WILLIAM ESPLEN SON & SWAINSTON LIMITED.

Billiter Buildings,
49, Leadenhall Street,
London. E.C. 3.

Consulting Engineers
& Naval Architects.

S.S. "IRENE".

SPECIFICATION FOR CONVERSION TO OIL FUEL BURNING.

Length	235' 0"
Breadth	37' 6"
Depth	18' 7"

S.S. "IRENE"

Conversion to Oil Fuel Burning

SPECIFICATION.

PROPOSAL

To construct 4 deep tanks which will also serve as settling tanks, in way of present side coal bunkers, between frames Nos. 54 to 69. At station 69, the watertight bulkhead between boiler room and forward hold is fitted.

The ballast double bottom tanks under the bunkers will not be used for oil fuel.

The capacity of the tanks will be approximately 85 tons each side.

The deep tanks will extend to the Main Deck.

The Oil Fuel Unit will be located in the starboard side of the engine room and the transfer pump in the stoke hold.

GENERAL

All new steel work for deep tanks to be of welded construction.

Scantlings and oil burning installation to Classification requirements and in accordance with the following Specification and approved plans Nos. 1 and 2, 161.63.

The Oil Fuel Unit and transfer pump will be supplied by Owners.

All work in connection with this Specification to be carried out to the satisfaction of the Owner or his Representative and to conform in all respects to Classification requirements for prevention of fire and International Convention for the Safety of Life at Sea, 1948.

No work additional to this Specification to be carried out without the approval, in writing, of the Owner or his Representative

PRELIMINARY WORK

Port and starboard forward hold bilge suctions to be removed. Openings in end bulkhead to be blanked off and made oiltight. Bilge suctions to be re-located outside the tanks and screwed down non-return valves fitted at bulkhead 69.

All steelwork, ship side plating tank top, margin plate etc., in way of proposed deep tanks to be thoroughly cleaned and scaled and made oiltight as necessary.

Engine and Boiler Room, tank tops and bilges to be thoroughly cleaned and painted with red lead.

Double bottom tanks in way of oil tanks to be cleaned and examined.

BOILERS

All coal burning equipment to be removed from the boilers.

The boilers to be thoroughly scaled and cleaned internally and externally. Particular attention to be paid to scale between the tubes in view of the change from coal to oil burning.

S.S. "IRENE"

NEW STEELWORK AND INCIDENTAL ITEMS

1. DEEP TANKS

To be of welded construction and with scantlings generally in accordance with drawing of proposed oil fuel bunkers included with this Specification.

All original seams, butts and rivet to make oiltight by seal welds as necessary.

Bulkhead stiffeners to have a modulus of not less than 7.9

2. MANHOLE OPENING AND LADDERS

One opening for each deep tank over crown of tank with necessary compensating rings, studs, coverplate and oiltight joints having a clear opening size of 24" x 16"

12" wide steel access ladders to supply and fit from manhole at top to base of tank.

3. GUTTERWAY

To be constructed round deep tank bulkheads.

Gutter bar to fit round oil fuel unit

4. AIR AND SOUNDING PIPES

The deep tank air pipes to be 3" diameter and lead to accommodation deck. The pipes to be finished with a gooseneck fitted with mesh wire gauze

The sounding pipes to be of 2" diameter and lead to accommodation deck. The pipes to be fitted with screw cap at deck level.

5. BULKHEAD No. 69/HOLD in

Supply and fit wood sheathing in way of oil fuel tanks

6. OILY BILGES

The oily bilge is to extend from frame 53 to bulkhead 69 Suitable suctions to be fitted at port and starboard and connected to the transfer pump;

7. OIL FUEL FILLING

Tank filling main pipes to be of wrought iron with strainer boxes and pressure gauges port and starboard to be fitted at accommodation deck level to take flexible pipe from oil barge A suitable relief valve to be fitted in the main and lead to the oily bilge.

Size of filling main on accommodation deck to be 4" diameter and vertical mains to be 2½" diameter.

8. OIL FUEL UNIT AND INSTALLATION

One Duplex pumping, heating and filtering unit complete with furnace equipment, furnishings, lighting up apparatus and spare gear to be supplied by Owner. The above unit to be fitted on suitably fab icated steel stools.

9. OIL FUEL TRANSFER PUMP

One vertical oil fuel transfer pump to be supplied by Owners. Pump to have suctions to oily bilge Port and Starboard and discharge to deep tanks and to oily water separator. The above pump to be fitted on suitably fabricated steel stool and oil tray.

The discharge of pump to be fitted with a relief valve in closed circuit with suction.

An alternative transfer connection to be made from the unit pressure pumps

10. LIGHTING UP UNIT

Supplied by Owner and to be fitted in Boiler Room in accordance with instructions.

11. DEEP TANKS

Heating coils to be of 1" bore solid drawn steel having a heating surface of not less than 1 sq.ft. per ton of oil fuel and capable of withstanding full boiler pressure of 200 lbs.

12. OIL PRESSURE PIPES

Oil pressure pipes from fuel unit to be of seamless steel tube 1" diameter.

a $\frac{3}{4}$" Diameter oil return pipe to pump suction to be fitted from each boiler fron pipe and having a non-return valve.

The arrangement of pipes to be in accordance with drawing approved by Classification.

13. AUXILIARY STEAM LINE

Steam line to oil fuel unit and transfer pump to be taken from the auxiliary steam range and master valves to units to have extended spindles operated through main deck.

A $1\frac{1}{2}$" steam line with master valve to be taken from auxiliary range and fitted to tank heating valve box with suitable return to observation tank.

14. STEAM SMOTHERING

A $1\frac{1}{2}$" diameter steam line with master valve operated by extended spindle from main deck to be fitted from auxiliary range to 1" diameter steam smothering line below boiler and oil unit.

The 1" steam smothering line to be suitable slotted.

15. STEAMING OUT CONNECTION

To be fitted to deep tanks and to consist of a S.D.N.R. valve with hose connection suitable for portable flexible metallic steamhose, A branch piece with valve and hose connection to be fitted in the auxiliary steam line in an accessible position.

16. EXTENDED VALVE SPINDLE

Extended spindles from steam valve to unit, transfer pump, fan and deep tank suction valve to be operated by extended spindles lead to the deck in accordance with requirements.

17 PIPE CLIPS

All pipes installed to be fitted with suitable clips and hangars.

18. LAGGING

All steam, exhaust and hot oil pipes to be efficiently lagged.

All new steam pipes to be suitably and efficiently lagged with magnesia and covered with asbestos cloth (1½ magnesia above 1" bore and 1" magnesia below 1" bore)

All new exhaust pipes to be lagged with 1" magnesia, covered with canvas.

Hot oil fuel pipes to be lagged with 1" magnesia, covered with asbestos cloth.

small pipes to be lagged with asbestos rope.

9. SAVEALLS

Savealls to be supplied and fitted below furnace mouths having a minimum depth of 3"

20. OBSERVATION TANK

All drains from tank steam heating and heaters to be led to tank through suitable steam traps.

Tank to be fitted with two way cock led to hotwell and bilge.

21. FUNNEL DAMPER

Funnel damper to be securely locked in "open" position.

Space between inner and outer funnels to be filled in with permanent closing plates and quick closing flaps for fire extinguishing purposes. Stokehold ventilators to have quick closing flaps fitted for fire extinguishing purposes.

22. FIRE EXTINGUISHING

Two one gallon foamite extinguishers to be supplied and fitted, one in Boiler Room and one in Engine Room, and one ten gallon foamite fire engine mounted on suitable trunnions and complete with spare charge and 50 ft. of hose to be sited in stokehold.

Fire extinguishing water supply connection to be fitted in stokehold, Port and Starboard. Hoses with jet and spray director and couplings to be supplied.

One sand box with scoop to be supplied and fitted in stokehold.

23. PIPES, VALVES AND PIPE SYSTEM GENERALLY

All new steam pipes to be efficiently drained and to be of solid drawn steel.

Water fire extinguishing pipes to be of galvanised steel.

Oil fuel discharge and steam heating pipes to be of solid drawn steel.

New exhaust and auxiliary steam, water and oil fuel suction valves generally to be of cast iron with outside screws.

Small valves and fittings for new steam lines may be of gunmetal.

Oil fuel discharge valves to be of cast iron or gunmetal

Overboard discharge valve from separator to be of gunmetal with non-ferrous valves, seat and spindle.

Cast iron or galvanised steel strums or strainer boxes to be fitted to new bilge suctions, the area through the holes to be well in excess of pipe area.

Any new bilge valves to have non-ferrous fittings.

Nameplates to be fitted to valves in new system.

Steam at full boiler pressure to be supplied to the oil fuel unit transfer pump and oily water separator.

ELETRICAL FITTINGS

Electric light fittings to be arranged in convenient positions in engine and boiler room to ensure adequate inspection and operation of plant.

25. WORK BENCH

A work bench of steel 3'0" long by 2'0" wide to be supplied and fitted in stokehold and having a burner vice and rack for six spare burners.

26. TESTS

All deep tanks and double bottom tanks to be tested by a head of water on completion of work.

All oil suction and discharge pipes to be tested hydraulically to required pressure.

The above test to be carried out to Classification requirements.

Steaming trials to be carried out to ensure the satisfactory working of the installation

27. TANK FITTINGS

Each deep tank to be provided with;

1 off - 1" drain cock, self-closing with internal pipe
1 off - Oil depth gauge of approved type
1 off - Thermometer pocket, to be fitted in accessible position.
1 off - 2" low suction valve with extended spindle to main deck
1 off - 2½" filling valve.

28. INCLINING TEST

The vessel to be inclined and the following conditions estimated;

1. Ballast condition
2. Loaded condition - departure
3. Loaded condition - arrival.

s.s. "I R E N E"

Conversion from coal to oil fuel burning

Specification

PROPOSAL
To construct a side tank port and starboard in way of present side coal bunkers. The starboard tank to be devided to serve partly also as a settling tank.
Provision to be made for a day tank and an observation tank.

The boilers to be converted to forced draught, oil burning. To that effect an oil fuel unit, transfer pump, fresh water heater and forced draught fan to be provided, together with all the secondary equipment required.

PRELIMINARY WORK
Port and starboard forward hold bilge suctions, if any, to be removed. Openings in end bulkhead, if any, to be blanked off and made oiltight. Bilge suctions to be re-located outside tanks and screwed down non-return valves fitted at bulkhead 71.

All steelwork, ship side plating, tank top, margin plate etc. in way of proposed side tanks to be thoroughly cleaned, scaled, examined and after found or placed in good order made oiltight as necessary. Drillings to be made at side shell and deck, in way of new tanks.
Engine and boiler room tank tops and bilges to be cleaned and painted. Double bottom tanks in way of oil tanks to be cleaned and examined.

BOILERS
All coal burning equipment to be removed from boilers, the boilers cleaned and scaled thoroughly for boiler survey. Fire & water sides. Furnaces gauged. Hydraulic test made. Lagging repaired.

DEEP SIDE TANKS
To be of welded construction, as per plans. Any original seams, butts and rivets to be made oiltight.

MANHOLE OPENING AND LADDERS
One opening for each deep tank over crown of tank with cover-plate etc. having a clear opening of 60 x 40 cm. Studs 5/8". 40 cm. wide steel access ladders to fit from manhole at top to base of tank, with flat bar sides 2"x 1/4" sides & round bar rungs 1/2" dia.

GUTTERWAY
To be constructed round new tanks. Gutterbar to fit round oil fuel unit and fuel transfer pump.

AIR AND SOUNDING PIPES
The tanks to be provided with air pipes, as per plan, and lead to the bridge deck. The pipes to be finished with a gooseneck fitted with mesh wire gauze and provided with means of closing and canvas covers. Air pipe opening above deck to be 46 cm.
The sounding pipes to be of 2" dia. and lead to the bridge deck. The pipes to be fitted with screw caps at deck level. Striking plates to be fitted.

BULKHEAD Nº 71 IN HOLD
Supply and fit wood sheathing in way of oil fuel tanks. 1"x 6" planks with 2"x 2" framings spaced 9 ft. apart.

OILY BILGES
The oily bilge is to extend from fr. 57 - 71 port and 55 - 71 starboard side. Suitable suctions to be fitted p & s and connected to the transfer pump.

OIL FUEL FILLING
Tank filling main pipes to be of wrought iron with strainer boxes and pressure gauges p & s to be fitted at bridge deck level to take flexible pipe from oil barge. A suitable relief valve can be fitted in the main but in such a case the discharge must be lead to a shore connection or an overflow tank.
Size of filling main on bridge deck to be 4" dia. and vertical mains 2 1/2" dia.

OIL FUEL UNIT AND INSTALLATION
One Duplex pumping, heating and filtering unit complete with furnace equipment (forced draught), furnishings, lighting up apparatus and spare gear to be supplied. The above unit to be fitted on suitably fabricated steel stools, and provided with pressure regulating valves.

OIL FUEL TRANSFER PUMP
One vertical O.F. transfer pump to be supplied. Pump to have suctions to oily bilges, fitted with S.D.N.R. valves and discharge to O.F. tanks and to oily water separator (if fitted).
The above pump to be fitted on suitable steel stool and oil tray.
The discharge of pump to be fitted with a relief valve in closed circuit with suction.
An alternative transfer connection to be made from the unit pressure pumps. Pump manifold to be with 5 suction & discharge screw down valves, one of which to be of the non return type.

LIGHTING UP UNIT
To be supplied and fitted in boiler room. Centrifugal pump 1" dia. with electric motor 110 v. D.C. & gravity tank of 1 ton capacity.

FORCED DRAUGHT FAN

To be provided and installed in a suitable position above and between boilers. Suitable ducts to be made and fitted leading to the furnace fronts.
Fan to be electric motor driven

FURNACE FRONTS

To be suitable for force draught air circulation

ELECTICAL INSTALLATION

Electrical generator output to be checked and made suitable for the increased loading due to new motor fan.
Switchboard to be altered to suit new circuit, complete with knife two pole switch, approved fuse, pilot lamp and fuse, all fitted with nameplates.
Cables used to be of approved type, armoured and above boilers passing through a steel tube.
Electric light fittings to arranged in convenient positions in E.R. and B.R. to ensure adequate inspection and operation of plant.

FRESH WATER HEATER

T be provided and fitted in a suitable position in the E.R., on line between feed pump & hot checks. Steam line to be taken from auxiliary exhausts & returned thereto.

HEATING COILS

To be of 1" bore solid drawn steel having a heating surface of not less than 1 sq.ft. per ton of O.F. and capable of withstanding full boiler pressure of 220 lb.per sq. inch.
Heating coils to be as near of the bottom of tanks as possible. Low suctions might require to have a coil round them.

OIL PRESSURE PIPES

Oil pressure pipes from fuel unit to be of seamless steel tube 1" dia.. A 3/4" dia. oil return pipe to pump suction to be fitted from each boiler front pipe and having a non-return valve. Pressure up to 240 lb per sq. inch.

AUXILIARY STEAM LINE

Steam line to O.F. unit and transfer pump to be taken from the auxiliary steam range and master valves to units to have extended spindles operated from boat deck level.
A 1 1/2" steam line with master valve to be taken from auxiliary range and fitted to tank heating valve box with suitable return to observation tank.

STEAM SMOOTHERING

A 1 1/2" dia. galvanised steam line with master valve operated by extended spindle from boat deck level to be fitted from auxiliary range to 1" galvanised (internally and externally) steel pipes, leading under the boilers, O.F. unit and transfer pump. The above pipes to be perforated and fitted not less than 15 cm above the tank top. The pipes to be self-draining.

STEAMING OUT CONNECTION

To be fitted to O.F. tanks and to consist of a S.D.N.R. valve with hose connection suitable for portable flexible metallic steamhose. A branch piece with valve and hose connection to be fitted in the auxiliary steam line in an accessible position.

EXTENDED VALVE SPINDLE

Extended spindles from steam valve to unit, transfer pump and tank high and low suctionsto be operated ~~xy x~~ from boat deck level.

REMOTE SWITCH

Forced air fan motor circuit to be provided with a switch placed outside the machinery casing at accomodation alleyway.

LAGGING

All steam, exhaust and hot oil pipes to be efficiently lagged. All new steam pipes to be suitably and efficiently lagged with magnesia and covered with asbestos cloth(1 1/2" magnesia above "1"bore and 1" magnesia below 1" bore). All new exhaust pipes

to be lagged with 1" magnesia, covered with canvas.
Hot O.F. pipes to be lagged with 1" magnesia, covered with asbestos cloth. Small pipes to be lagged with asbestos rope.

SAVEALLS
Savealls to be supplied and fitted below furnace mouths having a minimum depth of 3".

OBSERVATION TANK
All drains from tank steam heating and heaters to be led to tank through suitable steam traps. Tank to be fitted with two way cock led to hotwell and bilge.

FUNNEL DAMPER
Funnel damper to be securely locked in open postion.
Space between inner and outer funnels to be filled in with permanent closing plates and quick closing flaps for fire extinguishing purposes. Stokhold vents to have quick closing flaps fitted.

FIRE EXTINGISHING
Sea Water supply connection to be fitted in stokehold, with canvas hose and jet/spray nozzle.
Foam extinguishers to be supplied as directed.
One sand box with scoop to be supplied.

PIPES, VALVES AND PIPE SYSTEM GENERALLY
All new steam pipes to be efficiently drained and to be of solid drawn steel.
Water fire extinguishing pipes to be of galvanised steel.
O.F. discharge and steam heating pipes to be of solid drawn steel.
new exhaust and auxiliary steam, water and O.F. suction valves generally to be of C.I. with outside screws.
small valves and fittings for new steam lines may be of gunmetal.
overboard discharge valve from separator to be of gunmetal with non-ferrous valves, seat and spindle.
as. iron or galvanised steel strums or strainer boxes to be fitted to new bilge suctions, the area through the holes to be well in excess of pipe area.
any new bilge valves to have non-ferrous fittings
All lead bilge piping, if any, to be removed and steel one fitted.
fresh water lines to be kept separate from bilge lines.
nameplates to be fitted to valves in new system.
Steam at full boiler pressure to be supplied to the O.F. unit, transfer pump and oily water separator.

WORK BENCH

A work bench of steel 1 m. long by 60 cm. wide to be supplied and fitted in stokehold and having a burner vice and rack for six spare burners.

TESTS

All tanks now used for O.F. to be tested by a head of water to air pipe level.
All oil suction and discharge pipes to be tested hydraulically to required pressure.
New pumps and heaters, if allready used, to be examined and hydraulically tested.

TANK FITTINGS

Each side O.F. tank to be provided with :
1 off - 1" drain cock, self-closing with internal pipe
1 off - Oil depth gauge of approved type
1 off - Thermometer pocket, to be fitted in accessible position
2 off - 3" low suction valve with extended spindle
1 off - 2 1/2" filling valve
2 off - 2" high suction valve with extended spindle

Settling tank to have 1 high and 1 low suction valves only.