Machinery 42,548
Cargo System 12,110
Hull 70,877
125,527

Navy yard 7:30 A.M. May 3, 1963
Completion date June 2, 1963 = 3 CR Days

Gas Free (133)

The Owner will steam, clean and gas free, or cause to be steamed, cleaned and gasfreed, all cargo tanks, cofferdams, pumproom, compartment and pipelines other than those containing bunker or boiler fuel and such other tanks, cofferdams, compartments etc., as are specifically exempted by the Contractor's Certificated Chemist. The Contractor shall not assume, however, that the vessel and/or its compartments and/or its pumps and/or its piping is or are free from explosive or dangerous gas or gases or oil, but shall at his own expense have such tanks, compartments, pumps, piping, etc. tested by a Certificated Chemist engaged by the Contractor who shall furnish the Owner and/or his Representative with A Certificate showing that such compartments and/or pumps and/or piping, etc. have been so tested and found to be free from explosive and/or dangerous gases or oil.

Said Contractor shall keep all such cargo tanks, cofferdams, pumprooms, compartments and pipelines free from explosive and/or dangerous gas or gases or oil during the period of repairs and/or alterations.

50D Delivery of such aforementioned Certificate and receipt thereof by the Owner or his Representative shall in no way relieve and/or discharge the Contractor from his obligation to keep these places free from explosive and/or dangerous gas or gases or oil during the performance or this contract or any related additional work.

Should, during the course of repairs or alterations, the Contractor's Chemist report the presence of dangerous and/or explosive gases or oil, the Contractor shall immediately stop all work and shall not resume work until such places, etc. are again certified free from explosive and/or dangerous gas or gases or oil.

Burning or other hot work shall not be done by the Contractor on any part of the cargo piping system, gas vent lines or other piping lines which may have contained oil, gas or other inflammable products, unless permission to do so is specifically granted by the Contractor's Certificated Chemist.

2R Safety Precautions-Coated Materials (133)

The Contractor shall provide adequate exhaust ventilation; shall supply airline respirators, hose masks, or similar accessories; and shall take all other measures necessary to avoid creation of hazards resulting from burning or welding of coated plates, structural members, pipes, or other parts of the vessel or its equipment.

N.P. The Contractor shall at no time run steam lines, air lines, water lines, acetylene lines, welding cables, light cables, or any other lines of any nature through the passageway doors or portholes to the quarters or engine room.

These passageways are to be kept clear at all times.

3R Safety Valves (Consolidated)-303

Disconnect and remove one (1) 2" superheater and one (1) 2 1/2" fw'd drum safety valves from starboard boiler. (Valves to be sent to an approved service shop). 600 Open up, machine seats and discs, grind in, renew defective parts, thoroughly clean, reassemble, test and set under steam pressure, prove tight. Reinstall on boilers. Renew gaskets, defective studs, bolts and nuts, replace removals in way of work. Follow up on nuts when valves are hot.

Hull 87,777
Cargo 31,416
Mach 55,040
174,427

EXX-MOR-005884

Test out main and superheater safety valves after steam has been raised. Set valves to the requirements of A.B.S. and U.S.C.G.B.M.I. Connect up lifting gear in good order.

4R Boiler Refractory-353

Repair brickwork and refractory in furnaces of two (2) boilers. Remove slag and level off furnace floors prior to other repairs. Patch furnace floors.
Repair corbels in way of water wall headers, lower drums and front wells.
Repair brick work front walls, renew shoped burner arches in way of twelve (12) burner openings, also renew defective short bladed grids and flame diffusers. (Bladed grids and diffusers furnished by vessel). Note Starboard boiler has left hand rotation short bladed cones and diffusers.
Repair Kao-Cast refractory in way of superheater tube supports, and baffles, also repair refractory in way of superheater tube opening in way of removed superheater soot blower elements.
Remove all debris from fireroom and vessel as it is removed from boilers.
Approximately 3000 lbs. Chrome One, 1500 lbs, Kao-Cast and 100 sq. ft. brick required.
All brick, refractory and insulation supplied by shipyard.

1050

5R Boiler Expansion Bellows-303

Renew expansion bellows and face plate of both boilers as original. Size of boiler opening approx. 14'long X 6' wide each side and end. Size of bellows 1/8" x 8" x 2" x 1" R. Size of face plate 1/4" x 8".

5450

6R Astern Throttle Valve-303

Open for examination astern throttle valve, grind in, renew rings (furnished by vessel), check, clearance between disc and stem, also between stem and nut, repack valve stem. Close up in good order, renew bonnet gasket. Prove valve in good working condition. Note: Valve now vibrates a little.

450

7R Ahead and Astern Throttle Manifold-303

a. Renew one (1) 8" flexitallic 1500 lb. gasket at throttel valve manifold inlet. Prove tight. Replace flange insulation blanket as original.
b. Renew strainer cover gasket in throttle manifold, prove tight, renew defective studs and nuts. Replace cover insulation blanket as original.

275

8R Main Turbine Warm Up Line (~~303~~) Capitol

Crop 3/4" drain line before drain valve of main stop valve as designated, install 3/4" to 1/2" side outlet welded tee, install 1/2" flanged nipple, install flanged (1/2") steel valve.
Install at steam gauge line connections for ahead and astern turbines one (1) flanged tee to each connection (two (2) tees). Size of tees 1/2 inch. Install to each tee (1) one 1/2 inch flanged valve, install to each valve one (1) orifice plate approx. 3/4" thick, size of orifice for HP turbine. 180", for L.P. turbine .150". Stellite plates in way of orifices. Connect with 1/2" steel tubing the two orifices plates to the new installed 1/2" valve at main stop valve. Install 1/2" drain line with valve from new line and connect to drain funnel under main throttle valve. Reconnect ahead and astern gauge line valves, and alter and reconnect both gauge lines to the valves.

2410

EXX-MOR-005885

The above installation to meet the approval of USCG and ABS. Apply hydrostatic test to new installation and prove tight. Install suitable hangers to piping and valves. Insulate piping and valves. Will require staging. Valves and steel tubing, flanges, furnished by Owners.

Furnish and install extension stem (reach rod) to each new installed valve to HP and LP steam line, valves to be reached from operating flat.

9R Turbine For #1 Main Feed Pump G.E. 575 HP - 303
Insurance Claim No.
Take delivery of Owner furnished turbine casing.
Remove from vessel defective turbine (stowed midship house port side aft) to shop, dismantle complete. Thoroughly clean removed parts and install on new casing, including bearing supply and drain piping. Casing, nozzle plate, intermediate, posts, LP and HP packing boxes, bearings also carbon packing furnished by vessel. Test out over speed, trip, back pressure trip, also governor control valve and air operated valve prove all in good working order. Renew all defective allen head cap screws and gaskets. Install on vessel and connect up turbine shaft in correct alignment with pump. After plant is in service, test and prove turbine and pump in good operating condition. Renew insulation as original.
Work to be under supervision of G.E. Service Engineer. Apply one (1) coat of primer and two (2) coats of approved color paint to new and disturbed areas.

10R Main Condenser - 303
Open main condenser, removing access cover plates for examination.
Wire brush and thoroughly clean tube sheets and tubes. Test condenser to 15 lbs. hydrostatic pressure and prove tight with spectrotest. Plug all leaking tubes and tighten all leaking packing and renew any defective tube packing found.

Thoroughly clean and repair any damaged areas of Neoprene coating.

Renew swedish iron plates and any defective studs, nuts and washers.

Harden up on leaking exhaust flange joints.
Shore up condenser for hydrostatic test. Upon completion of work, condenser to be drained and shores removed. Close up in good order, renewing cover gaskets, defective studs and nuts.

Renew two (2) water chest cover steel studs. Approx. size 1 1/2" x 4" x 1 1/8".

11R High and Low Injection Copper Pipe (303)
Remove all damaged rubber and thoroughly scale, wire brush and clean and apply neoprene coating to all bare areas of low and high injection pipe from valves to main circulator inlet and connection to bilge injection valve. Approx. size 30" dia. x 21 ft. long.

12R Aft Fuel Oil Service Pump-Delaval-303
Removed aft fuel oil service pump to shop. Open for examination remove, rotors, housings, bearings, washers and etc. Build up shafts by spray welding in way of packing and bearings as necessary and machine to original size. Renew defective sleeves, bushings, bearings, washers and end plates. Check and adjust end clearances. Reassemble in good order using new gaskets, renewing defective studs, bolts and nuts. Reinstall and connect up pump and motor in true alignment. Repack

EXX-MOR-005886

coupling with approved grease. Test and prove pump in good operating condition. Repack stuffing box using approved packing.

13R Lube Oil Cooler Circulating Pump - 303
Warren 6-DBY-11 - 1500 GPM

a. Disconnect and remove pump to shop. Open and build up eroded areas of casing in way of bearings and wearing rings by brazing, and machine in way of bearings and wearing rings to correct size and in alignment. Note: Shaft either breaks or wear egg shaped in way of bearings.

b. Take delivery of Owner furnished rotating elements and install in repaired pump casing. Remove coupling from old impeller shaft and install on owner furnished impeller assembly shaft. Adjust impeller on shaft for correct vertical height. Fit the new casing rings to casing. Close up circulating pump in good order, using manufacturer's prescribed thickness gaskets. Prove grease fittings clear, repack, prove free. Renew defective studs, bolts and nuts. Align pump and motor in true alignment. Test out and prove in good working order.

c. Crate defective salt water cooling circulating pump rotating element, including casing rings and bearings. Ship via motor freight prepaid to:

U.S. METALLIC PACKING COMPANY
150-170 LYNHURST AVENUE
ROSE BANK
STATEN ISLAND 5, NEW YORK

Marked: From "ESSO GETTYSBURG"

14R Piping Machinery Space-303

a. Renew one (1) 1 1/4" welded steel union in the steam supply line to Generator Steam Seal Regulating Valve. Renew approx. 1 foot of 1 1/4" pipe insulation cover with asbestos cloth. Prove tight.

b. Renew one (1) section of bent, flanged, extra heavy steel pipe 6" dia. approx. 12 ft. long, two (2) bends, with one (1) 5" 90° elbow flanged side outlet, one (1) 2 1/2" x 7 flanged outlet, one (1) 1 1/2" threaded speed, main drain line at the drain collection tank.

15R Salt Water Service Piping Machinery Space - 303

Renew the following sections of salt water service piping using 90-10 cupro nickel pipe. Flanges to be reused and piping installed with new joints, bonding strips and proven tight. Pipe clamps over present leaks to remain property of vessel.

a. One (1) section 4 in. O.D. X 12 ft. bent, flanged with One (1) 1 1/2" side outlet. L.P. evaporator salt water supply.

b. One (1) section 3" dia. X approx. 6 ft. long two bends, flanged, reduced one end to 2" dia. with two (2) 1" outlets.

16R Main Air Ejector - 303

Disconnect and remove steam inlet connection to portmain air ejector to shop. Remove strainer cover and machine seats in way of steam cuts in cover and strainer body, machine same amount from each. Renew gasket, (strainer cover), reinstall renewing flange gaskets, defective studs, bolts and nuts. Prove steam tight. Replace insulation in good order.

17R Circulating Water and Feed Supply Pump - 303
L.P. Double Effect Distilling Plant

a. Disconnect and remove present pump and motor from foundation. Scrap pump. Disconnect and remove motor from pump, stow motor in engineers store room.

b. Install original pump and motor on foundation. Install blocks under pump and motor prove in true alignment. Connect up motor and pump, will require one (1) section of 4" dia. x 3 1/2 ft. long, bent, flanged, each flange has 8 - 3/4" dia. holes.

EXX-MOR-005887

One (1) section approx. 6 ft. long, bent, 3 1/2" dia. flanged one end and 3" dia. flanged other end, each flange has 4 - 3/4" dia. holes. Pipe to be 90-10 cupro-nickel. Renew gaskets, bolts and nuts. Prope pump and motor in good working order. (Pump and Motor furnished by vessel)

18R Relief Valves, Machinery Space - 303

Disconnect and remove to shop the following relief valves, open, machine seat and disc, grind in, renew bonnet gaskets, test, prove tight at required pressure with steam. Reinstall in good order, renew gaskets, defective bolts, studs and nuts, prove in good working order. Replace all disturbed insulation as original:

1300

One (1) 5" Leslie 35 lb. atmospheric exhaust valve, renew diaphragm. Prove outlet piping clear.
One (1) 5" relief valve on 85 lb. steam line (set at 100 lbs.).

19R Valves Machinery Space - 303

Disconnect and remove to shop the following valves, open up, machine seat and disc, grind in, repack, renew bonnet gaskets, test to required pressure and make tight. Reinstall in good order using new gaskets and renew defective studs, bolts and nuts. Prove tight. Replace disturbed insulation as original.

580

a. One (1) 6" exhaust valve, spring loaded, #3 feed pump.
b. One (1) 5" stop check valve steam to 4th stage heater (outboard valve). Weld seat.
c. Install one (1) new 4" flanged globe valve between sanitary pump disc. line and cooling water reducing valve. Renew gaskets, bolts and nuts. Valve furnished by vessel. As designated.
d. Install one (1) new 3" flanged, globe stop, check valve from cooling salt water service 30# line to generator coolers. Renew gaskets, bolts and nuts. Valve furnished by vessel. As designated.

Heaters - 303

Install temporary type heaters on all motors, generators that are not in use, also switchboards and keep same in service during the entire repair period.

400

21R Controllers - 303

Make necessary removals and remove mounting panels from the following motor controllers. Repair panels in way of three bladed knife switch. Panels are burnt in way of bolts holding knife switch. Replace, test and prove controllers in good operating order. Renew panel disconnect switches, and any defective cable lugs, studs, nuts, washers, etc.

1600

Controller for Fw'd Port Force Draft Fan motor H.P. 175.
" " Aft port force draft fan motor " "
Aft st'bd force draft fan motor " "
Controller for Main circulator pump motor H.P. 200.

22R Insurance Claim No. 174

(Stranded Mississippi River July 9-11, 1962)

1080

Aft Anchor Windlass - 303

a. Install new thrust washers on intermediate shaft. Thrust washers furnished by vessel. Adjust bearings, test and prove in good working order.
b. Renew steel gear guard - One section; Approx. size 3/16" x 14'6" long x 10 1/2" wide x 5" flange each side also one (1) section, approx.3/16" x 7'long x 8" wide x 4" flange each side as original.. Renew defective brackets and supports, install one (1) 3" dia. hole in each section of guard with portable cover for greasing gear. Apply two (2) coats of primer to inside and two (2) coats of primer and one (1) color coat of paint to outside of guards. Prove guards clear of gears and moving parts.
c.(Renew brake lining.) (Furnished by vessel)

EXX-MOR-005888

23R Guards-Anchor Windlass and Winches-303

a. Renew missing section of fw'd anchor windlass gear guard, approx. size 3/16" x 7'6" long x 7 1/2" wide x 5" flange each side, with one (1) 3 3/4" dia. hole with swing cover in guard.

b. Renew the following mooring winch gear guards, approx. size 3/16" x 13'6" long x 7" wide with one (1) 6" flange and one (1) 2" flange with one (1) 3 1/4" dia. hole with swing cover. Renew defective brackets and supports. #3; #4; and #9 mooring winches. A total of 3. Remove from old guards and install engaging lever handle clips.

1330

c. Cargo Winch-Renew gear guard, approx. size 3/16" x 9'6" long x 6 1/2" wide with 2 1/4" flange each side, with one 3 1/4" dia. hole with swing cover.
Renew crank guards of cargo winch using (lattice type).
Guards to be made portable. Also prove guards clear of cranks.
Size each guard. 3/8" x 25" x 8 1/2" x 35". A total of two guards.

d. Renew the following mooring winch crank guards, using welded lattice type guards. Guards to be made portable and also prove guards clear of cranks. Size each guard 3/8" x 10 1/2" x 32" x 3'9". A total of two guards.
#12 Winch aft guard (1).
#8 Winch aft guard (1).

Note: Before installing guards apply two (2) coats of primer to inside and outside of each. Apply one (1) color coat of paint to outside of guard. Stencil # of winch on new gear guards installed.

e. Hydraulic Pressure Gauge Guards-Renew the following sheet metal guards for mooring winch hydraulic brake pressure gauges. 1/8" x 11" high x 12" long x 5 1/2" wide, with 12" long x 4" strip each side. Ends flanged 2" drilled and bolted to winch foundation. One end has 3 1/2" dia. hole for seeing gauge face. Material galv. #1, 2, 3, 4, 6, 7, 9, 10,11&12. A total of ten guards.

24R Mooring Winches - 303

American Engineering Company 12" x 14"

Make necessary removals and remove drum clutch from shaft to shop, machine clutch.. 010" larger than present size, to give more clearance between shaft and clutch.
Install one (1) additional 1/8" alimite pin type fitting in each clutch and machine grease grooves in clutch so that grease will get to all parts of shaft and clutch as designated, of #1, 2, 3, 4, 5, 6, 7 and #8 mooring winches, and one (1) other designated winch. A total of nine (9) winches.

6320

Will require removing cable drums complete of No. 1 and No. 2 winches to shop for removal and replacement of gypsy heads for access to clutch.
Replace clutch and install drum shafts, also replace brake, (wire brush brake lining before reinstalling), gear guard and etc. in good order.
Renew defective or broken, hydraulic hoses with fittings for hydraulic brakes, also defective, broken or missing bolts, studs and nuts.
Upon completion of repairs, test winches and prove all in good working order.

CARGO SYSTEM

25R Cargo Gate Valves - 513

Take delivery of two (2) 8"and four (4) 16" gate valves owner furnished. Remove defective valve and install owner furnished valve in the following locations. Test flange joints and prove tight:

1350

Four (4) 16" gate valves in aft pumproom as designated
One (1) 8" master stbd. stripper line #3 center tank.
One (1) 8" master stbd stripper line #4 center tank.

EXX-MOR-005889

Remove the two (2) 8" four (4) 16" defective gate valves from vessel crate and ship via prepaid motor freight to:

HEMZE INSTRUMENT & VALVE CO. INC. (ALA.)
95 DIAZ STREET
PRICHARD (MOBILE) ALABAMA
Marked: "FROM SS "ESSO GETTYSBURG"

26R Cargo Pipe-523

Renew the following sections of cargo piping (using extra heavy steel pipe). Apply 100 lbs. hydrostatic test to all new pipe and flange gaskets prove tight. Replace all removals in good order.

Aft Pump Room

a. One (1) 16" dia. section approx. 10 ft. long, with 90° ell, flanged one end, dresser coupling other end, with one (1) 16" dia. x 18" flanged outlet, one (1) 16" dia. x 18" with 90° ell flanged outlet.
Located ballast suction line pumproom bilges port side.

3270

b. One (1) 6" dia. section approx. 5 ft. long, two bends, flanged. Port stripper bilge suction from strainer box to cut out valve at manifold.

c. One (1) 8" dia. section approx. 18" long, flanged each end, with one (1) 8" dia. x 18" long flanged outlet with 90° ell, also one (1) 1 1/2" threaded speed for drain. Starboard stripper pump suction.

d. No. 1 Center Tank-One (1) section 12" dia. x approx. 12' long, two bends, one end welded to 16" main line, other end flanged. Suction to #1 center tank.

e. No. 5 Center Tank. One (1) section 12" dia. x approx. 40 ft. long, straight, with dresser coupling each end. Ballast pipe #5 center tank. Use galvanize pipe.

Port and Starboard Cargo Stripping Pumps - 503
Warren - Vert. Duplex 16" x 14" x 18"

Open up port and starboard cargo steam stripper pumps for examination. Open steam and liquid end cylinders, steam and liquid end valve chests. Calibrate and record size of liners. Remove and machine suction and discharge valve seats. Renew defective and worn valve discs, rotators, springs and stems furnished by vessel. Fit new stems so that stem will rest against suction valve stem and against discharge valve seat. Renew liquid end liners and plunger cup type packing if found necessary (liners & plunger packing furnished by vessel). Scrape and lap in steam valves to faces, renew valve stems. Grind in, free up and repack cusion valve.

400

True up steam piston ring grooves, and renew piston rings, grind shoulders from steam cylinders as found necessary.
True up piston rods, renew neck bushings and rebush packing glands. Chase threads of steam, liquid rods also cross heads and prove same tight. Renew crosshead taper pins. (Rods become loose in crossheads).
Rebush and machine valve operating gear, renew pins and remove all lost motion.
Burn 6" dia. plug in foundation under inboard liquid cylinder of the port stripper pump.
Tighten cylinder plug and secure.
Test and prove tight. Weld plug in foundation.
Reassemble, rejoint, repack, renew defective studs, bolts and nuts, test out and prove in good order.

28R Cargo Heating Coil Steam Pipe - 523

Renew the following extra heavy 2 inch dia. steel pipe, fitting and etc. in cargo heating coil steam pipe on deck. Pipe clamps over present leaks to remain property of vessel. Test and prove tight.

a. From steam manifold valves to tank top flange #7 port and #7 starboard tanks.

1290

EXX-MOR-005890

Requires approx. 80 ft.of 2" dia. pipe, 12 flanges, 12 bends and 2 90° elbows.

b. From steam manifold valves to tank top flange #8 port and #8 starboard tanks. Requires approx. 80 ft. of 2" dia. pipe, 12 flanges. 11 bends and 2 90° elbows.

HULL

29R Steam Line To #7 Mooring Winch - 103

Renew one (1) section of X-heavy steel pipe dia. 3 inch approx. 14 ft., long, flanged, two bends, steam line to #7 mooring winch. Renew flange gaskets, bolts and nuts. Renew pipe insulation and cover with approved water proof coating.

325

30R Steam Line To #9 Mooring Winch - 103

Renew one (1) section of X-heavy steel pipe dia. 3 inch approx. 13 ft. long, flanged, one bend; also one (1) section 3 inch dia. x 18" long, flanged with 90° bend, steam line to #9 mooring winch. Renew flange gaskets, bolts and nuts. Renew pipe insulation and cover with approved water proof coating.

410

31R Steam Line to Cargo Winch - 103

a. Disconnect and remove defective 2 1/2" dia. flanged section of steam line to winch at valve chest connection. Install one (1) 2 1/2", 300 # flanged steel valve (furnished by vessel) at valve chest connection. Renew removed section of steam line. Approx. 2 1/2" dia. x 10' long, bent, flanged. Renew pipe insulation and cover with approved water proof coating.

325

Furnish and install one (1) approx. six (6) ft. long reach rod to new installed valve. Reach rod to be properly supported. Prove all in good order.

Heating System To Midships (Along Fore and Aft Walkway) - 103

a. Crop and renew two (2) welded 3" flanges in steam line to midship heating system along walkway port side. Replace insulation in way of repairs.

b. Renew three (3) sections of 1 1/2" dia. extra heavy steel pipe in return line from midship heating system, with screwed fittings, as designated. Prove tight. (Each section approx. 25 ft. long).

850

Renew insulation of pipes in way of repairs. Approx. size of insulated bank 24" top and bottom to 2" at sides. Use foam glass insulation covered with asbestos cloth, and coated with sealer and apply two (2) coats of approved paint to asbestos cloth. Located starboard side of midship to aft walkway.

33R Aft Battery Locker Exhaust Mushroom Cowl - 103

Renew aft battery locker exhaust mushroom cowl. Material galv. approx. size 18" dia. top x 9 1/2" I.D. bottom with 14" long spud.

125

34R Port and Starboard Potable Water Tanks (Aft) - 103

Thoroughly, scrape, wirebrush, clean and remove all scale and debris from tanks and vessel. Upon completion of satisfactory cleaning, apply one (1) coat of cement wash to all bare spots and one (1) full coat of cement wash to entire surfaces of tanks. Close up tanks using new gaskets, renewing broken studs and nuts. Fill with fresh water, chlorinate tanks, fill and dump tanks twice and refill with fresh water. Total of two (2) tanks Aft - 96 ton capacity.

950

35R Screen Door - 103

Renew metal port door from poop deck to drying room passage. Approx.size of door 28 1/4" wide x 6 ft. 4 1/2" long x 1 inch thick. Install plexiglass in way of openings. Free up door hinges. Renew door catch, door closer and hold back hook. Prove door in good working order.

225

EXX-MOR-005891

36R Midship Air Condition Room - 103
Renew stainless steel insect screen and 1/2" mesh galvanized steel wire guard screen also screen retaining ring in intake opening to midship air condition room port side bridge deck. Approx. size 24" x 41".

37R Steam Smothering Label Plates - 103
Renew screws in label plates for steam smothering pipes located top of f'wd. pumproom port side. A total of seven (7) label plates two screws each label. Size 10/32 x 3/8" brass screws and nuts.

38R Gauge Line Clips and Clamps - 103
Renew twelve (12) four copper tube hangers and twelve (12) two copper tube hangers forward pump room, from main deck to bilge and fire pump. Approx. size 1/8" x 3/4" x 4" x 1" legs and 1/8" x 3/4" x 2" x 1" legs. Staging required.
Renew 50 ft. of 3/8" copper tubing and fittings in gauge line to bilge pump.

39R Cable Clamps Radar Mast - 103
Renew four (4) four cable and two (2) three cable clamps at bottom of radar mast. Approx. size 1/8" x 1" x 6" x 2" legs.

40R Chain Stoppers (Three) - 103
a. Remove present handles from three (3) pawls.
b. Install pawl counterweights on the three chain pawls.
Similar to that done on the "ESSO LEXINGTON".

41R Hull-Starboard Side-Fore Peck - 103
Insurance Claim 240
Vee out and weld fractured seam in shell plates "C" and "E" for a distance of 12 inches, fw'd Fr. 154 stb'd side in fore peak tank. Hose test and prove tight. Wire brush and apply two (2) coats of zinc chromate to damage area. approx. size 6' x 4'.

42R Vent Line Cleanout Attachment - 103
Crop at flange defective 1 1/2 inch drains at bottom of vent lines at kingposts & install one(1) 1 1/2" dia.X12" extra heavy steel nipple, welded, install on nipple extra heavy steel coupling, threaded & install 1 1/2" fire hose fitting with chain cap in coupling. A total of (7) seven drains. Two at forward and five at midship kingposts.

43R Anchor Chains (103)
Range on dock forward port and starboard and stern anchor chains, unshackling same at bitter end connections, for examination by USCG B.M.I. andABS. Chain lockers to be thoroughly cleaned and dirt removed from vessel and suction pipes to be proven clear. The first through the fourth outboard shots of chain to be removed, scale knocked off and reinstalled on the inboard end of the chain and all to be coated with fish oil. Remark with paint and chain all shots of chain as directed. Harden up on anchor shackle pins, crown pins and patent link pins. Reinstall and stow chains in lockers in good order. Free swivels of both fw'd anchors.
Renew one (1) patent link stbd. anchor chain (Link at anchor) furnished by vessel.

44R Sea Valves, Chests and Strainers (103)
Open up all sea valves in engine room, fireroom, pumproom and cofferdams, including bilge injection and all overboard discharge valves for examination by USCG, B.M.I. and ABS survey. Machine seats and discs as found necessary, grind in, repack, renew

EXX-MOR-005892

bonnet gaskets, thoroughly clean, and after inspection apply two (2) coats of Apexior #3 paint to all valve surfaces and close up valves in good order, renewing defective studs bolts and nuts. Secure aft pumproom sea valve discs to stem lock nuts by tack brazing. A total of three (3) valves. Remove all sea strainers for examination of sea chests. Care to be taken not to damage rubber coating. Thoroughly scale and wire brush damaged areas and apply neoprene coating to areas as directed. Wire brush and clean strainers and apply two (2) coats of Apexior #3 paint. Replace strainers, and renew defective and missing clips, studs, nuts and cotter pins. After neoprene coating has dried, apply one (1) coat of bottom paint to all sea chests.
Open up all steam blow out valves to sea chests, machine seats and discs as found necessary, grind in, repack, renew bonnet gaskets, prove lines clear between blow out valves and sea chests, reassemble, renew defective studs, bolts and nuts. Prove tight.
NOTE: Some sea valves are coated with neoprene. All damaged areas to be thoroughly scaled, wirebrushed and cleaned and apply neoprene coating to bare areas.

45R Flame Arrestors (103)
650 Open seven (7) flame arrestors for cargo vent system located on king posts for inspection in accordance with USCG and ABS requirements. Thoroughly clean and free up all parts, grease runner with Rust-Ban #324. Renew defective screens or missing studs and nuts. Reinstall and close in good order.

46R Spill Valves (103)
320 Open for inspection in accordance with USCG and ABS requirements seven (7) spill valves located on vent piping. Thoroughly clean, machine seats and discs as found necessary, grind in. Renew defective flame screens, also defective or missing brass cap screws. Close in good order.

47R Pressure Vacuum Relief Valves and Vent Lines (103)
a. Open thirty (30) pressure vacuum relief valves for inspection in accordance with USCG and ABS requirements. Thoroughly clean, machine seats and discs as found necessary, grind in and close in good order after inspection. Renew all defective screens, gaskets, also defective or missing brass cap screws.
600
b. Blow out vent piping with compressed air.

48R Electric Range Splash Backs - 113
300 Remove wasted splash back and pan rack from behind two (2) electric ranges and install stainless sheet steel on aft bulkhead in way of splash backs. Approx. size 1/16" x 3'6" x 9'.

49R Lifeboats (103)
1600 Remove all gear from four (4) lifeboats, including air tanks and provision boxes etc. for inspection in accordance with USCG and ABS requirements. Test, make necessary repairs and prove tight all air tanks. Scrape, wirebrush, remove all scale and loose paint. Apply one (1) coat Primer and one (1) coat approved color paint to inner surface of boats. Paint and mark all gear. Replace all air tanks, boxes, gear, etc. and renew defective metal bands. Upon completion, test and prove releasing gear in good operating condition.

50R Cargo Tank Bulkhead Leaks - 103
a. Vee out and weld both sides of ~~three~~ two (3) leaks in way of #8, #9 and #10 shell longitudinal from bottom, outboard side bulkhead between #6 and #7 port tank. Erect and furnish necessary staging to carry out above repairs. Test tank and prove tight.
b. Also one (1) leak between #6 & #7 center tank.
1000

EXX-MOR-005893

51R Guard Rail - 103

a. Renew ten (10) sections 1 1/2" dia. x 5 ft. long and renew ten (10) sections 3/4" dia. x 5 ft. long of guard rail, using galv. pipe.
b. Fair and reweld two (2) rail stanchions.
Reweld four (4) broken 1" rails as designated.

52R Rudder Repairs (103)

Carry out necessarywork to obtain a certified chemist's gas free certificate on the rudder before starting any hot work. Remove inspection plates and harden up on pintle nut in presence of ABS, USCG and Owner's representative. Check bushing clearances and submit to Owner's Representative. Reinstall inspection plates and replace pintle nut stop. Tack weld inspection plate in four places.

53R Propeller - Insurance Claim No. 174 (additional)

a. Furnish two pictures showing cavitation areas in propeller blades.
b. While propeller is in shop. Chip out cavitation areas of each blade to good material. Build up by welding with approve material and dress. Approx. size of each area 16 inches in dia. Material of propeller "Nialite". Dress edges of all four propeller blades. Build up & grind smooth approx. 6"X24" missing section, leading edge near top of one blade. Heat and fair the edges of four (4) blades.

54R Rudder Post - 103

Renew packing in top and bottom glands of rudder post. Using sea-ro Co. #850 1" sq. braided and sea-Ro Co. #155 1" thick x 2" moulded packing. Prove grease connections clear.

55R Scupper Plugs (103)

a. Before any paint is applied to hull, install wood plugs with extension pipes of sufficient lengths or other approved means in all scupper and overboard drains through out vessel, including ice machine and air conditioner overboard discharge to prevent any water running on shell of vessel. Plugs to remain in until painting is completed and then removed.
b. Install stockings on soil lines and scuppers from washrooms to enable ship's personnel to use toilets and washrooms while vessel is on drydock.

56R Drydocking (123)

Vessel to be drydocked, keel blocks to be spaced at not less than three foot centers, except in way of forward and after ends of dock pontoons in order to properly apply paint to keel between keel blocks.
Contractor is to furnish water under pressure to painters for washing off vessel's hull.

Vessel is to remain on dock sufficient time to permit all testing to be carried out and paint to dry to approval of Owner's Representative.
It is understood that the Contractor will allow Representatives of Special Equipment Manufacturers to install or repair such equipment.

57R Simplex Stern Tube Seals and Oil Lubricated Bearings - 103

Furnish necessary engineering information of stern tube bearings and seal from Waukesha Bearing Corporation.
Make necessary removals, disconnect and remove propeller, section of line shafting and draw tailshaft. Magnaflux shaft taper and in way of keyway and search for fractures in presence of USCG, ABS, and Owner's Representative.

EXX-MOR-005894

Remove shell plug, remove tailshaft from shaft alley to shop. Remove liner from shaft. Machine external dimension of tailshaft to suit dimensions of Waukesha Bearings. Remove lignum vitae bearings and bronze stern tube liner from stern tube. Set up Bore-Scoop equipment and check alignment of stern tube.
Machine face of sterntube. Machine stern tube to proper alignment if and when directed by Owners.
Vee out joint of stern tube and stern frame and weld. Machine true after welding.
Sandblast stern tube areas between new bearing landings.

Take delivery of owner furnished new ductile iron backed Waukesha bearings to shop. Machine outside dimensions to suit the rebored stern tube. Deliver new bearings to vessel and install in the stern tube in proper position. Drill and install tap screws in outside perimeter of bearings to stern tube to lock bearings in position. Drill and tap. Install tap bolts in outer face to suit the new adapter plates. Machine and install inner and outer adapter plates on the faces of the stern tube to suit bolt circles of Waukesha seals.
Blank water service line to stern tube.
Fabricate and install a stern tube lubrication system complete with pump, float switch and tank in the shaft alley, gravity tank in the space above and necessary supply and return piping with vents. New pump and gravity tank to be installed on proper foundations. Provide gratings and ladder for access to upper tank. Furnish, machine and install new adapter ring on propeller to suit new Waukesha seal housing.

Place tailshaft in line with bearings in stern tube and push out into stern tube taking care not to damage the new bearings. Install the new inner and outer seals on shaft end and to stern frame.
All work to be carried out as per N.N. Dwg. Nos.

Remove propeller to shop and machine groove at outer edge of liner of propeller to receive rope guard.
Fabricate and install a rope guard which will protect the entire seal assembly. Stern frame to be machined and rope guard welded to frame and overlap propeller hub.

Upon completion of installation, the lubricating oil system to be filled with oil. Thoroughly flush lube oil system and prove free of foreign matter.
Apply four hour test of lube oil system and prove tight.

Furnish services of Waukesha Engineer to supervise installation of bearings, etc. All work to be in accordance with rules and requirements of American Bureau of Shipping.

Furnish material and labor to fabricate and install a monorail in shaft alley of vessel for drawing of tailshaft. Install new I beam along overhead at centerline of vessel with necessary brackets and chocks as shown on drawing No.

Install two (2) 16-ton trolleys and after installation remove the two trolleys from vessel and hold in storage for Owners use.

Upon completion of installation, make up pin gauge to set between monorail and shaft, so true alignment of shaft with rail and stern tube can be obtained before movement of tailshaft into stern tube begins.

EXX-MOR-005895

Rotary wirebrush the lower horizontal portion of the new I beam track and coat with Rust-Ban 191.

Coat remainder of rail similar to surrounding areas and leave in good order.
Erect and dismantle necessary staging.

Propeller hub to be filled with Rust-Ban #324 by filling through AEC holes. Apply Rust-Ban #324 to threaded end of coupling bolts (large end).

Securely moor vessel and have men stand by for dock trial.

Supply twelve (12) sketches of lubrication system, including drain and gravity oil tanks of stern tube. Supply twelve (12) sketches of all sizes of finished tailshaft. Deliver to vessel one (1) copy of all the above drawings. Supply twelve (12) drawings of Details of Simplex Seal Installation.
Supply twelve (12) drawings Arrangement of Simplex Seal and Oil.
Lubricated Bearing Installation
Supply twelve (12) Propeller Key Detail drawings.

58R Hull Painting - 113

A. All bare and rusty areas of the entire exterior shell surface from keel to rail to be thoroughly sandswept. Oil and grease to be removed using approved solvent, then washed down with fresh water under pressure and [redacted] Paints applied as specified.

B. Keel to Light Load Line, Rudder and Stern Frame
Apply two (2) coats of Marine primer to all bare areas (of different color). Then apply one (1) full coat of Keelite (light color) and one (1) full coat of Keelite (dark color). (This does not include 7300 sq.ft. of sandblasted surface covered in separate item.)

C. Light to Deep Load Line
All bare spots to be touched up with two (2) coats of Permadol Red Marine Primer. Then apply two (2) full coats of XD Boottopping.

D. Deep Load Line to Rail (Topsides)
Touch up all bare spots with two (2) coat #366 blue lead Primer. Then apply one(1) full coat of #366 and one (1) full coat of S.O. Gray Black.

E. Miscellaneous
Repaint vessel's name, hailing port, plimsol marks and draft marks.

F. General
Paint will be supplied by Owners.
Paint may be sprayed on. Drying time allowed between each coat of Primer or paint to be in full accordance with manufacturer's recommendations.
All surfaces to be inspected and approved by Owner's Representative before applying priming coat and before applying each additional coating.
No painting to be done except during clear and dry weather.

EXX-MOR-005896

59R Deck Sandblasting and Coating (Corrosion Project)
Quote Separate Price - Do Not Start Unless Authorized

Sandblast to white metal the following areas

A. The entire forecastle deck including rolling chocks, fair leads, bulwark, sheer strake, cargo hatch cover, bo'sn stores hatch, gunwale, vent trunks, entire surfaces of bitts, hawse pipe to first weld, and platform at top of ladders leading to main deck.

17,400 deleted -

B. Bulkhead aft of forecastle including overhead of cofferdam access trunks.

C. Entire main deck forward of midship house including cargo tank hatch trunks and covers, San-Jurs trunks, sheer strake, cofferdam and bunker hatch trunks, base of bitts, and any other deck appurtenances not including hand wheel stanchions, pipe supports, etc.

A total area of approximately 23,200 square feet to be coated with Humble Oil & Refining Co. coatings as follows:
One (1) coat of Rust Ban 191, One (1) coat of Humble Modified Epoxy Primer 566, and One (1) coat of Humble Modified Epoxy Deck Hull Gray 597.

60R Hull Sandblasting and Coating (Corrosion Project)
Quote Separate Price - Do Not Start Unless Authorized

Sandblast to white metal the area between the light load line and the end of the turn of the bilge from Frame 99 to the bow, port and starboard sides. This includes all vertical surfaces down to the flat bottom - approximately 7300 sq. ft.
Apply the following coats of Humble Oil & Refining Co. coatings:
(1) one full coat of Humble Vinyl Primer Red 520
(1) one full coat of Humble Vinyl Mastic 9512 and
(1) one full coat of Humble Vinyl Finish Red 501.
Total dry film thickness to be 8.5 mils minimum.
The following general instructions apply to the two above items:
Paint will be supplied by Owners.
Paint may be sprayed on. Drying time allowed between each coat of Primer or paint to be in full accordance with manufacturer's recommendations.
All surfaces to be inspected and approved by Owner's Representative before applying priming coat and before applying each additional coating.
No painting to be done except during clear and dry weather.

31,550

EXX-MOR-005897

ADDITIONAL HULL ITEMS

61R Midship Heating System Return Line Bulkhead Pipe - 103

Renew midship heating system return pipe through aft pumproom bulkhead. Size 1 1/2" dia. x approx. 20 ft. long, union each end, pipe welded to aft pumproom bulkhead. Use extra heavy steel pipe. Prove tight. Renew insulation in way of repaired pipe.

62R Steward's Storeroom - 103

Install in the forward bulkhead of stewards storeroom as designated two (2) 6 inch dia. holes, cover with rat wire, wire to be tack welded to bulkhead.

63R Safety Chain Padeyes Fore and Aft Walkway - 103

Renew eighteen (18) galvanized padeyes for safety chains on fore and aft walkways. Radeyes of 3/8" material 1 1/2" outside dia. welded.

64R Stays Aft King posts - 103

Renew as original the following stays to the aft port and starboard kingposts- use galvanized wire cable. Use existing sockets, free up turnbuckles, reconnect ground wires. Coat stays with Owner furnished Rust-Ban:

Two (2) stays from kingposts to stack deck. Approx. size 1/2" dia. x 35' long each stay.

65R Stays Radar Mast - 103

Renew as original the four (4) stays to the radar mast, use galvanized wire cable. Use existing sockets, free up turnbuckles, reconnect ground wires. Each stay in 4 sections. Approx. size 1/2" dia. x 38 ft. long each stay.

66R Ventilator To Stewards Storeroom - 103

Renew stainless steel insect screen and 1/2" mesh galvanized steel wire guard screen also screen retaining ring on ventilator to stewards storeroom. Located starboard side poop deck. Size 20" x 10".

67R Aft Air Condition Fan Room Intake - 103

Renew stainless steel insect screen and 1/2" mesh galvanized steel wire guard screen in intake of or aft air condition fan room. Overall measurement 6 ft. x 6 ft. in four sections. Located on after boat deck.

68R #4 Center Cargo Tank - 103

Reweld broken hand rail top section of ladder in #4 center cargo tank.

69R Watertight Door - Galley - 103

Fair door and frame, adjust hinges to allow door to close by one man, galley port door. Test and prove tight.

70R Screen Door - 103

Renew metal door port side poop deck aft, including, hinges, lock or latch and door closer. Approx. size of door 28 ins. x 6 ft. 5 ins. long x 1" thick. Remove plexiglass from old door and install in new door in way of openings for screen. Prove door in good working order.

EXX-MOR-005898

71R Pumproom Ventilator Cowl Spider Bolts - 103
Renew port and starboard pumproom ventilator cowl spider bolts, adjust cowls so that they do not vibrate, prove grease fittings clear, thoroughly grease new bolts. Approx. size 1 1/2 in. dia. x 12 ins. long.

200

72R Machinery Space Ventilation - 103
Renew the following type E terminals for ventilating ducts (flexible) complete with dampers, handles, and 1/2" mesh wire screen, galv.:
One (1) 22" terminal located over aft end of port boiler.
Apply one (1) coat of primer and two (2) coats of color paint to the inside and outside of the new work.

190

73R Aft Bilge Well Strainer Plates - 103
Renew two (2) steel plate strainers in aft bilge well.
Approx. size each plate 1/2" x 18" x 29" oval shape with 1/2" holes.
One plate split to in way of pipes. Renew supporting lugs, bolts, studs and nuts. Paint all new work with two (2) coats of primer.

150

74R Meat Box Door - 103
Renew tadpole rubber gaskets on meat box door. Approx. size of door 36" x 75".
Adjust door to get even fit on door gasket.

125

Straighten or renew latch handle.

Lengthen welded door stop two inches to provide clearance between handle when door is in open position.

75R Freon Pipe Covering Chill Box - 103
Wire brush pipe covering to remove mold and apply 2 coats of water proof coating to pipe covering of freon piping to port diffuser unit in chill box. Approx. 20 ft.

60

Additional Cargo System Items

76R Cargo Pipe Aft Pumproom - 523
Renew the following sections of cargo piping (using extra heavy steel pipe). Replace all removals in good order. Pipe test covered item 26:

1900

One (1) section 8" dia. approx. 4'6" long, with 90° elbow, flanged each end. Located in overboard discharge line starboard side of pumproom.
One (1) section 16" dia. approx. 3'6" long, with one (1) 16" dia. outlet 4' long. Two (2) 16" flanges, one (1) dresser coupling. Suction to #3 cargo pump.
One (1) section 16" dia. approx. 4' long, flanged each end, with one (1) 16" dia. flanged outlet 6" long. Suction to #4 cargo pump.
Note: The above piping also piping in item 26, to be sandblasted inside and outside and coated with Humble Rust Ban 191.

77R No. 3 Cargo Pump Turbine & Gears - 503
Open up No. 3 cargo pump turbine and Gears for examination, and check clearances, open bearings for examination, renew defective bearings of gears and turbine. Open up oil pumps, renew all worn and defective parts. Clean gear sump and turbine bearing housings. Renew oil furnished by vessel. Check alignment of gears to pump and also gears to turbine. Prove in correct alignment. Refit carbon packing, polish shaft in way of packing.
Open governor control valve for examination, renew worn and damaged parts, test

1800

EXX-MOR-005899

main valve seat for tightness, renew if found leaking, examine air operated valve and speed changer check all parts for wear and defects, renew defective parts. Reassemble, renew gaskets, defective cap bolts, studs and nuts. After plant is in operation, test and adjust overspeed trip, low pressure trip, prove in good operating condition. Renew or replace disturbed insulation as original. Work to be under supervision of G.E. Service Engineer. Parts furnished by vessel. Note: Gears very noisy also turbine will not stop when trip throttle valve is closed.

ADDITIONAL MACHINERY ITEMS

78R #11 Mooring Winch - 303
Open up control valve of #11 Mooring Winch. Remove piston valve to shop and machine .001 smaller. Reinstall using new gaskets, studs, bolts and nuts, repack valve stem. Free up linkage. Test and prove in good order.

350

79R Condenser - Air Condition System - Midship - 303
Open up midship air condition freon condenser, thoroughly clean tubes and water box and heads. Test tubes, prove tight. Renew zincs. Reassemble using new gaskets, renew defective studs, bolts and nuts. Replace all removals in way of work, prove tight and in good order.

400

80R Feed Pump Turbines (G.E. 575 HP) - 303
Open casings of No. 2 and No. 3 feed pump turbines and bearings for examination. Check clearances. Renew defective bearings. Test lube oil coolers and prove tight. Polish shaft and clean housing in way of carbon packing. Renew or refit carbon packing. Install four (4) carbon rings at each end of turbine instead of three. Open lube oil pumps and speed changers, check all parts for wear and defects, renew defective parts. Clean bearing housing and strainers. Reassemble, renew gaskets, defective cap bolts, studs and nuts. After plant is in service, test and adjust overspeed trip and low pressure alarm, prove in good operating condition. Renew or replace disturbed insulation as original. Work to be under supervision of G.E. Service Engineer. Carbon packing, bearings, and parts furnished by vessel. Note: Both turbines leak excessively in way of carbon packing.

3000

81R Ventilator Fan - No. 18 - Boiler Room and Aft Engine Supply - 303
Buffalo Forge Fan (17.5 H.P.) G.E. Motor (HP 17.5/4.375). Disconnect and remove #18 fan and motor to shop. Clean motor windings with approved solvent, and bake dry until a satisfactory megger reading is obtained, then apply one (1) coat of approved insulating varnish. Renew motor bearings and seals, pack with approved grease. Clean and apply two (2) coats of approved primer to fan housing. Reassemble and test operation, reinstall, connect up and prove in good operating condition at all speeds.

500

82R Forward Anchor Windlass - 303
American Engineering 13 x 14 Spur Geared Windlass

a. Open starboard crank shaft bearing, remove bearing, build up bearing cap, and machine to tight fit in way of landings or contack surface of cap to windlass casting. Refit bearing to proper clearance. Test and prove in good working order.
NOTE: Bearing rocks on studs when lifting anchor.

900

EXX-MOR-005900

b. Renew port and starboard piston rods using stainless steel rod. Renew packing gland on starboard piston rods.

c. Disconnect and remove one (1) 5" globe steam valve for windlass to shop. Open, seal weld seat, machine seat and disc, grind in, close, renew bonnet gasket, repack valve stem, test to 250 lbs, prove tight. Reinstall, renew flange gaskets, bolts and nuts. Prove tight, replace valve insulation as original.

83R Starboard Boiler Steam Line to Bailey Board - 303
Renew stop valve in actuating line to Bailey Board. Size 1/2" H.P. flanged globe valve (furnished by vessel). Prove tight. Replace insulation in good order.

75

84R Emergency Diesel Generator - 303
Free up, clean TS relay contacts of diesel generator governor.
Clean hand rheostat contacts
Check and clean voltage regulator contacts.
Test and prove in good working order.

125

85R Gaskets-Machinery Space - 303
Renew gasket at outlet flange of 6th stage turbine extraction valve to 3rd stage feed heater. Prove tight. Replace insulation as original. Size 6".

150

86R Port Boiler Air Duct - 303
Drill stopper holes, vee out and reweld the following fractures in port boiler air duct as designated.
One (1) 10" fracture andone (1) 2" fracture.

150

87R Valves-Engine Room - 303
Disconnect and remove to shop one (1) 8" globe stop check valve Lube Oil Cooler Circulating Water Pump discharge to main lube oil coolers, open, renew seat and disc if found necessary (furnished by vessel), machine, seat and disc, grind in, close up, renew bonnet gasket, repack valve stem, test, prove tight. Reinstall, renew flange gaskets, bolts and nuts. Prove tight and in good working order.

200

88R Piping Machinery Space - 303

a. Renew the following sections of salt water piping, using 90-10 cupro nickel pipe: Use flanges and fittings from old pipe.
One (1) section 4" dia. approx. 12 ft. long, bent, flanged with
One (1) 4" dia. flanged outlet, 12" long, and one (1) 2" dia, flanged outlet with 90° elbow approx. 18" long. Renew insulation. Above two (2) sections located in salt water line to evaporators as designated. Prove tight.
One (1) 1 1/2" dia. x 9" long nipple in salt water service to #1 and #2 feed pumps between stop valve and strainer, welded, under floor plates inboard of No. 1 feed pump.

725

b. Renew the following sections of high pressure drain line located on port side of engine room inboard of lube oil settling and storage tank, use extra heavy steel pipe, test, prove tight. Renew pipe insulation:
One (1) section 1" dia. approx. 9 ft. long, bent, flanged.
One (1) section 1" dia. approx. 11 ft. long, bent, flanged.

EXX-MOR-005901

89R Tank Coating Application Corrosion Project (Quote Separate Price)

Shipyard is to supply staging, equipment, labor, power and material (including coating materials) necessary in preparing and coating with Humble Rust Ban 191 inorganic zinc coating all internal surfaces including bulkheads, deck and shell plating, stiffeners and brackets, expansion trunks and hatch covers, pipe lines and valves, ladders and all other internal structure of the following cargo tanks.

No. 1 port and starboard cargo tanks, upper section.
Bottom section is already coated.

3124.00

No. 2 port and starboard cargo tanks, entire tanks.

No. 4 port, center and starboard cargo tanks upper section. Bottom section is already coated.

No. 5 port, center and starboard cargo tanks, entire tanks.

The total surface area to be coated is approximately 236000 sq. ft.

Shipyard is required to use dehumidification equipment to maintain dry tank atmosphere (average relative humidity 40% or below) during sandblasting, precoating inspection and application of coating.

Attached instructions prepared by Owner are to be strictly followed.

All work including rigging of staging, preparation of surfaces, application of coating is to be performed to the satisfaction of Owner's Representative.

Cargo heating coils including hangers and deck fittings are to be removed from all cargo tanks being partially or entirely coated also steam and return lines on deck complete with manifolds, valves and hangers removed up to the main lines and bolted blanks installed on the main lines in way of removals.

Install welded spigot patches or inserts in the deck in way of deck fittings removal.

All cargo tanks partially or entirely coated are to be tested with a full tank of water and proved tight as far as the coating application is concerned.

All cargo lines in the cargo tanks partially or entirely coated are to be hydrostatically test to 100 lbs. with suction valves closed, all other valves open and proved tight as far as the coating application is concerned.

All cargo valves and operating rods that are froze up by the coating are to be freed up.

EXX-MOR-005902

90R FIXED TANK WASHING SYSTEM — QUOTE SEPARATE PRICE

Install fixed tank washing system in Nos. 3, 4 and 5 port, center and starboard cargo tanks.

Owner will furnish the following:

THIRTEEN	(13) Type K Butterworth tank washing machines.
NINE	(1) 2" flanged ball valves
ONE	(1) 3" 300 lb. gate valve
ONE	(1) 6" 300 lb. gate valve
ONE	(1) 3" 300 lb. strainer
ONE	(1) 6" 300 lb. strainer
ONE	(1) 3" 300 lb. Hamer blind
ONE	(1) 6" 300 lb. Hamer blind

12950

All other material furnished by Contractor. All pipe and fittings including deck penetrations are to be extra heavy galvanized.
Brackets or hangers which support the pipes in the tanks are to be welded at designated points for electrical continuity with hull.
Angle iron supports to be 3/8" x 3" x 3".
Pipe brackets stool type TWO (2) legs and of a type the pipes will slip through and not clamp.

Furnish FOUR (4) drawings of the completed Tank Washing System.

CARGO TANKS NOS 3 AND 5 PORT AND STARBOARD

Deck penetration to be approximately 4" aft of forward bulkhead or 4" forward of after bulkhead and approximately 8" outboard of the longitudinal bulkhead.

The deck penetration may be in either the forward or after end of the tank which ever is convenient and closest to the manifold on deck. In either case the pipe is to follow down and be secured to the longitudinal stiffeners on the longitudinal bulkhead.

Pipe to be run with long sweeping bends to center of tank and then fore and aft just below the lower 30" transverse trusses with ONE (1) outlet in way of the forward truss and ONE (1) outlet in way of the after truss.

Pipe to slope down 1'0" lower under center truss than forward and after truss and ONE (1) 1/4" hole drilled in low point for drainage.

Install ONE (1) Owner furnished Butterworth machine with 2" pipe threads on the end of each riser. Total of TWO (2) Center of Butterworth machine to be 2'0" above top faceplate on truss.

Install ONE (1) 2" union in each riser for easy removal of the Butterworth machine.

Pipe to be suitably bracketed and supported.

EXX-MOR-005903

CARGO TANKS NOS 4 PORT AND STARBOARD

Deck penetration to be approximately 4" forward of after bulkhead and approximately 8" outboard of the longitudinal bulkhead.

The pipe is to follow down and be secured to the longitudinal stiffeners on the longitudinal bulkhead.

Pipe to be run with long sweeping bends to center of tank and then fore and aft just below the lower 30" transverse trusses with ONE (1) outlet in way of each truss. Total of THREE (3)

Pipe to slope down 1'0" lower under center truss than forward and after truss and ONE (1) 1/4" hole drilled in low point for drainage.

Install ONE (1) Owner furnished Butterworth machine with 2" pipe threads on the end of center riser. The center of Butterworth machine to be 2'0" above top face plate on truss.

The risers at the forward and aft trusses are to be same length as center riser and are to have a screw cap installed on the end.

Install ONE (1) 2" union in each riser for easy removal of Butterworth machines. Pipe to be suitably bracketed.

CARGO TANKS NOS. 3, 4 AND 5 CENTER

Deck penetration to be approximately 4" aft of forward bulkhead or 4" forward of after bulkhead and approximately 1'3" to starboard of center line.

The deck penetration may be in either the forward or after end of the tank which ever is convenient and closest to the manifold on deck. In either case the pipe is to follow down and be secured to the transverse stiffeners on bulkhead if existing or on the transverse bulkhead.

Pipe to extend down to top of center line keelson and be run to the center of the tank using long sweeping bend in pipe.

Pipe to be bracketed to face plate on top of center line keelson.

Install ONE (1) 2" extra heavy weld elbow in the end of the pipe and extend up so center of Butterworth machine will be 18'0" above the bottom of tank.

Install ONE (1) Owner furnished Butterworth machine with 2" pipe threads on the end of the riser.

Install ONE (1) 2" union in riser for easy removal of the Butterworth machine.

The riser to be suitably bracketed with 3/8" x 3" x 3" angle iron.

EXX-MOR-005904

Drill ONE (1) 1/4" drain hole in the elbow on the bottom of the riser.

DECK MANIFOLD AND PIPING NO. 3 PORT, CENTER AND STARBOARD CARGO TANKS

Fabricate and install ONE (1) 3" x 2'6" extra heavy pipe manifold flanged ONE (1) end, closed other end with welded insert and with TWO (2) 2" x 9" and ONE (1) 2" x 5" welded flanged outlets. The 5" long outlet is to be installed in between the 9" long outlets.

Manifold to be sandblasted to white metal and coated with Humble Rust Ban 191, inside and outside.
Manifold to be connected to main fire line at a point just forward of the amidship square and is to be installed in a fore and aft position.

Install ONE (1) 3" welded flanged outlet in the bottom of the fire main, install ONE (1) Owner furnished 3" valve on the outlet, then ONE (1) 3" fabricated flanged elbow with flange suitable for the strainer on ONE (1) end, standard flange other end, ONE (1) Owner furnished 3" strainer, install ONE (1) 1 1/2" 300 lb. gate drain valve in the strainer, ONE (1) 3" x 6" welded flanged spool piece with flange suitable for the strainer on ONE (1) end and standard flange other end, ONE (1) Owner furnished 3" THREE (3) bolt Hamer blind and then the manifold.

Install ONE (1) Owner furnished 2" flanged ball valve on each 2" manifold outlet total of THREE (3) and connect with 2" pipe to their respective cargo tanks Nos. 3 port, center and starboard.

Deck connection for the tank piping to be just forward of the after bulkhead of the No. 3 tanks and as specified in the piping for the tanks. Pipes and manifolds are to be securely bracketed.

DECK MANIFOLD AND PIPING NO. 4 AND NO. 5 PORT, CENTER & STARBOARD CARGO TANKS

Fabricate and install ONE (1) 6" x 4'6" extra heavy pipe manifold flanged ONE (1) end, closed other end with welded insert and with SIX (6) 2" welded flanged outlets.

THREE (3) outlets are to be 5" long and THREE (3) outlets 9" long.

The short outlets go in between the long outlets.

Manifold to be sandblasted to white metal and coated inside and outside with Humble Rust Ban 191.

Manifold to be connected to the main fire line at a point just aft of the first fore and aft walkway A frame aft of the amidships square and is to be installed in athwartship position.

Install ONE (1) 6" welded flanged outlet in the bottom of the fire main, install ONE (1) Owner furnished 6" valve on the outlet, then ONE (1) 6" fabricated flanged elbow with flange suitable for the strainer on ONE (1) end standard flange other end.

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DECK MANIFOLD & PIPING ======CONTINUED

ONE (1) Owner furnished 6" strainer install ONE (1) 2" 300 lb. gate drain valve in the strainer ONE (1) 6" x 6" welded flanged spool piece with flange suitable for the strainer on ONE (1) end and standard flange other end, ONE (1) Owner furnished 6" THREE (3) bolt Hamer blind and then the manifold.

Install ONE (1) Owner furnished 2" flanged ball valve on each 2" manifold, outlet and connect with 2" pipe to their respective cargo tanks. No. 4 and No. 5 port, center and starboard.

Deck connection for the tank piping for No. 4 port, center and starboard cargo tanks to be just forward of the after bulkhead and for No. 5 port, center and starboard cargo tanks to be just aft of the forward bulkhead and as specified in the piping for the tanks.

Pipes and manifolds are to be securely bracketed.

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91R ARRANGEMENTS FOR CARRYING ALCOHOL AND SOLVENT - PROJECT #63-8)
Quote Separate Price For Entire Item. Also For Each Group.

(A) It is the intent of the following specifications to provide a fully segregated system for handling alcohol and or solvent cargoes in No. 1 and No. 2 port and starboard cargo tanks. It is not the intention to mention every little detail.

The sizes where given are approximate and the Contractor shall obtain his own measurements from the actual work and complete the installation without any additional cost to Owners.

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All valves removed and not reused are to remain property of Owner and are to be shipped prepaid to nearest Henze Instrument and Valve Inc. either Hoboken, N.J. or Mobile, Alabama

All new or existing pipes and fittings including pump suction strainers that are to be used for the alcohol and or solvent system are to be sandblasted to white metal inside and outside and coated with Humble Rust Ban 191.

Existing pipes and strainers are to be removed for blasting and coating.

All pipe hangers in the tanks No. 1 and No. 2 port and starboard are to be blasted to white metal and coated with Humble Rust Ban 191 before they are installed.

All bolts and nuts used in the tanks are to be bronz including bolts in hangers. All pipes are to be suitably bracketed. Brackets are to be of a type that will not clamp the pipes. The pipes are to be able to slip through the brackets.

Chill rings are to be installed in all welded joints in the pipes and are to be sandblasted to white metal and coated with Humble Rust Ban No. 191 before installation.

Upon completion the new system is to be hydrostatically tested and proved tight. All new pipe, valves, hangers etc. and disturbed areas except in tanks are to be cleaned and receive one (1) prime coat and two (2) color coats. The primer used on the Humble Rust Ban coated pipes shall be Humble Modified Epoxy Primer 566. All valves and operating rods to have brass name plates. All welds made in pipes or brackets after they are coated are to be wire brushed and coated with Humble Rust Ban No. 191

Bulkheads in way of new or removed pipe penetrations are to be hydrostaticly tested and proved tight. All cargo piping is to be installed so that there are no pockets and also sloped for drainage to the tanks or as designated.

Where pockets are unavoidable 1 1/2" 150 lb. brass gate valves with brass screw plugs are to be installed as drains.

Pipe in tanks is to be all welded construction and have expansion bends in lieu of Dresser couplings.

Pipe on deck and in the pumproom to be all welded construction where ever possible.

All drain valves installed in a horizontal position are to be connected to a cross connection and a screw plug installed in the two (2) outlets of the cross not used.

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Where Dresser couplings are used in the deck lines or in the pumproom they shall have armored 42 type packing.

All flange and valve stem and plunger packing is to be Teflon impregnated asbestos.

Suction pipe in cargo tanks, drop lines passing through a tank other than that in which its open end is located and all pumproom piping is to be extra heavy.

Pipe on deck and drop lines in their own tank may be standard weight.

Pipe hangers for the general run of pipe on deck shall be constructed of 1/2" X 3" flat bar and shall be two (2) legged stool type with two (2) 1/2" X 3" flat bar cross stiffeners and hangers spaced at from 12'0" to 15'0" centers.

Pipe supports for spool pieces at end of loading and discharge connections amidships and forward shall be constructed of 1/2" X 15 1/2" wide plate of suitable height for pipe and are to have 1/2" x 3" F.B. vertical stiffener on back side and braced with 5/16" x 3" x 3" angle iron. Saddle welded in top of flat bar for pipe is to be 1/2" thick x 3" wide.

Hangers in the tanks are to be the same weight as existing hangers.

All parts of the alcohol system including securing nuts, bolts and studs for cargo tank hatches, ullage covers. Butterworth plates, vent lines, cargo lines, flanges, Dresser couplings, valves, Shan Jurs gauges, Hamer blinds, drain valves etc. are to be drilled and laced with 1/16" copper wire for sealing by the Federal Taxing Authorities. In the forward pumproom only the suction valves and their flanges need sealing.

The entire installation is to be in accordance with the latest requirements of the U.S.C.G. and A.B.S.

(B) Exhaust Blower for Port Ventilator Forward Pumproom

Install one (1) Owner furnished Model ST300 Coppus blower in the port after end of the forecastle head space. Crop at main deck, also at underside of forecastle head deck, remove and scrap 20" x 26" x 26" ventilator duct to port side of foreward pumproom. Ventilator duct is located in the forecastle head space.

Install one (1) 25" to 16" I.D. x 2'-0" long x 1/2" thick welded transition piece on underside of forecastle head deck inway of opening of ventilator trunk. Also one (1) 1/8" x 20" x 23" to 16" I.D. x 2'-0" long transition piece on main deck in way of opening. Install one (1) 1/4" x 6" high welded coaming around bottom of transition piece. New transition pieces to angle approx. 6" to outboard so new exhaust blower will clear pumproom house. Install two (2) 1/2" x 3" x 7" long approx. welded brackets 22-3/8" approx. off forecastle head space after bulkhead. Each bracket to have four (4) 11/16" drilled holes for securing the blower.

Secure the blower to the brackets with 5/8" bolts and nuts. Install shims as necessary between the blower and the brackets to prevent any strain on blower.

Install one (1) 1-1/4" welded boss in the 6" spool piece for the deck exhaust line at foreward pumproom bulkhead. Disconnect exhaust line to remove dirt and slag and reconnect. Install one (1) 1" boss outlet in main steam line and install necessary fittings and one (1) 300 lb. union bonnet brass globe valve on each

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outlet, also at steam and exhaust inlets to the blower turbine. Two (2) 3/4" 300 lb. WP valves and two (2) 1 1/4" 150 lb. HP valves.

Install one (1) 3/4" Sarco or equal steam strainer between the turbine and the valve.

Connect the valves on turbine to valves on main lines. Requires approx. 15'-0" of 3/4" pipe and fittings and 17'-0" of 1 1/4" pipe and fittings and necessary hangers.

Install one (1) 1" boss outlet in steam line to turbine and one (1) 1 1/4 boss outlet in exhaust line from turbine. Install one (1) 1" 300 lb. union bonnet brass globe valve and one (1) 1 1/4" 150 lb. union bonnet brass globe valve on the outlets. Install one (1) brass plug in each valve. These connections are for air and exhaust connections for running turbine with air.

Install one (1) 3/8" by-pass line with one (1) 3/8" drain between the lines just before the steam and exhaust valves to the turbine. One (1) 3/8"-300 lb. W.P. union bonnet globe valve required, also necessary 3/8" pipe and fittings.

Scale and wirebrush bulkhead in way of removed section of ventilator duct in forecastle head space. Apply two (2) coats of primer and one (1) color coat, also apply two coats of primer to the inside and outside of the two (2) new sections of ventilator duct above and below the exhaust blower in way of the forecastle head space, also one (1) color coat.

(C) Alcohol Pumps. Warren Vert. Duplex 16 x 14 x 18

The two (2) existing port and starboard ballast pumps in the foreward pumproom are to be overhauled and made suitable for pumping alcohol and solvent cargoes. Open up port and starboard steam ballast pumps in the forward pumproom for examinations. Open up steam and liquid end cylinders, steam and liquid end valve chests.

Valves now have Durabla seats, discs and stems.

Install Owner furnished Sims valve seats, discs, rotators, valve stems and sleeves in place of existing Durabla type.

Renew copper gaskets for the cap nuts and valve bushings in the valve chest covers for the holding down studs or jack bolts.

Machine, scrape and lap in steam valves to faces. Renew valve stems.

Grind in, free up and repack cushion valves. True up steam piston ring grooves and renew piston rings. Grind shoulders from steam cylinders.

Machine and true up piston rods and renew neck bushings.

Machine and bush steam valve operating gear, renew pins and remove all lost motion. Remove in place three (3) tie rods, fabricate and install three (3) removable tie rods each pump. Care to be taken that proper alignment of pumps is maintained.

Renew Owner furnished liquid end liners and Owner furnished Darcova cup rings, plungers and rods.

Drill one (1) 1/4" diameter hole in each plunger to drain cylinder above the piston.

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Renew gaskets in way of all covers and heads also for liquid cylinders bottom heads, between liquid valve chests and cylinders and all inlet and outlet pipe connections to valve chests also for blanks on valve chests and any connections to the liquid ends.

Reassemble, rejoint, repack, renew defective studs, bolts and nuts.

Prove pumps in good running order.

All packing and gaskets used on the liquid ends including plunger packing is to be Teflon impregnated asbestos.

(D) Drains For Alcohol Pumps and Lines In Forward Pumproom

When the two (2) pumps are opened for repairs drill, tap and install nipples and drain valves. The drains are to be a minimum of 1/2" diameter and where ever possible 1" diameter drains are to be used.

Existing drains of a smaller size are to be enlarged and in any case all drain valves and nipples are to be renewed.

300 lb. bronz gate valves are to be used and each valve is to be packed with Teflon impregnated asbestos packing.

Install operating rods with necessary brackets and also universals and or gear boxes so all drain valves can be operated from above the gratings.

Drains to be installed as follows.

Two (2) drains on the bottom of the suction valve chest.
One (1) drain in inlet between suction strainer and pump.
One (1) drain in bottom of strainer.
One (1) drain in each valve chest inspection plate.
One (1) drain in bottom of each liquid cylinder.
One (1) drain in each outlet from pump including air chamber.
One (1) drain in each blank end of valve chests.
Six (6) additional 1 1/2" drains as designated in the pipe lines.
Drains are to be located so that liquid ends of pumps and pipes will drain absolutely dry.

(E) Cleaning of Pumps

All internal areas of liquid ends of pumps including strainer and air chambers are to be cleaned by the use of solvents and chemicals.

(F) Fire and Bilge Pump to Bilge and Fuel Oil Pump

Disconnect and remove two (2) 5" sections of fire line and one (1) 5" valve all connecting to the fire main in the top of the forward pumproom. Pipe to be scraped.

Install bolted 5" blank on fire main in way of removal. A connection will be made to this flange for eductor water, as later designated.

Remove coaming and install welded insert in deck in way of pipe removal.

Removed valve to remain property of Owners.

Make connection with 5" pipe in the top of the pumproom between the remaining 5" discharge line from the pump to the flange on the existing 6" fuel oil transfer pipe.

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Requires approxinately 8'0" of 5" pipe and fittings. Disconnect and remove one (1) 1 1/2" and one (1) 2 1/2" fire hydrant valves and connecting pipe in lower pumproom from 5" discharge line adjacent to pump.

Crop end of pipe and install welded blank in way of the removed 2 1/2" valve.

Install 1 1/2" brass screw plug in way of the removed 1 1/2" fire valve.

Disconnect and remove and scrap one (1) 2 1/2" angle relief valve from 5" discharge line from pump.

Install one (1) 4" welded flanged outlet in place of the existing 2 1/2" flanged outlet.

Install one (1) Owner furnished 4" flanged relief valve set at 110 lbs. and pipe back to the suction side of the blank flange on the starboard side of the suction valve chest.

Blank flange is bronz and is to be removed suitable hole installed for pipe and then drilled and tapped for flange connection and then reinstalled.

Requires approximately 7'0" of 4" pipe and fittings.

Install one (1) 5" welded elbow flanged outlet in the discharge line from pump adjacent to pump and one (1) 5" flanged outlet in the 8" fuel oil crossover line and make connection between the two (2) outlets with 5" pipe and one (1) valve. Requires approximately 4'0" of 5" pipe.

The 5" valve removed in the top of the pumproom is to be overhauled, made tight, rejointed, repacked, tested and proved tight and installed on the flanged outlet from the 8" fuel oil crossover line.

Install operating rod and wheel so valve can be operated from above the gratings. Alter grating in way of valve installation.

Crop 6" sea suction line just before the suction plug cock and install two (2) welded flanges and one (1) Owner furnished 6" 125lb. gate valve.

Install one (1) 6" welded flanged outlet in elbow section of suction line between newly installed valve and plug cock. Install one (1) Owner furnished 6" 125 lb. gate valve on the outlet.

Install one (1) 6" welded flanged outlet in the 8" fuel oil crossover suction line.

Make connection between this outlet to the valve on outlet side of the elbow.

Requires approximately 3'0" of 6" pipe and fittings.

Reroute, rebracket and renew suction pipe to starboard cofferdam to clear new pipes installation in the bilges.

Requires approximately 20'0" of 4" pipe and fittings.

Renew 6" suction strainer with type with bolted cover plate. Install one (1) 1 1/2" drain with 150 lb. bronz gate valve and plug in bottom of strainer.

Install operating rod on drain valve so same can be operated from above the floor plates.

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(G) Forward Pumproom Removals and Alterations

Disconnect and remove complete with all fittings, valves and pipe brackets the following pipe lines in the forward pumproom.

Entire 8" and 10" sea suction line from starboard sea chest to inlet suction valve before the strainers of each the port and starboard ballast pumps.

Install one (1) 1 1/4" thick bolted blank on the sea chest in way of removed sea valve.

Steaming out line and valve from sea chest to center of after bulkhead.

Install welded blank on sea chest and welded plug in the line.

8" crossover line between removed sea suction line and fuel suction line.

Crop at fuel oil line and install welded insert in way of removal.

8" discharge line after stop valve from starboard pump to outlet in discharge line from port pump.

Install one (1) 8" bolted blank on outlet in port line.

8" connecting line between the removed

8" discharge line and 8" fuel suction line.

One (1) section of 10" overboard discharge line from ballast pumps and one (1) 10" valve upper port side of forward pumproom.

Install one (1) 10" bolted blank on remaining flange at bulkhead.

Overboard discharge from eductor is to be connected in this flange as later designated.

One (1) section of 6" discharge line from ballast pumps to deck upper port side of pumproom.

Valves to be removed are
Two (2) 10" valves
Five (5) 8" valves
One (1) 3/4" valve.

Remove operating rods and brackets for removed sea suction and steaming out valves. Total of two (2).

Install one (1) 3/8" x 1'4" x 1'5" section of diamond tread floor plate with supporting angle runners and 1'6" of angle coaming in way of one (1) removed valve.

(H) Cargo Tank Removals and Alterations
No. 1 Port, Center and Starboard Cargo Tanks

Disconnect, remove 12" main suction crossover line in No. 1 center cargo tank.

Valve between this suction line and end of 8" stripper main to be removed and bolted blank installed on end of 8" stripper main in way of removal. Valve to be relocated. Crossover line to be cropped flush at under side of 16" main line and welded insert installed in bottom of main line.

Total of one (1).

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The above line to be removed through the port and starboard longitudinal bulkheads and the 12" suction valve and bellmouth one (1) each in the No. 1 port and starboard cargo tanks removed.

Install welded inserts or welded lapped plates on the longitudinal bulkheads in way of pipe removals.

Total of two (2)

Crop 8" suction line in the center tank just outboard and to port of suction for No. 1 center cargo tank. Install one (1) additional hanger on remaining line.

Install welded insert in the line in way of crop.

Remove the remaining line through longitudinal bulkhead complete with 8" suction valve and bellmouth in No. 1 port cargo tank.

Crop 8" suction line on starboard side of 8" main line in No. 1 center cargo tank. Install one (1) 8" welded flange on remaining outlet from the main line.

Flange to be as close as possible to main line.

Remove the remaining suction pipe through the longitudinal bulkhead complete with 8" suction valve and bellmouth in No. 1 starboard cargo tank.

Install the valve removed from the end of 8" main line on the side outlet flange and make connection between the valve and the 12" suction pipe to No. 1 center cargo tank.

Connection to be made between the 16" main line and the 12" suction valve.

Relocate, part renew and alter operating rod and brackets and connect to relocated valve in No. 1 center cargo tank.

No. 2 Port, Center and Starboard Cargo Tanks

Disconnect and remove the 12" main suction crossover line in No. 2 center cargo tank including sections through the port and starboard longitudinal bulkheads and the 12" suction valves and bellmouths in No. 2 port and starboard cargo tanks.

Crossover line to be cropped flush with the underside of the 16" main line and a welded insert installed.

Total of one (1).

Install welded inserts or welded lapped plates on the longitudinal bulkheads in way of pipe removals.

Total of two (2).

Crop 8" suction line in the center tank just outboard and to port of suction for No. 2 center cargo tank. Install one (1) additonal hanger on remaining pipe.

Install welded insert in the line in way of crop.

Remove the remaining line through longitudinal bulkhead complete with 8" suction valve and bellmouth in No. 2 port cargo tank.

Crop 8" suction line flush on starboard side of 8" main line in No. 2 center cargo tank. Install one (1) welded insert in way of removal.

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Remove the remaining line through longitudinal bulkhead complete with 8" suction valve and bellmouth in No. 2 starboard cargo tank.

(I) Operating Rod Removal

Crop under deck and remove operating rods complete with brackets for 8" and 12" removed suction valves in No. 1 and No. 2 port and starboard cargo tanks. Total of eight (8). Bulkheads are to be chipped flush in way of bracket removals.

NOTE: Tanks are being coated. No additional staging should be required.

(J) Suction Pipes In No. 1 and No. 2 Port and Starboard Cargo Tanks

Install 8" suction lines from No. 1 and No. 2 port and starboard cargo tanks. Total of four (4) lines.

All four (4) lines are to be run through No. 1 center cargo tank and through the after bulkhead of the forward pumproom.

The installation is to be all welded construction and with out flanges or Dresser couplings in the tanks except the vacuum type bellmouths will be flanged and bolted to the suction pipes.

Expansion bends and or offsets are to be used in lieu of Dresser couplings.

There will be no valves in the tanks.

Fabricate and install vacuum type bellmouthsfor each suction. Total of four (4). Each bellmouth to have 12" clearance from the transverse bulkhead and to be centered between the longitudinals or the longitudinal and the longitudinal bulkhead.

Install 8" suction pipe for No. 1 port cargo tank.

Pipe to run through longitudinal bulkhead and then through No. 1 center cargo tank and is to be starboard inboard line through pumproom bulkhead.

Install 8" suction pipe for No. 1 starboard cargo tank.

Pipe to run through longitudinal bulkhead and then through No. 1 center cargo tank and is to be starboard line through pumproom bulkhead.

Install 8" suction pipe for No. 2 port cargo tank.

Pipe to run through longitudinal bulkhead and then No. 2 and No. 1 center cargo tanks and is to be port line through pumproom bulkhead.

Install 8" suction pipe for No. 2 starboard cargo tank. Pipe to run through longitudinal bulkhead and then through No. 2 and No. 1 center cargo tanks and is to be port inboard line through pumproom bulkhead.

(K) Forward Pumproom Alterations and Connections To and From Pumps

Install one (1) 8" welded flange in the forward pumproom on each of the four (4) 8" suction lines from No. 1 and No. 2 port and starboard cargo tanks.

Install one (1) welded fabricated elbow flanged one (1) end outlet in each of the above four (4) lines between the flange on end of pipe and the bulkhead.

Install one (1) Owner furnished 8" ductile iron teflon seated gate valve on each flange. Total of eight (8).

Disconnect & remove the following pipe & valves remaining after previous removals.

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One (1) 8" suction valve, one (1) 8" strainer and connecting pipe including discharge pipe to the suction line from the 5" relief valve on each the port and starboard pumps.

The 8" valves are to be renewed with Owner furnished 8" C.I. 125lb. teflon seated gate valves and the pipe and strainers sandblasted to white metal and coated inside and outside with Humble Rust Ban No. 191 and reinstalled with new gaskets (Teflon impregnated asbestos) Renew defective, studs, bolts and nuts.

Renew Teflon impregnated asbestos gaskets for strainer covers. Total of two (2).

Make the following pipe connections from the valves installed on the 8" suction lines from No. 1 and No. 2 port and starboard cargo tanks and their elbow outlets.

Port line (No. 2 port cargo tank) to be connected to suction valve to port pump.

Install one (1) 2 1/2" and one (1) 3" welded flanged outlet and one (1) 8" welded outlet in this line. 2 1/2" outlet to be horizontal but spudded into lower half of 8" pipe so as to act as a drain.

Install one (1) Owner furnished 2 1/2" fire hydrant valve on the 2 1/2" outlet.

Install one (1) 3" welded flanged outlet in discharge line from port pump adjacent to pump, install one (1) Owner furnished 3" 125 lb. gate valve on outlet and connect to 3" outlet in suction pipe.

Connect the 8" outlet to suction line valve from No. 1 starboard cargo tank. (Starboard Line)

Install in this line two (2) 8" welded flanged side outlets connected to suction line valves from No. 2 starboard (port inboard line) and No. 1 port cargo tanks (starboard inboard line).

Install one (1) Owner furnished 8" 125 RS teflon seated gate valve in the line between the suction lines tie in for No. 2 starboard and No. 1 port cargo tanks. Connect the 8" side outlet valve in suction line from No. 1 starboard cargo tank (starboard line) to suction valve to starboard pump.

Install one (1) 2 1/2" and one (1) 3" welded flanged outlet and one (1) 8" welded outlet in this line. 2 1/2" outlet to be horizontal but should be spudded into lower half of 8" pipe so as to act as a drain.

Install one (1) Owner furnished 2 1/2" 125 lb. fire hydrant valve on the 2 1/2" outlet.

Install one (1) 3" welded flanged outlet in discharge line from starboard pump adjacent to pump, install one (1) Owner furnished 3" 125 lb. gate valve on outlet and connect to 3" outlet in suction pipe.

Connect the 8" outlet to 8" side outlet valve in suction line from No. 2 port cargo tank (Port line).

Install in this line two (2) 8" welded flanged side outlets and connect to side outlet valves on suction lines from No. 2 starboard cargo tank (Port Inboard Line) and No. 1 port cargo tank (Starboard Inboard Line).

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Install one (1) Owner furnished 8" 125 lb. R.S. teflon seated gate valve in the line between the suction lines tie in for No. 2 starboard and No. 1 port cargo tanks.

(Note) In the installation of the 8" suction manifold endeavor to leave room for an additional two (2) 8" valves to be installed at a future date for a suction line from No. 1 center cargo tank.

Disconnect and remove and scrap two (2) 5" angle relief valves.

Renew with two (2) Owner furnished C.S. angle relief valves set at 125 lbs.

Disconnect, remove ashore, sandblast to white metal and coat inside and outside and reinstall with teflon impregnated asbestos, renew defective studs bolts and nuts all remaining ballast discharge pipe in forward pumproom.

8" Discharge pipe from each the port and starboard pumps to the stop valves.

Two (2) sections total approximately 25'0" of 10" pipe port side of pumproom. This is discharge pipe from both pumps.

While one (1) section is removed install one (1) 10" to 8" welded reducer flanged on 8" end on end of the top pipe.

The stop valves in the lines adjacent to each pump are to be renewed with Owner furnished valves. Total of two (2) 8" valves.

Install one (1) 8" discharge line for port pump from 8" reducer on the 10" line up through deck after end of forecastle head space and through after bulkhead of forecastle head space approximately.
21" from deck to center of this pipe.

Requires approximately 40'0" of 8" pipe and fittings.

Pipe to be just outboard of Coppus blower.
Continuation of this pipe will be covered in deck piping.

Install one (1) 8" discharge line for starboard pump from stop valve adjacent to pump up to top of pumproom and through after bulkhead approximately 1'0" just inboard of where spare anchor is secured.

Approximately 21" from deck to center of this pipe.

Requires approximately 60'0" of 8" pipe and fittings.

Continuation of this pipe will be covered in deck piping.

Install operating rods and brackets for all eight (8) 8" suction valves so valves can be operated above grating in bottom of pumproom.

Install two (2) 2'0" x 2'0" approximate rung type gratings in the pumproom below the floor plates.

Install two (2) 12" x 5'0" wide rung type ladders.

Relocate and renew one (1) 13'0" x 12" wide rung type ladder.

Make floor plates portable in two (2) places 2'0" x 2'0" each approximately.

(L) Pressure Gauges

Renew for each the two (2) alcohol pumps and the bilge and fuel oil pump gauges adjacent to the pumps and in the top of pumproom. Renew the 1/4"I.D. tubing & 1/4"globe valves for the suction and discharge gauges for the two (2) alcohol pumps.

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Install one (1) 1/4" gauge cock before each gauge.

The 1/4" globe valves are to be installed at the main lines.

Other existing tubing and valves can be used if not defective. If found defective renew.

Renew stools and brackets for the existing and new gauge line tubing.

Required for each pump.

Two (2) 4 1/2" face 0 to 400 steam pressure gauges

Two (2) 4 1/2" face - 30 to 30 pressure vacuum exhaust gauge.

Two (2) 4 1/2" face 0 to 200 discharge pressure gauges

Two (2) 4 1/2" face - 30 to 60 pressure vacuum suction gauges.

(M) Discharge and Loading Lines On Main Deck

Install one (1) 8" discharge line connected to the 8" discharge line from the port pump for No. 2 port and starboard cargo tanks at after bulkhead port side of the forecastle head space also one (1) 8" discharge line connected to the 8" discharge line from the starboard pump for No. 1 port and starboard cargo tanks at after bulkhead starboard side of forward pumproom.

The pipes to run one (1) port side and one (1) starboard side of the fore and aft walkway "A" frames to a point approximately 4'0" aft of after bulkhead of No. 1 center cargo tank at a height of approximately 1'9" from deck to center of pipe.

Install one (1) welded flanged 90° elbow facing outboard and one (1) Owner furnished 8" 125lb teflon seated gate valve on after end of each line.

Lines to be connected as later designated.

Install one (1) 2 1/2" welded flanged elbow outlet in the bottom of each line just before the valve. Outlets to face inboard.
Install one (1) Owner furnished 2 1/2" 150 lb. gate fire hydrant valve on each outlet as a drain and wash out connection.

Install one (1) each 8" filling or drop line through the main deck to within 6" of the bottom of No. 1 and No. 2 port and starboard cargo tanks.
Total of four (4) 8" drop lines.

Install on the starboard side of vessel in the filling or drop lines for No. 1 and No. 2 starboard cargo tanks one (1) each 8" fabricate welded flanged 90° elbow outlet. Total of two (2) outlets.

Install on end of each outlet one (1) brass blank flange secured with brass bolts and nuts also install in bottom of each outlet one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb brass gate valve for sample.

Drop on filling line for No. 1 port cargo tank is to extend to starboard side of vessel and connect into drop or filling line for No. 1 starboard cargo tank. Drop or filling line for No. 1 starboard cargo tank is to extend to port side of vessel and connect into drop or filling line for No. 1 port cargo tank.

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Drop or filling line for No. 2 port cargo tank is to extend to starboard side of vessel and connect into drop or filling line for No. 2 starboard cargo tank.

Drop or filling line for No. 2 starboard tank is to extend to port side of vessel and connect into drop or filling line for No. 2 port cargo tank.

The above transverse lines are to be run over the longitudinal discharge lines from the forward pumproom and are to slope radically to port or starboard as necessary for complete drainage to their respective tanks.

Install in each drop or filling line two (2) Owner furnished 8" 125 lb. teflon seated gate valves with 8" Tees between the valves in the drop or filling lines to No. 1 port and starboard cargo tanks and with 8" flanged crosses between the valves in the drop or filling lines to No. 2 port and starboard cargo tanks.

The Tees in the drop or filling lines to No. 1 port & starboard cargo tanks are to be connected with 8" pipe to the crosses in the drop or filling lines to No. 2 port and starboard cargo tanks. Total of eight (8) valves.
Install one (1) 8" discharge and loading line one (1) port side and one (1) starboard side connected into the 8" crosses and from this connection to approximately 4'0" port side and 2'0" starboard side aft of the new port stripper pump discharge crossover line in way of the amidships cargo loading and discharging manifold.

The lines are to run to outboard port and starboard sides of the amidships square gradually dropping lower to a point approximately midway of the amidships cargo loading and discharge manifold.

This is to be low point in line.

Lines are to then raise towards after end for loading and discharge connections. Lines are to be connected and valved as follows.

Port Line
Install one (1) 8" Dresser coupling and then two (2) 8" welded flanges and one(1) Owner furnished 8" hamer blind valve just aft of the connection into the drop or filling line for No. 2 starboard cargo tank.

Install one (1) 8" welded flanged outlet in the line just aft of the 8" hamer blind and connect to the valve previously installed on the 8" port discharge line from the forward pumproom.

Install one (1) 8" all welded loading and discharge line from the port line to the starboard side of the vessel.

Install one (1) Owner furnished 8" 150 lb. ductile iron gate valve and one (1) 8" x 2'0" welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125lb. brass gate valve for sample in the spool piece.

The line to slope radically from starboard to port for complete drainage.

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Deck to center of spool piece to be approximately 4'9" and pipe is to be located over No. 2 cargo tanks.

Install two (2) welded flanges and one (1) Owner furnished 8" 125 lb. teflon seated gate valve in the longitudinal line just aft of the loading and discharge connection.

Install one (1) welded flanged outlet and one (1) Owner furnished 8" flanged hamer blind and one (1) 8" Dresser coupling on the outlet in the longitudinal line in way of the forward end of the amidships loading and discharge manifold.

Install one (1) 8" welded flanged elbow outlet in the "Y" connection port side of the forward main crossover line of the amidships loading and discharge manifold.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb. brass gate valve for sample in the bottom of the elbow.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the elbow outlet and connect with one (1) 8" welded bent fabricated flanged spool piece to the 8" hamer blind valve.

Install one (1) 8" welded flanged elbow outlet in the above spool piece.

Install one (1) Owner furnished 8" flanged hamer blind on the elbow outlet.

Install one (1) 8" line running inboard and then aft from the hamer blind and then outboard for loading and discharge connection.

Install one (1) 8" Dresser coupling in way of the above line connection into the Hamer blind.

The line is to extend outboard just aft of the new after 8" stripper crossover line to be installed aft of the amidships loading and discharge manifold 2'0" center to center between the lines and same distance from deck as center line of the existing pipe just forward of the new line.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the end of the pipe.

Install one (1) 8" x 3'9" approximate welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb. brass gate valve for sample in the spool piece.

The longitudinal pipe in way of manifold to slope down from forward to aft and from aft to forward for drainage. An outlet as later designated is to be connected into this low point.

The port 8" line run from forward is to extend outboard just aft of the above loading and discharge connection 2'0" center to center of the two (2) pipes and same distance from the deck to the center of pipe.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the end of the pipe.

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Install one (1) 8" x 3'9" approximate welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop type nipple and one (1) 125lb. brass gate valve for sample in the spool piece.

The valves in the above connections are to be in line with the existing valves in the loading and discharge manifold and the ends of the spool pieces in line with the existing outlets.

Install one (1) 2 1/2" welded flanged elbow outlet and one (1) Owner furnished 2 1/2" 150 lb. fire hydrant on the outlet in the low point of the 8" port line in way of the amidships loading and discharge manifold. Outlet to be connected in bottom of pipe and face outboard.

Starboard Line

Install one (1) 8" Dresser coupling and then two (2) welded flanges and one (1) Owner furnished 8" hamer blind valve just aft of the connection into the drop or filling line for No. 2 port cargo tank.

Install one (1) 8" welded flanged outlet in the line just aft of the 8" hamer blind and connect to the valve previously installed in the 8" starboard discharge line from the forward pumproom.

Install one (1) 8" all welded loading and discharge line from the starboard line to the starboard side of vessel.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve and one (1) 8" x 2'0" welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb. brass gate valve for sample in the spool piece.

The line to slope radically from starboard to port for complete drainage.

Deck to center of spool piece to be approximately 4'9" and pipe is to be located 2'0" center to center forward of port loading and discharge line over No. 2 cargo tanks.

Install two (2) welded flanges and one (1) Owner furnished 8" 125 lb. teflon seated gate valve in the longitudinal line just aft of the loading and discharge connection.

Install one (1) welded flanged outlet and one (1) Owner furnished 8" hamer blind and one (1) 8" Dresser coupling on the outlet in the longitudinal line in way of forward end of amidships loading and discharge manifold.

Install one (1) 8" welded flanged elbow outlet in the "Y" connection starboard side of the forward main crossover line of the amidships loading and discharge manifold.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb. brass gate valve for sample in the bottom of the elbow.

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Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the elbow outlet and connect with one (1) 8" welded bent fabricated flanged spool piece to the 8" hamer blind valve.

Install one (1) 8" welded flanged elbow outlet in the above spool piece.

Install one (1) Owner furnished 8" flanged hamer blind on the elbow outlet.

Install one (1) 8" line running inboard and then aft from the hamer blind and then outboard for loading and discharge connection. Install one (1) 8" Dresser coupling in way of the above line connection into the Hamer blind.

The line is to extend outboard just aft of the new after 8" stripper crossover line to be installed aft of the amidships loading and discharge manifold 4'0" center to center between the lines and same distance from deck as center line of the existing pipe just forward of the new line.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the end of the pipe.

Install one (1) 8" x 3'9" approximate welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop type nipple and one (1) 1/2" 125 lb. brass gate valve for sample in the spool piece.

The longitudinal pipe in way of manifold to slope down from forward to aft and from aft to forward for drainage. An outlet as later designated is to be connected into this low point.

The starboard 8" line run from forward is to extend out board just forward of the above loading and discharge connection 2'0" center to the center of the two (2) pipes and same distance from the deck to the center of pipe.

Install one (1) Owner furnished 8" 150 lb. ductile iron teflon seated gate valve on the end of the pipe.

Install one (1) 8" x 3'9" approximate welded flanged spool piece with one (1) brass blank flange secured with brass bolts and nuts on the end of the spool piece.

Install one (1) 1/2" scoop nipple and one (1) 125 lb. brass gate valve for sample in the spool pieces.

The valves in the above connections are to be in line with the existing valves in the loading and discharge manifolds and the ends of the spool pieces in line with the existing outlets.

Install one (1) 2 1/2" welded flanged elbow outlet and one (1) Owner furnished 2 1/2" fire hydrant valve on the outlet in the low point of the 8" starboard line in way of the amidships loading and discharge manifold. Outlet to be connected in bottom of pipe and face outboard.

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Install two (2) 8" outlets and make connection with 8" pipe from low point in 8" port side loading and discharge line in way of the amidships loading and discharge manifold for No. 1 port and starboard cargo tanks to low point in starboard line starboard side of the vessel in way of the manifold. This line to slope to starbcard.

Install two (2) 8" outlets and make connection with 8" pipe from low point in 8" starboard side loading and discharge line in way of the amidships loading and discharge manifold for No. 2 port and starboard cargo tanks to low point in port line port side of the vessel in way of the manifold. This line to slope to port.

Install one (1) 4" welded elbow flanged outlet in the bottom of each of the two (2) 8" cross over lines at low point between the port and starboard lines in way of the amidships loading and discharge manifold.

Install one (1) Owner furnished 4" Rockwell flanged plug cock on each outlet.

Install one (1) 4" welded outlet in the drop line to No. 7 center cargo tank on starboard side of vessel and connect to starboard side plug cock with 4" pipe.

Connect the port side plug cock to the above line to No. 7 center cargo tank drop line. The lines are to slope from the plug cocks to the No. 7 center cargo tank drop line for complete drainage.

Install teflon impregnated asbestos gaskets and valve stem packing in six (6) Owner furnished 2 1/2" fire hydrant gate valves.

In addition to other pipe brackets installed in the system there are to be two (2) brackets installed under the new spool pieces in way of the amidships loading and discharge manifold and one (1) bracket under each of the spool pieces for the loading and discharge connections on starboard side of the forward main deck also one (1) bracket just in board of each loading and discharge valve.

(N) Vent and Gauge Connections

Install in the top of the 8" pipes just inboard of each loading and discharge valve two (2) on starboard side of forward main deck and six (6) in way of the amidships loading and discharge manifold one (1) 3/4" extra heavy welded boss.

Install in each boss one (1) 3/4" nipple, one (1) 3/4" T. Install in top of T one (1) 3/4" to 1/4" reducer, one(1) nipple and one (1) 1/4" 125 lb. brass globe valve. This is for gauge connection.

Install in side outlet of T one (1) 3/4" nipple, one (1) 3/4" 125 lb. brass gate valve, one (1) 3/4" nipple and one (1) 3/4" elbow.

(O) Fuel Oil Loading and Transfer Pipe

Raise 6" longitudinal fuel oilloading and transfer pipe on forward main deck to clear new transvese filling and drop lines. Install two (2) 6" 45° weld elbows and short section of 6" pipe at each end of sections to be raised.

Renew disturbed gaskets. Lengthen or renew the pipe hangers. Air test line and prove tight.

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(P) Gratings Forward Main Deck

Fabricate and install necessary 3/8" x 2 1/2" x 2 1/2" angle iron framing and grating on the forward main deck starboard side in way of the new loading and discharge connections.

Grating to be 7'0" long x 7'0" wide and to have aluminum type gratings and is to be approximately 1'6" above the main deck.

(Q) Gratings Amidships

Extend the amidships loading and discharge manifold gratings for the new pipe lines as follows.
Forward end port and starboard sides extend approximately 5'0" with one (1) tier handrail and stanchions.

After end port and starboard sides extend approximately 9'0" with one (1) tier hand rail and stanchions.
Relocate two (2) vertical ladders and renew two (2) vertical ladders.
Use aluminum gratings approximately 2'5" wide.

(R) Sealing For Carrying Alcohol No. 1 and No. 2 Port and Starboard Cargo Tanks

Drill and lace with 1/16" copper wire all bolted connections to the No. 1 and No. 2 port and starboard alcohol tanks and their connecting pipe lines and valves as follows.

Cargo Tank Hatch Covers and Pipes

Swing bolts and nuts and pins for same Gauge line and cock on cover or in pipe lines or hatch.

Ullage Covers

Lifting screw and handle and securing nut also pins for same.

Shans Jurs Gauges and Stands

Approximately 75% of all securing bolts, studs and nuts for all removable parts, pins for same, screw caps and etc.

Butterworth Plates

75% of all studs and nuts for each Butterworth plate.

Vent Pipes

75% of studs and nuts (each end) of Dresser coupling in way of each cargo tank hatch.

Pipes and Valves On Deck

75% of studs and nuts (each end) of each Dresser coupling.

75% of bolts and nuts in each flange connection.

75% of bolts, studs and nuts in all valve bonnets and packing box.

100% valve packing gland studs and nuts.

75% of studs and nuts in inspection plates on any valves.

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Valve stem nut and wheel so valves cannot be operated.

All small valves are to be drilled and laced so they cannot be disassembled, removed or operated.

Forward Pumproom
75% of inlet flange bolts and nuts on the eight (8) 8" suction valves also 75% of bolts, studs and nuts in valve bonnets, packing boxes and inspection plates.

Valve stem nut and wheel so valves cannot be operated.

(S) Alteration To Vent System

Relocate the P.V. valves for No. 1 and No. 2 center cargo tanks from the port to starboard main vent header.

Install two (2) 6" x 2'7" each approximately welded flanged outlets on the top of the starboard main vent header on forward main deck.

Disconnect and remove P.V. valves for No. 1 and No. 2 center cargo tanks and install on the new outlets and connect up to their respective tanks.

No. 1 center cargo tank P.V. valve requires approximately22'0" of bent 6" pipe flanged one (1) end and dresser coupling other end No. 2 center cargo tank P.V. valve requires approximately 30'0" of bent 6" pipe flanged one (1) end and dresser coupling other end.
Relocate and renew brackets as required chip flush in way of removals.

Install bolted blanks on the two (2) outlets on the port line.
(NOTE) Vent pipe removed from No. 1 center cargo tank to remain property of Owners and stowed on board the vessel.

(T) Tank Strapping and Ullage Tables
The Contractor shall secure the services of an approved Contractor and have No. 1 and No. 2 port and starboard cargo tanks strapped and computed and furnish five (5) sets of ullage tables computed in accordance with the requirements of the Federal Taxing Authorities.

(U) Water Jet Eductor Forward Pumproom
Install one (1) Owner furnished 2" flanged Schutte and Koerting Co. water jet eductor Fig. 266 SK and one (1) 2" Schutte and Koerting flanged foot valve Fig. 959SK in the after end of the forward pumproom and connect up with extra heavy galvanized pipe, fittings, flanges, valves and brackets also bracket for the eductor.

The eductor is to be installed in a horizontal position below the grating.

Install one (1) 2" flanged section of pipe between the eductor and the foot valve.

Install one (1) 2 1/2" welded flanged outlet in the blank flange on the fire line in the top of the pumproom.

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Install one (1) Owner furnished 300 lb. flanged brass globe valve on the outlet.

Run 2 1/2" pipe from this valve to approximately 3'0" above the grating approximately 19'0" below the main deck level reduce line to 1 1/2" at this level and furnish and install one (1)1 1/2 300 lb. threaded globe valve in the line just above grating level then run 1 1/2" line to the eductor reducing to 1 1/4" approximately 1'0" from the eductor and connect to 1 1/4" flanged inlet on the eductor.

Install one (1) 2 1/2" welded flanged outlet in the 2 1/2" line at approximately 4'0" above the 19'0" below deck grating.

Install one (1) 2 1/2" fire hydrant valve on this outlet.

Use valve removed from the lower pumproom.

The pipe is to be run so that both valves can be operated from the grating without any operating rods.

Install one (1) 2" welded flanged outlet in the 10" blank flange on the overboard discharge line upper port side of the pumproom.

Connect this with 2" pipe to the 2" flanged outlet on the eductor.

Install one (1) 2" 150 lb. brass flanged gate valve in the line.

Valve to be located adjacent to the grating 19'0" below main deck in the top of the pumproom.

Run the pipe so the valve can be operated from the grating without any operating rods.

Alter gratings in the bottom of the pumproom as necessary for the pipe penetrations.

Requires approximately
One (1) ft. of 1 1/4" extra heavy galvanized pipe, fittings and one (1) flange.

Thirty (30) ft. of 2 1/2" extra heavy galvanized pipe, fittings and flanges.

Forty five (45) ft. of 1 1/2" extra heavy galvanized pipe, fittings and flanges.

Seventy (70) ft. of 2" extra heavy galvanized pipe, fittings and flanges.

One (1) 1 1/2" 300 lb. brass screw type valve (Contractor furnished)

One (1) 2" 150 lb. brass flanged gate valve (Contractor furnished)

One (1) 2 1/2" 300 lb. brass flanged globe valve (Owner furnished)

One (1) 2 1/2" fire hydrant valve (Owner furnished) Necessary hangers.
(NOTE) Two (2) unions are to be installed adjacent to the 1 1/2" valve so it can be easily removed.

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