new spot coat paint is sufficiently cured and approved by the PGM Engineer, the entire freeboard surface shall then be evenly coated with one (1) coat of urethane, Jotun Hardtop AS at 2.0 mils DFT. The finish coat shall be haze gray in color.

The coating shall be applied in accordance with the MARAD Coating Guidelines (Latest Revision).

Paint will be applied in accordance with the following general schedule of Jotun paint:

-1st Spot Coat - Zinc Rich Epoxy 13F83 @5.0 mils DET

-2nd Spot Coat - Primastic Universal Alum. RT @ 5.0 mils DFT

-1st Full Coat - Hardtop AS @ 2.0 mils DFT

ICCP System Dielectric Shields on Hull:

Contractor shall renew "capastic" coating in way of the four (4) cathodic protection system anodes. This work is covered under Item 210 - Underwater Hull Cathodic Protection System item detailed elsewhere in this specification. This work shall be coordinated with the blasting and coating of the underwater hull.

Hull Markings:

Repaint all hull markings in areas recoated at this time using two (2) coats of contrasting colored paint compatible with the hull paint finish coat in accordance with the MARAD Coating Guidelines (Latest Revision). Hull markings include, but shall not be limited to, ship's name and port of registry, the draft marks, Load Line and Plimsoll markings, bow and stern thruster makings, ABS and USCG underwater survey markings, etc. The PGM Engineer will provide a copy of "Underwater Hull Survey Markings" drawing to be used as guidance.

Furnish the services of a naval architect to update this drawing. The drawing shall be reviewed to ensure that all markings are included. Items not on the drawing, such as sea chests and other fixed reference points, are to be newly incorporated into the drawing. Submit the prepared drawings to ABS and USCG for approval. Following approval, furnish the PGM Engineer with six (6) copies (original + five) of the approved drawings.

Furnish videotaping services to video the hull following completion of all underwater work (painting, tailshaft, rudder, etc.) The video shall be accompanied by a verbal/recorded description of the underwater hull and its markings and appurtenances. This shall be done using the hull survey markings drawing as specific reference. This video will be used as a reference for future underwater hull surveys and shall be in accordance with regulatory body requirements. Provide four (4) copies of the video in DVD format to the PGM Engineer.

Contractor shall clean and unplug the 4-Deck, garage ramp deck, and 4 1/2-Deck scuppers and drains following completion of blasting. All subject drains shall be proven clear to the PGM Engineer.

All painted areas shall be maintained free of dirt and contamination.

Any areas found to be damaged shall be repaired to the satisfaction of the PGM Engineer.

PERFORMANCE CRITERIA/DELIVERABLES

Daily written progress report of paint manufacturer's representative
Paint manufacturer's representative final report
Paint Report
Coating work schedule

REFERENCES

Under Water Road Map- Sheets 1 and 2

NOTES

All deck drains and scuppers shall be cleaned and proven clear of grit.

The calculation of the quoted prices for this item are to include the following:

The total areas as provided are approximate, but are based on totals from previous drydockings. All hull openings including, but not limited to the stern ramp access and bow and stern thruster tunnels are considered to be included in this total area and shall be properly prepared and coated along with all other portions of the underwater hull. The total areas are not negotiable, and the Contractor shall provide a fixed price for the completion of this work including but not limited to all cost of labor, materials, equipment and services, including clean-up and waste disposal necessary to accomplish this item. If in the opinion of the Contractor the quoted area is incorrect then it shall be the responsibility of the Contractor to make adjustments to his fixed price as he sees fit to allow for any variance he estimates.

The only portion of this item subject to negotiation will be the total area of spot preparations (degreasing, abrasive sweep, and abrasive blast) which shall be presented as a percentage of the total area, and which shall be negotiated and agreed in writing with the PGM Port Engineer, prior to the commencement of any work and based upon the unit prices provided in response to this quotation (note: unit prices for spot blast and abrasive sweep must include the application of the specified spot coats necessary to restore the underlying coating system as detailed in the below paint schedule).

The Contractor must take care to include in his pricing all cost associated with this item including all full coats as required by this specification.

INTENT

The intent of this item is to record a set of audio gaugings to credit ABS Continuous Hull Survey.

WORK DESCRIPTION

Furnish labor, material, equipment, staging, and qualified NDT technicians as required to perform the following gaugings. This will include accessing vessel internal areas, such as tanks, cofferdams, etc. Ballast and water tanks will be pumped down to loss of suction. In the event that gas treeing of oil tanks, cofferdams, voids, etc. is required, it will be dealt with separately. All areas disturbed during the taking of gaugings shall be prepared and painted in accordance with MARAD's latest coating guidelines.

Areas that are intended to receive a full surface preparation and coating treatment (e.g., main deck, underwater hull, etc.) will be gauged prior to the application of any coatings.

Daily gauging reports shall be submitted to the ABS Surveyor and the PGM Engineer.

Immediately upon completion of gaugings, a typewritten completed gauging report shall be prepared and submitted to the PGM Engineer. Four (4) typewritten copies of the report, allowing one for submission to ABS, will be required.

Girth Belts:

Three (3) girth belts of deck, bottom, side, and longitudinal bulkhead plating in way of cargo holds within the amidships 0.5L are to be taken. This is together with longitudinal and adjacent internals (including side and bottom ballast tanks) in way of the belts. The exact location of the girth belts will be as chosen by ABS and the PGM Engineer. Allow for 150 readings.

Fore Peak and After Peak:

Gaugings in internals of the fore peak and after peak tanks are to be taken as deemed necessary by ABS and the PGM Engineer. Allow for 50 readings.

Wind and Water Strakes:

Gaugings of all plates in two (2) wind and water strakes, port and starboard sides, for the full length are to be taken. Exact location of gaugings shall be as deemed necessary by ABS and the PGM Engineer. Allow for 200 readings.

Keel and Bottom Plating:

All keel plates full length shall be gauged. Any additional bottom plating, particularly in way of cofferdams and machinery spaces, as deemed necessary shall also be gauged. Exact location of gaugings shall be as deemed necessary by ABS and the PGM Engineer. Allow for 100 readings.

Pipe Tunnel Plating:

Pipe tunnel plating and internals will be ganged as deemed necessary. Exact location of Gaugings will be as specified by ABS and the PGM Engineer. Allow for 50 readings.

PERFORMANCE CRITERIA/DELIVERABLES

Ganging Report

REFERENCES

None.

NOTES

None.

INTENT

The intent of this item is to install rubber scupper and drain extensions on the hull to avoid staining the hull.

WORK DESCRIPTION

Furnish all labor and materials to install Base Ring during Hull Blasting and Painting. Install backing ring and rubber extension after final curing of Hull Top Coat. The final sizes and amounts of installed extensions shall be determined by the Contractor and approved by the PGM Port Engineer. A listing of the final installation sizes and locations shall be given to the PGM Engineer.

Below is a list of intended sizes and locations, it is for the purpose of estimating and bidding.

2" PIPE DRAINS

15 PORT SIDE.
15 STBD SIDE

4" PIPE DRAINS

1 PORT SIDE
1 STBD SIDE

PERFORMANCE CRITERIA/DELIVERABLES

Final listing of locations and sizes

REFERENCES

None.

NOTES

None

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Item Description

0300 Index
0301 Material Handling Assistance

INTENT

Intent of this item is for shipyard crane, forklift and shipping, receiving and storing services.

WORK DESCRIPTION

Provide crane services with operator and riggers for loading and unloading of materials, supplies, laundry and equipment for the ships personnel. This service is to be available on a daily basis between 0800 and 1700 and is to be provided when authorized by the PGM Port Engineer. For quoting purposes use a total of 8 lifts during the repair period.

Provide forklift services with operator for material, supplies, laundry and equipment handling. This service is to be available on a daily basis between 0800 and 1700 and is to be provided when authorized by the PGM Port Engineer. For quoting purposes use a total of 8 times during the repair period.

Provide the services for the receiving, handling and storing of owner furnished materials, goods arriving for the vessel, etc. for the duration of the repair period.

All Contractor time sheets for this item are to be signed for by the member of the ship's force receiving or landing the goods at the time of the labor and these chits are to be provided to the PGM Port Engineer on a daily basis.

PERFORMANCE CRITERIA/DELIVERABLES

Provide services are to be documented on a chit signed by the ships officer each time a service is utilized. Chits are to be submitted weekly to the PGM Port Engineer.

NOTES

None.
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Item Description

0400 Index
0401 Steel Renewals
0402 Pipe Renewals
0403 Staging

INTENT

As part of our process in selecting the best value contractor, PGM will consider and the potential costs associated with supplemental work. Therefore, we require each offeror to quote their costs for additional work or services on the following:

STEEL RENEWALS

Steel Types	500 Poundsor Less	501 to 2500 Pounds	2501 to 5000 Pounds
Side Shell (Flat)			
Side Shell (Shaped)			
Deck Plating			
Bulkhead Plating			
Stringers			
Frames			
Side Longitudinal			
Bulkhead Stiffeners			
Clad Weld:1 sq ft x ¼"			

PERFORMANCE CRITERIA/DELIVERABLES

Steel and welder certificates will be required to be delivered to the PGM Port Engineer.

NOTES

All steel replacement should be priced as ABS grade, mild steel and high tensile steel and include allowances for preparation, handling, installation, welding, painting and testing. The weight ranges listed are for contract total weights.

INTENT

As part of our process in selecting the best value contractor, PGM will consider and the potential costs associated with supplemental work. Therefore, we require each offeror to quote their costs for additional work or services on the following:

PIPE RENEWALS

DIA	SCH 40 BLACK			SCH 40 GALV			CUNI		
	FOOT	BEND	FLANGE	FOOT	BEND	FLANGE	FOOT	BEND	FLANGE
1/2"									
1"									
2"									
3"									
4"									
6"									
8"									
10"									
12"									
14"									

DIA	SCH 80 BLACK			SCH 80 GALV			BHD Penetration		
	FOOT	BEND	FLANGE	FOOT	BEND	FLANGE			
1/2"									

1"
2"
3"
4"
6"
8"
10"
12"
14"

PERFORMANCE CRITERIA/DELIVERABLES

Material and welder certificates will be required to be given to the PGM Port Engineer.

NOTES

All pipe replacement should be priced as ABS grade, and include allowances for staging, preparation, handling, installation, welding, painting and testing.

INTENT

As part of our process in selecting the best value contractor, PGM will consider and the potential costs associated with supplemental work. Therefore, we require each offeror to quote their costs for additional work or services on the following:

STAGING

HEIGHT	IN TANKS OR CARGO HOLDS	ON DECK OR DRYDOCK FLOOR	ENGINE ROOM AND MACHINERY SPACES
UP TO 6'			
6 - 15'			
15 - 30'			
30 - 45'			
45 - 55'			

NOTES

Included in the above is the cost of labor to erect and dismantle OSHA approved staging. The quote is for a standard 4' X 10' staging at the listed heights.