

We look to both Vessel and Owners for Payment of this Bill.

(H/M/11)

Newport News, Virginia, June 16 19 66

6134

S. S. ESSO LEXINGTON and Owners.

Bill No.

Humble Oil & Refining Co.

Checked By

P. O. Box 1512

Houston, Texas 77001

To Newport News Shipbuilding and Dry Dock Company Dr.

J. O. 1350

Product S

Furnishing services and making repairs and/or renewals to the S. S. "Esso Lexington" at this plant as detailed in the attached customer's order No. 1350-S dated June 3, 1966.

For the sum of ----- \$ 500,706.00

Net on Receipt of Invoice

Make Payment to
Newport News Shipbuilding & Dry Dock Company
Attention: Treasurer
Newport News, Virginia

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

UNLESS OTHERWISE STATED HEREIN, ALL TENDERS ARE SUBJECT TO IMMEDIATE ACCEPTANCE. QUOTATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL AGREEMENTS AS TO TIME OF COMPLETION ARE MADE CONTINGENT UPON STRIKES, LABOR DIFFICULTIES, FIRE, ACCIDENTS, DELAYS IN DELIVERY OF MATERIAL AND/OR CAUSES OF ANY KIND BEYOND OUR CONTROL. FOR PAYMENT FOR ANY WORK DONE OR MATERIALS SUPPLIED HEREUNDER, WHETHER AUTHORIZED ORALLY, BY LETTER, OR WRITTEN CONTRACT, WE LOOK TO BOTH VESSEL AND OWNER. WE ALLOW NO DISCOUNTS AND BILLS ARE PAYABLE WHEN RENDERED. IN CASE OF DEFECTIVE WORKMANSHIP OR MATERIAL, OUR LIABILITY IS LIMITED STRICTLY TO THE CORRECTION OF SUCH DEFECTS DISCOVERED AND REPORTED TO US IN WRITING WITHIN THIRTY (30) DAYS FROM THE COMPLETION OF THE WORK.

WE UNDERTAKE TO PERFORM WORK ON, AND DRY DOCK VESSELS AND PROVIDE BERTH, WHARFAGE, TOWAGE AND OTHER SERVICE AND FACILITIES, ONLY UPON CONDITION (1) THAT NO LIABILITY SHALL ATTACH TO US FOR CONSEQUENTIAL OR CONTINGENT DAMAGES; (2) THAT WE SHALL NOT BE LIABLE IN RESPECT TO ANY ONE VESSEL, DIRECTLY OR INDIRECTLY IN CONTRACT, TORT OR OTHERWISE, TO ITS OWNERS, CHARTERERS OR UNDERWRITERS FOR ANY INJURY TO SUCH VESSEL, ITS CARGO, EQUIPMENT OR MOVABLE STORES, OR FOR ANY CONSEQUENCES THEREOF, UNLESS SUCH INJURY IS CAUSED BY OUR NEGLIGENCE OR THE NEGLIGENCE OF OUR EMPLOYEES, AND (3) THAT IN NO EVENT SHALL OUR AGGREGATE LIABILITY TO ALL SUCH PARTIES IN INTEREST FOR DAMAGES SUSTAINED BY THEM, AS A RESULT OF SUCH INJURY AND/OR DAMAGES, EXCEED THE SUM OF THREE HUNDRED THOUSAND DOLLARS (\$300,000.00).

WE WILL ACCEPT VESSELS FOR REPAIRS ON A DIFFERENT BASIS WITH MORE EXTENSIVE LIABILITIES THAN HEREINBEFORE SET FORTH, BUT ONLY UPON THE OWNER DECLARING THE VALUE OF SUCH VESSELS AND SPECIFYING THE DESIRED INCREASED LIABILITY IN ADVANCE OF DELIVERY OF THE VESSEL TO US, TOGETHER WITH AN AGREEMENT TO PAY AN ADDITIONAL CHARGE OVER AND ABOVE THE USUAL CHARGES FOR REPAIR, WHARFAGE AND DRY DOCKING SUFFICIENT TO COVER THE COST OF INSURANCE EQUAL TO SUCH DECLARED RISK AND UNLESS THE OWNER DOES SPECIFY IN ADVANCE AND MAKE PROVISION FOR PAYMENT OF ADDITIONAL INSURANCE, THE DELIVERY OF THE VESSEL OR MAKING THE VESSEL AVAILABLE TO US FOR REPAIRS SHALL BE DEEMED AN ACCEPTANCE OF THE TERMS AND CONDITIONS SET FORTH IN THE PRECEDING PARAGRAPH.

PLEASE NOTE THAT WE DO NOT AGREE TO THE ACCIDENT AND/OR INDEMNITY AND/OR INSURANCE PROVISIONS, IF ANY, CONTAINED IN YOUR INVITATION AND/OR SPECIFICATIONS, RELATING TO LIABILITY FOR DEATH OR PERSONAL INJURY, AND THAT IN SUCH CASES WE ACCEPT ONLY SUCH LIABILITY AS IS IMPOSED UPON US BY LAW.

CUSTOMER'S ORDER

No. 1350-S

Newport News, Virginia, June 3, 1966

Newport News Shipbuilding and Dry Dock Company:

Subject to the conditions printed hereon, please furnish the following for

S.S. ESSO LEXINGTON

Humble Oil & Refining Co., P.O. Box 1512, Houston, Texas 77001

By Contract \$

By Dry Dock

Vessel Arrived: April 20, 1966

Vessel Sailed: May 20, 1966

\$ 500.00 1.

GAS FREE (137)

The Owner will steam, clean and gasfree, or cause to be steamed, cleaned and gasfreed, all cargo tanks, cofferdams, pumproom, compartments, 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 compartment 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. 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

Orders for account of vessel and owners must be signed by Managing Owner, Ship's Husband, Master, or any person to whom the management of the vessel at the port of supply is entrusted.

Accepted:

Newport News Shipbuilding and Dry Dock Company
By—

(Signature)

(Title)

1. GAS FREE (CONTINUED)

or gases or oil during the performance of 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 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.

2. SAFETY PRECAUTIONS - COATED MATERIALS

The Contractor shall provide adequate exhaust ventilation; shall supply airlines 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. 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 port holes to the quarters or engine room.

--These passageways are to be kept clear at all times-----

\$ 1,400.00 3.

INTERNAL CLEANING - MAIN BOILERS (327)

Open up two (2) Babcock & Wilcox boilers for internal examination and cleaning, including steam and water drums, waterwall headers and superheater tube headers. Remove eighty (80) designated hand-hole plates on each boiler for examination and cleaning of boiler tubes and headers. Thoroughly wash out boilers with fresh water. Clean and remove all sludge and sediment from drums and tube headers. Thoroughly clean tube header handhole plate gasket landings prior to installing new gaskets. Close up boilers with new gaskets and upon completion of repairs, apply a hydrostatic working pressure to both boilers to prove all gaskets tight. NOTE: Be heated to a temperature of approximately 80 degrees F. prior to applying this pressure.

\$ 3,800.00 4.

EXTERNAL CLEANING - MAIN BOILERS (327)

Scrape, wirebrush and thoroughly clean all external heating surfaces of two (2) Babcock & Wilcox boilers, including stack, uptakes, fan damper valves, casing, air ducts, air heater tubes, generating and superheater tubes. Wash air heater, generating and superheater tubes with fresh water under pressure, and at approx. 150 deg. F temperature. Special attention to the cleaning of superheater and generator tubes, hand lancing when necessary. Upon completion of cleaning, remove all sludge and sediment from boilers and from vessel and replace all boiler casing access doors renewing asbestos tape gaskets as necessary. Also renew all missing or defective studs, nuts and lugs.

NOTE: Special attention to completely cover electric and mechanical equipment in shaft alley under boilers and fire room before washing is started. Keep fire room and boiler drains clear.

\$ 7,200.00 5.

MAIN TURBINE - HP AND LP UNITS -26500 HP (307)

Make necessary removals and remove upper half of both HP and LP turbine casings, secure and raise both turbine rotors for examination and ABS survey. Check all blading. Examine all labyrinth seals and packing, straighten any bent packing. Examine all nozzle ring Allen head bolts, prove same tight and sound. Prove diaphragm free. Upon completion, re-install rotors, take and record all blade and bearing clearances, check and adjust to proper thrust bearing clearance. Close up turbines in good order, renewing any defective bearings, etc. (furnished by vessel). Supply Owner's Representative with five (5) typewritten copies of all readings taken prior to and after all adjustments are made. Prove all in good order after running dock trial of four (4) hours. After exposed to heat, reharden all casing flange and pipe joint bolts, proving same tight. Replace all insulation and lagging in good condition as original. Work to be done under constant supervision of Newport News Service Engineer for contractor's account. Replace all removals in good order.

Renew twelve (12) Allen head cap bolts in way of labyrinth packing gland top half LP turbine, forward and aft ends. Size 3/4" dia. approx. 3" long. Heat treated. Remove two broken bolts.

\$ 2,960.00 5-A.

MAIN TURBINE -HP AND LP UNITS-26500 HP (307)

a. Remove from vessel HP turbine rotor, fly ash, renew four (4) sections of damaged blade shrouding. Check and tighten loose shrouding. Dynamically balance rotor. Replace in good order.

5-A. MAIN TURBINE HP AND LP UNITS (CONTINUED)

b. Renew forward LP rotor bearing (furnished by vessel). Remetal defective LP rotor bearing, bore to correct size. Return to vessel and stow as directed by 1st Engineer.

\$ 1,200.00 6. MAIN TURBINE HP AND LP HIGH SPEED COUPLINGS (307)
Open up and remove for inspection, two (2) high speed flexible couplings for HP and LP turbines. Thoroughly clean and check same for wear. Remove shoulders and wire edges by stoning as directed. Remove and clean oil supply pipes and nozzles. Reassemble couplings, oil lines and nozzles in good order. Renew neoprene rubber seal at forward end of coupling covers top and bottom.

\$ 225.00 7. MAIN THRUST (307)
Take clearances of main thrust bearing. Give readings to Repair Inspector.

\$ 1,090.00 8. MAIN CONDENSER (307)
Open main condenser, remove access cover plates for examination. Wirebrush 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 condensers 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.

\$ 600.00 9. AUXILIARY CONDENSER (307)
Open up auxiliary condenser for examination. Wirebrush and thoroughly clean tube sheets and tubes. Clean heads. Test condenser to 15 lbs. hydrostatic pressure and prove tight. Repair any damaged areas of neoprene coating. Renew Swedish iron plates and any defective studs and nuts. Harden up on all leaky joints and prove tight. Upon completion of work, condenser to be drained and closed up in good order.

\$ 180.00 9-A. AUXILIARY CONDENSER (307)
Renew three (3) baffle plates for air eliminator in auxiliary condenser, size 3" wide x 3/4" thick x 10" long, with two (2) 7/8" holes for bolts.

- \$ 1,200.00 10. DEAERATING TANK (307)
Open up deaerating tank for examination and cleaning. Thoroughly wirebrush and clean all internal surfaces, including dome. Remove all sediment and wash down inside of tank with fresh water. Test floats for leaks and make tight, also free up and adjust all linkage for make up and dump valves. Blow out, prove clear and tight all air lines. Remove spray nozzle valve assemblies, overhauling as required or if necessary, renew valve assemblies, supplied by vessel. Reinstall assemblies in good order.
- \$ 540.00 10-A. DEAERATING TANK (307)
Machine seat and disc, grind in, test and prove tight relief valve on deaerating tank and set valve to lift at 60 lbs. pressure. Remove, clean, test and make tight and reinstall vent condenser. Upon completion of work and examination, close up in good order using new gaskets. Renew all defective studs, nuts and bolts. Replace disturbed insulation and blankets as original.
- \$ 1,200.00 11. EVAPORATOR (307)
Open for examination one (1) make up feed evaporator. Remove all coils and baffles, thoroughly scale, wirebrush and clean all surfaces of shells and headers. Remove all coils to shop, test to working pressure, repair all leaking coils by brazing, anneal all coils, free up spud nuts, replace all coils in good order, test coils and headers to working pressure and prove tight. Renew defective tie bolts and zinc plate. Close evaporator in good order, renewing all gaskets, defective studs, bolts and nuts. Test and prove all connections tight. Machine seats and discs, grind in, test, adjust, prove tight relief valves to requirements of USCG. Repair or renew as original all disturbed insulation and blankets.
- \$ 2,800.00 12. TWO (2) 750 KW GENERATORS AND 7.5 KW EXCITERS (303)
Remove covers and shields from two (2) 750 KW generators and 7.5 KW exciters. Thoroughly clean windings, rotors, fields and armatures if necessary with approved solvent. Check air gap and binding wires. Bake until satisfactory megger readings are obtained. Apply one (1) coat of approved insulation varnish. Machine slip rings of both generators and commutators of two (2) 7.5 KW exciters, undercut mica, install and fit new brushes (furnished by vessel). Thoroughly clean exciters after above work. Reinstall covers and shields in good order, test and prove in good working condition under load.

12. TWO (2) 750 KW GENERATORS & 7.5 KW EXCITERS (CONT'D)
Open for examination air coolers, wirebrush and air lance, clean tubes, also clean tube sheets, scrape, wirebrush, clean and apply two (2) coats of Apexior #3 paint to water boxes and heads. Renew zinc plates or rods, test tubes to working pressure, prove tight, and close coolers in good order, renew gaskets, defective studs, bolts and nuts.
- \$ 400.00 13. HEATERS (307)
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.
- \$ 300.00 14. MEGGER TEST READING (307)
Test and deliver to Owner's Representative as soon as practical after vessel's arrival in yard and after repairs are completed five (5) typewritten copies of each set of megger readings of all generators, motors, controllers, and electric circuits throughout vessel. Locate and demonstrate to Owner's Representative section breakdown of all low readings found.
- \$ 5,800.00 15. FEED PUMP TURBINES (G.E. 575 HP) (307)
Open top casings of No. 1 and 2 feed pump turbines and bearings for examination and ABS survey. Check and record clearances. Remove rotors, check nozzle plates, intermediate, spacer and etc., renew defective parts, also worn or defective bearings. Open lube oil pumps and speed changers, check all parts for wear and defects, renew defective parts. Clean bearing housings and strainers, test lube oil coolers, prove tight. Polish shaft in way of carbon packing, adjust carbon packings to proper clearances. Reassemble, install correctly, renew gaskets, defective studs, bolts and nuts.
- Open governor and trip throttle valve assemblies also air-operated valves, renew all worn and damaged parts, close up in good order.
- Adjust to proper clearances and connect up turbine shafts in correct alignment with pump. After plant is in service, test and adjust overspeed trip, prove in good operating condition. Renew or replace disturbed insulation as original. Work to be under supervision of G. E. Service Engineer for Owner's account.

- 15-A. FEED PUMP TURBINES (G.E. 575 HP)(307)
Parts and carbon packing furnished by vessel.

No. 2 Feed Pump Turbine - Straighten first row of blading and dynamically balance rotor.

- \$ 2,825.00 15-B. FEED PUMP TURBINES (G.E. 575 HP)
a. Open up #3 feed pump turbine as per Item #15.
b. Build up shaft in way of bearings by chrome plating and machine to original size. #2 feed pump turbine rotor. Build up steam cuts in machine faces of spacer ring for #2 feed pump turbine and grind to original thickness.
c. Disconnect and remove trip, throttle valve assembly from #3 feed pump turbine casing to shop, weld up steam cuts in ground face joint and re-grind. Replace and reconnect in good order, Replace all removals as original. Build up steam cuts in machine faces of spacer ring for #3 feed pump turbine and re-grind to original thickness.

- \$ 25.00 15-C. FEED PUMP TURBINES (G.E. 575 HP)(307)
Furnish twenty-four (24) CRES Allen head bolts, size 3/4" x 2 1/2".

- 15-D. FEED PUMP TURBINES (G.E. 575 HP)(307)
Furnish sixty-four (64) CRES Allen head bolts, size 5/8" x 2 1/4".

- \$ 2,500.00 16. MAIN CIRCULATING PUMP -WARREN - SIZE 30SLMV(307)
Open up main circulating pump and remove impeller assembly for ABS survey and examination. If found necessary, remove coupling from defective impeller shaft and install same on spare impeller assembly. Adjust impeller on shaft for correct vertical height. Fit the new casing rings to casings. Close up circulator in good order, using manufacturer's prescribed thickness gaskets. Prove grease fitting clear, re-pack, prove free and in good order. Renew defective studs, nuts and bolts. Test and prove in good working order.

- \$ 100.00 16-A. MAIN CIRCULATING PUMP -WARREN (307)
Crate defective main circulator pump rotating element, including casing rings and bearings. Ship via motor freight prepaid to:
U.S.M.P. Company
150-170 Lynhurst Avenue
Rosebank
Staten Island, New York
MARK: "From SS ESSO LEXINGTON
For repair and return to vessel".

- \$ 2,100.00 17. ANCHOR CHAINS (107)
Range on dock forward port, starboard and stern anchor and chains, unshackling same at bitter end connections, for examination by USCG and ABS. 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 chains 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. Free up three (3) anchor chain swivels. (One swivel each chain). Reinstall and stow chains in lockers in good order.
- \$ 390.00 17-A ANCHOR CHAINS (107)(ADDITION TO ITEM 17)
a. Renew two (2) pear shaped anchor joining links, one to port, one to starboard anchors. Links furnished by vessel.
b. Renew port and stbd. anchor shackle pins, size of each 5-1/4" dia. x 22" long.
c. Fair bitter end link stbd. anchor.
- \$ 450.00 17-B. ANCHOR CHAINS (107)(ADDITION TO ITEM 17)
a. Remove two (2) incorrect size pear shaped anchor joining links, one to port, one to starboard anchors, and ins. tall correct size links (furnished by Owners).
b. Remove the two incorrect size links from vessel, crate and ship via freight, collect to:
Baldt
Anchor, Chain and Forge Division
Sixth and Butler Streets
Chester, Pennsylvania
MARKED: "From SS ESSO LEXINGTON"
- \$ 3,600.00 18. LIFEBOATS (107)
Remove all gear from four (4) lifeboats, including air tanks, 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 of primer and one (1) coat approved color paint to inner surfaces of boats. Coat inner bottom strake, up to floor board with heavy coating of Humble Rust Ban grease. Paint and mark all gear and air tanks. Replace all air tanks, boxes, gear, etc., renew defective metal bonds, free up and grease and prove in good working condition releasing gear. Check, clean, free up and adjust limit switches on all four (4) boats, renew defective cover gaskets, defective or missing bolts and

18. LIFEBOATS (CONTINUED)

nuts. Open up as required by USCG for inspection limit switches, disconnect switches and motor controllers, close up in good order.

\$ 420.00 19.

SPILL VALVES (107)

Open up six (6) spill valves located on vent piping for inspection in accordance with USCG and ABS requirements. Thoroughly clean, machine seats and discs as found necessary, grind in, renew defective flame screens also defective or missing brass cap screws. Close up in good order.

\$ 1,180.00 20.

PRESSURE VACUUM RELIEF VALVES AND VENT LINES (107)

A. Open up 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, after inspection close up in good order. Renew all defective screens, gaskets, also defective or missing brass cap screws.

B. Blow out all vent piping with compressed air and prove clear.

\$ 3,760.00 21.

SEA VALVES, CHESTS AND STRAINERS (107)

Open up all sea valves in engine room, fire room, pumproom, and cofferdam, including bilge injection and all overboard discharge valves for examination by USCG and ABS. Machine seats and discs as found necessary, grind in, repack, renew bonnet gaskets, thoroughly clean, and after inspection apply two (2) coats of Apexior #3 paint to all valves internal surfaces and close up valves in good order, renewing defective studs, nuts and bolts. Secure aft pump room sea valves discs to stem lock nuts by tack brazing. A total of three (3) valves.

NOTE: Some sea valves are coated with neoprene. All damaged areas to be thoroughly scaled, wire-brushed, cleaned and apply neoprene to all bare areas.

\$ 3,075.00

a. Furnish and install the following steel sea valves:

One (1) 8" angle stop valve, suction to L.O. cooling circulating pump.

One (1) 2" globe stop check valve, overboard discharge valve from feed pump lube oil coolers.

One (1) 4" gate valve, overboard from generator lube oil and air coolers.

One (1) 2½" gate valve, overboard from electric fire pump.

One (1) 1½" angle stop check valve boiler blow overboard, 1500 lb.

21 SEA VALVES, CHESTS AND STRAINERS (CONTINUED)

b. Renew the following sea valves, furnished by vessel:

One (1) 3" gate valve overboard from M.U.F. Evaporator.

One (1) 3½" stop check valve overboard from distiller.

One (1) 3" gate valve overboard from cargo pump lube oil coolers.

One (1) 3" gate valve overboard from refrigerating condensers.

Apply two coats of Apexior to internal surfaces of above valves except brass seats and discs.

c. Renew guides in 5" gate valve overboard from general service pump.

Starboard pump room sea valve, thoroughly clean pitted areas in body of valve and fill with Red Hand Cement. Size 16". Secure nut for bottom of stuffing box in bonnet.

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.

Remove all sea strainers for examination of sea chests, care to be taken not to damage rubber coating. Thoroughly scale and wirebrush damaged areas and apply neoprene coating to areas as directed. Wirebrush and clean strainers and apply two (2) coats of Apexior #3 paint. After neoprene coating has dried, apply one (1) coat of bottom paint to all sea chests. Replace strainers, and renew defective studs, nuts and cotter pins.

\$ 300.00

a. Renew four (4) welded clips and bolts and nuts in main condenser overboard discharge pipe for holding grid, size of each clip 4" x 2½" x 1/2", size of bolts, monel, 3/4" x 2".

b. Starboard sea chest aft pumproom - wirebrush and clean, pitted areas in 16" flanged x 6" long connection to sea chest and fill with red hand cement.

NOTE: Cargo pumps, auxiliary circulator, high and low injection sea chests, coated with "FOXITAR". Repair above sea chests with same material.

21-A. MAIN CONDENSER SEA SUCTION AND OVERBOARD VALVES(107)

a) Disconnect and remove from vessel the following sea valves:

- One (1) 30" high injection sea valve
- One (1) 30" low injection valve
- One (1) 28" main condenser overboard discharge valve.

Crate and ship the three (3) removed valves via motor freight, prepaid, to:

ITT Henze Instrument & Valve, Inc.
95 Diaz

Pritchard, Alabama

Crate marked: "FROM SS ESSO LEXINGTON"

\$ 3,565.00

b) Take delivery and install three (3) Butterfly valves (Owner furnished) in the above locations, renew flange, gaskets, bolts, studs and nuts. Prove flange joints tight.

Crop and install 3/4" dia. tee in air line to engine room machine shop, air line located below machine shop deck. Run 3/4" dia. galv. pipe near overboard disc valve, near high injection and ending at (near) low injection valves. Install 1/4" dia. threaded outlets near each of the above valves, install 1/4" x 3 galv. nipple and one (1) 1/4" dia. 150# gate valve in each outlet, total of three (3) nipples and valves. Furnish three (3) 1/4" dia. four way air valves (brass), 150 lb. Fabricate and install three (3) brackets for above air valves, one each to be located near the three Butterfly valves as directed. Connect the 1/4" air valve to the installed 3/4" supply line using 1/4" brass pipe and fittings and connect air valve to air cylinder on Butterfly valve using 1/4" dia. copper tubing and fittings. Furnish and install brass label plates for each Butterfly valve. Letters to be 1/2" high. Furnish and install necessary hangers for new pipe line also copper tubing. Staging required. Test and prove pipe and copper tubing tight.

Prove Butterfly valves in good working order. Apply one (1) coat of primer and two coats of color paint to all new work and damaged areas. All materials furnished by yard.

\$ 620.00

Alter one (1) section of CO-2 piping in way of main condenser overboard Butterfly valve.
Alter top support bracket for main circulator controller in way of high injection butterfly valve air cylinder, also alter support of grating in way of emergency handwheel. Alter floor plate and support in way of low injection butterfly valve.

21-A. MAIN CONDENSER SEA SUCTION AND OVERBOARD VALVES
(CONTINUED)

Install one (1) flat bar clip to each air cylinder support welded, drill 3/4" hole, install toggle pin with chain to each threaded stem of hand wheel for securing emergency wheels. Total of three valves.

Install in air line to low injection Butterfly valve air operator one 1/4" Leslie reducing valve, nipple and strainer (furnished by vessel). Install 150 lb. gauge outlet side of reducing valve.

Renew one (1) bent pin for low injection valve, use eye from old pin, weld to new pin - material size B-16 1" dia. approx. 12" long.

Furnish and install over air operators for high and low injection valve one (1) sheet metal guard. Size 1/8" x 10" x 52" portable.

\$ 750.00 22. SCUPPER PLUGS AND STOCKINGS (107)

A. Before any paint is applied to hull, install wood plugs with extension pipes of sufficient lengths or other approved means in all scuppers and overboard drains throughout vessel to prevent any water running on hull of vessel. Plugs to remain in until painting is completed and dry and then removed.

B. Install stockings on soil lines, scupper drains from wash rooms and air conditioner also ice machine overboard discharges while vessel is on dry dock to enable ship's personnel to use toilets and washrooms preventing any water running on shell during painting.

\$ 450.00 23. LINES AND GANGWAYS

Furnish labor and crane service to handle lines and gangways.

\$ 450.00 24. FIREMAIN

Connect firemain and maintain pressure.

\$ 450.00 25. POWER

Connect switchboard and furnish power.

\$ 450.00 26. STEAM

Connect shore steam and furnish steam.

\$ 1,260.00 27. SUPERHEATER TUBE SUPPORTS (307)

Fabricate and install six (6) superheater tube supports for each port and starboard boiler. Approx. twelve (12) 3/8" J bolts and twelve (12) 1/2" x 1" x 6" stainless steel flat bar required.

- \$ 190.00 28. EXTERNAL CLEANING - MAIN BOILER (337)
Renew six (6) each securing lugs, studs welded and nuts. Renew two (2) wedges on uptake door starboard boiler.
- \$ 6,000.00 29. BOILER VALVES AND STUDS (317)
a) Open up as required by USCG and ABS all boiler mountings to complete four (4) year survey for two (2) B&W boilers.

b) Disconnect, remove fittings, etc., as required by the USCG for examination of boiler mountings and studs in order to complete the eight (8) year mounting requirement. After examination; disconnect and remove to shop the following valves, open up, machine seat and disc, grind in, renew bonnet gasket, repack valve stem, close up, test to working pressure, prove tight, replace, reinstall, renew gaskets, studs and nuts. Grind in all opened valves, repack all valve stems, renew all bonnet gaskets, renew defective studs, nuts. Close up in good order.

Replace all mountings and fittings, renew gaskets, bolts and nuts and studs.
Test and prove all gaskets and valves tight.
Replace all disturbed insulation and blankets as original.

Starboard boiler - bottom stop valve for top gauge glass - size 1"
Starboard boiler - top stop valve for bottom gauge glass - size 1"
- \$ 260.00 29-A BOILER VALVES AND STUDS (317)
Renew bottom valve stems of top gauge glass of port and starboard boilers. A total of two stems, material size each 3/4" dia. x 11 1/2" long, machined.

Renew three (3) piston rings for desuperheater steam stop valves, ring size 4-3/4" OD x 4-3/8" ID x 3/16" wide.
- \$ 1,600.00 30. BOILER AND SUPERHEATER SAFETY VALVES (317)
(CONSOLIDATED)
Disconnect and remove four (4) 2 1/2" and two (2) 2" safety valves from two boilers. (Valves to be sent to an approved service shop.) Open up, machine seats and discs, grind in, renew defective parts, thoroughly clean, reassemble, test and set under steam pressure, prove tight.

30. BOILER & SUPERHEATER SAFETY VALVES (CONTINUED)
Reinstall on boilers and superheaters, renew gaskets, defective studs, bolts and nuts. Test and prove all valves in good operating condition and set to the requirements of USCG. Follow up on nuts when valves are hot. Connect up lifting gear and replace all removals in way of work in good order.
- \$ 600.00 31. WORKING HYDROSTATIC TEST MAIN BOILERS (307)
Upon completion of boiler repairs also boiler valve repairs, apply working hydrostatic test to both boilers. Prove all handhole and manhole gaskets tight, also all boiler mounting flanges and packing glands tight.
Report any leaks found to Repair Inspector.
NOTE: Water in boilers to be heated to approx. 80 deg. F. prior to test. After test has been satisfactorily completed, boilers are to be emptied.
- \$ 1,800.00 32. SUPERHEATER INNER ACCESS DOORS (357)
Renew insulation, anchor bolts and refractory using Kaocast on six (6) access doors. Install heat resistant metal lining over refractory. Approx. size each door 26" x 42". Refit doors so same will fit free.
- \$ 1,200.00 33. STEAM SOOT BLOWERS (307)
Remove air motors, soot blower heads and renew swivel tubes and couplings of the following soot blowers. Remove all old packing from wall boxes and repack. Renew ball retainer assembly including thrust washer at each side of retainer. Remove elements for examination, and straighten if found necessary, as per instructions in "Diamond" instruction book.
- Reinstall elements, heads and air motors, renewing gaskets, defective copper tubing and fittings.
Reset #4 soot blower on stbd. boiler to shut off when nozzles of element are at top arc.
- Test and prove soot blowers in good operating condition. All parts supplied by vessel:
Port Boiler - #5, #6 soot blowers
Starboard Boiler - #4, #5, #6 soot blowers
- \$ 390.00 34. BOILER AIR CASING FRACTURES (307)
Vee out and weld the following fractures: Port boiler approx. twelve (12) foot in casing at top of drum adjacent to joint at uptake.

34. BOILER AIR CASING FRACTURES (CONTINUED)

Port boiler - one (1) 6" x 3" crack at aft and bottom sides of air duct at stop valve to preheater. One (1) 12" crack at junction of fwd. and aft air ducts at discharge from force draft fans. One (1) 12" crack at bottom forward side of air duct at stop valve to preheater.

Starboard boiler - One (1) 6" x 3" crack at aft end bottom side of air duct at stop valve to preheater.

\$ 600.00 35.

COMPRESSED AIR TANKS (307)

Open two (2) compressor air tanks for examination for USCG and ABS. Thoroughly clean, wirebrush internal surfaces and remove sediment. Upon completion, close up tanks in good order, renewing gaskets, defective studs and nuts. Test relief valves and prove same in good order, overhaul or renew as found necessary.

\$ 1,100.00 36.

LUBE OIL COOLER CIRCULATING PUMP (307) -WARREN - 1500 GPM

Open up lube oil cooler circulating pump and remove impeller assembly for ABS survey and examination.

If found necessary, remove coupling and install same on spare assembly. Adjust impeller on shaft for correct vertical height. Fit casing rings to casing as necessary. Close up pump in good order using gaskets of correct thickness. Prove grease fittings clear, repack, prove free and in true alignment. Renew defective studs, bolts and nuts. Test and prove in good working order.

36-A. Replace defective rotating element on board vessel as directed by 1st Engineer.

\$ 1,850.00 37.

FEED PUMP - WARREN - SIZE 4-TMH-6, GPM 660(307)

Open casing and bearings of #2 feed pump for examination and ABS survey. Disconnect and remove impeller assembly. Check and record all casing and impeller wearing ring also inner stage clearances, check sleeves in way of packing, renew worn or defective parts. Renew worn or defective bearings. Reassemble and reinstall impeller assembly, clean casing faces, and renew casing gasket (giving special attention to thickness of gasket). Open up oil pump, check and renew defective and worn parts, clean, test, close up in good order. Repack glands with approved packing. Test out pump and prove in good working order. Parts for pump, bearings and packing also oil pump, furnished by vessel.

Open up, clean lube oil cooler, test, prove tight and close up in good order.

- \$ 750.00 38. BUTTERWORTH HEATER AND DRAIN COOLER (307)
Remove heads from Butterworth heater and drain cooler. Thoroughly clean tubes, tube sheets, heads and water boxes. Remove all scale from tubes. Test tubes, plug all leaking tubes, prove tight. Renew zincs, renew head gaskets, remove old packing and renew packing floating head packing gland. Replace heads, renew defective and broken studs, bolts and nuts. Prove tight. Replace disturbed insulation as original. Renew gasket between tube sheet and water box of heater and drain cooler.
- \$ 700.00 39. FUEL OIL HEATER (307)
Chemically clean one (1) inboard fuel oil heater in place. Make necessary removals and connections to accomplish same. After heater is clean, neutralize, wash net tubes with fresh water.

Hydrostatic test, prove tight, replace all removals in good order, renew all gaskets, defective studs, nuts and bolts, prove tight. Replace any disturbed insulation as original.
NOTE: Take necessary precautions to keep fuel oil out of bilges.
- \$ 1,350.00 40. FEED WATER HEATERS (307)(ROSS)
Remove covers of 1st, 3rd and 4th stage feed water heaters. Thoroughly clean tubes, heads and water boxes. Test, prove tight, close up in good order, renew cover gaskets. Replace all removals in good order.
NOTE: Feed temperature at 4th and 3rd stage heaters 0-25 deg. below normal.
Renew gasket between channel and shell on 1st stage heater, Ross #2112 "EUA" Exchanger.
- \$ 5,120.00 41. VALVES MACHINERY SPACE (307)
Disconnect and remove to shop. the following valves, open, machine seats and discs, grind in, renew bonnet gaskets, repack valve stems, close up, test to required pressure, prove tight. Replace, reinstall, renew flange gaskets, defective studs, bolts and nuts. Prove tight. Harden up on joints after lines reach proper temperature. Replace disturbed insulation as original:

One (1) 4" steam inlet valve to 850# to 215# reducing station serving 4th stage heater deck steam, etc.
One (1) 10" stop check valve at deaerator on 35# line.
One (1) 5" stop check valve 215 to 85# reducing station and 6" main turbine bleeder steam line.

41. VALVES MACHINERY SPACE (CONTINUED)

One (1) 5" stop valve forward deck steam line.
One (1) 3" steam stop #2 Feed pump turbine.
One (1) 1½" outlet valve from external desuper-heater trap.
One (1) 3" steam stop for #3 cargo pump turbine.
Machine bonnet and body in way ring joint.
Renew ring gasket furnished by vessel.
One (1) 4" inlet to 850 to 215 reducing station for reciprocating pumps.
One (1) 3" stop check valve HP drains at deaerator.
Build up wasted area of body in way of seat landing by welding, machine, renew seat.
One (1) 6" gate valve - renew bonnet gasket in place, before 40# dump valve for aux. exhaust
One (1) 5" steam stop valve to pumps in forward pumphroom.

Valve located in top of forward pumphroom starboard side.

Valve installation - Remove blanks for by-pass connection at 850 to 215# reducing station for reciprocating pumps. Install 3" 900# angle stop valve furnished by vessel. Renew gaskets, bolts and nuts. Leave blanks on vessel. Renew insulation on valve. Replace flange blanket.

The following valves are for salt water service:
After repairs coat with Apexior #3:

One (1) 10" stop check valve lube oil cooler pump discharge.
One (1) 8" gate - outlet from Butterworth heater.
One (1) 6" gate - fire line valve at Butterworth heater.
One (1) 6" swing check valve cross connection Butterworth heater to fire line.
One (1) 4" gate valve tie into fire line from sanitary and emergency fire pump.
One (1) 4" swing check valve, before gate valve at fire line conn. from san. and emerg. fire pump.
Renew one (1) 6" gate valve, inlet, bottom lube oil cooler, valve furnished by vessel.

\$ 490.00 41-A. VALVES MACHINERY SPACE (307)

Renew inlet valve to steam smothering reducing station size 4" (valve furnished by vessel).
Remove 3" bypass valve for steam smothering reducing station. (Install two blanks furnished by vessel).
Remove the two valves to shop, overhaul the 4" valve. Drill out sand hole in body of the 3" valve also the porous spot inlet side of valve flange, weld and dress, overhaul, test and prove tight.
Return to vessel and stow as required by 1st Engineer.

\$ 650.00 41-B. VALVES MACHINERY SPACES (307)

- a. Open up for examination port boiler main stop check and desuperheater stop check valves, close up in good order, renew bonnet seal ring for main stop check valve.
- b. Open up 3/4" bypass valve for main stop valve, lap in seat and disc, close up in good order, repack valve stem.
- c. Open up for examination 1/2" Leslie reducing valve, renew valve body, piston and rings, gaskets, main valve, cylinder liner and bottom cylinder liner plate, (furnished by vessel), close up valve in good order. Renew flange gaskets. Prove in good working order. Drill two 1/4" dia. holes in cylinder liner bottom plate.
- d. Remove blanks and install 3" repaired valve bypass for steam smothering reducing station. Replace valve insulation. Stow blanks as required by 1st Engineer.

\$ 1,200.00 42. RELIEF VALVES MACHINERY SPACES

Disconnect and remove to shop the following relief valves, open up, thoroughly clean, machine seats and discs, grind in, renew bonnet gaskets, repack, reassemble. Test, set to proper relieving pressure and prove tight at required pressure. Reinstall in good order, renew gaskets, bolts, studs and nuts. Prove tight and in good working order. Replace disturbed insulation as original,

- One (1) 2 1/2" fire pump relief valve set 125#.
- One (1) 2 1/2" Fire & Butterworth pump set 125#.
- One (1) 2 1/2" Fire and Bilge Pump (forward pump room) set 125#.
- One (1) 1 1/2" relief valve for whistle, set 160# (test with steam)
- One (1) 1 1/2" relief valve for air ejector steam, set 230# (test with steam)
- One (1) 6" x 8" relief valve at 950 to 215# reducing station (set 230#)(test with steam).

\$ 225.00 42-A. RELIEF VALVES MACHINERY SPACES (307)

Disconnect and remove to shop, open up, thoroughly clean, machine seats and discs, grind in, renew bonnet gasket, repack, reassemble, test, at required pressure, prove tight. Reinstall, renew gasket, bolts, nuts, prove tight and in good working order:
 One (1) 2" heating system relief valve set for 45#.

- \$ 1,200.00 43. EXPANSION JOINTS (307)
Make necessary removals, disconnect and remove three (3) expansion joints in circulating water piping to and from main condenser.
Install new expansion joints furnished by vessel.

One (1) located at inlet to main circulator.
One (1) located at outlet from main circulator.
One (1) located at outlet from main condenser.

Renew all disturbed gaskets, bolts, and nuts.
Test and prove tight. Approx. size 30" diameter.
- \$ 1,640.00 44. MAIN CIRCULATOR SUCTION & DISCHARGE ALSO MAIN CONDENSER OVERBOARD PIPING (307)
Remove all damaged rubber coating, wirebrush, thoroughly clean and apply neoprene coating to all bare areas of low and high injection, circulator discharge and main condenser overboard piping. Approx. size 30" dia. x 50 ft. Minimum thickness $1/8"$.
- \$ 300.00 45. DRAIN PIPING TO ATMOSPHERIC DRAIN TANK (307)
a) Crop and renew one (1) section $2\frac{1}{2}"$ dia. extra heavy steel pipe approx. 5 ft. long, two bends, two flanges. Install $2\frac{1}{2}"$ dia. flange at cropped pipe. Drain pipe to atmospheric drain tank under electric fire pump.

b) Crop and renew 4 ft. bent section of $2\frac{1}{2}"$ dia. extra heavy steel pipe drain from air ejectors to atmospheric drain tank. 3 flanges required.
- \$ 150.00 46. #1 STARBOARD DOUBLE BOTTOM TANK (307)
Renew one (1) section approx. 8 ft. long, bent, of $2\frac{1}{2}"$ dia. two flanges, extra heavy galv. pipe. Suction and filling pipe to #1 starboard double bottom tank.
- \$ 4,090.00 47. SALT WATER COOLING PIPE MACHINERY SPACES (307)
Renew the following sections of cooling water pipe, using 90-10 cupro-nickel pipe:
a) One (1) section 2" dia. approx. $2\frac{1}{2}$ ft. long, two bends, two flanges, Inlet to forward cargo heating coil drain cooler. Salt water cooling.
b) Renew one (1) $1\frac{1}{2}"$ spud in 3" copper overboard line from cargo pump turbine. Lube oil coolers. Located under aux. condenser.
c) Renew cooling water piping and fittings for lube oil coolers and air coolers of two (2) turbo generators in its entirety from stop valve at salt water service main to overboard

47. SALT WATER COOLING PIPE MACHINERY SPACES (CONT'D)
 discharge valve at shell of vessel. Requires approx. 50 ft. of 4"; 12 ft. of 2½"; 4 ft. of 2"; 15 ft. of 1½"; and 10 ft. of 1" 90-10 cupro-nickel pipe. Prove tight.
 Renew pipe insulation. Two (2) 1½" angle valves, flanged, one (1) 1½" flanged globe valve, four (4) 1½" gate valves flanged, five (5) 1½" unions, eight 1½" tees, four (4) 1½" 90 deg. ells, one (1) 2½" Y, six (6) 2½" flanges, six (6) 2" flanges, four (4) 4" flanges. Material brass.

d) Renew cooling water piping for #1 and #2 main feed pumps in its entirety. Requires approx. 15 ft. of 1/2", 10 ft. of 1¼", 72 ft. of 1½", 90-10 cupro-nickel pipe. Eight (8) 1½" unions, four (4) 1¼" unions, four (4) 1/2" unions, valves flanged, one (1) 1¼" globe valve, union end, three (3) 1" globe valves union end, and four (4) 1/2" globe valves brass.

- \$ 6,250.00 48. TWO (2) GENERATOR TURBINES AND GEARS (307)
Two (2) 750 KW (DeLaval)

Make necessary removals and raise upper casing of two (2) generator turbines for examination and survey by ABS. Check all blading, rotor and bearing clearances, hone shaft in way of bearings. Free up diaphragms, clean and straighten all damaged labyrinth seals and packing. Renew defective packing, also defective or worn bearings furnished by vessel. Check, adjust if found necessary, necessary turbine rotor and pinion shaft alignment, also adjust nozzle and thrust bearing clearances, when ready reassemble, replace all removals. Clean flexible couplings.

- \$ 900.00 Remove from vessel two (2) turbine rotors, fly ash and dynamically balance both rotors. Replace in good order. Renew two (2) pinion bearing holding screws - 3/8" x 2" (steel).

Open for examination nozzle valve chest, clean and free up all nozzle valves, adjust to proper clearances. Close up nozzle chest in good order. Harden up on all casing bolts after steam is on turbines and replace all insulation to its original good condition. Open reduction gear casings for examination and survey. Check and adjust alignment of gear and generator shaft coupling. Check and record clearances. Renew worn bearings and adjust to proper clearances.

48. TWO (2) GENERATOR TURBINES AND GEARS (CONTINUED)
Open up lube oil pumps, check all parts for wear and defects, renew defective parts, examine all orifice plates in lube oil system for wear, open for examination nozzle strainer for gears, clean, renew gaskets and replace in good order, renew all enlarged orifice plates, also overhaul and adjust all relief valves. Open up governors and controls, check relays, valves, etc., for wear and renew worn or defective parts. Open up bearing on generator shaft, check clearances, renew defective bearings, clean out bearing housings and shaft seals. Upon completion of work close up all in good order. Clean oil sumps, on completion of all work and close immediately after being inspected by Owner's Representative. Vessel to furnish necessary bearings and parts. Lube oil to refill sumps furnished by Owners. Furnish five (5) typewritten copies of all readings before and after adjustments are made to Owner's Representative.

\$ 320.00

Remove head from port generator lube oil cooler to shop, machine out old division piece and install new division piece and machine approx. size 1/2" x 2" x 12". Return to vessel.

Test and adjust overspeed trip and prove turbines and gear in good operating condition under load. Replace all removals in good order.

\$ 160.00

Remove defective speed governor element from vessel, pack and ship via prepaid motor freight consigned to: DeLaval Turbine, Inc.

South Plant

Trenton, New Jersey

Att: Mr. C. Watts

MARK: "EX, SS ESSO LEXINGTON

Humble Oil & Refining Company

Marine Dept."

Thoroughly clean, test and prove lube oil coolers tight, renew zinc plates.

All repairs under supervision of DeLaval Service Engineers for Owner's Account.

\$ 1,160.00 49.

THROTTLE VALVES FOR TWO (2) GENERATOR TURBINES (307)

Disconnect and remove to shop throttle valve for #2 and #1 generator turbines. Open for examination, machine seat and disc, grind in, renew bonnet gaskets, repack, free up and prove in good working order pilot valves. Check overspeed trip latch gear and renew all worn parts as required (parts supplied by vessel). Test valves, prove tight

49. THROTTLE VALVES FOR TWO GENERATOR TURBINES (CONT'D)
using steam; replace valves, renew flange gaskets, defective studs and nuts, prove tight, replace disturbed insulation as original. Test and prove in good working order.
- \$ 850.00 50. VENTILATION FAN AND MOTOR (307)
Disconnect and remove the following fan and motor to shop. Check and if found necessary rewind motor. Clean motor windings with approved solvent, and bake until a satisfactory megger reading is obtained, then apply one (1) coat of approved insulating varnish. Renew motor bearings and seals, packed with approved grease. Clean and dynamically balance fan and motor.
Clean and apply two coats of approved primer to inside of fan housing and motor.
Reassemble, and reinstall, connect up and prove in good operating condition in all speeds. Replace all removals in good order.

One (1) #14 boiler room exhaust HP 10
One (1) exhaust fan from galley. Clean fan and casing of grease.
- \$ 980.00 51. ELECTRIC MOTOR (307)
Disconnect and remove to shop the following motor. Thoroughly clean motor windings with an approved solvent, bake until satisfactory megger reading is obtained, apply one (1) coat of approved insulating varnish. Renew motor bearings and pack same with grease supplied by vessel. Reassemble, reinstall and connect up motor in true alignment with gear coupling and prove in good operating condition:

One (1) starboard steering gear motor, G.E., HP 100.
- \$ 240.00 52. HOOD LIGHTS - GALLEY RANGE (307)
Renew all wiring and eight (8) pigtail sockets for hood lights over galley range. Sockets to be secured with lock washers and protective sleeves. Sockets approx. 12" long. Test and prove in good working order.
- \$ 2,650.00 53. ANCHOR WINDLASS (307)
Remove caps from crankshaft bearings. Renew both bearings. Machine new bearing caps to proper size and install.
Fit and adjust bearings to proper clearances. Test and prove in good order. Bearings and caps furnished by vessel.

53-A. ANCHOR WINDLASS (307)

Remove crankshaft to shop, check for truth, Remove piston cylinder covers, cross head and guides, check to see if cylinders and crank bearings are in alignment.

Shim piston rod for port cylinder.

Renew rod for starboard cylinder, material size 2-3/4" x 53", bronze, finished size of rod 2.275, threaded each end, 2-1/4" nuts. Renew one 2-1/4" steel nut.

Replace cylinder covers, renew gaskets, defective nuts, replace removals in good order.

\$ 830.00 54. CARGO HOSE WINCH, SIZE 9 x 12 (307)(HYDE)
 a) Renew brake linings of cargo hose winch. Chip, wirebrush, apply two (2) coats of primer to bands in way of lining. Scale and clean brake drums. Free up, grease brake operating gear, linkages, pins, etc. Renew all defective pins using stainless steel material, renew defective grease fittings.

b) Remove defective and install new crank guards. Guards, brake linings furnished by vessel.

Upon completion prove that brakes and guards are in good order. Parts stood in midship square.

\$ 5,860.00 55. CARGO SYSTEM PIPE RENEWAL (527)
 Renew the following sections of cargo piping. Use extra heavy steel pipe, sandblast to white metal internally and externally and coat with Humble Rust Ban 191. Upon completion of repairs apply 125 lb. hydrostatic test to new and repaired pipe and prove tight.

#7 Center - Renew approx. 35 ft. of 12" dia. ballast pipe, straight, - 2- 12" Dresser couplings.

#8 Center - Renew approx. 35 ft. of 12" dia. ballast pipe, straight, two(2) 12" Dresser couplings.

#9 Center - Renew approx. 35 ft. of 12" dia. ballast pipe, straight, two(2) 12" Dresser couplings.

#10 Center - Renew one (1) section approx. 25 ft. long of 12" dia. ballast pipe, straight, one (1) 12" Dresser coupling, one weld.

One (1) section 12" dia. approx. 12 ft. 6" long ballast pipe, two (2) bends,

One (1) section 12" dia. approx. 8 ft. long, straight, ballast pipe, one weld - one (1) 12" Dresser coupling.

Renew missing pipe hanger bracket in way of pipe clamp.

\$ 1,815.00 55-A. CARGO SYSTEM PIPE RENEWAL (527)

a. Renew the following bulkhead pipe in ballast piping in the following tanks. Sandblast internal and external coat with Humble Rust Ban 191 the bulkhead pipe. Size 12" dia. x 42" long each, welded.

#7 Center - 1 fwd. bulkhead, 1 aft bulkhead	= 2 pcs. pipe
#8 center - Aft bulkhead	= 1 pc. pipe
#9 center - Aft bulkhead	= 1 pc. pipe
#10 center - Aft bulkhead	= 1 pc. pipe

b. No. 7 Center - Renew one (1) leaking Dresser coupling and gaskets, crop pipe as designated in two places, install two Dresser couplings with stops. Size 12" dia.

On Deck - Remove clamp and cordobond at 16 inch 90 deg. ell starboard inboard line connecting with 16" drop. Vee out and reweld in way of leak. Approx. 12" of welding required. Inboard port line, reweld broken pipe bracket for line, size 10" dia.

Renew the 16" Dresser coupling between #3 and #4 discharge lines in pumproom, Prove tight.

\$ 600.00 56. TRIP THROTTLE VALVE #2 CARGO PUMP TURBINE-G.E.(507)

Open up trip throttle valve of #2 cargo pump turbine. Remove valve seat, and install new seat, welded, furnished by vessel. Test, prove valve and seat tight. Close up, free up and renew any defective parts on latching mechanism. Check, adjust and prove in good working order overspeed and low oil pressure trips. Also that turbine will stop rotating after tripping out. Replace all removals in good order.
Work to be done under constant supervision of G.E. Service Engineer for Owner's account.

\$ 620.00 56-A. Make necessary removals, disconnect and remove trip throttle valve steam chest to shop, build up casting in way of seat by welding and machine to correct size as directed. Replace, connect up, replace all removals in good order.

\$ 350.00 56-B. Renew spacer ring for steam chest. Re-align turbine.

- \$ 2,150.00 57. #1 CARGO PUMP TURBINE AND REDUCTION GEAR-G.E.(507)
Open up #1 cargo pump turbine and gears for examination, 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 gear 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 main valve seat for tightness, renew if found leaking, examine air operated valve and speed changer, renew all worn or defective parts. Dynamically balance rotor.
- Reassemble, renew gaskets, defective cap bolts, studs and nuts. After plant is in operation, test and adjust overspeed trip, low oil pressure trip, prove in good operating condition. Renew or replace disturbed insulation as original. Work to be under supervision of G. E. Service Engineer for Owner's account. Parts furnished by vessel.
- \$ 3,900.00 58. CARGO STRIPPING PUMPS (507)
Warren, Vert. Duplex, 16 x 14 x 18.
Open liquid end valve chest on port and starboard steam stripping pumps. Remove and machine suction and discharge valve seats. Renew Sims valve discs, defective rotators, springs and stems (furnished by vessel). Label seats and stems before removing to insure that seats and stems are returned to same spot as removed from, in order that seats and valve assemblies are securely locked by locking screws. Close up valve chests in good order, renew gaskets, defective studs, bolts and nuts.
Rebush upper and lower crankshafts of both pumps and reinstall in good order.
Test both pumps and prove in good working order.
- \$ 350.00 58-A. CARGO STRIPPING PUMPS (507)
Remove steam piston and liquid piston from starboard cylinder of starboard pump. Remove valve disc and rotor from liquid end cylinder. Replace steam and liquid pistons, close up cylinders, renewing cover gaskets. Replace removals in good order.
- \$ 350.00 59. #3 CARGO PUMP DISCHARGE ELL (527)
Renew 16" x 10" cast steel reducing ell located at discharge from #3 cargo pump. Fitting supplied by vessel. Prove tight.

- \$ 1,500.00 60. AFTER PEAK TANK 184 TONS (107)
Remove all rust, scale and loose cement from all internal surfaces by scaling, scraping and wire brushing. Remove all sediment from tank and thoroughly clean area below stem tube. On completion of satisfactory cleaning and inspection by Owner's Representative, coat all bare spots with an approved coating and one (1) full coat of approved coating. After coating is dry, tanks to be filled and flushed out and refilled as directed by Chief Engineer.
- \$ 2,800.00 61. #1 DOUBLE BOTTOM TANKS PORT AND STARBOARD (107)
Remove all rust, scale and loose pint from internal surfaces by wirebrushing, scraping and scaling where necessary, #1 double bottom tanks. Port and starboard. Remove all sediment and clean. Upon satisfactory completion of cleaning, apply one (1) coat of approved coating to bare spots and one (1) full coat of approved coating to entire surface of tanks. Tanks to be inspected and approved before closing up. Tank capacity 110 tons each.
- \$ 3,130.00 62. CARGO TANK VENT PIPE (107)
Renew the following sections of defective vent pipe, using extra heavy steel pipe, sandblast to white metal externally and coat with Humble Rust Ban 191. Use cadmium plated or galvanized bolts and nuts; also coat Dresser couplings:
#4 Port - One (1) section 6" dia. approx. 12 ft. long, one bend, 2 Dresser couplings.
#4 Center - Crop and renew one (1) section 6" dia. approx. 12 ft. long, two (2) bends, one Dresser coupling, one butt weld, one 1½" coupling.
#4 Starboard - One (1) section 6" dia. approx. 35 ft. long, two bends, one Dresser coupling, one flange, one 1½" coupling.
#5 Port - Crop and renew one (1) section 6" dia. approx. 30 ft. long, two bends, one Dresser coupling, one welded butt.
#5 Center - Crop and renew 20 ft. section of 6" dia. vent pipe at vertical section, two bends, one Dresser coupling, one welded butt.
- \$ 290.00 62-A. #5 starboard - crop and renew 20 ft. section of 6" dia. vent pipe, 1 bend, 1 Dresser coupling, 1 butt weld.
- \$ 3,860.00 63. LIFEBOAT DAVITS WIRE CABLE (107)
Reverse six (6) wire cables for lifeboat davit falls. While wire is removed, remove all sheave pins for examination, clean, free up, grease and reinstall in good order. Grease with Cold Rust Ban 370 when restowing cable. Prove that wire tracks on both drums even.

- \$ 720.00 63-A. LIFEBOAT DAVITS WIRE CABLE (107)
Renew twelve (12) Federal 1205F ball bearings and twelve (12) bronze bushings - material size 1-3/16" OD x 7/8" ID x 1-3/4" in 6 floating sheaves for lifeboat falls.
- 63-B. LIFEBOAT DAVITS WIRE CABLE (107)
Renew steel cable 5/8" dia. (6 -37) for port and starboard lifeboat davits, 2 cables 250 feet long each, 2 cables 235 ft. long each. Grease cable with Cold Rust Ban 370 when stowing.
- \$ 1,200.00 64. LIFEBOAT WEIGHT TEST (107)
Make necessary preparations as required and weight test four (4) lifeboats and related equipment as per USCG requirements.
- \$ 770.00 65. FLAME ARRESTORS (107)
Open up seven (7) flame arrestors for cargo vent system, located on kingposts, for inspection in accordance with USCG and ABS requirements. Thoroughly clean and free up all parts. Fly ash arrestors as found necessary. Renew three (3) defective screens as designated (furnished by vessel). Starboard vent line forward remove slides, scale, grease, replace slides renewing broken and defective slide screws. Grease runner with Rust Ban #324. Renew broken studs also defective wing nuts. Upon completion, reinstall and close up in good order.
- \$ 210.00 66. INERT GAS SYSTEM, BUTTERFLY VALVE (107)
Disconnect, remove 6" Butterfly valve in inert gas line to #1 starboard tank. Free up, clean, renew any broken pins, renew defective seals. Ease up in way of seat (valve jams closed). Reinstall in good order, renew defective seals, bolts and nuts. Prove in good order.
- \$ 1,400.00 67. PADEYES FOR SAND JURS TANK GAUGE GUIDE WIRES (107)
Remove guide wires and renew pad eyes, welded for guide wire of tank gauge, located in bottom of the following cargo tanks:
#1 port, #1 center, #1 starboard
#2 center
#3 port, #3 center, #3 starboard
#5 port, center, starboard
#7 port, center, starboard
#8 port, center, starboard
#9 center
#10 port, center, starboard
- Replace guide wires, adjust as necessary, prove in good working order. Two (2) padeyes per tank. Dia. of padeye material 1/2" stainless steel.

- \$ 2,240.00 68. FLOOR PLATE SUPPORT -CARGO PUMP TURBINE AREA (107)
Renew the following sections of angle irons for floor plate support in area of cargo pump turbines as original, size $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $1/4$ ", one section 30" long, three sections 24" long, one section 17", four sections 48" each, one section 32", one section 36".

Renew vertical supporting pieces approx. 120 ft. of angle required.

Sandblast and coat above angle with Humble Rust Ban 191. Apply one full coat of Humble Modified Epoxy Primer No. 6566.
- \$ 830.00 69. BULKHEAD SPOOL PIECES (107)
Fabricate and install circular split type doublers around the following bulkhead spool pieces, welded:

Forward of miship house - one (1) 13" dia. x $1/2$ " doubler for 5" deck steam.
One (1) 16" dia. x $1/2$ " doubler for 8" deck exhaust.
One (1) 16" dia. x $1/2$ " doubler for 8" fire line.
Drill holes at ends of fractures, vee out, and weld to deck exhaust and fire line doublers. 2 fractures approx. 4" long each.

Aft bulkhead of pumpman locker - one (1) 13" dia. x $1/2$ " doubler for 5" deck steam line; one (1) 16" dia. x $1/2$ " doubler for 8" fire line.

Clean and apply two coats of primer and one coat of approved paint to new and disturbed work.
- \$ 460.00 70. PIPE HANGERS (107)
a) Reweld one broken bunker line pipe hanger (midship)
b) Renew six (6) 8" deck exhaust line hangers on after walkway.
c) Renew one (1) 5" exhaust line hanger #3 winch.
d) Renew one (1) 5" exhaust line hanger #4 winch.
e) Renew one (1) 5" exhaust line hanger #8 winch.
f) Reweld six broken pipe hanger legs along aft walkway
g) Install between each of the following four (4) deck steam pipe hangers forward of midship house, two (2) $5/8$ " brass washers. Renew hanger bolts and nuts. The reason for the washers is to let the pipe move in the hangers. Size of bolts $5/8$ " x $1-1/2$ ".
- \$ 200.00 70-A. Renew three (3) 5" pipe hangers on exhaust line and two (2) 3" hangers on steam line to #9 mooring winch, replace lagging and waterproof same in way of hangers.

- \$ 225.00 71. AFT STARBOARD KINGPOST (107)
Drill stopper holes each end of fracture, vee out and reweld 6" fracture in aft starboard kingpost plating at the boat deck level.
- \$ 1,250.00 72. WATERTIGHT DOORS (107)
Pair doors and frames, adjust hinges to make doors close by one man and also close in the center of gasket all around. Remove gasket, scale to bare metal the channel and packing retainer strips. Renew rubber neoprene packing, hose test and prove tight the following doors, approx. size of each door 60" x 30":

One (1) paint locker door - renew welded packing retainer strips.
One (1) forward door starboard side poop deck.
One (1) diesel generator room, renew welded packing retainer strips.
Two (2) forward side midship house one port, one starboard.
Renew dog wedges using bronze for each door, wedges to have less angle than old ones. Reason when present doors are hammered tight the vibration of ship causes dogs to become loose.
- \$ 640.00 73. STEAM OUT PIPING TO SEA CHESTS IN FORWARD PUMPROOM (107)
Renew steam out line from top of pumproom out valve to sea chests in fwd. pumproom as original. Approx. 100 ft. of 3/4" dia. extra heavy steel pipe, fittings, bent, one (1) 3/4" x 3/4" x 1/2" tee with nipple and valve for drain at bottom. Renew all defective hangers. Prove tight. Staging necessary.
- \$ 315.00 74. FORWARD DECK STEAM LINE (107)
Renew one (1) section of 5" dia. extra heavy steel pipe approx. 12 ft. long, two bends, two flanges, with one (1) 4" dia. flanged outlet approx. 4" long; one (1) 3/4" spud, one (1) 1 1/2" spud, forward deck steam line.
First section aft of forecastle bulkhead. Replace removals, test and prove all tight.
- \$ 85.00 75. DECK EXHAUST FLANGE (107)
Braze crack at flange of 1 section of deck exhaust line on foredeck. Size 8". Prove tight. Renew gasket.
- \$ 650.00 76. DECK SCUPPERS AND GUARDS (107)
a) Renew fifteen (15) missing brass scupper guards and stools as per original at designated locations of forecastle deck and aft house.

76. DECK SCUPPERS AND GUARDS (CONTINUED)

b) Prove clear all open deck drains (scuppers) including engine room, fire room fidley, diesel room, engineer's quarters, boat deck also forward and aft anchor windlass.

Prove above drains clear to Chief Mate.

\$ 360.00 77.

PAD EYE AND CLEAT REMOVALS (107)

Chip clear and remove fourteen (14) pedestal type padeyes and two (2) cleats. Grind smooth all welds. Prime coat all disturbed areas.

\$ 555.00 78.

DECK WELDING (107)

a) Vee out and reweld crack in forward bulkhead of the midship square beneath the fire line and return line adjacent to a vertical stiffener.

b) Vee out and reweld five (5) broken angles on catwalk - "A" frames.

c) Vee out and reweld two (2) cracks on the forward end of the poop deck house. Make necessary removals and replacements in way of quarters in order to accomplish this item. Hose test and prove tight.

d) Reweld stbd. cargo hose rack, where fractured. Port side of main deck fwd. of hose rack, vee out and reweld crack.

e) Reweld stbd. ventilator bracket on main pumproom vent.

f) Build up and grind smooth area of landing in way of Butterworth plate to No. 3 center, port side. Prove in good order. Hose test and prove plate tight.

\$ 2,800.00 79.

EXPANSION JOINTS (107)

Remove all packing, renew all defective studs, bolts and nuts, fair bent packing glands, renew packing in the following expansion joints:

Four (4) 5" in deck steam line, one forward of midship house, three (3) aft of midship house.

Three (3) 6" in heating coil steam

Three (3) 5" in heating coil steam and return

One (1) 3" in heating coil steam

Three (3) 5" in steam smothering system

- \$ 750.00 80. GRATING AND LADDER STEPS (107)
a) Crop and renew two (2) welded ladder steps in pumproom. Diamond plate with a rolled edge.
b) Renew a 2 ft. by 10 ft. section of 3/4" square bar grating in pumproom.
Renew a 18 inch by 12" diamond plate floor plate in main pumproom.
Sandblast to a white metal and coat above items with RB 191 before installation.
- \$ 95.00 81. ALUMINUM GANGWAY (107)
Vee out and reweld approx. 2 ft. crack at end of aluminum gangway. Search out and report to Owner's Representative any other defective areas located.
- \$ 150.00 82. MANHOLE HATCH COAMING (107)
Build up with welding and grind to a true fit the coaming landing for manhole plate. Chip, scale, wirebrush and prime coat gasket landing in cover. Install new neoprene rubber gasket. Hose test and prove tight.
- \$ 150.00 83. CHILL ROOM DECK (107)
Make necessary removals, apply suitable material to fill up cracks in deck composition. After drying time, apply two (2) coats of approved sealer to entire area of chill box deck. Approx. 250 sq. ft. area. Replace removals.
- \$ 750.00 84. WATERTIGHT DOORS (107)
Disconnect and remove to shop the following doors. Crop and renew welded gasket retainer strips all around and renew gaskets. Wirebrush and prime coat gasket landings before installing gasket. Reinstall, refit, hose test and prove tight:
a) Lamp Locker Door
b) Dry Cargo Space door
c) Forward pumproom door
- \$ 390.00 85. DOOR GASKETS (107)
Renew the weather door gaskets on the following doors: Hose test and prove weather tight upon completion of renewals:
1) Boat deck midship - port side
2) Boat deck midship - stbd. side
3) Boat deck aft, after end door on ladder to poop deck.
- \$ 85.00 86. HANDRAIL RENEWALS & REPAIRS (107)
a) Crop and renew one (1) section of ex. heavy galvanized handrail 1 1/2" by 7 ft. long, fwd. of midship house.
b) Reweld two (2) rail brackets fwd. of midship house.

- \$ 45.00 87. HANDRAIL RENEWAL - MIDSHIP KINGPOST (107)
Renew approx. 42" of 1-1/2" ex. hvy galvanized shaped 1-1/2" dia. handrail at the top of the port kingpost, midship.
- \$ 70.00 88. BRACKETS -CO-2 CONTROL SYSTEM (107)
Crop and renew seven (7) welded brackets on the CO-2 control system forward of the main pumproom.
- \$ 60.00 89. HANDRAIL EYEBOLTS (107)
a) Crop and renew twelve (12) welded eye bolts for safety chain on the main deck aft.
b) Crop and renew six (6) welded eye bolts for safety chain on the main deck forward.
- \$ 40.00 90. TONNAGE DOOR BRACKET (107)
Fabricate and renew one (1) tonnage door bracket approx. size 6" x 1" x 2" angle iron.
- \$ 290.00 91. AFT PUMPROOM EXHAUST SYSTEM (107)
Renew one (1) 10 ft. section of 12" dia. suction duct as original 1/16" galvanized sheet metal, bent, flanged.
- \$ 1,820.00 92. WIRE CHAFFING GUARDS -WINCHES (107)
Renew mooring wire chaffing guards on the following winches:
#2 mooring winch
#3 mooring winch
#4 mooring winch
#5 mooring winch
#6 mooring winch
#7 mooring winch
#8 mooring winch

Make necessary removals and replacements.
Reuse brass rubbing bar. Resecure brass bars on new fabricated guards.
Approx. size of guards is 32" long, 2" x 2" x 3/8" angle.
Sandblast all newly fabricated guards and coat same with RB 191 before installation.

\$ 2,240.00 93. WINCH GUARDS (107)

- a) Renew the following wasted winch crank guards. Sandblast newly fabricated guards all areas and coat with Humble Rust Ban 191 before installation. Guards are to be of the lattice type, using 2" x 1/4" flat bar. Approx. size of guard is 12" x 32" x 4 ft. Renew all welded clips on winch used to secure guards. All guards are to be bolted to clips and are to be portable. After installation, apply one (1) coat of Humble Modified Epcxy Primer #6566 and one coat of approved color paint:

\$ 840.00

- #1 Winch, outboard side, one (1)
- #5 Winch, forward side, one (1)
- #7 Winch, forward and aft, two (2) crank and crosshead guards. Size of each guard 12" x 28" x 6 ft.
- #8 Winch, forward side, one (1)
- #10 Winch, inboard side, one (1)
- #12 Winch, renew one (1) crosshead guard, size 14 1/2" x 32".

- b) Renew the following bull and intermediate gear guards of 1/8" steel with hinged access covers 4" x 3" approx. size 18" x 62" x 6":

- Aft anchor windlass one (1)
- #11 Mooring Winch - one (1)

\$ 280.00 94. CARGO WINCH (107)

Crop steam line to cargo winch, install 3" flange. Install 3" globe valve above valve chest. Valve furnished by vessel. Furnish and install reach rod, so that a man can control winch while operating same.

- \$ 3,000.00 95. SLOP OIL DISPOSAL (107)
Accept approx. 3,000 bbls. of dirty slop from one(1) tank and to dispose of same. Tank is to be gas freed by contractor as required to obtain gas free certificate, together with connecting pipelines and related pumps. There is to be no delay in accomplishing this item, so that repairs may proceed promptly upon vessel's arrival.
- \$ 2,000.00 96. TWO (2) 18" BITTS (107)
Furnish and install on poop deck two (2) 18 inch bitts, one port, one starboard, as designated between Frs. 17 and 19.
- \$ 450.00 97. RUDDER REPAIRS (107)
Carry out necessary work to obtain a certified chemist's gas free certificate on the rudder before starting any hot work. Remove inspection plates as necessary for examination of pintle nut and check pintle bushing clearances and submit to Owner's Representative. Harden pintle nut if found necessary. Reinstall inspection plates as original. Two (2) plates.
- \$ 300.00 97-A. RUDDER REPAIRS - ADDITION
Renew missing pintle bushing plate (opening for taking pintle clearances). Approx. size 12" x 10" x 1/2". Tack weld plate in four places. Renew flat head screws monel.
- \$ 1,840.00 97-B. RUDDER REPAIRS (107)
Make necessary removals, remove pintle pin, true up pintle pin liner. Renew pintle pin bushing (micarta staves). Replace removals in good order.
- \$ 90.00 97-C. RUDDER REPAIRS (107)
Vee out and weld 7 ft. of fractures in top plate of rudder fairwater, weld 6" fracture each bottom corner of fairwater.
- \$ 660.00 98. RUDDER STOCK (107)
Remove all old packing and renew packing in top and bottom of glands and rudder stock using Sea-RO Co #850 - 1" sq. braided and Sea Ro. Co. #155 - 1" x 2" molded packing.
Prove grease connections clear.
- \$11,250.00 99. HULL PAINTING (117)
a) The entire exterior shell surface from keel to rail, oil and grease to be removed using approved solvent, and entire area then washed down with fresh water under pressure.

99. HULL PAINTING (CONTINUED)

b) Keel to Light Load Line, Rudder and Stern Frame
Sandsweep clean all rusty and bare areas.

Apply the following paints: Red Hand Paints -

Apply two (2) full coats of #508 Primer red hand.
Then apply one (1) full coat of #506 finish coat.
Each coat approx. 2.5 mils thick.

c) Light to Deep Load Line

Apply the following Humble Paint:

One (1) full coat of Modified Epoxy Finish 6591
(Boot top red).

d) Deep Load Line to Rail

Apply one (1) full coat Humble Modified Epoxy
Finish 6597 (Hull Gray Black).

e) Miscellaneous

Repaint vessel's name, hailing port, plimsol marks
and draft marks with Epoxy White.

f) General

Paint will be supplied by Owners.

Paint may be sprayed on. Drying time allowed
between each coat of paint to be in full accordance
with manufacturer's recommendations. All surfaces
are to be inspected and approved by Owner's Repre-
sentative before applying priming coat and before
applying each additional coat.

All painting to be done only during clear and
dry weather.

NOTE: Before starting sandsweeping or painting,
cover transducer, hull anodes and reference cells;
on completion remove in good order.

\$12,670.00 100. DISTILLER, G.E.

Disconnect and remove from vessel Griscom Russel
first and second effect distiller complete, includ-
ing foundation. Fabricate and install new founda-
tion 34'-0" of 1" x 6" flat bar. Take delivery and
install Owner supplied distiller, G. E.

Furnish labor and material to complete the following
Connect salt water feed from existing line to dis-
tiller. Remove to shop one 3-1/2" dia. globe valve,
overhaul and replace. One (1) section 3-1/2" dia. x
approx. 10' bent flanged reduced to 4" at distiller.
Material 90-10 cu-ni pipe.

100. DISTILLER, G.E. (CONTINUED)

Connect salt water overboard line from valve on shipside to distiller. Approx. 18'-0" of 3" 90-10 cu-ni pipe, bent, 3 - 3" flanges, 1 - 3 to 3-1/2" reducer, 1 - 3-1/2" flange. Install 2-1/2" Leslie temperature control valve and control pilot. Owner furnished.

Spud into 3-1/2" overboard line before ship side valve with 1-1/2" outlet and connect to distiller brine connection using 1-1/2" pipe and fittings. Install in above line one (1) 1-1/2" 125 lb. swing check valve, brass, monel trim, flanged, one (1) 1-1/2" flanged, globe valve, brass, monel trim, as designated. Approx. 20 feet of 1-1/2" dia. 90-10 cu-ni pipe and fittings.

Connect 1st effect drain from distiller to drain line (existing). Furnish and install one (1) Armstrong trap 8-14 with 5/8" orifice, size 1 1/4", 150# flanged. Install vent for trap as per manufacturer's instructions. Trap to be located below distiller. Also install bypass to bilge 1 - 1-1/4" flange, brass, 3 - 1-1/4" brass flanged globe valves. Approx. 10 ft. of 1-1/4" 90-10 cu-ni pipe and necessary fittings. Relocate salinity cell from pasteurizer inlet to inlet before trap from 1st effect.

Salt water feed strainer drain from 2nd effect, pipe to funnel. Approx. 10 ft. of 1" dia. 90-10 cu-ni pipe, 1 - 1" gate valve, 1 - 1" union and fittings.

Connect distiller discharge from meter to existing tank and bilge connections. Approx. 10 ft. of 3/4" dia. and 10 ft. of 1" dia. 90-10 cu-ni pipe and necessary fittings.

Connect air ejector drain from after condenser to double bottom tank and to bilge. Approx. 40 feet of 1" dia. extra heavy steel pipe required, 2 - 1" brass globe valves 200 lbs. and necessary fittings.

Crop and plug one end of steam line (existing), connect other opening to distiller air ejector. Approx. 15 feet of 3/4" extra heavy steel pipe and necessary fittings, 1 - 3/4" 600# steel valve, 1 - 3/4" union, 1 - 0 - 400 lb. gauge, 6 ft. 3/4" OD copper tubing and fittings, and 1 - 1/4" 200# brass globe valve.

100. DISTILLER, G.E. (CONTINUED)

Install in steam line to air ejectors one (1) 1/2" welded coupling, 1 - 1/2" nipple, 1 - 1/2" 600# steel valve. Connect to pasteurizer steam supply using 1/2" extra heavy steel pipe and necessary fittings. Install one 1/2" 600 lbs. steel valve at pasteurizer inlet. Install in steam line between valve and pasteurizer one (1) 0-400 lb. gauge. 6 ft. 3/4" OD copper tubing and fittings and 1 - 1/4" 200 # brass globe valve.

Install vent line from air ejector condenser, 1 - 3/4" to 1/2" reducer, 2 ft. of 1/2" steel pipe, bent.

Connect drain from pasteurizer to drain collecting tank 15 ft. of 1" extra heavy steel pipe, tees, ells and unions as necessary, 3 - 1" 150# brass valve, one 1" Yarway impulse trap.

Connect distiller steam supply to existing reducing station, approx. 10 ft. of 6" dia. steel pipe, bent, 4 - 6" flanges, machine owner furnished orifice to suit dia. of 6" flanges.

Install necessary hangers for above various size pipe. Insulate distiller shell and hot pipes. Don't insulate feed headers or ends of heat exchangers.

Fabricate and install foundation as directed for compound tank and pump (Owner furnished). 10" x 20" x 3/16" steel plate, 3 ft. of 1-1/2" x 1-1/2" x 1/4" angle iron. Bolt compound tank and pump to foundation and connect to distiller and to ship air supply, 30 ft. of 3/8" OD copper tubing and fittings, 2 - 1/4" 200 lb. brass globe valves.

Install Owner furnished salinity panel on new distiller. Remove (3) three watertight plug boxes from old cables and install same on new distiller, furnish and install 3 conductor #14 cable from these boxes to new salinity panel. Extend existing salinity panel feeder and two existing pump feeders to new pump motor controllers on the new distiller. Remove the existing gauge light from old distiller and reinstall on outboard near vertical vent trunk and rewire to old source. Furnish and install angle bar bracket for this light. Furnish and install D-4 cable from new salinity panel to dump valve on the distiller. Remove old unused cables from the two motor controllers and existing salinity panel.

\$ 820.00 100-A. DISTILLER, G.E.
Furnish 2 - 3" gate valves, 1 - 3" globe valve, brass, for salt water overboard line. Open up 6" globe valve outlet from reducing valve. Send to shop, free up valve stem, repack, return to vessel and replace, renew bonnet gasket, defective nuts.

The above installation to meet the requirements of the USCG and ABS.

\$ 1,140.00 101. MIDSHIP DECK HOUSE ENCLOSURE BULKHEAD (107)
Furnish and install in aft bulkhead of midship deck house upper deck one door and frame. Furnish and install watertight door and frame and dogs size 60" x 42". Coat with Rust Ban 191. Furnish and install (1) one 2" dia. extra heavy pipe roller with bearings at bottom edge of opening. Furnish and install four (4) angle iron supports welded in line with the bottom opening of hatch for gangway support. Sandblast and coat with Humble Rust Ban 191, one (1) coat of H.M.E. 6566, one (1) approved color coat.

\$ 1,600.00 102. MIDSHIP KINGPOST FLOODLIGHTS (107)
Remove present midship kingpost floodlights (a total of 4 lights). Install four (4) Owners light fixtures complete underside of the kingpost platforms as directed, two lights on each platform. Lights to be installed so that light bulbs can be changed working from platforms. Staging required. Check existing cable on kingposts, if found defective, renew cable from junction box in pumpman's locker to new installed lights. Renew defective cable stools and clamps, length of existing cable 190 feet. 40 feet of cable furnished by yard. Apply two coats of primer and one coat of color paint to new and disturbed areas. Prove lights in good working order.

\$42,000.00 103. DECK SANDBLASTING AND COATING (CORROSION PROJECT)
Contractor to supply all necessary, equipment, labor, power, materials, (inc. paint), lighting, etc. required to perform this item. Drying time allowed between each successive coat of paint to be in accordance with the manufacturer's recommendation but in no case should be less than three hours. All surfaces are to be inspected and approved by Owner's Representative before applying any coat either prime or additional. No painting shall be done except during clear and dry weather.

103. DECK SANDBLASTING & COATING (CORROSION PROJ.) (CONT'D)
Suitable covers over all cowls, vent openings, port holes, doors, etc. will be required to prevent sand and dust from filtering into house interior spaces. Cover deck machinery to keep sand and dirt out of working parts. Doors and ports to be taped where possible. Any excessive dirt accumulation inside any spaces to be vacuumed upon completion of job. Area to be roped off and access to house restricted to one entrance way. Work to be completed in minimum successive days so as to free this area as quickly as possible.

Foc'sle Deck -Area: Approximately 9,000 sq. ft. Sandblast to a white metal the entire foc'sle deck area including bulwark coaming, ventilation trunks and covers, roller chock bases, cargo hatch trunk and cover, Allen Hatch, fair leads, bitts, winch bases and windlass base, davits and bases. The following items shall also be sandblasted:

Ladders from main to foc'sle deck the after bulkhead, overhead, and side plates aft of foc'sle deck,

Forward Main Deck -Area: Approximately 14,000 sq.ft. Sandblast to white metal the entire deck up to the top of the sheer strake plates including the top edge of plates and scuppers. Also include all winch bases, bitts and chocks, Shand and Jurs hatches, cargo and bunker tank trunks and covers, darts and bases of same, two ladders complete leading from main deck to catwalk, all deck valve stands (tape all valve stem and packing gland nuts), and six (6) inches up from the deck of fwd. deck house bulkhead. Also port and starboard outboard sides of midship enclosures bulkhead and deck trough and coaming.

Bridge deck, also 6" up on house and forward bulwark.

Upper Bridge Deck, 6" up on house and forward bulwark.

Navigating Bridge 6" up on outboard and forward bulwark.

Coat the above areas by spraying with Humble coatings as follows:

First Coat: One (1) full coat of Humble Rust Ban 191, three to four (4) mils dry film thickness.

Second Coat: One (1) full coat of Humble Modified Epoxy Primer No. 6566.

103. DECK SANDBLASTING & COATING (CONTINUED)

Forward Main Deck -

Third Coat: One (1) full coat of Humble Modified Epoxy Finish No. 6592. This coat to contain one lb. of Humble #6491 non-skid per gallon of paint on deck.

Foc'sle Deck - One (1) full coat of Humble Modified Epoxy Finish No. 6591 Red.

Also Bridge Deck, Upper Bridge Deck and Navigating Bridge Deck.

Tank tops, hatches, tape gauge stands, Foc'sle bulwark and bulkhead pipe lines, etc., one (1) full coat of Humble AK #6435 dark green.

Port and starboard outboard sides of midship house enclosure bulkheads - two (2) full coats of Humble Modified Epoxy #6590 white.

103-A. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM

Disconnect two (2) anodes in the forward deep tanks. Remove two (2) forward cofferdam anodes and replace with two (2) 8'-0" anodes (Owner furnished). Increase the size of the two (2) forward cofferdam shields from approx. 10' dia. to 16'-0" long x 8'-0" wide. Material for shields furnished by Owners.

Repair the other two (2) shields.

Fabricate and install support and install one (1) 200 amp. saturable reactor power supply (Owner furnished). Disconnect and remove cable from power supply to the removed anodes in #2 deep tanks. Connect up new saturable reactor power supply to ship power and new anodes as directed.

Install one (1) 50 amp breaker Owner furnished in power panel amidship for forward anodes system.

Fabricate and install support for and install one (1) 7KVA transformer in air condition room midship for power and connect to forward anode system. Transformer furnished by Owners. Work to be carried out under supervision of Englehard Inc. Service Engineer for Owner's account.

Remove two (2) aft cofferdam anodes and replace with two (2) 4' anode assemblies, Owner furnished. Increase the size of the two (2) aft cofferdam shields from approx. 10' dia. to 12'-0" long x 8'-0" wide. Material for shields furnished by Owners.

103-A. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM(CONTD)

- a. Renew the four (4) machinery space anodes: furnished by Owners. Increase the size of the two forward cofferdam anode shields to 20'-0" long x 12'-0" wide instead of 16'-0" long x 8'-0" wide.
- b. Increase the size of the two aft cofferdam anode shields to 16'-0" long x 12'-0" wide instead of 12'-0" long x 8'-0" wide. Repair two (2) other shields (port side) instead of four (4) shields.
- c. Install new reference cell assembly in new bow section, furnished by Owners. Remove reference cell enclosure and pipe from old bow and install in new bow section, with necessary pipe hangers. Eight (8) feet of 1-1/4" dia. extra heavy pipe required, welded.

\$ 1,825.00 104. TANK CLEANING AND GAS FREE (137)
Clean and gas free as necessary to obtain Chemist Certificate for the following tanks:

- #1 and #2 starboard deep tanks
#8, #9, #10 center cargo tanks

\$ 200.00 105. MAIN FEED LINE GASKET (307)
Renew one (1) 6" flexitaillie gasket in main feed line to boilers. Located below floor plates in boiler room. Examine flange faces for steam cuts. Prove tight. Replace insulating blanket in good order.

\$ 325.00 106. QUARTERS VENTILATION (107)
Remove paneling at diffuser in Chief Engineers room, open up vent duct as necessary to make damper accessible, free up damper, refit so that it moves freely. Renew reach rod and handle for damper. Close up vent duct and replace paneling as original. Remove all dirt in way of work and from room.

\$ 410.00 107. SINK DRAIN VALVES IN PANTRIES, GALLEY, ETC. (107)
Overhaul drain valves in sinks in pantries and galley. Made by "Atlantic" size 2". Renew all bent and/or broken rods, renew all "O" rings, renew all springs, prove valves tight and in good operating condition.
Total of eleven (11) sinks.
Furnish Chief Engineer one (1) drawing #235-1464, "List of Faucets".

- \$ 180.00 108. #3 MOORING WINCH (107)
Remove 3' section of 3" connection pipe between reverse valve and operating valve. Braze leak at flange of lower section of pipe. Test, prove tight. Replace removed section of pipe, renew flange gaskets, repack packing gland, prove in good order.
- \$ 360.00 109. #11 MOORING WINCH (107)
Repair or renew 5" corrugated deck expansion joint for #11 mooring winch exhaust. Prove water tight.
- \$ 1,100.00 110. STEAM SMOTHERING SYSTEM (107)
Renew the following sections of steam smothering pipe using extra heavy steel pipe and fittings. One (1) section 5" dia. approx. 11'-6" long main line under walkway, straight, 2 flanges; one (1) manifold 4" dia. approx. 4' long with 90 deg. elbow one end, six (6) 1-1/2" dia. outlets, two flanges. (For #7 and #8 tanks). Two (2) sections of 1 1/2" dia. approx. 18' long, one to port wing and one to port settler fuel tanks, renew from valves at manifold to union at fwd. side of pumproom bulkhead. Four (4) bends, two (2) unions, one (1) 90 deg. ell, two (2) 1 1/2" x 6" nipples each section.
- \$ 2,575.00
Renew four (4) manifolds, 4" dia. approx. 4' long with 90 deg. elbow, one end, six (6) 1 1/2" outlets, two flanges, 12 - 1 1/2" nipples, 12 - 1 1/2" unions each manifold, use valves from old manifolds. One manifold for #2 and 3, one for 5 and 6, and one for 9-10 and aft cofferdams, etc.
- Renew 25 ft. of 1 1/2" dia. pipe, bent, with fittings to #7 starboard tank.
Renew 25 ft. of 1 1/2" dia. pipe, bent, with fittings to #8 center tank.
Renew 25 ft. of 1 1/2" dia. pipe, bent, with fittings to #7 center tank.
Renew one (1) section main line 5" dia. approx. 15'-6" long, straight, 2 flanges, below manifold for 5 and 6 tanks.
Free up and clean valves, and prove lines clear to the following tanks: Stbd. Fuel Oil Settler, Aft Port Cofferdam, 9 Center, 3 Center, 3 Starboard.
- Renew one (1) section bottom of fwd. pumproom, 1 1/2" dia. approx. 20' long, 2 bends, 1 tee, 2 - 1 1/2" x 9" long nipples, welded, 3 hangers.
- Renew 3 pieces of micarta 1 1/2" x 1/4" x 41" under catwalk grating in way of steam smothering pipe renewal.

- \$ 575.00 110. STEAM SMOTHERING SYSTEM (CONTINUED)
Repairs found during USCG test.
Renew two (2) sections main line, each section
dia. 5" approx. 12'-6" long, straight, 2 flanges,
1 fixed bracket, welded.
Two (2) sections 5" dia. approx. 10'-0" long each,
straight, welded, four flanges.
- \$ 1,530.00
Renew the following sections, welded, of steam
smothering system pipe, material extra heavy
steel:
One (1) section 5" dia. x 18'-0", straight,
2 flanges.
One (1) section 5" dia. x 16'-0", straight,
2 flanges
One (1) section 5" dia. x 18'-2", straight,
2 flanges.
One (1) section 5" dia. x 18'-0" straight,
2 flanges
One (1) section 5" dia. x 12'-3", 1 bend,
2 flanges.

Drain line 3 - 3/8" nipples, 1 - 3/8" gate valve,
200 lbs., 1 - 45 deg. elbow.
One (1) section 3" dia. 32" pipe, 1 - 45 deg.
ell, 2 flanges - line to manifold for #9 and #10
center tanks.
- \$ 125.00 111. GASKET DECK STEAM LINE (107)
Renew one (1) gasket in 5" deck steam line located
in co-2 room. Notify Repair Inspector if flange
faces are found steam cut. Renew defective bolts
and nuts. Prove tight. Replace insulation blanket
as original.
- \$ 300.00 112. BALLAST VALVE REACH ROD #6 STARBOARD (107)
Renew coupling and bolts for ballast valve reach
rod #6 stbd. tank. Also renew bushing near
coupling. Size of rod 1 1/2". Staging required.
Prove reach rod in good working order. Coupling
approx. 20 ft. below deck.
- \$ 200.00 112-A. Renew 7' of 1 1/2" rod in way of coupling, 1 bearing
cap, two bearings (Micarta).
- \$ 200.00 113. OVERBOARD DISCHARGE VALVE FROM MAIN CONDENSER
TO FIRE AND BUTTERWORTH PUMP (307)
Open one (1) 8" gate valve discharge, from main
condenser to fire and Butterworth pump suction
manifold for examination. Repair as directed.
- \$ 350.00 114. UPTAKE FRACTURES (307)
Vee out, drill stopper holes, reweld 4 feet of
fractures in uptake of starboard boiler.

- \$ 100.00 115. EMERGENCY DIESEL GENERATOR (307)
Check, clean, adjust contacts of relay in emergency diesel automatic controller.
Supply Chief Engineer one (1) drawing for Monitor Controller Co. Automatic Controller, Boston 84, Mass.

Volts 450, Cy. 60, Ph. 3, Amps 200
Type 8690 HT 3CC 2, Ser. 378097
- \$ 185.00 116. LUBE OIL COOLER CIRCULATING PUMP DISCHARGE PIPE (307)
Renew one (1) orifice plate in lube oil cooler for circulating pump discharge line to lube oil coolers. Material brass, size 13½" OD x 3-15/16" ID x 3/8", with 8 - 7/8" bolt holes.
- \$ 2,235.00 117. CARGO TANK BALLAST PUMP-WORTHINGTON 8LN18V01(507)
Open cargo ballast pump, 4000 GPM, single stage. Remove impeller assembly to shop, renew casing rings, machine impeller rings, renew shaft sleeves and "O" rings, renew ball bearings. Renew impeller key 5/8" x 8-7/8" long. Braze impeller wearing ring in way of twelve (12) keeper screws. Re-assemble, replace in pump, rejoin, repack, prove pump and turbine in true alignment. Test and prove in good working order. "O" rings furnished by vessel.
- \$ 400.00 118. LIFE RING STOWAGE (107)(USCG REQUIREMENT)
Furnish and install two (2) quick release life ring stowage racks. Material CRES. One port, one on starboard side, aft wings of Navigating Bridge. Staging required.
- \$ 680.00 119. LIFERAFTS (107)(USCG REQUIREMENT)
Install one (1) 10-person liferaft and foundation midships, and one (1) 15-person liferaft and foundation aft as directed. Apply one coat of primer and one coat of color to foundations and damaged areas of deck.
- \$ 1,080.00 120. LIFEBOAT COVERS (107)(USCG REQUIREMENT)
Install in each lifeboat support plates (brackets) for life boat cover support. A total of eight brackets each boat as per sketch. furnished with covers. Covers and brackets furnished by vessel.
- \$ 100.00
Install in the weather covers for the two motor life boats 2 pockets in each cover in way of brackets installed for cover support. Size each 8" x 8" x 8".

- \$ 965.00 121. TAILSHAFT (107)
Dispose of oil from system (may be pumped into ship's bunker fuel tanks). Fill system with oil furnished by vessel. Check centimeter gauge reading in presence of Owner's Representative. Drain aft seal, flush and refill with new oil furnished by vessel. Shift sleeve of fwd. seal to new location for seals, adjust to true alignment. Fill seal with oil.
- \$ 125.00 122. STARBOARD DIFFUSER DRAIN CHILL BOX (107)
Renew 36" of 1" dia. pipe, 2 - 1" 90 deg. ells, 1 - 1" nipple, 1 - 1" union, material galvanized. Drain line from starboard diffuser in chill box. 1 - 1" pipe bracket.
- \$ 175.00 123. FORECASTLE BULKHEAD (107)
Install one (1) split welded doubler around deck exhaust line in way of forecastle bulkhead. Size 16" OD x 8-3/4" ID x 1/2".
- \$ 350.00 124. #1, #2 MOORING WINCHES (107)
Crop and renew at expansion bellows exhaust pipe from #1 and #2 mooring winches. Size of each 5" dia x 6" long, flanged one end, butt welded other end, extra heavy steel pipe. Renew 5" exhaust valve furnished by vessel #2 mooring winch.
- \$ 780.00 125. PROPELLER FAIRWATER (107)
Disconnect and remove propeller fairwater to shop, renew welded end plate, size 24" dia. x 1/2" plate, weld up pitted holes. Sandblast and coat outside of fairwater with cordobond and glass cloth.
- \$ 365.00 126. SPECTACLE BLANK (307)
Renew steel spectacle blank between main circulator discharge and main condenser as per sample. Approx. size 1/2" thick 39" x 75" one end drilled with (28) 1-3/8" dia. holes. The other end machined with 30" dia. hole and drilled with (25) 1-3/8" dia holes. Coat blank with Apexior #3.
- \$ 1,840.00 127. MEGGER TEST READING (307)
Remove grounds and low megger readings from the following circuits:
Stbd. Lifeboat Aft
Stbd. Lifeboat Fwd.
Telephones
Gen. Alarm
Mast Head Light
Fwd. Anchor

127. MEGGER TEST READING (CONTINUED)

Lt. Panel L8 Poop Dk. Aft Circuit 3
 Emer. Lt. Panel E1 Midship Circuit 3
 Lt. Pnl. L-2 Midship Circuit 8, Circuit 11
 Power Panel, 2 EP & Z-A1 Wheelhouse Circuit 1
 Lt. Pnl. L-3 Midship Circuit 7, Circuit 17
 Lt. Pnl. L-6, Boat Dk. Circuit 8, Circuit 5
 Lt. Pnl. L-8A, Circuit 5
 Lt. Pnl. L-5, Circuit 9, Circuit 15

After repairs, furnish inspector 5 copies of megger readings.

\$28,716.00 128. BULKHEAD AND HORIZONTAL STIFFENER FRACTURES (107)
 Note of Protest - Heavy Weather 23, 24, 25 of February 1965 Ostrica, La. to New York

Flood bottoms of all cargo center tanks, and fill wing tanks to cover outboard riveted plate, while vessel is in drydock. Mark and report all leaks to Owner's Representative. Remove and replace plugs and drain water as necessary on completion.

Veel out, weld up from both sides the following bulkhead fractures, prepare surface and reweld the following horizontal stiffener fractures, where horizontal stiffener weld to three brackets at each end.

#2 Port Tank Fwd. Bulkhead Counting from Top
Outboard #6, 8, 9, 10, 11, 12

4 Stages, 6 fractured stiffeners, each fracture approx. 6".

Inboard - #5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16 - 11 fractured stiffeners, 4 stages, each fracture approx. 6".

#2 Stbd. Tank Fwd. Bulkhead

Outboard - #7, 8, 9, 10, 11, 12, 13 - 7 fractured stiffeners, 3 stages.

Inboard - #7, 9, 10, 11, 12, 13, 14, 15, 16 - 9 fractured stiffeners, 4 stages, each fracture approx. 6".

#3 Starboard Fwd. Bulkhead

Outboard - #9, 10 - 2 fractured stiffeners, 1 stage, each fracture approx. 6".

Inboard - #9, 10, 11, 12, 13 - 5 fractured stiffeners, 2 stages, each fracture approx. 8" aft bulkhead.

Outboard #9, 10, 11, 12, 13 - 5 leaks in way of three brackets - 2 stages.

Inboard #12 - 1 leak in way of three bracket, 1 stage.

128. BULKHEAD & HORIZONTAL STIFFENER FRACTURES (CONT'D)#3 Port Aft Bulkhead

Outboard - #10, 11, 12 - 3 leaks in way of three brackets, 2 stages.

#4 Port Fwd. Bulkhead

Outboard - #7, 8, 10, 9, 11, 12, 13, 14, 15, 16, 17, 18 - 12 fractured stiffeners, each fracture approx. 6", 5 stages. Fill tank, prove tight.
3 leaks in way of #10, 11, 12, three brackets.

#4 Stbd. Fwd. Bulkhead

Outboard - #6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 - 12 fractured stiffeners, 5 leaks in way of three brackets, 5 stages, each fracture approx. 6".

Inboard - #9, 10, 11, 12, 13, 14, 15 - 7 fractured stiffeners, 4 stages.

#4 Stbd. Aft Bulkhead

Outboard - #12 - 1 leak in way of three brackets, 1 stage, fill tank, prove tight.

#5 Port Fwd. Bulkhead

Outboard - #7, 8, 9, 10, 11, 12, 13, 14, 15 - 9 fractured stiffeners, 4 stages.

Inboard - #7, 8, 9, 10, 11, 12, 14 - 7 fractured stiffeners, 4 stages.

#5 Port Aft Bulkhead

Outboard - #9, 1 leak in way of three bracket, 1 stage.

#5 Starboard Fwd. Bulkhead

Outboard #8, 9, 10, 11, 12, 13, 14, 15, 16 - 9 fractured stiffeners, 5 stages, each fracture approx. 6".

#6 Port Fwd. Bulkhead

Outboard - #7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 - 12 fractured stiffeners, 1 leak #9 three brackets, 5 stages, each fracture approx. 6".
Fill tank, prove tight.

#6 Stbd. Fwd. Bulkhead

Outboard - #6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 - 11 fractured stiffeners, 4 stages, each fracture approx. 6".

Inboard - #11, 12 - 2 fractured stiffeners, 1 stage.

Aft Bulkhead - #1 - 6" fracture aft vertical outboard web at #11 shell longitudinal. 1 stage,
Fill tank, prove tight.

128. BHD. & HORIZ. STIFFENER FRACTURES (CONTINUED)#6 Center

1 - leak on port longitudinal bulkhead approx.
16'-0" aft of forward bulkhead near #8 bulkhead
longitudinal from top, 1 stage.

1 - leak on starboard longitudinal bulkhead approx.
6' aft of forward bulkhead near #11 bulkhead
longitudinal from top, 1 stage.

#7 Port Fwd. Bulkhead

Outboard - #8, 9, 10, 11, 12, 13, 14 - 7 fractured
stiffeners, 3 stages, each fracture approx. 8"
long.

#7 Stbd. Fwd. Bulkhead

Outboard - #6, 7, 8, 9, 10, 11, 12, 13, 14, 15 -
10 fractured stiffeners, 4 stages, each fracture
approx. 8" long.

#8 Port Fwd. Bulkhead

Outboard - #11, 12, 14, 15 - 4 fractured stiffeners
2 stages, each fracture approx. 8".

#8 Stbd. Fwd. Bulkhead

Inboard - #7, 8, 10, 11 - 4 fractured stiffeners,
2 stages, each fracture approx. 6".

#9 Port Fwd. Bulkhead

Inboard - #5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16 - 12 fractured stiffeners, 4 stages, each
fracture approx. 6".

Outboard - #7, 8, 9, 10, 11, 12, 13, 14, 15, 16,
- 10 fractured stiffeners, 4 stages, each fracture
approx. 6".

#9 Starboard Fwd. Bulkhead

Outboard - #5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 -
11 fractured stiffeners, 4 stages, each fracture
approx. 6".

Inboard - #5, 6, 7, 9, 10, 11, 12, 13, 15, 16 -
10 fractured stiffeners, 4 stages, each fracture
approx. 6".

Caulk and weld and make tight all leaking rivets
in seams.

Retest tanks, head up and prove repairs tight to
the satisfaction of ABS and USCG.

\$ 480.00 129.

PROPELLER (107)(Insurance Claim (Time and Place Unknown))

Heat and fair one (1) bent #4 blade 45" long, 8"
deep. Heat and fair bent #2 blade 17" long, 4"
deep. Dress leading edge of Blade #3. Weld one
fracture and dress #1 blade approx. 3" long by 2"
deep. Dress 4 nicks in blades.

- \$ 250.00 130. STEAM LINE TO HP TURBINE (307)
Grind out ten (10) sand holes in flanged casting elbow main steam line to HP turbine for examination of depth of each hole.
- \$ 190.00 131. STEAM OUT PIPE TO SEA CHESTS (307)
Renew one (1) section 3/4" dia. extra heavy steel pipe approx. 8 ft. long, two flanges, 3 bends, welded, steam out line to lube oil cooling water pump sea chest.

Renew one (1) section 3/4" dia. extra heavy steel pipe approx. 10 ft. long, four bends, 1 flange, 1 coupling, welded, steam out pipe to high and low main injection sea chests.
- \$ 135.00 132. DRAIN LINE FROM DISTILLER TO MAIN & AUX CONDENSER (307)
Renew one (1) section of pipe, 1 1/2" dia. approx. 4 ft. long, 2 flanges, 2 bends, extra heavy galv.
- \$ 285.00 133. FORWARD PUMPROOM (107)
Renew twenty (20) gauge line brackets (copper tube) from upper deck to gauge board above fire and bilge pump forward pump room. Stage required. Each bracket consisting of stool and clamp. Size each approx. stool, 1/8" x 3/4" x 1" legs x 4" long, welded. Renew two brackets for gauge board at pump 1/8" x 6" x 6" legs. Renew discharge gauge line fittings, brass, from fire and bilge pump.
- \$11,100.00 134. BOILER REFRACTORY (357)
Repair brickwork and refractory in furnaces of two (2) boilers. Renew front walls, including insulation, anchor bolts, brick of each boiler. Renew shaped burner tile in way of eight (8) burner openings.
Remove 4 short bladed grids from port boiler and install 4 short bladed grids same as starboard boiler, 2 from starboard boiler and 2 new ones (furnished by Owners). Renew 2 shelf plates 1/2" x 6" x 5'-0" steel flat bar above top burner openings. Renew 150 ft. of #16 Z bar for anchor bolts. Fair both inner casings in way of burner openings.

Repair refractory back wall of each boiler, remove defective refractory and renew with Kaocast behind tubes.
Renew top rear corbel each boiler.
Repair top and bottom screen baffle each boiler.
Renew front and back fire baffles each boiler.
Renew refractory in superheater tubes opening furnace side each boiler.

134. BOILER REFRACTORY (CONTINUED)
Renew refractory in way of superheater headers both boilers.
Remove defective pebble and brick top layer and renew pebble on floor to approx. $2\frac{1}{2}$ " thick each boiler.
Renew corbels in way of front wall, side wall, rear wall headers and lower drum.
Remove all debris from fireroom and vessel as it is removed from boilers.
All brick, insulation and refractory supplied by Yard.
- \$ 225.00 135. GALLEY (107)
Check out galley bake oven, tighten loose connections, renew fuse, repair indicating light. Prove in good working order.
- \$ 380.00 136. #9 MOORING WINCH (107)
Renew one (1) section extra heavy steel pipe exhaust from #9 mooring winch, dia. 5", approx. 42" long, 1 right angle bend, reduced to 4" one end, 2 flanges. Insulate and waterproof insulation.

Renew 11 - $3/4$ " pipe hangers for drain line from aft deck winches.
- \$ 115.00 137. MAIN CIRCULATOR MOTOR CONTROLLER (307)
Repair motor controller door switch for main circulator motor.
- \$ 165.00 138. GLAND SEAL EXHAUSTER MOTOR (307)
Check out and repair controller for gland seal exhauster motor.
- \$ 50.00 139. MAGNETIC COMPASS (107)
Weld port fractured compensating ball bracket for magnetic compass top of wheel house. Material aluminum.
- \$ 180.00 140. STAYS (107)
Renew stay for radio antenna port side aft, size $1/2$ " approx. 40 ft. long, 2 eyes, galvanized.
Renew one (1) stay for life boat mast (aft starboard) as per sample, size $1/4$ ", approx. 8 ft. long (stainless steel).
- \$ 340.00 141. STEAM AND EXHAUST DECK CONNECTIONS (107)
Renew one (1) 3" dia. tee deck connection with steel collar, 3 ft. of 3" pipe, 3 flanges, collar size $1/2$ " x 18" dia. Renew one (1) 5" dia. tee connection, material 4 ft. of 5" pipe, 1 - 5" 90 deg. ell, 3 flanges, 1 collar $1/2$ " x 20" dia. welded.

- \$ 140.00 142. GUIDE WIRE FOR TANK GAUGES (507)
Renew one (1) stainless steel guide wire for tank gauge float #9 center.
- \$ 650.00 143. HAND WHISTLE PULL (507)
Repair hand whistle pull as found necessary to make work properly from bridge (3 stations). Shorten wire and install turnbuckle in stack just above deck. Supply and install two springs each approx. 18" long. Remove panels and replace in Captain's Office and shorten wire to port bridge station, install turnbuckle. Install turnbuckle starboard bridge station. Shorten cable to whistle pull in wheelhouse.
- N.C. 144. PARTS FOR 1-1/2" BAILEY FUEL OIL REGULATING VALVE (307)
Hold in storage for Owner's disposition, One (1) cardboard box from Fisher Governor Company containing parts for 1-1/2" Bailey Fuel Oil Regulating Valve except valve stem packing, which was removed and sent to Fisher Company for correct size packing. Box marked for SS ESSO WASHINGTON.
- \$ 1,400.00 145. CATWALK SHELTER
Fabricate and install a shelter over forward and after catwalk similar to that shown on N.N. Dwg. No. 127-3209. Shelter to be six ft. long and placed in location designated by Owner's Representative. Sandblast and coat new steel with Rust Ban 191.
- \$49,000.00 146. INSTALLATION AND MODIFICATION FOR PEABODY CONTROL SYSTEM
The following specification lists, in general, the necessary work involved in installing owner supplied, USCG and ABS approved, additional Boiler and Engine Room equipment.
- It is not the intention to detail every small item, size or exact location of same. Material estimates are approximate and contractor shall obtain his own measurements and exact locations from actual work involved.
- Contractor shall install owner supplied integrated control panels as required using the specifications and drawings furnished all in accordance with the latest rules and regulations of the USCG and ABS.
- The installation and testing of the systems shall be carried out under the supervision of a representative of Peabody Engineering Corp., cost of supervision to be for Owner's account.

146. INSTALLATION & MOD. FOR PEABODY CONTROL SYS. (CONT'D)
Contractor shall make necessary drawings of the completed installation, including addition and alterations to Bailey System, showing in detail the material layout as installed by him and exact locations of Owner supplied control consoles in their final positions. Five (5) complete sets of drawings are to be furnished to the Owners.

All material supplied by Contractor shall be that as approved for the required service, whether fuel oil, steam or air.

All exposed steam and fuel oil lines, as installed by Contractor, are to be adequately braced and lagged. All other disturbed pipe line insulation is to be renewed. All new flange joints are to have insulation type blankets.

Contractor is to make necessary removals and replacements as required from detailed dimensions to place aboard vessel the assembled control consoles in their final positions. Removal of a section of engine room skylight and a section of fire room forward bulkhead is deemed necessary to accomplish this item.

All electric cables are to be properly run and securely bracketed. Care is to be taken not to damage cables while laying out same. All cable leads are to be proven intact, by the sound powered phone method. Multi-lead connections to terminal blocks shall be made with the open type sta-kons. All furnace front cable connections are to be made with "amphenol" screw type connectors, M.S. series, Contractor to supply all material except where stated specifically otherwise.

The new piping on the furnace and boiler fronts shall be connected so that it may be easily removable. Necessary flanges and/or pipe fittings are to be utilized in order to accomplish this.

All pipes one (1) inch or over, also fuel oil supply lines, shall be of all welded construction, wherever possible, and where there are screwed connections, these shall be seal welded.

Upon completion of the modifications and installations, the entire system is to be tested as required by the societies involved, both hydrostatically and functionally.

146. INSTALLATION & MOD. FOR PEABODY CONTROL SYS. (CONTD)

Vessel is to be adequately secured to dock to allow the maximum permissible dock RPM's for at least a four (4) hour period.

Due to the many intricacies involved and the necessity of the Owner to obtain required approvals of the completed installation, it is requested that the contractor accomplish this item in a minimum number of successive continuous days from vessel's arrival, to allow sufficient time within the scope of the allotted repair period to make all the required tests and adjustments that may be necessary to prove out the system.

Engineer's Emergency Call System

Install in engine room, engineer's room and passageway, engineer's emergency call system.

One (1) Owner supplied six (6) station annunciator to be mounted in engine room at the control platform to be connected to emergency lighting circuit.

One (1) buzzer and pushbutton is to be installed in each Engineer's room, a total of five (5) rooms.

One (1) 6" bell is to be installed in passageway in engineers' lounge area. Connect above units to annunciator panel in engine room.

Owners will supply annunciator panel, 6" bell, room buzzers and pushbutton.

Contractor is to supply all other material to complete this system.

The approximate amount of cable required is as follows:

1000 ft. of 4 conductor #14 gauge FSCA-3

Cables to run on existing cable runs on bulkheads, passageways as feasible and practicable and secured with necessary clips.

All units are to be tested and proven in good working order to the satisfaction of the U. S. Coast Guard and Owner's Representative.

146. INSTALLATION & MOD. FOR PEABODY CONTROL SYS. (CONTD)Air Supply Line

Crop outlet air supply line in designated location leading from combustion control air supply tank. Spud into line with a welded one (1) inch diameter extra heavy steel spud. Install a 1 in. diameter brass 150# master gate valve on this outlet. Supply and install all necessary material to run a new one inch (1") extra heavy brass line from air tank to the forward end, between the two (2) boilers. Install owner supplied air filter (Refrigifilter) in this line complete with bypass line and valve. Furnish and fabricate angle iron foundation for above filter. Approx. 10 ft. of 2 x 2 x 5/16 angle required. Install drain pipe and valve from filter and pipe to nearest deck drain. Approx. 20 ft. of 1/2" dia. brass pipe and valve required. Connect up refrigifilter motor to a suitable 115 volt supply source. Size of motor 1/2 HP, 115 V.A.C., 50/60 cycle, single phase. Yard to supply cable, cable clamps, etc. to make motor operable and entire installation approved as required. This one inch line will "tee" off at terminal point, into two (2) 3/4" dia. extra heavy brass branch lines, one to each fire room control console. Install one (1) 3/4" diameter brass 150# gate valve in each branch line at take-off point. The new air supply line will connect to the consoles thru a "cross" type fitting. Lower end of this fitting will have installed a 3/4" brass gate valve. Upper side of cross from each console will connect to a "Copes' Thermostat" installed on steam drum forward end of each boiler.

All lines are to be securely bracketed. If control valves are inaccessible, reach rods must be installed, complete as necessary.

Estimated requirements for air line will be:

- 80 ft. of 1" brass pipe and fittings
- 80 ft. of 3/4" brass pipe and fittings
- 80 ft. of 5/16" copper tubing, with fittings
- Four (4) one inch diameter 150# brass gate valves
- Three (3) 3/4" diameter 150# brass gate valves

"CUNO" Oil Filter Installation

Disconnect and remove fuel oil lines as necessary to accomplish a modification and addition to filter assembly. Supply and install one (1) inlet and one (1) outlet 3" diameter flanged, steel globe valve 600# on present existing discharge strainer. Crop lines and install necessary welded flanges.

146. INSTALLATION & MOD. FOR PEABODY CONTROL SYS(CONTD)
"Cuno" Oil Filter Installation (continued)

Immediately before inlet valve and immediately after outlet valve of present existing strainer, crop fuel line and install a welded "tee". Total of two (2) 3" diameter "tees" required. Supply and install a 3" diameter steel, flanged, 600# globe valve on each "tee". Supply and install necessary welded flanges.

Accept delivery of Owner supplied "Cuno" type filter. Filter dimensions are approx. 40" high and 20" diameter. Fabricate and install 3" diameter sections of pipe extra heavy steel, flanged as necessary to connect up filter in line. Will require approx. 12 ft. of 3" diameter shaped, flanged pipe. All new pipe is to be lagged and all disturbed lagging on original fuel oil line, is to be renewed.

Fabricate and install a suitable welded, fabricated base plate for installation of "Cuno" filter. Will require approx. 2 ft. x 2 ft. of 5/8" thick plate and twenty (20) feet of 3" x 3" x 1/2" thick angle iron. Approved 22" above floor plates.

Install 3/4" diameter drain line in bottom of filter, complete with approved valve. Cut hole in center of base plate for drain line and valve.

Crop inlet and outlet lines of newly installed "Cuno" filter and install one (1) welded 1/2" diameter extra heavy steel welded boss in each line. Total of two (2) required.

Install two (2) gages, one (1) to each boss fitting complete with necessary tube and fittings. Gages are to be mounted in an easily visible location. There is to be a gage valve installed in each line to each gage. Owner will supply gages only.

Contractor is to mount control panel for "Cuno" filter motor and connect up same to a suitable 115 volt supply source. Owner will supply control panel. Contractor is to supply all other items necessary to make motor operable and entire installation approved as required. Approximately thirty (30) feet of cable required for this fractional HP motor.

146. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTINUED)Bailey Automatic Feed Water Valves (317)

Remove two (2) automatic Bailey feed water regulator valves to shop (size 4"). Disassemble valves and renew seat and ~~wages~~ together with all defective parts. Rejoint, repack and assemble, test and prove tight. Reinstall valves aboard vessel in good working order with new gaskets. Replace or renew all disturbed insulation. All parts to be furnished by Owner. All work to be carried out under supervision of Bailey Service Engineer.

Installation of Copes Type P Thermostat (H.O. & R. Co. Dwg. 270-525-2)

It will be necessary to remove 1" tee on boiler drum (air vent and gauge connection) and replace with 1" cross. Connect 3/4" Sched. 80 steel pipe to top by pass Copes thermo (socket weld coupling). Disconnect and crop 1/2" steel flanged pipe on line from boiler drum to lower connection, Bailey D.L. trans. Install 1" tee formerly on boiler drum. Run flanged 3/4" Sched. 80 pipe to bottom cam on by pass Copes thermo (3/4" socket weld).

Reconnect line to Bailey D.L. trans. supply lines to Copes thermo to have two owner supplied 3/4" gate valves socket weld.

Run 1/2" Sched. 80 steel pipe from Copes thermo blow down valve flanged to fireroom bilge. Run 1/4" copper tubing to air supply and L.W.C. air switch each boiler control panel.

Valve Boards (2)

Install valve board on front of each boiler along side of burners and pipe to burners as directed. Will require being fitted to existing fuel oil supply line. Will require approx. 56' of 3/4" O.D. tubing per boiler.

Engine Room Deck Console

Fabricate suitable foundation for engine room deck console. Approx. 48" x 48" x 6' high. To be mounted on deck plating with suitable stiffeners under deck plating.

Burner Registers - 12

Remove twelve (12) burner registers and modify eight (8) as directed.

Remove metal rings and short bladed grids from two (2) top fires each boiler. Install welded metal blanks over openings inner casing. Install brick as front wall.

Weld metal plates over outside casing in way of two (2) top burner registers and insulate as original.

146. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTINUED)Burners

Extend threads on each eight (8) distance pieces approx. $1\frac{1}{4}$ " , cut approx. $1\frac{1}{4}$ " off end of each piece. Install eight (8) new impeller plates and distance pieces in 8 registers and adjust same so that burner fits in register as per drawing. Impeller plates, distance pieces and burners furnished by vessel.

Solenoid Valves

Remove two (2) existing 1 1/2" air operated solenoid valves from existing atom, steam line, Supply and install flanged spool pieces. Disconnect electric cables and obsolete air lines.

Size of flanged spool pieces, $1\frac{1}{4}$ " dia. x approx. 42" long. Install in each spool one (1) $1\frac{1}{4}$ " , 300 lb. check valve, screwed.

Electrical Sub-Panels

Fabricate suitable foundation to support two (2) sub-panels in fire room. One for port and one for stbd. boiler at a designated location. Panels approx. 28" x 28" x 6' high, foundation to run from deck to above floor plates. Sway brace as directed.

Electrical Cable Installation

Provide extension to existing electrical cable raceways and make bulkhead penetration as required. Install Owner supplied cables between engineroom and fireroom control panels.

a) From Peabody panel in engine room to Peabody panel port boiler, four (4) runs of 44 conductor (2828C.M. each conductor) approx. 125' per run. Stbd. boiler will be approx. 162' per run. Total of approx. 1196 feet of cable.

b) From Peabody panel in engine room to Peabody panel port boiler, one (1) run of 14 conductor cable (2828C.M. each conductor) approx. 125'. Stbd. boiler will be approx. 162'. Total of approx. 290' cable.

c) From Peabody panel in engine room to main switch board. Requiring approx. 30' of #9 galvanized armour, impervious sheath, stranded copper, with TWH class insulation. Tobe furnished by Yard.

146. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTD)A. C. Klaxon

Supply and install one (1) 110 V.A.C. Klaxon in fireroom. Connect to Engineer's supervisory panel in engine room.

Register Modification

Modify eight (8) registers to accommodate flame scanners, igniters, register operators, interlock switches, etc. These items will be supplied in kit form by Peabody Engineers. Two (2) air register modification drilling templates for B&W modified Iowa type registers will be furnished by P. E. Corp., one for port boiler and one for stbd. boiler.

Cash Fuel Valve

Overhaul two (2) size 1/2" minimum flow fuel valves. Parts supplied by Owner. Fabricate and install suitable permanent heat lamp with guard and reflector in way of each valve.

Leslie Reducing Valve

Overhaul Leslie reducing valve, size 1 1/2", 850# to 175#, which supplies atomizing steam.

Fuel Oil Shutoff Valves -Port & Stbd. Boilers

Install two (2) Leslie flanged, air operated master fuel oil shutoff valves. To be installed in the line at designated location. Size 2" with micro switch, supplied by P.E. Corp., and electrically connected to fireroom control cubicle.

Install reach rod with suitable gear universal and bearings so valve can be operated from floor plates. Universal and bearings supplied by vessel.

Bailey Fuel Control Valves

Install ASCO valves on two (2) Bailey fuel control valves. Run cables from valves to fireroom control cubicle. Valves supplied by P.E. Company.

Overhaul two (2) Bailey fuel control valves size 1 1/2" flanged. Parts supplied by Owner.

Steam Strainers

Install eight (8) screwed steam strainers on burner atom. steam line to each burner. Strainers supplied by Owners.

Size 3/8" - Install one (1) strainer in steam line to burner cleaner bench.

146. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTINUED)Copper Tubing

Run 17 lengths approx. 160' per length, copper tubing from Peabody Console in engine room to Bailey board in fire room. Make connection to Bailey board as directed.

Install 20 tube runs, total of approx. 350 feet from igniter operators and register operators to fire room consoles, tubing supplied by Contractor.

Damper Drive Motors

Install ASCO valves on two (2) forced draft fan damper drive motor air supply lines. Valves supplied by P.E. Corp. Run two (2) wire #14 cable from these valves to fire room control cubicles.

Aero Quip Hoses

Install 16 Aero Quip hoses, 8" long, 1/8" male NPT each end on each register operator air connection. Supplied by Owners.

Atomizer Valve Body

Drill and tap for 1/2" NPT eight (8) atomizer valve bodies and install eight (8) screwed shut off valves, size 1/2". Valves supplied by Owner.

Steam Line Boss

Install 1/2" boss in steam atomization line to each boiler. Boss to be located after shut off valve at a designated location.

Thermo Sockets

Weld in four (4) size 1" thermosockets in fuel supply line to each boiler at a designated location. Sockets supplied by P.E. Corp.

Gauge Connections

Weld in three (3) pressure gauge connections into each fuel oil supply line. Size 1/4", and connect up fuel oil gauges on panel.

High Tension Cable

Install owner supplied high tension armoured cable from each of eight burner igniters to fireroom control panel transformers, approx. total of 80'. Cable supplied by P.E. Company.

Electric Cables

Supply and install 4 conductor #14 stranded copper cables - TWH insulation, impervious sheath on each of eight (8) burner registers, total of approx. 1000' as follows:

Open register interlock to fire room control panel.

Closed register interlock to fire room control panel.

Burner position interlock to fire room control panel

146. INST. & MOD. FOR PEABODY CONTROL SYS. (CONT'D)Amphenol Plugs

Install total of 42 amphenol plugs and sockets in above wiring as directed by service engineer. Plugs and sockets supplied by Owner.

Flame Scanner

Supply necessary cable #14, 2 conductor, stranded copper, TWH insulation, impervious sheath to connect eight (8) flame scanners. Total of approx. 200' of wire needed.

- 146A. a. Ventilation - Furnish and install one (1) 17" 45 deg. ell and renew 17" terminal on outlet over front of engine room console.
- b. Leslie Reducing Valve - Build up body by welding in way of steam cut in body landing for seat ring and machine to correct size. Size of valve 3".
- c. Valve Boards (2) - Install in each atomizing steam header located outboard of burner register one (1) 1/2" steel coupling, install 1 - 1/2" nipple, 1 - 1/2" 600 lb. steel valve welded. Install in steam line to each pre-air heater to port and starboard boilers, one 1-1/4" welded spud, 1 - 1-1/4" nipple, 1 - 1/4" 600 lb. valve, one 1-1/4" nipple, 1 - 1-1/4" check valve 600 lb. (Valve and check valve bought for use on the ESSO FLORENCE), 1 - 1-1/4" nipple, 1 - 1/4" union, reduce and connect to 1/2" pipe at top of valve boards, located outboard fwd. corner of each boiler using 1" dia. steel pipe extra heavy for purging steam with necessary fittings and pipe hangers. Prove tight. Insulate pipe. Insulate 8 burner fuel pipes from cut off valve at burner to valves in valve boards. Connect to each inlet of the 4 purge steam valves of each board to the 1/2" pipe, using 1/4" pipe and necessary fittings. At bottom of each 1/2" pipe install 1/2" 300 lb. trap, strainer, with by pass line around trap, 3 - 1/2" 200 lb. brass globe valves, required. Pipe outlet from each strainer to drain well in fwd. end of fire room, one port, one starboard. Install necessary brackets for pipe support. Use extra heavy steel pipe and fittings. Test, prove tight, Insulate pipe. Approx. 60 ft. of 1/2" steel pipe and necessary fittings required.
- d. Crop 1/4" and 1/2" pipe outlet from each valve of valve boards for both boilers and install 1/4" and 1/2" check valves, welded. A total of 8 - 1/4" and 8 - 1/2" check valves; valves furnished by Peabody Corp.

146A. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTINUED)

e. Install in fuel discharge line before strainer as designated, one (1) 1/2" spud; 1 - 1/2" nipple; 1 - 1/2" to 1/4" tee; 2 - 1/4" nipples; 2 - 1/4" 600 lb. steel valves welded; install in each 1/4" valve - 1 - 1/4" nipple; 1 - 1/4" tee; 1 - 1/4" nipple; 1 1/4" x 3" nipple and cap threaded, 1 - 1/4" union welded. Connect one 1/4" valve to starboard fire room panel Low F.O. pressure switch using 1/4" pipe and fittings. Connect other 1/4" valve to port fire room panel low F.O. pressure switch using 1/4" pipe and fittings. Install necessary pipe hangers. Test, prove pipe tight. After test fill pipe with anti-freeze furnished by vessel.

f. Crop 1/4" boiler drum gauge line for each boiler as designated, install welded 1/4" tee, connect gauge line from starboard boiler to high steam pressure switch in starboard fire room panel using 1/4" steel pipe; install 1/4" union at switch. Connect gauge line from port boiler to high steam pressure switch in port fire room panel using 1/4" steel pipe, install 1/4" union at switch.

g. Low Atomizing Steam Pressure Switch - install on existing 1/2" outlet in steam atomizing header for each boiler one 1/2" 90 deg. ell, 1 - 1/2" to 1/4" reducer, 1 - 1/4" nipple, 1 - 1/4" 90 deg. ell, 1 - 1/4" nipple, 1 - 1/4" union, material extra heavy steel; connect from starboard boiler header to starboard fire room panel low atomizing steam pressure switch using 1/4" extra heavy steel pipe, install 1 - 1/4" 300 lb. brass globe valve in line, with 2 unions and nipples, approx. 20 feet of pipe required each boiler. Install necessary pipe hangers. Do same for port boiler.

h. Atomizing Steam Pressure Drop Switch - Install on existing 1/2" outlet in steam atomizing header for each boiler, 1 - 1/2" 90 deg. ell, 1 - 1/2" to 1/4" reducer, 1 - 1/4" nipple, 1 - 1/4" 90 deg. ell, 1 - 1/4" nipple, 1 - 1/4" union, material extra heavy steel, connect from starboard boiler header to starboard fire room panel atomizing steam pressure drop switch using 1/4" extra heavy steel pipe, install 1 - 1/4" 300 lb. brass globe valve in line, with two (2) unions and nipples, approx. 20 feet of pipe required each boiler. Do same for port boiler. Install necessary pipe hangers.

146A. INST. & MOD. FOR PEABODY CONTROL SYS. (CONTINUED)

i. Atomizing Steam - Disconnect and remove one section of pipe atomizing steam line at -215 lb. steam line to heaters and etc. Install 2" bolted blank at outlet. Crop and remove 12" of 2" pipe outlet steam line from 1/2" reducing valve to reciprocating pumps, plug pipe to reciprocating pumps. Install 2" 90 deg. ell on outlet pipe from reducing valve and connect to atomizing steam pipe, 8' of 2" pipe, 2 bends, 1 flange. Install gauge and line, gauge furnished by vessel, 1 - 1/4" spud, 1 - 1/4" x 5" nipple, 1 - 1/4" 600 lb. steel valve, 2' of 1/4" pipe, 2 - 1/4" unions, welded, 1 bracket for gauge. Furnish and install in 2" steam line one relief valve set at 175 lbs. Install by pass line for reducing station. Install 1 - 1" spud in supply line to reducing valve, 1 - 1" x 5" nipple, 1 - 1" globe valve (furnished by vessel), 1 - 1" nipple, 1 - 1" flange. Install 1" flanged outlet in steam atomizing line approx. 4-1/2" long, connect with 1" dia. pipe, approx. 5'-3" long, 3 bends, 2 flanges, 300 lb. pipe extra heavy steel.

j. Ventilation -Renew one section of duct over engine room console size 24" x 42" with 2 outlets - 17" square to 17" round 5' long, 1 - 14" square to 14" round 5' long, #16 galv. metal. Renew one section of duct over operating flat 18" dia. reduced to 16" dia. approx. 5' long, 1 - 16" terminal. Furnish and install one (1) 24 volt relay for 110 volt klaxon installed in fire room.

Renew one volume chamber for feed water regulator.

Renew one pilot valve and seat for exhaust chamber port boiler Copes thermostats.

Lower thermostat tube of each Copes thermostat as directed, material used 4 - 45 deg. 1/2" weld ells, 4 - 1/2" socket weld coupling, approx. 6' of 1/2" steel pipe, magnaflux welds.

Alter primary element piping for each steam flow meter of port and starboard boiler.

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

UNLESS OTHERWISE STATED HEREIN, ALL TENDERS ARE SUBJECT TO IMMEDIATE ACCEPTANCE. QUOTATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL AGREEMENTS AS TO TIME OF COMPLETION ARE MADE CONTINGENT UPON STRIKES, LABOR DIFFICULTIES, FIRE, ACCIDENTS, DELAYS IN DELIVERY OF MATERIAL AND/OR CAUSES OF ANY KIND BEYOND OUR CONTROL. FOR PAYMENT FOR ANY WORK DONE OR MATERIALS SUPPLIED HEREUNDER, WHETHER AUTHORIZED ORALLY, BY LETTER, OR WRITTEN CONTRACT, WE LOOK TO BOTH VESSEL AND OWNER. WE ALLOW NO DISCOUNTS AND BILLS ARE PAYABLE WHEN RENDERED. IN CASE OF DEFECTIVE WORKMANSHIP OR MATERIAL, OUR LIABILITY IS LIMITED STRICTLY TO THE CORRECTION OF SUCH DEFECTS DISCOVERED AND REPORTED TO US IN WRITING WITHIN THIRTY (30) DAYS FROM THE COMPLETION OF THE WORK.

WE UNDERTAKE TO PERFORM WORK ON, AND DRY DOCK VESSELS AND PROVIDE BERTH, WHARFAGE, TOWAGE AND OTHER SERVICE AND FACILITIES, ONLY UPON CONDITION (1) THAT NO LIABILITY SHALL ATTACH TO US FOR CONSEQUENTIAL OR CONTINGENT DAMAGES; (2) THAT WE SHALL NOT BE LIABLE IN RESPECT TO ANY ONE VESSEL, DIRECTLY OR INDIRECTLY IN CONTRACT, TORT OR OTHERWISE, TO ITS OWNERS, CHARTERERS OR UNDERWRITERS FOR ANY INJURY TO SUCH VESSEL, ITS CARGO, EQUIPMENT OR MOVABLE STORES, OR FOR ANY CONSEQUENCES THEREOF, UNLESS SUCH INJURY IS CAUSED BY OUR NEGLIGENCE OR THE NEGLIGENCE OF OUR EMPLOYEES, AND (3) THAT IN NO EVENT SHALL OUR AGGREGATE LIABILITY TO ALL SUCH PARTIES IN INTEREST FOR DAMAGES SUSTAINED BY THEM, AS A RESULT OF SUCH INJURY AND/OR DAMAGES, EXCEED THE SUM OF THREE HUNDRED THOUSAND DOLLARS (\$300,000.00).

WE WILL ACCEPT VESSELS FOR REPAIRS ON A DIFFERENT BASIS WITH MORE EXTENSIVE LIABILITIES THAN HEREINBEFORE SET FORTH, BUT ONLY UPON THE OWNER DECLARING THE VALUE OF SUCH VESSELS AND SPECIFYING THE DESIRED INCREASED LIABILITY IN ADVANCE OF DELIVERY OF THE VESSEL TO US, TOGETHER WITH AN AGREEMENT TO PAY AN ADDITIONAL CHARGE OVER AND ABOVE THE USUAL CHARGES FOR REPAIR, WHARFAGE AND DRY DOCKING SUFFICIENT TO COVER THE COST OF INSURANCE EQUAL TO SUCH DECLARED RISK AND UNLESS THE OWNER DOES SPECIFY IN ADVANCE AND MAKE PROVISION FOR PAYMENT OF ADDITIONAL INSURANCE, THE DELIVERY OF THE VESSEL OR MAKING THE VESSEL AVAILABLE TO US FOR REPAIRS SHALL BE DEEMED AN ACCEPTANCE OF THE TERMS AND CONDITIONS SET FORTH IN THE PRECEDING PARAGRAPH.

PLEASE NOTE THAT WE DO NOT AGREE TO THE ACCIDENT AND/OR INDEMNITY AND/OR INSURANCE PROVISIONS, IF ANY, CONTAINED IN YOUR INVITATION AND/OR SPECIFICATIONS, RELATING TO LIABILITY FOR DEATH OR PERSONAL INJURY, AND THAT IN SUCH CASES WE ACCEPT ONLY SUCH LIABILITY AS IS IMPOSED UPON US BY LAW.

CUSTOMER'S ORDER

No. 1350-S

Newport News, Virginia, June 3, 1966

Newport News Shipbuilding and Dry Dock Company:

Subject to the conditions printed hereon, please furnish the following for

SS. ESSO LEXINGTON

By Contract \$ 151,000.00

~~By Dry Dock~~

147. BULBOUS BOW

Furnish necessary labor and material to construct and install bulbous bow in accordance with Newport News Drawing No. 226414, "Shell Plating in Way of Bulbous Bow" and Drawing No. 226415, "Bow Framing in Way of Bulbous Bow".

The above is to include removal of section of bow in way of the new installation and old section to be scrapped, which is to become the property of the Shipyard.

Furnish labor and material to coat inside and outside with one coat of zinc chromate. Exterior to be coated with one AC and one AF.

Remainder of painting to be issued with repair specifications.

The above to include necessary drydockage.

FOR THE SUM OF \$500,706.00

Humble Oil & Refining Co.

By:

Orders for account of vessel and owners must be signed by Managing Owner, Ship's Husband, Master, or any person to whom the management of the vessel at the port of supply is entrusted.

Accepted:

Newport News Shipbuilding and Dry Dock Company

(Title)

(Signature)