

SPECIFICATIONS FOR DRYDOCKING

M/V NODAWAY

Spring 1997

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PREAMBLE

I. General Terms and Conditions-

- A. The subject vessel is owned by the United States of America, represented by the U.S. Maritime Administration hereafter called "MarAd." Crowley Maritime Corporation, hereafter called "CMS," is appointed as general agent, acting on the behalf of MarAd in matters concerning vessel maintenance, repair, crewing and operations per agreement DTMA91-94-A-00025.
- B. The terms "contractor", "yard" and "shipment" are to be interpreted to mean the prime contractor to whom the specification is directed.
- C. The term "subcontractor" as used herein shall be understood to mean any firm other than the Contractor, engaged to perform any service to the subject vessel whether hired by the Contractor or CMS and MarAd.
- D. Whenever the terms "approved", "required", "satisfactory", "suitable", "necessary", "designated", or "as directed" are used, the decision of the CMS and MarAd representatives is intended.
- E. Whenever "renew" is used it is understood to mean "remove the old or defective material and replace with new material of the same design, specification or standard," unless otherwise defined.
- F. Whenever the terms "furnish", "install", "fit", or "provide" are used with respect to any item to be supplied, it is understood to mean "furnish, install and connect in proper order," unless otherwise defined.
- G. The Contractor shall prepare a detailed work schedule, with target dates, for all work evolutions/items in the specifications package, and submit four copies to the CMS and MarAd representatives before acceptance of custody of the vessel. A daily progress meeting shall be held and an itemized progress breakdown submitted to the CMS and MARAD representatives.
- H. The Contractor is to furnish individual costs for each work item contained in the specification.
- I. The Contractor shall furnish adequate supervision for all evolutions and work performed. All evolutions and work performed are to be inspected by either the Contractor's ship superintendent assigned to the vessel or the Contractor's quality control department prior to presenting work for acceptance by the CMS and MarAd representatives or regulatory authorities.
- J. Notations in the Specifications of staging requirements are given for guidance. The Contractor is responsible for providing staging, man lifts or other means of access for all specified work.

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- K. Details not specifically mentioned in these specifications, but which are usual, and necessary for this type of work, shall be furnished by the Contractor.
- L. Any particulars for the work involved are given for the guidance of the Contractor. However, the Contractor is to take his own particular measurements, dimensions and counts, and is to be responsible for the same.
- M. It is the Contractor's responsibility to ensure full compliance with all local and statutory regulations during the contract performance period. Any discrepancies or violations of such statutes or regulations by the Contractor or the owner or his representative shall immediately be brought to the attention of the CMS and MARAD representatives.
- N. Where drydocking is required for regular periodic overhaul, Contractor shall allow sufficient time in the dock to properly apply paint or carry out other works as called for in the specifications. Additional items in dock for work not mentioned in the specifications shall be mutually agreed upon between the Contractor, and the CMS and MarAd representatives. Additional items cost and additional days required, if any, are to be agreed on by the CMS and MarAd representatives and the yard representative before the work commences. In connection with additional days in dock, should the Contractor request an interruption of drydocking, any costs relative to undocking, shifting, mooring, redocking, interruption of repair work, etc., are to be borne by the Contractor.
- O. Scrap credit shall be given to the Owner for all scrap.
- P. Quality of work: All workmanship and materials are to be of the highest quality consistent with good shipbuilding and ship repair practice. All work performed by the Contractor shall be to the satisfaction of the CMS and MarAd representative and/or inspectors representing American Bureau of Shipping and the United States Coast Guard. It is the intention of these specifications that the Contractor shall perform all work necessary to complete the job in every respect.
- Q. CMS and MarAd reserve the right to correct errors and/or omissions in, or to make deductions from, or additions to this specification. However, in the event of additions, the increased costs, if any, and the time of completion specified shall be adjusted accordingly, and agreed to by the CMS and MarAd representatives. Deletion of items from this specification shall be adjusted accordingly and shall result in no expense to CMS or MarAd.
- R. CMS and MarAd reserve the right to perform normal overhauls, repairs, and maintenance on deck and in the engine room by using the crew while the vessel is in the Contractor's care and custody.
- S. CMS and MarAd reserve 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 purposes.

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- T. Except as otherwise specified, all reports required by these specifications shall be delivered to the CMS and MarAd representatives within five working days of completion of work on the item. All drawings and reports prepared by the Contractor in conjunction with work items shall become the sole property of the owner, including all design and engineering pertaining thereto. Reports include: Test Reports, Inspection Reports and Additional Work Requirements.
- U. Any and all equipment, apparatus, etc., as noted in the work items, which is opened for examination and/or repairs, shall, upon completion of examinations and/or repairs, be properly closed and tested to the satisfaction of the CMS and MarAd representatives and regulatory authorities, and shall be left ready for the intended service. All new or repaired piping systems and hull repairs shall be hose or hydrostatically tested to the satisfaction of the CMS and MarAd representatives, and the regulatory authorities.
- V. All dirty and solid surfaces shall be properly cleaned and, if necessary, recoated as original. All disturbed insulation and lagging shall be repaired or renewed with non-asbestos materials. All pipe joints and valve packing glands shall be tight before insulation and lagging is installed.
- W. All new and disturbed interior surfaces shall be Power Tool Cleaned to SSPC-SP3 Standards, primed with two (2) contrasting coats of owner-furnished surface tolerant epoxy primer, and over-coated with an area color-compatible alkyd enamel.
- X. All new and disturbed exterior surfaces shall be spot grit blasted to SSPC-SP6 Commercial Standards, or Power Tool Cleaned to SSPC-SP3 Standards, as appropriate to the situation. The prepared surfaces are to be primed with two (2) contrasting coats of owner-furnished surface tolerant epoxy primer, and over-coated with one (1) coat of the proper color of owner-furnished aliphatic urethane gloss enamel or heavy-duty epoxy non-skid coatings, as appropriate.
- Y. Where the Contractor must prepare working drawing or sketches necessary for performance of his work or when required by the regulatory authorities, such drawings shall be submitted to the CMS and MarAd representatives for review prior to starting work on the work item.
- Z. Furnish compressed air as required to accomplish work.
- AA. All material received shall be stored in a covered, secure location and delivered to the vessel only when ready for installation. Copies of packing slips shall be submitted to the CMS and MarAd representative upon receipt of material.
- BB. Unless specifically approved by the CMS and MarAd representative the Contractor shall NOT USE ANY OF THE SHIP'S SPARE PARTS, MATERIAL AND/OR EQUIPMENT to accomplish work under contract.
- CC. All material ordered for installation in the vessel shall be of good quality, suitable for the marine environment, and where applicable, meet the requirement of ABS and USCG. Copies of required affidavits or certificates shall accompany the material for the vessel's record.

- DD. The ship's sanitary and sewage systems have been deactivated, drained and dried. The Contractor is to ensure that the ship's toilets are not used, and is responsible for clean-up if they are used. Furnish adequate toilet facilities on deck or on the drydock wingwall.
- EE. The vessel will be available for ship checks at Tsuneishi Shipbuilding Co., Ltd., Numakuma-Cho, Hiroshima-Pref., Japan, on weekdays between 0800 and 1400 hours. For an appointment to see the vessel, contact Gary Graham of Crowley Marine Services, Inc., Seattle, Washington at (206) 443-8100.

II. Asbestos-

Due to the age of the vessel, all insulation and lagging must be assumed to contain asbestos until determined otherwise. Removal and disposal of asbestos is to be in accordance with all applicable regulations. All asbestos exposed by work is to be properly sealed. All new insulation and lagging is to be asbestos-free.

III. Regulatory Inspections-

- A. This drydocking is to be conducted for full credit by the American Bureau of Shipping (ABS) and United States Coast Guard (USCG). Items requiring inspection by the regulatory authorities include but are not limited to those with a notation in the item title. The Contractor shall assume responsibility for those items requiring certification inspections and classification surveys, and for notifying the CMS, MarAd, ABS, USCG, and other concerned parties when items are ready for inspection.
- B. Schedule the services of ABS and USCG surveyors for all required surveys, examinations and inspections, including but not limited to the following:
 - i. Bottom Survey
 - ii. Tailshaft wear-down readings and examination
 - iii. Pintle clearance readings
 - iv. Sea valve and scupper valve inspections
 - v. Anchor chain gaugings and chain locker inspection
 - vi. Propeller examination
 - vii. Hull gaugings
 - viii. Sea connection repairs
- C. Any fees for ABS and USCG inspections will be paid directly to ABS and USCG by CMS under separate purchase orders.

IV. Invoice and Payment-

- A. Immediately following drydock, repair and cleanup work, submit a pro forma invoice for CMS and MarAd representative review. The pro forma should reflect the numeric order of the specification with additional items, if any, listed under the appropriate corresponding item for easy reference.
- B. Following review by the CMS and MarAd representatives, a meeting will be scheduled with appropriate members of the shipyard's business and repair sections. The pro forma invoice will be reviewed with the intent of clarifying work accomplished and resolving related cost issues as they apply.
- C. Following final agreement between the shipyard, CMS and MarAd representatives, the shipyard will prepare a final invoice. The original and four copies should be sent via express, registered mail to:

CROWLEY MARITIME CORPORATION
2401 FOURTH AVENUE
SEATTLE, WA 98121 USA

ATTN: G.M. GRAHAM

ITEM 100 DRYDOCKING AND VESSEL MOVEMENT

ITEM 101 Shifting of the Vessel To, Within and From the Contractor's Facility

Accomplish the following work to shift the vessel from its berth to the Contractor's facility, shift the vessel within the Contractor facility, and to shift it back to the layberth:

- A. Provide adequate notice to, and obtain approval from the Harbormaster, the Japanese Marine Safety Agency, and all other cognizant authorities, as required, prior to shifting of the vessel.
- B. Provide an electrician to shut-down the vessel's dehumidification and cathodic protection systems prior to leaving the layberth. At the completion of the drydocking and after the vessel has been returned to the layberth, provide an electrician to restore these systems as original.
- C. Provide labor to retrieve and clean all cathodic anodes. On return to the layberth, rehang them over the side at the proper locations.
- D. Provide labor to unmoor the ship from the layberth, taking onboard all wires and lines, and putting ashore any fenders rigged at the layberth. Stow the wires and mooring lines aboard the ship in a location designated by the CMS representative. Contractor lines only shall be used at the Contractor. Lift gangway off and place on the pier. On return to the layberth, provide labor to break out the stowed lines and wires, and to remoer the ship. Lift the gangway back into place and properly secure it.
- E. Provide two assist tugs and one pilot to shift vessel from the layberth to Contractor, within the Contractor, and from the Contractor to the layberth.
- F. Provide labor and lines to moor and unmoor the vessel in the drydock or at the Contractor repair berths as required. The MARAD and CMS representatives shall be advised no less than 24-hours in advance of all vessel movements.

ITEM 102 Drydocking

- A. Immediately upon arrival in the Contractor's yard, drydock the ship for examination and repairs specified herein. Furnish labor, material and equipment to safely drydock the vessel with a minimum of four (4) foot high soft cap blocking for the duration of underwater surveys, hull cleaning, surface preparation, coating, steel work, and any required repairs. Undock the vessel upon completion of the work. Furnish the CMS representative four (4) copies of the drydocking report showing blocking positions.
- B. The fathometer transducers (2) are located between Frames 23 and 24, 3-feet starboard of centerline. The blocks are to be arranged so as to leave the transducers exposed. After carefully hand cleaning any fouling and prior to commencing any hydroblasting, gritblasting or coating, cover the transducers to protect them from damage. After all hull painting is completed and prior to undocking, remove the protection.

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- C. Arrange for a diver to be in the water during docking to prevent landing the fathometer logs on the keel blocks.
- D. The block spacing shall be such that a "Position One" and a "Position Two" can be established for drydocking that will expose one hundred percent (100%) of the keel in only two drydockings without the need to fleet the vessel (the length of the keel covered by each block should be somewhat less than the space between the blocks). This requirement does not relieve the Contractor from the requirement to block the ship in a safe manner that does not overstress any areas of the hull structure.

ITEM 200 SERVICES

Furnish the following services for the duration of the vessel's stay at the Contractor's facility. Connect and disconnect, as required, on arrival and departure, and at all shifts within the Contractor's facility.

ITEM 201 Access

Keep all doors, hatches, and ports sealed and closed except yellow access doors. The yellow access doors are also to be kept closed except when actually in use.

ITEM 202 Offices and Telephone

- A. If the ship is layberthed in the Contractor's facility, provide one(1) additional office with two(2) desks for both ships.

- B. If the ship is layberthed at a pier outside of the Contractor's facility, provide two(2) offices. Each of these offices shall have two (2) desks and a telephone with direct-dial international access.

- C. Provide an additional shore telephone with direct-dial international access on board *M/V Chattahoochee* only in the Chief Engineer's room.

ITEM 203 Gangway

The vessel shall be provided with suitable access gangway when in the drydock and when alongside a repair berth. The gangways shall be suitably illuminated at night.

ITEM 204 Gas Free Certification

- A. Furnish the services of a certified chemist to examine and test all tanks, compartments and void spaces and to issue certification the entire vessel is "Safe for Men-Safe for Fire" and note any exceptions. Two(2) copies of the Certificate shall be issued to CMS and MARAD representatives and one(1) copy shall be posted on deck at the head of gangway.
- B. Areas of testing shall include, but not be limited to cargo, fuel, and ballast tanks, peak and deep tanks, cofferdams, pumproom, machinery spaces, all piping connected to cargo, fuel, ballast, MSD, and fuel transfer system.
- C. All residual cargo, fuel and any other flammable material shall be cleaned as necessary prior to hot work in the immediate area.
- D. A new gas free certificate shall be issued at the beginning of each work week, at any time conditions of the certificate change, such as vessel trim or when deemed necessary by the chemist, the Contractor, CMS, MARAD or regulatory agencies.
- E. A member of the Contractor's Safety Department qualified as a "Competent Person" shall visit the vessel at least daily to observe safety and work conditions.

ITEM 205 Fire Protection

- A. Furnish and connect two 2-1/2" fire lines from dock to vessel's deck--midship and aft. Furnish sufficient 1-1/2 inch hoses to reach all parts of the vessel. The fire line shall be charged, 7 bar (100 psig) minimum, to the deck manifold stop valve, and branch hoses shall be stowed for ready use. NOTE: The ship's fire main system is dry and is used for D/H air circulation. The fire main shall not be pressurized.
- B. Hang warning sign-boards on deck and bulkheads of all tanks in pumproom, engineroom and on deck which contain oil or oil residue. Signs should state in English and Japanese "warning, fuel tank--no welding, burning or open flame."
- C. Supply sufficient portable fire extinguishers at locations of all hot work.
- D. Furnish a qualified fire watch on site, equipped with portable radio, who shall be aware of all current hot work.

ITEM 206 Deck Protection

All decks in passageways, stairways, landings and all rooms shall be protected with substantial fire-resistant covering and maintained throughout the repair period. Just prior to redelivery remove and replace all soiled and damaged covering. Covering is to be left in place at redelivery. The minimum thickness of the covering shall be 7 mils.

ITEM 207 Lighting

- A. Renew all interior and exterior burnt-out lights with appropriately rated incandescent light bulbs and fluorescent tubes throughout the vessel and maintain lighting during the repair period. Replacement bulbs and tubes will be owner-furnished. The Contractor's electricians shall note and report all defective lamp receptacles and lighting circuits. Repair fluorescent fixture ballasts and starters as needed.
- B. All lighting shall be operational when the ship leaves the Contractor.
- C. Furnish portable lighting as required to accomplish specified work.

ITEM 208 Shore Current

Rig shore power cable aboard the vessel and connect 440V AC, 3 Phase, 50 or 60 Hz shore power upon the vessel's arrival in the dock and when the ship is shifted to and from a drydock. Shore power shall be properly phased to meet the vessel's requirements and shall remain connected and energized until redelivery. The vessel's shore power circuit breaker is rated for 250 amps. The Contractor's electricians shall insure correct phasing on the ship immediately upon energizing the shore power breaker to prevent equipment damage.

ITEM 209. Compressed Air

Furnish clean, dry compressed air at 7bar (100psig) minimum pressure at temporary, Contractor-furnished manifolds. Do not connect compressed air to the ship's system.

ITEM 210. Cleaning

- A. The Contractor shall remove all trash and debris from the vessel daily and shall not allow debris to accumulate during the vessel custody period. This also includes the proper removal and disposal of water, oily waste and hazardous waste generated by the contracted work items.
- B. Upon completion of repairs, the entire vessel shall be ready for habitation; all quarters, galley, storerooms and machinery spaces shall be cleaned, all machinery and equipment casings cleaned, all bilges cleaned of oil and debris, all vessel's tools and maintenance equipment stowed and secured. All debris and garbage shall be removed from the ship prior to it's return to the layberth.
- C. All disturbed and/or soiled surfaces shall be properly cleaned and coated and/or lagged or insulated with non-asbestos material. Joints and/or packing shall be hardened prior to insulating.

ITEM 211 Bilges

Maintain the bilges clean and dry throughout the vessel. Provide oil and slops retention, as necessary, during any oil and slops transfer operations.

ITEM 212 Crane Services

Supply crane and rigging services for all items of work in this Specification, and for any Supplemental items issued.

ITEM 213 Berthage

Furnish safe berthage with all services if the vessel is not to be on drydock the entire time it is in the Contractor's facility. A minimum of two (2) feet of water shall be maintained under the entire length of the ship's keel at all times and under all tidal conditions. Provide and maintain proper mooring lines and wires.

ITEM 300 DRYDOCK WORK

In the following Drydock work items, all paint areas disturbed during repairs or modification, and all new steel shall be cleaned, primed and coated per Section 400, Vessel Painting Specifications.

ITEM 301 Seachests, Strainers and Hull Blanks (ABS & USCG)

- A. Remove all hull blanks. Furnish a report listing the markings, sizes, weights, and locations of all blanks.

FRAME	SIDE	DESCRIPTION	APPROX. DIAMETER
43	STBD	CARGO PUMP SUCTION	28"
47	STBD	M/E HIGH SUCTION	24"
48	STBD	M/E LOW SUCTION	24"
54	STBD	M/E OVERBOARD	13-1/2"
57	STBD	#1 D/G & R/O OVERBOARD	18"
61	STBD	WATERMAKER SUCTION	18"
61	STBD	#1 D/G SEACHEST	20"
62	STBD	UNUSED - BLANKED INTERNALLY	18"
68	STBD	REDUCTION GEAR COOLING OVBD	20"
73	STBD	REEFER COOLER OVERBOARD	13-1/2"
23	PORT	FWD PUMPROOM OVERBOARD	22"
23	PORT	FWD PUMPROOM SUCTION	20-1/2"
43	PORT	PUMPROOM SEACHEST	28"
51	PORT	#2 D/G AND SANITARY SUCTION	24"
55	PORT	#2 D/G OVERBOARD	15"
61	PORT	D/G SERVICE PUMP OVERBOARD	15"
61	PORT	FIREPUMP SEACHEST	24"
62	PORT	FORMER EVAPORATOR SUCTION	16"
65	PORT	D/G SERVICE PUMP SUCTION	24"
66	PORT	UNUSED - BLANKED INTERNALLY	16"
67	PORT	BILGE & BALLAST OVERBOARD	15"
68	PORT	BILGE & BALLAST SUCTION	21"
69	PORT	OIL/WATER SEPARATOR OVBD	13-1/2"

- B. After the seachests and strainers examined, reinstall the strainers with safety wires, renewing any missing or defective nuts, bolts, studs, pins, and washers.
- C. After completion of inspection and coating of seachests, reinstall all hull blanks below the 12-foot waterline with new gaskets, grommets and galvanized hex bolts. All bolts shall be treated with heavy duty, water-proof grease before installation. Remaining blanks for seachests above the 12-foot waterline shall be stowed aboard the ship as directed by the CMS representative.
- D. Furnish to the CMS representative six(6) copies of a report listing markings, sizes, weights, and locations of all hull blanks reinstalled.

ITEM 302. Zinc Anodes

- A. Chip off approximately forty-eight (48) expended zinc plates from the underwater hull, seachests, and appendages.
- B. Furnish and install approximately forty-eight (48) new 12 x 6 x 1-1/4 inch strap-type zinc plates at the same locations as those removed, and other locations as directed.
- C. Application of the hull coatings shall be completed in way of the new zinc anodes prior to welding them to the hull.
- D. The hull surfaces in way of where the anode straps will be welded shall be ground to bright, bare metal, as shall the straps in way of the welds.
- E. The bearing surfaces of straps of the new zinc anodes and hull plate shall be brought up tight before welding.
- F. The zinc anodes shall be left unpainted on completion of work.
- G. Gas free the rudder before welding or burning on it. The rudder is of the contraguide-type, divided into two (2) sections. See Item No. 305- Rudder Pintles and Gudgeons.

ITEM 303. Sea Valves (ABS & USCG)

Open up, clean, repack, grind in and blue all sea valves. After inspection by ABS, USCG, CMS and MarAd, reassemble the valves, renewing deteriorated fasteners and all bonnet gaskets. All sea valve gates shall be marked "outboard" and "inboard" sides before removal to insure that they are reassembled in the same orientation. New packing shall be Chesterton 1727 teflon packing or equal. If sandblasting occurs in way of open sea valves, it is the responsibility of the Contractor to close the openings with the appropriate covers so that grit will not enter the ship. The valves shall include, but not be limited to the following:

FORWARD HOUSE & FOCSLE

<u>VALVE</u>	<u>SIDE/DK</u>	<u>FR</u>	<u>SIZE/TYPE</u>
BALLAST PUMP OVERBOARD	PORT #3	23	3" GLOBE (LWR COFFERDAM)
BALLAST PUMP SEA CHEST	PORT #3	23	3" GATE (LWR COFFERDAM)
ABANDONED SUCTION	PORT #3	23	1" GLOBE

ITEM 303. Sea Valves continued

AFT PUMPROOM COFFERDAM

<u>VALVE</u>	<u>SIDE</u>	<u>FR</u>	<u>SIZE/TYPE</u>
CARGO PUMP SEA CHEST PORT	44		8" GATE
CARGO PUMP SEA CHEST STBD	44		8" GATE
CARGO PUMP OVERBOARD	STBD	44	8" GATED

ENGINE ROOM

<u>VALVE</u>	<u>SIDE/DK</u>	<u>FR</u>	<u>SIZE/TYPE</u>
M/E SEACHEST HIGH SUCTION	STBD #3	47	6" GLOBE
M/E SEA HIGH SUCTION STM OUT	STBD #3	47	1" GLOBE
M/E SEACHEST LOW SUCTION	STBD #3	48	6" GLOBE
M/E LOW SEA SUCTION STM OUT	STBD #3	48	1" GLOBE
M/E SEA WATER OVERBOARD	STBD #3	53	6" GLOBE
NO. 1 D/G SW. OVERBOARD	STBD #3	57	3" GLOBE
WATERMAKER SEA SUCTION	STBD #3	61	2" GLOBE
NO. 1 D/G SEACHEST	STBD #3	61	4" GLOBE
NO. 1 D/G STEAM OUT	STBD #3	61	1" GLOBE
FORMER BOILER BLOWDOWN	STBD #3	62	1" GLOBE (BLANKED)
REDUCTION GEAR S.W. OVBD	STBD #3	68	2" GLOBE
REEFER S.W. OVERBOARD	STBD #3	73	1" GLOBE
STERN TUBE S.W. COOLING	CL #3	76	1" GLOBE
#2 D/G-SANITARY PUMP SUCTION	PORT #3	51	6" GLOBE
#2 D/G-SANITARY PUMP STM OUT	PORT #3	51	1" GLOBE
NO. 2. GEN. OVERBOARD	PORT #3	55	3" GLOBE
D/G SERVICE PUMP OVBD	PORT #3	61	4" GLOBE
FORMER UNIDENTIFIED OVBD	PORT #3	61	1/2" GLOBE (UNUSED)
FIRE PUMP SEACHEST	PORT #3	61	6" GATE
FIRE PUMP SUCTION STEAM OUT	PORT #3	61	1" GLOBE
FORMER EVAP SUCTION	PORT #3	62	3" GATE (UNUSED)
FORMER EVAP STEAM OUT	PORT #3	62	1" GLOBE (UNUSED)
D/G SERVICE PUMP SEACHEST	PORT #3	65	6" GATE
D/G SERVICE PUMP STEAM OUT	PORT #3	65	1" GLOBE
BILGE & BALLAST OVBD	PORT #3	67	3" GLOBE
BALLAST PUMP SEACHEST	PORT #3	68	3" GLOBE
OILY/H2O SEPARATOR OVBD	PORT #3	69	3" GLOBE

ITEM 304. Scupper Valves (ABS & USCG)

Open up, clean, grind in and blue all scupper valves. After inspection by ABS, USCG, CMS and MarAd, reassemble the valves, renewing deteriorated fasteners and all bonnet gaskets. If sandblasting occurs in way of open scupper valves, it is the responsibility of the Contractor to close the openings with appropriate covers so that grit will not enter the ship. The valves shall include, but not be limited to the following:

FORWARD HOUSE & FOC SLE

<u>VALVE</u>	<u>SIDE/DK</u>	<u>FR</u>	<u>SIZE</u>	<u>TYPE</u>
EDUCTOR OVERBOARD		PORT #2	04	4" CHECK
DRAIN OVERBOARD		PORT #2	11	4" CHECK
DRAIN OVERBOARD		PORT #2	30	2" CHECK
DRAIN OVERBOARD		PORT #2	30	2" CHECK
SEWAGE OVERBOARD		PORT #2	30	4" CHECK
DRAIN OVERBOARD		STBD #2	30	2" CHECK
SEWAGE OVERBOARD		STBD #2	30	4" CHECK
DRAIN OVERBOARD		STBD #2	30	4" CHECK

ENGINE ROOM

<u>VALVE</u>	<u>SIDE/DK</u>	<u>FR</u>	<u>SIZE</u>	<u>TYPE</u>
SEWAGE OVERBOARD		PORT #2	54	4" CHECK
DRAIN OVERBOARD		PORT #2	60	3" CHECK
DRAIN OVERBOARD		PORT #2	67	4" CHECK
DRAIN OVERBOARD		PORT #2	67	3" CHECK
DRAIN OVERBOARD		PORT #2	72	2" CHECK
DRAIN OVERBOARD		PORT #2	79	3" CHECK
DRAIN OVERBOARD		STBD #2	54	4" CHECK
DRAIN OVERBOARD		STBD #2	54	3" CHECK
DRAIN OVERBOARD		STBD #2	61	3" CHECK
DRAIN OVERBOARD		STBD #2	66	4" CHECK
DRAIN OVERBOARD		STBD #2	66	3" CHECK
DRAIN OVERBOARD		STBD #2	72	2" CHECK
DRAIN OVERBOARD		STBD #2	76	4" CHECK
DRAIN OVERBOARD		STBD #2	79	3" CHECK

ITEM 305. Rudder Pintles and Gudgeons (ABS & USCG)

- A. Obtain four (4) clearance readings (fore, aft, port and starboard) on each of the two (2) pintles and the rudderstock bearing in the presence of the CMS, MarAd, ABS and USCG representatives within eight (8) hours of drydocking.
- B. Conduct a 0.2bar (3 psig) air test on both chambers of the rudder. Repair leaks and washed out welds by grinding out and rewelding, allowing for ten (10) lineal feet of weld; prove tight. See Item No. 302- Zinc Anodes for gas-freeing requirement.
- C. Remove the packing and repack the rudderstock packing gland with Chesterton "Stern-Lon" Style No. 329, 3/4-inch square, polytetrafluorethylene (PTFE) impregnated, long-fibered roved flax packing, with the ends seized, angle-buttet and staggered. Furnish two (2) spare turns of packing.
- D. Fill and drain both chambers of the rudder with an approved float coat preservative compound.
- E. Submit six(6) typewritten copies of clearance readings to the CMS representative.

ITEM 306. Tailshaft Removal and Examinations (ABS & USCG)

The Contractor shall commence the following work as soon as the ship is on drydock:

- A. Stage the area around the propeller and remove when work is completed.
- B. Take as found and as delivered dial indicator clearance readings between the tailshaft and the inboard and outboard tailshaft bearings. Take before and after feeler gauge readings between the intermediate shaft and the two (2) lineshaft bearings. Submit four (4) copies of the results to the CMS representative. The readings shall be taken in the presence of the CMS, MarAd, ABS and USCG representatives.
- C. Remove the fairwater cap, rope guard, any interferences and the propeller nut.
- D. Scribe the position of the propeller hub on the shaft. Furnish and install rigging to support the propeller, and jump the propeller. Examine hub and taper for evidence of proper fit. **CAUTION:** Do not use flame heat on the propeller hub to release fit without receiving prior permission from the CMS and MarAd representative.
- E. Remove and reinstall all interferences such as coupling guards, handrails, and platforms.
- F. Disconnect the intermediate shaft couplings, release the lineshaft bearings, and rig the intermediate shaft clear of the tailshaft.

ITEM 306. Tailshaft Removal and Examinations continued

- G. Draw the tailshaft completely into the engineroom for examination, taking care not to drag the shaft over the bearing. Take care to keep blasting grit and dust out of the stern tube and engineroom.
- H. Clean and prepare the stern tube and tailshaft for examination by CMS, MarAd, ABS and USCG Representatives. Keep the lignum vitae wood bearing wet at all times to prevent the wood from drying and loosening in the bearing.
- I. Conduct magnaflux, dye-penetrant, or other non-destructive tests on the tailshaft, and especially the keyway, as required by the ABS and USCG Representatives.
- J. After completion of all inspections, rig the tailshaft back into the stern tube.
- K. Rig the intermediate shaft back into place. Make up the flanges and resecure the bearings as before. Restore all interferences.
- L. Repack the tailshaft packing gland with Chesterton "Stern-Lon" Style No. 329, square, polytetrafluorethylene (PTFE) impregnated, long-fibered roved flax packing, with the ends seized, angle-buttet and staggered. Furnish two (2) spare turns of packing.
- M. Reinstall the propeller. Harden (ring) the propeller nut in the presence of the CMS, MarAd, ABS and USCG Representatives.
- N. Fill the fairwater cap with approved grease, and reinstall. Reinstall the rope guard and restore any interferences.

ITEM 308. Propeller Cleaning and Inspection (ABS & USCG)

- A. Clean the propeller by power nylon brushing and by using abrasive pads.
- B. Provide the services of a certified non-destructive testing specialist to conduct dye-penetrant tests of the propeller blades, hub and keyway as required by the ABS and USCG Representatives.
- C. Submit six (6) records of the propeller condition report from the non-destructive testing specialist.

ITEM 308. Chain Locker Eductor (USCG)

- A. After removing the chains from the chain locker, open and clean the chain locker sump.
- B. Demonstrate the operation and proper functioning of the chain locker eductor to the satisfaction of the USCG representative.

ITEM 309. Hull Gaugings (ABS)

- A. Furnish a certified ultrasonic gauging technician and all necessary Contractor labor, material and service support to perform hull and internal gaugings as directed by the ABS Surveyor. Assume for bidding purposes six hundred (600) individual gaugings.

- B. Furnish six(6) copies of the gauging report to the CMS Representative.

400 Bottom, Hull and Topside Painting

All paint shall be furnished by the Contractor.

The colors of the topcoats listed in this item are fixed; those listed for undercoats are for guidance only. The Contractor may use other colors so long as there is a strong contrast in colors between coats.

The Haze Gray touch-up topcoat required in Item 404 must exactly match the existing paint color; a patch-work of mismatched paint colors topsides will not be accepted by the CMS and MARAD representatives.

The Contractor shall ensure that a CMS-approved manufacturer's paint representative is on site at all times to oversee the surface preparation and coating work.

ITEM 401. Underwater Area (keel to 11' waterline) Approx. 2,000 m²

Hand scrape to remove heavy marine growth. Approx. 500 m²

High pressure wash hull at minimum 200bar (3,000psig) to remove loose paint and the remaining marine growth. The fathometer transducers shall be protected from blasting and coating. Approx. 2,000 m²

NOTE: PROPELLER AND STERN BEARING AREA SHALL NOT BE SANDBLASTED. PROPELLER AND SHAFT AREA SHALL BE WRAPPED IN PLASTIC AND SECURELY TAPED TO PREVENT CONTAMINATION WITH BLASTING ABRASIVE AND DUST.

- A. Brush-off blast (SSPC-SP7) to remove all existing antifouling coatings down to the anticorrosive coating. Approx. 2,000 m²
- B. Spot commercial blast (SSPC-SP6) rusted or bare areas as designated by CMS and MARAD representatives. Approx. 200 m²
- C. Wash down surface with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust.
- D. Apply one (1) touch-up coat of Red anticorrosive epoxy to all spot blasted areas per manufacturer's specifications. Approx. 200 m²
- E. Apply two (2) full coats of anticorrosive epoxy to underwater area per manufacturer's specifications. First coat Red, second coat Black. Approx. 2,000 m² per coat.
- F. Apply two (2) full coats of Antifouling per manufacturer's specifications. First coat Red, second coat Black. Approx. 2,000 m² per coat.

ITEM 401. Underwater Area continued

- G. Apply two (2) coats of Antifouling to the propellers per manufacturer's specifications. First coat Red, second coat Black. Approx. 20 m² per coat, per propeller.
- H After the vessel is fleeted, spot commercial blast (SSPC-SP6) the areas that had been hidden by the blocks before the fleetting. Approx. 75 m²
- I. Wash down surface of the block areas with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust from surface.
- J. Apply three (3) touch-up coats anticorrosive epoxy per manufacturer's specifications to the block areas. First coat Black, second coat Red, third coat Black. Approx. 75 m² per coat.
- K. Apply two (2) touch-up coats of Antifouling per manufacturer's specifications to the block areas. First coat Red, second coat Black. Approx. 75 m² per coat.
- L. Paint draft markings on forward, midships and after part of vessel, port and starboard. Draft markings from top of boot topping to keel shall be painted in white urethane.

ITEM 402. Boot Top Area (11' to 16' waterlines) Approx. 400 m²

- A. Hand scrape to remove heavy marine growth. Approx. 40 m²
- B. High pressure wash with fresh water at minimum 200bar (3,000psig) Approx. 400 m²
- C. Brush-off blast (SSPC-SP7) to remove all existing antifouling coatings down to the anticorrosive coating. Approx. 400 m²
- D. Spot commercial blast (SSPC-SP6) scaled, rusted and bare areas as directed by CMS and MARAD representatives. Approx. 40 m²
- E. Wash down surface with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust from surface.
- F. Apply one (1) touch-up coat of Black anticorrosive epoxy to all commercial blasted areas per manufacturer's specifications. Approx. 40 m²
- G. Apply two (2) full coats anticorrosive epoxy per manufacturer's specifications. First coat Black, second coat Red. Approx. 400 m² per coat.
- H. Apply one (1) full top coat Black Acrylic Epoxy Gloss coating per manufacturer's specifications. Approx. 400 m²

ITEM 403. Hull - Freeboard Area and Anchor Hawse Pipes (16' waterline to gunwale)

Approx. 1,200 m²

- A. High pressure wash with fresh water at minimum 200bar (3,000psig) Approx. 1,200 m²
- B. PORT LIGHTS SHALL BE COVERED WITH SUITABLE MATERIAL TO PREVENT DAMAGE TO GLASS DURING SANDBLASTING & PAINTING. THIS DOES NOT EXCLUDE ANY OTHER AREAS OR ITEMS THAT NEED TO BE COVERED DURING SANDBLASTING OR PAINTING.
- C. Spot commercial blast (SSPC-SP6) rusted areas as designated by CMS and MARAD representatives. Approx. 60 m²
- D. Wash down surface with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust from surface.
- E. Apply two (2) touch-up coats of anticorrosive epoxy to all blasted areas, per manufacturer's specifications. First coat Red, second coat Light Gray. Approx. 60 m² per coat.
- F. Apply one (1) full coat of Haze Gray urethane topcoat to freeboard area per manufacturer's specifications. The color of the new paint must exactly match the existing Haze Gray topside color. Approx. 1,200 m²
- G. Paint vessel's draft markings, hailing port, and name, margin lines, Plimsoll (loadlines) marks as located before. Marking above boot topping shall be painted in Black urethane.

ITEM 404. Topside Touch-up Painting Main Deck up to truck approx. 2,880 m² (decks approx. 1,520 m², all other areas approx. 1,370 m²).

- A. High pressure wash all surfaces with fresh water at minimum 200bar (3,000psig) to remove all dirt, grease, loose paint.
- B. ALL PORT LIGHTS, WINDOWS, WINCHES, RUNNING GEAR, ELECTRIC CABLE, RADAR SCANNERS, VALVES, ETC., IN WAY OF SANDBLASTING AND PAINTING SHALL BE COVERED WITH SUITABLE MATERIAL TO PREVENT DAMAGE FROM SANDBLASTING AND PAINTING. THIS LIST DOES EXCLUDE ANY OTHER ITEMS THAT MAY NEED PROTECTION.
- C. Tank vents shall be properly covered and sealed to prevent blast grit, dirt, and dust from entering the vent lines.
- D. The Contractor shall be held responsible for clean-up of all paint overspray on port lights, windows, light fixture globes, etc., or replacement thereof at the Contractor's expense.
- E. Name plates in way of sandblasting and painting shall be removed and marked as to their location, and reinstalled at the completion of painting.
- F. Spot commercial blast (SSPC-SP6) rusted areas as designated by CMS and MARAD representatives. Approx. 100 m²
- G. Power tool clean (SSPC-SP3) rusted and scaled areas as designated by CMS and MARAD representatives. Approx. 50 m²
- H. High pressure waterwash with fresh water at minimum 200bar (3,000psig) all rust stained areas as designated by CMS and MARAD representatives. Approx. 100 m²
- I. The shipyard shall make sure that the back and undersides of coamings and frame flanges are properly prepared and coated. These areas in particular will be inspected by CMS and MARAD representatives.
- J. Galvanized pipe runs shall not be sand blasted, i.e., CO₂ lines. They shall be hand prepped as needed.
- K. Wash down all surfaces with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust.
- L. Apply two (2) touch-up coats of anticorrosive epoxy to all blasted areas, per manufacturer's specifications. First coat Red, second coat Light Gray. Approx. 150 m²

ITEM 404. Topside Touch-up Painting continued

- M. Apply one (1) touch-up coat of Haze Gray urethane topcoat to all blasted and power tool cleaned areas, and also all stained areas, per manufacturer's specifications. Approx. 250 m²
- N. Paint the three (3) colored bands on the stack. Top ring between weld marks Red, 2nd ring White, 3rd ring Blue, using urethane paint. The colors shall match those in the flag of the United States.
- O. Where touch-up is required, fire mains, CO₂ lines, fire hose racks, nozzle hooks shall be painted red.
- P. Where touch-up is required, the top and bottom treads of topside ladders shall be painted yellow after the ladders are top coated.
- Q. Where touch-up is required, topside piping, manifolds, and valves shall be labeled and color coded per ship's color code system, as original.
- R. Apply one(1) full coat of Deck Gray medium grit nonskid to all topside decks per manufacturer's specifications. Approx. 1,520 m².

ITEM 405. Anchors

- A. Quantity two (2) anchors. Spot commercial blast (SSPC-SP6) approximately 30% of each anchor to remove loose paint and rust scale.
- B. Wash down surface of anchors with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust from surface.
- C. Apply one (1) touch-up coat of Red anticorrosive epoxy to blasted areas per manufacturer's specifications.
- D. Apply one (1) touch-up coat of Light Gray anticorrosive epoxy to anchors per manufacturer's specifications.
- E. Apply one full top coat of Haze Gray urethane.

ITEM 406. Anchor Chains (ABS & USCG)

- A. Remove all anchor chains from the chain locker onto drydock floor.
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- B. The anchor chains shall be tumbled on the drydock floor to remove loose paint and rust scale, and high pressure water washed with fresh water at minimum 200bar (3,000psig).
- C. Gauge the chains as required by the ABS. Submit six(6) copies of the gauging reports to the CMS representative.
- D. Repaint the shot markings with Red connecting links, and White links painted on each side of the connecting links in the quantity corresponding to the shot number (i.e., at the end of the seventh shot, there shall be seven White links on either side of the Red connecting link).
- E. Paint the last shot red, the second to last shot yellow.
- F. Paint the remaining unpainted areas between the shot markings black.
- G. Insure that there is one turn of heavy-duty stainless steel wire on each connecting link for each shot of chain that is inboard of the link. Where the wire is missing, or the number of turns is incorrect, furnish and install the correct turns of heavy-duty stainless steel wire.

ITEM 407. Interior Painting

All disturbed painted areas resulting from repairs, alteration or installation, including new steel and mechanical parts not sensitive to paint, shall be mechanically cleaned (SSPC-SP3), primed with epoxy primer and over-coated with area color-compatible paint.

500- Machinery Work

ITEM 501. To Be Assigned

600- Electrical Work

ITEM 601. To Be Assigned

700- Deck Equipment Work

ITEM 701. Watertight Doors (ABS & USCG)

- A. Chalk test the gaskets of all watertight doors, hatches and scuttles to the satisfaction of the CMS, MARAD, ABS and USCG representatives. Furnish the CMS and MARAD representatives six(6) copies of a condition report on the doors, hatches and scuttles, including defective gaskets, knife edges, dogs, etc.
- B. When and as directed by CMS and MARAD, make necessary repairs to doors, hatches and scuttles. Recheck test repaired closures. Prime and coat all new and disturbed areas per Item 404.

ITEM 702. Dehumidification Machine

- A. Open the access covers of the Cargocaire dehumidification (D/H) machine on the Main Deck in the midship house.
- B. Open and clean the reduction gears. Refill with clean grease and close.
- C. Clean the interior of the machine, including the filters and airways.
- D. Inspect the bearings, along with all mechanical and electrical components.
- E. Change the drive belts and desiccant with owner-furnished materials. Lubricate the bearings.
- F. Close up in good order and demonstrate operation to the satisfaction of the CMS representative, and furnish two(2) copies of a report of as-found conditions, and of work accomplished.