

SPECIFICATIONS FOR DRYDOCKING
M/V ALATNA and M/V CHATTAHOOCHEE

Spring 1997

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PREAMBLE

I. General Terms and Conditions

- A. The subject vessels are owned by the United States of America, represented by the U.S. Maritime Administration hereafter called "MarAd." Crowley Marine Services, Inc., 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. UNLESS OTHERWISE STATED IN AN PARTICULAR SPECIFICATION ITEM, ALL WORK DESCRIBED IN THIS SPECIFICATION IS FOR TWO(2) SHIPS. Certain items may be designated as pertaining to either *M/V Alatna* or *M/V Chattahoochee*. All other items pertain to both *M/V Alatna* and *M/V Chattahoochee*, even though the specification items refer only to "the vessel", rather than to "the vessels". All items shall be priced by ship, not for both ships. Final settlement of prices for work done under both the base specification and any additional work authorized by CMS shall be by ship and by individual item. See Section V.
- C. The terms "Contractor", "Yard" and "Contractor" are to be interpreted to mean the prime contractor to whom the specification is directed.
- D. 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.
- 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 "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.
- G. Whenever the term "furnish", "install", "fit", or "provide" is used with respect to any item to be supplied, it is understood to mean "furnish, install and connect in proper order," unless otherwise defined.
- H. 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.
- I. The Contractor shall furnish individual costs for each work item contained in the specification.
- J. The Contractor shall furnish adequate supervision for all evolutions/items of work. All evolutions/items of work are to be inspected by either the Contractor's ship

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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.

- K. 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.
- L. Details not specifically mentioned in these specifications, but which are usual, and necessary for this type of work, shall be furnished by the Contractor.
- M. 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.
- N. 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.
- O. 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.
- P. Scrap credit shall be given to the Owner for all scrap.
- Q. Quality of work: All workmanship and materials shall 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.
- R. 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.
- S. 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

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the Contractor's care and custody.

- T. 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 Contractor and the vessel for such purposes.
- U. 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.
- V. 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.
- W. 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.
- X. 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.
- Y. 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.
- Z. 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.
- AA. Furnish compressed air as required to accomplish work.
- BB. 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.
- CC. 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

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accomplish work under contract.

- DD. 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.
- EE. 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.
- FF. 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

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- 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

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 blocks shall be arranged so as to leave the transducers exposed. After carefully hand cleaning any fouling and prior to commencing any hydroblasting,

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ITEM 102 Drydocking continued

gritblasting or coating, cover the transducers to protect them from damage. After all hull painting is completed and prior to undocking, remove the protection.

- C. Arrange for a diver to be in the water during docking to prevent Doppler speed log and fathometer transducer from landing on 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 ships are layberthed in the Contractor's facility, provide one(1) additional office with two(2) desks for both ships.
- B. If the ships are layberthed at a pier outside of the Contractor's facility, provide two(2) offices for both ships. 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 Gangways

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

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.

- A. 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.
- B. All residual cargo, fuel and any other flammable material shall be cleaned as necessary prior to hot work in the immediate area.
- C. 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.

ITEM 204 Gas Free Certification continued

- D. 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.

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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 marking, sizes, weights, and locations of all blanks.

Item No.	Name	Size of Hull Opening	P/S	Frame	Height Above Keel
1	Overboard Discharge	12"	P	117	4'-6"
2	Bilge and Ballast Pump Suction Seachest	2'-0" x 4'-0"	S	117	3'-9"
3	Boiler Blow Down	4"	P	113	7'-0"
4	Miscellaneous Saltwater Overboard Discharge	4"	S	113	7'-0"
5	Fire Pump Suction Seachest	2'-0" x 3'-0"	P	107	3'-8"
6	Main Engine and Auxiliary Generator Cooling System Seachest	2'-0" x 6"	P	103	9'-0"
7	Main Engine and Auxiliary Generator Cooling System Seachest	2'-0" x 6"	S	103	9'-0"
8	Main Engine and Auxiliary Generator Cooling System Seachest	2'-0" x 4'-0"	P	103	7'-6"
9	Main Engine and Auxiliary Generator Cooling System Seachest	2'-0" x 4'-0"	S	103	7'-6"
10	Fire Main and Distilling Plant Suction Seachest	2'-0" x 4'-0"	S	102	8'-0"
11	Overboard Discharge	4"	P	100	11'-1"
12	Cargo Pump Suction Seachest	2'-0" x 3'-0"	P	90	1/2"
13	Cargo Pump Suction Seachest	2'-0" x 3'-0"	S	90	1/2"
14	Overboard Discharge	6"	P	88	2'-6"
15	Overboard Discharge	6"	S	88	2'-6"
16	Overboard Discharge	6"	P	25	5'-0"
17	Cargo Bilge and Ballast Suction Seachest	2'-0" x 3'-0"	P	25	2'-5"
18	Bilge and Ballast Suction Seachest	2'-0" x 2'-6"	S	22	2'-9"
19	Overboard Discharge	4"	S	21	5'-0"

B. After the seachests and strainers are 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

ITEM 301 Seachests, Strainers and Hull Blanks continued

(ABS & USCG) 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. The Contractor shall remove sixty-two(62) existing zinc anodes on the hull. Anodes within the seachests shall be left intact.
- B. Weld sixty-two (62) new Contractor-furnished 32mm x 150mm x 300mm (1-1/4" x 6" x 12") zinc anodes (dimensions approximate) to the underwater hull and appendages at locations designated by the CMS representative.
- 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. See Item 306- Rudder Pintles and Gudgeons.

ITEM 303 Port/Starboard Shaft Seals and Bearing Wear Down Readings (ABS & USCG)

- A. Provide and remove staging around propellers and shaft seal assembly.
- B. Remove and refit upper and lower half of strut rope guards.
- C. Under no circumstances shall the shaft seal internals be exposed to dirt, dust, or sandblasting grit. The drydock shall be cleaned of blasting grit before the work commences, and no blasting shall be performed while the seals are open. The propeller hubs and blades, along with the stern seal and strut areas shall be thoroughly cleaned before any work starts. The Contractor shall scrupulously maintain the cleanliness of the work areas while the seals are open.
- D. Work at the direction of the owner's Cedervall seal service representative.
- E. Thoroughly clean marine growth from the outboard seal and hub areas by hand scraping and brushing.

ITEM 303 Port/Starboard Shaft Seals and Bearing Wear Down Readings continued

- F. Take and record the outboard bearing wear down readings using the inspection fittings on the top and bottom of the aft shaft seal housing. Take and record the inboard bearing wear down readings. ABS, USCG, CMS and MarAd shall witness all readings.
- G. Measure and record the gap between the propeller and the seal housing ("C" dimension). Remove the packing backing strips (12 - 10 mm cap screws). Using the owner furnished special clamp tool, compress the seal springs and inspect the faces. Coat faces with heavy wheel bearing grease. Release the spring tension using care to prevent introduction of foreign material. Check the faces to be sure no clearance exists anywhere on the periphery. Remove the tool and reinstall the packing ring halves. Fill the system with oil to the proper head level in the tanks. Check for leaks. At each stage of the work required in this paragraph, the CMS, MarAd, ABS and USCG representatives shall witness the work and measurements before proceeding to the next stage. See Item 502-Stern Tube Lube Oil.
- H. Furnish a certified magnaflux testing technician and all necessary support to perform magnaflux testing of the port and starboard tailshafts in way of the stern seal to the satisfaction of the CMS, MarAd, ABS, and USCG representatives.
- I. Submit (6) records of propeller shaft bearing wear down readings and magnaflux test results to the CMS representative.

ITEM 304 Port and Starboard Propellers

- A. Clean the propellers by power nylon brushing and by using abrasive pads. Take care not to damage or contaminate the propeller hub blade seals or the shaft seals.
- B. Furnish the services of a Vickers Japan/KaMeWa technical representative to supervise the removal and reinstallation of the propeller blades, along with any repairs that should prove necessary. The technical representative shall take all necessary and available measurements and clearances.
- C. Under no circumstances shall the propeller internals be exposed to dirt, dust, or sandblasting grit. The drydock shall be cleaned of blasting grit before the work commences, and no blasting shall be performed while the propellers are open. The propeller hubs and blades, along with the stern seal and strut areas shall be thoroughly cleaned before any work starts. The Contractor shall scrupulously maintain the cleanliness of the work areas while the propellers are open.
- D. Furnish labor and materials to perform an inspection of the controllable pitch propeller for the CMS, MarAd, ABS, and USCG representatives. All work shall be done in accordance with the propeller technical manual available aboard the ship, and shall include, but not be limited to the removal of one(1) blade on each propeller, and the reinstallation of the blades with owner-furnished O-rings. The

ITEM 304 Port and Starboard Propellers continued

Contractor shall furnish a suitable torque wrench for tightening the blade fasteners under the direction of the technical representative.

- E. Operate the KaMeWa adjustable pitch propeller hydraulic system and inspect propeller hubs at full pitch in both directions. Check for leaks.
- F. Provide the services of a certified non-destructive testing specialist to conduct dye-penetrant tests of the propeller blades and hubs as required by the ABS.
- G. Submit (6) records of the propeller condition report from the Vickers Japan/KaMeWa technical representative.

ITEM 305 Sea Valves (ABS & USCG)

- A. 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 appropriate covers so that grit will not enter the interior spaces of the ship.

- B. The valves shall include, but not be limited to the following:

Valve	Size & Type	Frame Location
FORWARD (PUMP) MOTOR ROOM		
Fire Pump Sea Suction	5" Gate	22 Stbd
Sea Chest Vent	1-1/2" Globe	22 Stbd
Steam to Sea Chest	3/4" Globe Hose Valve	22 Stbd
Fire Pump Overboard	4" Gate	20 Port
FORWARD PUMP ROOM		
Cargo Pump Overboard Discharge	6" Gate Deck Op.	23 Port
Cargo Pump Sea Suction	8" Gate	25 Port
Sea Chest Vent	3" Gate	25 Port
Steam to Sea Chest	3/4" Globe	25 Port
AFT PUMP ROOM		
Cargo Pump Overboard Discharge	6" Gate Deck Op.	88 Port
Cargo Pump Sea Suction	8" Gate	90 Port
Sea Chest Vent	3" Gate	90 Port
Steam to Sea Chest	3/4" Globe	90 Port
Cargo Pump Overboard Discharge	6" Gate	88 Port
Cargo Pump Sea Suction	8" Gate	90 Stbd
Sea Chest Vent	3" Gate	90 Stbd
Steam to Sea Chest	3/4" Globe	90 Stbd

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ITEM 305 Sea Valves continued

AUXILIARY MACHINE ROOM

Evaporator Saltwater Pump Suction	3" Gate	95 Stbd
Sewage Overboard	4" Gate	98 Port
Steam to Sewage Overboard	1/2" Globe	98 Port
Fire Pump Overboard	4" Gate	102 Port
Evaporator Brine Overboard	1-1/2" Gate	96 Stbd
Fire Pump Sea Suction	5" Gate	102 Stbd
Evaporator Sea Suction	2" Gate	102 Stbd
Sea Chest Vent	1-1/2" Gate	102 Stbd
Steam to Chest	3/4" Globe	102 Stbd
Steam to Evaporator Sea Chest	3/4" Globe	102 Stbd
Emergency Bilge Suction to Fire Pump	5" Globe	102 CL

MAIN ENGINE ROOM

Main Sea Suction (High)	8" Gate	104 Port
Main Sea Suction (Low)	8" Gate	104 Port
Sea Chest Vent (High)	3" Gate	104 Port
Sea Chest Vent (Low)	3" Gate	104 Port
Steam to Sea Chest	3/4" Globe	104 Port
Fire Pump Sea Suction	5" Gate	107 Port
Fire Pump Circ.	4" Gate	107 Port
Sea Chest Vent	1-1/2" Gate	107 Port
Steam to Sea Chest	3/4" Globe	107 Port
Boiler Blowdown	3" Angle	113 Port
Main Engine Overboard	6" Gate	116 Port
Bilge Pump Overboard	4" Globe Stopcheck	118 Port
Water Service to Stern Tube	1" Globe	120 Port
Stern Tube Drain Valve	1" Globe	120 Port
Main Sea Suction (High)	8" Gate	104 Stbd
Main Sea Suction (Low)	8" Gate	104 Stbd
Sea Chest Vent (High)	3" Gate	104 Stbd
Sea Chest Vent (Low)	3" Gate	104 Stbd
Steam to Sea Chest	3/4" Globe	104 Stbd
Main Engine Overboard	8" Gate	111 Stbd
General Service Saltwater Overboard	4" Gate	112 Stbd
Bilge and Ballast Sea Suction	4" Gate	118 Stbd
Sea Chest Vent	1-1/4" Gate	118 Stbd
Steam to Sea Chest	3/4" Globe	118 Stbd
Water Service to Stern Tube	1" Globe	120 Stbd
Stern Tube Drain	1" Globe	120 Stbd
Main Saltwater Recirc. Valve	5" Gate	104 Port
Main Saltwater Recirc. Valve	6" Gate	104 Stbd
Emergency Bilge Suction to SME	6" Globe	118 Stbd
Emergency Bilge Suction to PME	6" Globe	118 Port

STEERING GEAR ROOM

Soil Drain Overboard	4" Gate	133 Port
Soil Drain Overboard	1-1/2" Gate	132 Port

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ITEM 305 Sea Valves continued

- C. The Bilge and Ballast Sea Suction valve (4-inch gate) at Frame 118 Starboard will not operate correctly (*M/V Alatna* only). As part of the requirements of Paragraph B above, open and inspect the valve. Report to the CMS representative the defect found to be causing the problem.

ITEM 306 Rudder Pintles and Gudgeons (ABS & USCG)

- A. Remove the two(2) upper and the two(2) lower insert plates, port and starboard sides of the rudder, covering the pintles. Reinstall plates at the completion of all inspections.
- B. Check the pintles, bushings, posts and carriers for wear and tightness.
- C. Take rudder pintle bearing clearances, at the athwartship and fore and aft positions. Readings shall be taken in the presence of ABS, USCG, CMS and MarAd.
- D. Upon completion of inspection work in this item, Contractor shall reinstall upper and lower insert plates and retaining plates.
- E. Remove the drain plug and reinstall same, to prove the rudder free of water. Air test the rudder to 0.2bar (3 psig) pressure. 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.
- F. Remove the packing and repack the rudderstock 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.
- G. Fill and drain both chambers of the rudder with an approved float coat preservative compound.
- H. Submit six(6) typewritten copies of clearance readings to the CMS representative.

ITEM 307 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.

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ITEM 308 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. 1,975 m²

- A. Hand scrape to remove heavy marine growth. Approx. 500 m²
- B. High pressure wash hull at minimum 200bar (3,000psig) to remove loose paint and the remaining marine growth. The doppler speed log and fathometer transducers shall be protected from blasting and coating. Approx. 1,975 m²

NOTE: PROPELLER AND SHAFT SEAL 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.

- C. Brush-off blast (SSPC-SP7) to remove all existing antifouling coatings down to the anticorrosive coating. Approx. 1,975 m²
- D. Spot commercial blast (SSPC-SP6) rusted or bare areas as designated by CMS and MarAd representatives. Approx. 200 m²
- E. Wash down surface with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust.
- F. Apply one (1) touch-up coat of Red anticorrosive epoxy to all spot blasted areas per manufacturer's specifications. Approx. 200 m²
- G. Apply two (2) full coats of anticorrosive epoxy to underwater area per manufacturer's specifications. First coat Red, second coat Black. Approx. 1,975 m² per coat.
- H. Apply two (2) full coats of Antifouling per manufacturer's specifications. First coat Red, second coat Black. Approx. 1,975 m² per coat.

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ITEM 401 Underwater Area (keel to 11' waterline) continued

- I. 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.
- J. After the vessel is fleeted, spot commercial blast (SSPC-SP6) the areas that had been hidden by the blocks before the fleeting. Approx. 75 m²
- K. 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.
- L. 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.
- M. 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.
- N. 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. 378 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. 378 m²
- C. Brush-off blast (SSPC-SP7) to remove all existing antifouling coatings down to the anticorrosive coating. Approx. 378 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. 378 m² per coat.
- H. Apply one (1) full top coat Black Acrylic Epoxy Gloss coating per manufacturer's specifications. Approx. 378 m²

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ITEM 403 Hull - Freeboard Area and Anchor Hawse Pipes (16' waterline to gunwale)
Approx. 1,115 m²

High pressure wash with fresh water at minimum 200bar (3,000psig). Approx. 1,115 m²

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.

- A. Spot commercial blast (SSPC-SP6) rusted areas as designated by CMS and MarAd representatives. Approx. 60 m²
- B. Wash down surface with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust from surface.
- C. 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.
- D. 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. 1,115 m²
- E. 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. 2,230 m² (decks approx. 1,208 m², all other areas approx. 1,022 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 vent overflow containment boxes shall have their return-to-tank drains properly plugged to prevent any blast grit, dirt, and dust from entering the drain lines.
- D. Tank vents shall be properly covered and sealed to prevent blast grit, dirt, and dust from entering the vent lines.

ITEM 404 Topside Touch-up Painting continued

- E. 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.
- F. Name plates in way of sandblasting and painting shall be removed and marked as to their location, and reinstalled at the completion of painting.
- G. Spot commercial blast (SSPC-SP6) rusted areas as designated by CMS and MarAd representatives. Approx. 100 m²
- H. Power tool clean (SSPC-SP3) rusted and scaled areas as designated by CMS and MarAd representatives. Approx. 50 m²
- I. 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
- J. The Contractor 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.
- K. Galvanized pipe runs shall not be sand blasted, i.e., CO2 lines. They shall be hand prepped as needed.
- L. Wash down all surfaces with fresh water and tie coat solvent solution at minimum 7bar (100psig) pressure to remove all dirt and dust.
- M. 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
- N. 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
- O. 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.
- P. Where touch-up is required, fire mains, CO2 lines, fire hose racks, nozzle hooks shall be painted red.
- Q. Where touch-up is required, the top and bottom treads of topside ladders shall be painted yellow after the ladders are top coated.
- R. Where touch-up is required, topside piping, manifolds, and valves shall be labeled and color coded per ship's color code system, as original.

ITEM 404 Topside Touch-up Painting continued

- S. Apply one(1) full coat of Deck Gray medium grit nonskid to all topside decks per manufacturer's specifications. Approx. 1,208 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.
- 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

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

ITEM 501 Emergency Generator and Boiler Fuel Tank Level Indicators

- A. Drain both the emergency generator and the boiler fuel tanks.
- B. Remove the existing magnetic float-type tank level indicators from the emergency generator and boiler fuel tanks.
- C. Furnish all necessary labor and materials to make necessary modifications and to install an owner-furnished GEMS Sure-Sight magnetic float liquid level indicator in each tank.
- D. Refill the tanks with ships oil to demonstrate to the CMS representative the proper functioning of the new gauges.

ITEM 502 Stern Tube Lube Oil

- A. Drain and pump out all lube oil from the port and starboard stern tube systems, including the stern tubes, head tanks, settling tanks (located under the seals in the engineroom bilges). Drain the oil carefully, first into disposal drums until clean oil is observed, then put the clean oil into clean drums for reuse . The oil in the low areas shall be discarded if it is discolored or contains water. See Item 303- Port and Starboard Shaft Seals and Bearing Wear Down Readings.
- B. Take a sample of the oil from each system after it starts running clean and send the oil to a qualified lab for analysis for viscosity, water, contaminants, and metals. Submit two(2) copies of each report to the CMS representative.
- C. The bilge settling tank gaskets shall be renewed. The tanks shall be tested with air and soap upon reassembly to insure watertightness, so that the bilge water does not contaminate the tank oil.
- D. Thoroughly clean and flush the systems to the satisfaction of the CMS and MarAd representatives.
- E. Drain and pump out all flushing oil from the stern tube systems, and properly dispose of the same.
- F. Refill with clean lube oil from drums and the vessel's storage tanks to the proper operating levels, and thoroughly circulate the oil using the stern tube lube oil pumps. Prior to using ships oil, the CMS representative must receive and approve the lab analysis results.

600- Electrical

ITEM 601 To Be Assigned

700- Deck Equipment Work

In the following Deck Equipment work items, all painted areas disturbed during repairs or modifications, and all new steel shall be cleaned, primed and coated per Section 400, Vessel Painting Specifications.

ITEM 701 Watertight Doors

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. Rechalk test repaired closures. Prime and coat all new and disturbed areas per Item 404.

ITEM 703 Deck Drains

A. Seal weld 12mm thick by 150mm diameter blanks over the Main Deck and sideshell openings of six(6) deck drains as designated by the CMS representative. There are three(3) deck drains Port, and three(3) deck drains Starboard, with two(2) blanks to be fitted per deck drain.

B. Repair exterior coatingscoatings per Items 403 and 404. Restore damaged epoxy tank coatings per existing system.

ITEM 704 Dehumidification Machine

A. Open the access covers of the Cargocaire dehumidification (D/H) machine on the Main Deck in the forward 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.

ITEM 705 Hose Boom Cargo Gear Examination

- A. Furnish labor, materials and services to rerig and make operational the Port and Starboard hose booms.
- B. Weight test both booms to the satisfaction of the CMS and ABS representatives.
- C. Furnish labor, materials and services to assist the CMS and ABS representatives in the examination of the hose boom gear for ABS Cargo Gear Quintennial Examination credit.
- D. Unrig both hose booms, and stow the gear as directed by the CMS representative.
- E. Stencil the Safe Working Load on both hose booms, along with the date of the weight test. The stencil shall be applied in block letters four(4) inches high on one(1) side at the base of each boom, and shall read "SWL 5 TONS--TESTED MM-DD-YY" (substituting the actual date for MM-DD-YY).
- F. Submit six(6) copies of the cargo gear condition report to the CMS representative.