

Rpt. 17 (b)

Date of writing Report MAY 28 1959

Survey held at Mukaishima, Japan

Received London

No. of visits 20

Port Kobe

First date 22, Jan., 1959

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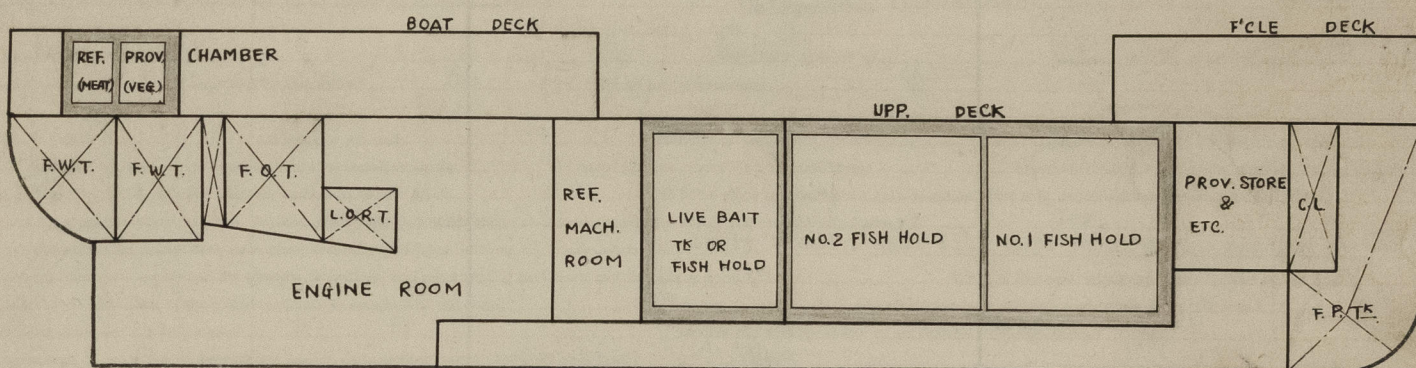
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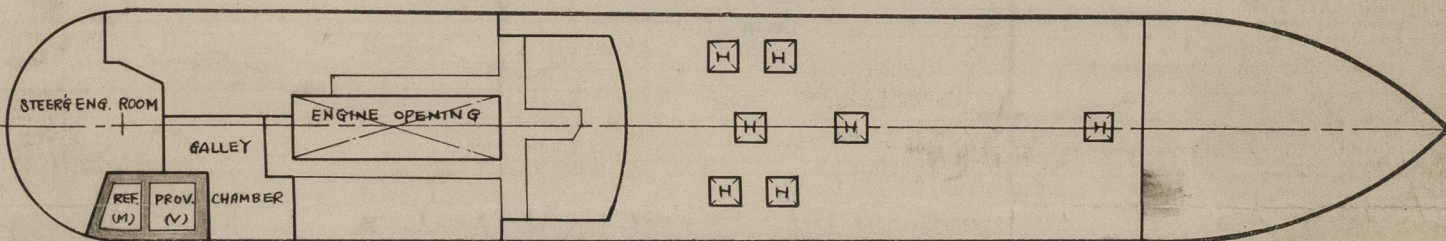
REFRIGERATED CARGO INSTALLATION—REPORT ON INSULATION WORK, ERECTION OF PLANT ON BOARD AND TESTS AFTER COMPLETION

No. in R.B. Name Steel Single Screw Motor Fishing Boat "DNEPR" Gross tons 497.10
Built at Mukaishima, Japan By whom Hitachi S.B. & E. Co., Ltd., Mukaishima Shipyard
Owners V.O. Sudoinport Moscow U.S.S.R. Port of Registry Vladivostok
Refrigerating Machinery made by Sabroe Co. of Japan Ltd., Machine Nos. 60029 & 60030 When made 11-1958
Insulation fitted by Hitachi S.B. & E. Co., Ltd., Mukaishima Shipyard Total No. of Chambers 2
Total refrigerated cargo capacity measured in accordance with Society's requirements 6,184 cu. ft.

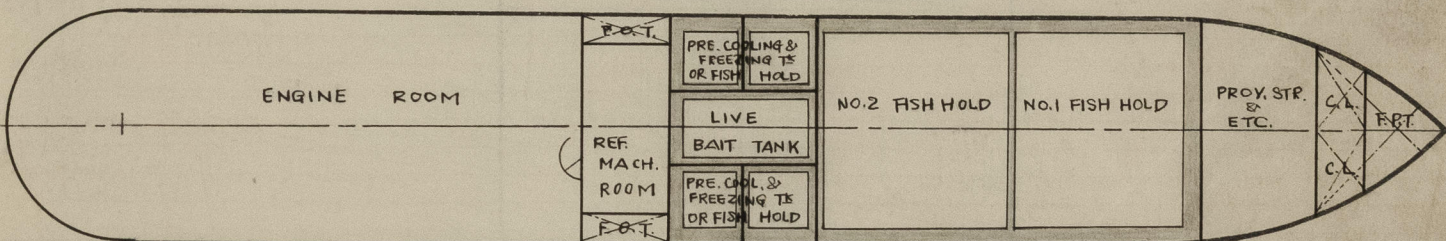
Location and boundaries in elevation and plan of each refrigerated cargo chamber, main and refrigerating machinery space(s), evaporator and brine rooms, and cooler houses to be shown by inserting decks and bulkheads in the diagrams. The frame numbers to be shown at each transverse bulkhead. The decks to be clearly marked in elevation and plan. Insulation to be shown by a line (preferably in colour) on the appropriate side or sides of decks and bulkheads. Oil storage tank tops and bulkheads adjoining refrigerated chamber(s) also to be shown. (If desired, a separately prepared diagram sheet may be attached by paste or staples provided the size is not greater than that below, all the required particulars are shown and the sheet is signed by the Surveyor.)



UPPER DECK PLAN



HOLD PLAN



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| INSULATION OF BOUNDARIES EXPOSED TO EXTERNAL CONDITIONS | | | | | | | | |
|--|---|--------------------------|---------------|--|-----------------------------------|---|--------------------------|---------------|
| In cols. (1) identify each chamber by position (e.g. No. 2 UTD PORT) with each of its exposed surfaces immediately below (e.g. ships side, overheading, etc.), where the size of frames etc., change on any surface, give frame Nos. (e.g. Fms. 102 to 109) applicable to each size, on separate lines. Depth of insulation in cols. (3) to exclude any air space, linings, etc. | | | | | | | | |
| (1) Chamber(s) and Boundary | (2) Frames, reverse frames, beams, stiffeners, etc., within insulation | | | (3) Depth of Insulation fitted | (1) Chamber(s) and Boundary | (2) Frames, reverse frames, beams, stiffeners, etc., within insulation | | |
| | Pitch ins. | Width of face ins. | Depth ins. | | | Pitch ins. | Width of face ins. | Depth ins. |
| FWD. FISH HOLD | | | | | | | | |
| Ship Side | 550 | 75 | 150 | 238 | Fms 56 to 66 | | | |
| Fwd. Bulkhead | 500 | 75 | 125 | 257 | At Fm. 66 | | | |
| Aft Wall | - | - | - | 266 | At Fm. 56 | | | |
| Deck Over | 550 | - | 125 | 238 | | | | |
| AFT. FISH HOLD | | | | | | | | |
| Ship Side | 550 | 75 | 150 | 238 | Fms 48 to 56 | | | |
| Fwd. Wall | - | - | - | 266 | At Fm. 56 | | | |
| Aft Bulkhead | 500 | - | 100 | 138 | At Fm. 48 | | | |
| Deck Over | 550 | - | 125 | 238 | | | | |

Are all divisional bulkheads of steel construction in accordance with the Rule? Yes If not, state position and when approved

Insulating material(s) (if more than one, state where fitted) Cork board & Alflex

Air space, if any, within insulation lining, position and depth Shell side, 31mm Fwd. Chamber Fwd. Bhd. (F66), 50mm Deck Above, 31mm Top of Inner Bottom

Is approved fire resisting insulation fitted in way of oil bunkers and other surfaces exposed to excessive heat? Yes State material fitted Air space & gutter way

Insulation lining(s) material and thickness Timber: Shell side, Bhd. & Deck above 2 x 19mm Top of Inner Bottom: 50mm

Methods of securing lining(s) (if timber grounds state whether across face, on face or on sides of frames, etc.) Timber grounds on sides of frames

Floor insulation covering 1mm Galvanized Steel Plate on 50mm Timber Support for floor covering Steel Plate directly covers timber on jo

State location and thickness of insulation of all insulated hatch coamings exposed to external conditions One hatch each located on centre line at fwd. (F.Nos. 61-63) and aft (F.Nos. 49-51) of Nos. 1 & 2 chambers respectively

Insulation ribbands state where, the insulating material, thickness, width and covering

Hatch covers, type and thickness of insulation Removable wood cover, 150mm Exposed loading and tonnage doors, state thickness of insulation

Air ducts buried in insulation, state where

Max. 1mm grid hangers, state in which chambers In fore & aft fish holds

State location and dimensions of all web frames, deep girders or beams within the insulation Deep girders (depth, 250mm face 210mm) and Side stringers

(depth, 200mm face 65mm) in both fwd. and aft fish holds 75mm Cork board covered by 2 x 19mm wood on both side

State how hold pillars and masts are insulated Pillars in insulated divisional wooden bulkhead (40mm thick.)

Are air ducts and insulation linings so constructed and erected as to prevent air entering insulation? Yes

Where oil storage tanks adjoin refrigerated chambers, are the arrangements in accordance with the Rules? Yes Are screens fitted over cooling grids on sides of chambers? Yes

Is the insulation in way of hatchways on the tank and top of tanks protected in accordance with the Rules? Yes Are bilge limbers and plugs, satisfactorily fitted and airtight? Yes

Are hatch plugs and their supports; chamber, air cooler and other access doors and frames; closing appliances of tonnage openings; bilge limbers and plugs, satisfactorily fitted and airtight? Yes

Are access plugs and/or panels provided in the insulation where required for easy access to the bilges, bilge suction roses, drains, tank manhole doors, air and sounding pipes? Yes

Are cargo battens provided in accordance with the Rules? Yes Dimensions and spacing on sides, vertical surfaces and horizontal 50mm x 50mm sp. 300mm

Have all ventilators and ducts passing through refrigerated chambers to other compartments been made airtight and insulated closing appliances? Yes

Where ventilators are provided in the insulation where required for easy access to the bilges, bilge suction roses, drains, tank manhole doors, air and sounding pipes? Yes

Are insulation linings and air screens on the sides of chambers suitably stiffened to prevent crushing by cargo? Yes

Are all steel bolts, nuts, hangers and fixtures which support or secure cooling appliances, insulation, exposed etc., galvanized? Yes

Is the insulation and air ducting in accordance with the approved plans and specification? Yes

The foregoing is a correct description of the insulation and appliances.

K. Sasaki
Builders or Insulation Contractor
K. Sasaki
Under-Director, Head of Yard
Hitachi Shipbuilding & Engineering Co., Ltd.
Mukaishima Shipyard.

No. of refrigerating units 2 Can each unit operate on all chambers? Yes if not, state how connected

Primary refrigerant NH₃ Where specified in the Rules, is the machinery isolated in an efficiently ventilated compartment? Yes

Medium for cooling chambers. For particulars of refrigerating machinery see Report No.

Diagrammatic sketch sufficient to show relative position (port or starboard, fore or aft) of each compressor, condenser, evaporator (brine cooler), condenser cooling pumps, and brine pumps.

Is provision made for subcooling the liquid refrigerant (if so, state method) No

MOTIVE POWER supplied from (state No. of boilers or electric generators) 2 off, Diesel Eng. Elect. Generators Condenser cooling medium (if not sea water) Sea water

CONDENSER COOLING PUMPS No. 2 Capacity of each 20 M³ lit./min. 1.1 kg./cm². B.H.P. of driving motors @ 2 BHP

Are safety valves fitted where required by the Rules? Yes No. of sea connections 2

BRINE PUMPS No. - Capacity of each - lit./min. - kg./cm². B.H.P. of driving motors -

No. of brine temperatures which can be circulated simultaneously - Brine system "open" or "closed" type - Are safety valves fitted where required by the Rules? -

Are thermometers fitted to brine delivery and each return pipe? - If brine pipes and tanks are galvanized on brine side, is ventilation provided as per Rules? -

Are steel brine and refrigerant pipes, cooling grids and air cooler coils galvanized externally where required by the Rules? Yes

How are refrigerant steel pipes connected (flanges, butt welds, screw joints, etc.) Every element made with butt welding and flanged to each other.

Where brine pipes are connected by screwed couplings, are the coupling and back nut threads a good fit? - What is the pipe thickness at the bottom of the thread? -

Are the screw threads clear of the coupling coated as required by the Rules? - Are air cooler coils parallel to or across the air stream? -

Is provision made for air refreshing? No If so, are the arrangements in accordance with the Rules? -

What provision is made for defrosting air cooler coils and/or cooling grids in chambers? None

PARTICULARS OF COOLING APPLIANCES IN EACH CHAMBER

Identify each chamber by position (e.g. No. 2 LTD. Port, No. 3 Orlop D., No. 5 L.H. etc.)

| Chamber(s) | Capacity measured in accordance with Society's requirements cu. ft. | Roof grids | | Side grids | | Floor coils | | | FANS | | | | | |
|------------|---|---------------|-----------------|---------------|-----------------|---------------|-----------------|--------|-------------|-------------|--|-------------------------|------------------|--|
| | | Length in ft. | No. of sections | Length in ft. | No. of sections | Length in ft. | No. of sections | Number | Maximum RPM | Minimum RPM | Cubic ft. of air per minute at maximum RPM | Static water gauge ins. | BHP of fan motor | Motor inside or outside insulated envelope |
| FISH HOLD | 3114 | 967 | 8 | 1050 | 10 | 210 | 2 | | | | | | | |
| FISH HOLD | 3070 | 866 | 4 | 1194 | 10 | 245 | 2 | | | | | | | |

Are air cooler fans reversible? - Is access to the refrigerating plant including air cooler fans and their motors, in accordance with the Rules? -

Can each section of refrigerating and chamber grids be readily isolated? Yes

Where cooling pipes pass through watertight bulkheads or deckplating, are the fittings and gland packing both watertight and fire resisting? Yes

PRIMARY REFRIGERANT PIPING (not fabricated at Plant Makers Works) internal diameter and thickness of each size 52.9mm x 3.8mm 41.6mm x 3.5mm

27.6mm x 3.2mm 21.6mm x 2.8mm 16.1mm x 2.8mm 12.7mm x 2.3mm

Material Steel How manufactured Solid drawn Pressure tests 35 kg./cm² hydraulic 17.5 kg./cm² air

Pressure tests after erection 14 kg./cm² gas or air Brine system pressure test on completion - kg./cm² air

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Do all pipes, including scupper pipes, air pipes and sounding pipes which pass through refrigerated chambers comply with, and are they erected and insulated in accordance with the Rules? Yes
Are air cooler trays provided in accordance with the Rules? Yes Are the drainage arrangements of the refrigerated chambers, cooler trays and air spaces behind insulation in accordance with the Rules? Yes Are liquid sealed traps provided as required by the Rules? Yes Has the spare gear (see Report 17(a)) been placed on board? Yes
Is a separate plant fitted for ships stores and/or air conditioning purposes? No Where the installation is on a ship not classed or intended to be classed with the Society, have the generator engines and electrical equipment which supply power to the refrigerating plant been examined generally and under working conditions and found sufficient and satisfactory? Yes
Steam or oil engines driving refrigerant compressors. Report 4c, Port No
Where the machinery is driven by steam engines, is the exhaust steam connected to the main and auxiliary condensers? No
Motors over 100 BHP driving refrigerant compressors. Port No Certificate Nos. No
Air cooler fan driving motors. Port No Certificate Nos. No
Motors under 100 BHP driving refrigerant compressors. Have makers' certificates been obtained? Yes Are certificates attached? Yes
DISTANCE READING THERMOMETERS: Are they approved type? Yes Makers No Type No Where tube thermometers are fitted, are the tubes in accordance with the Rule requirements? Yes No. and position of thermometers in the cargo space and air ducts of each chamber. One for each chamber. At centre of division BHD in each fore & aft chambers. Please see approved plan No. 0-000116

TESTS AFTER COMPLETION: Have the thermometers provided for measuring chamber, air suction and air delivery temperatures been checked for accuracy and found in order? Yes
Have the air cooler fans been tested? No (the statements showing the results of these tests to be attached to the report). Have the air distribution arrangements in each chamber been checked and found satisfactory? Yes Has all the plant been tested under working conditions? Yes Where a plant is operated by thermostatic refrigerant control, are the arrangements for manual control in accordance with the Rules? Yes Have the manual controls been tested? Yes Were all the plant electrical instruments, gauges and thermometers checked for accuracy before the commencement of the refrigeration test? Yes Have the air cooler defrosting arrangements been tested? No

REFRIGERATION TEST. When did cooling down chamber(s) commence? Date 6-4-59 Time 18.00 When was the desired temperature of 711.1 ^{°C} attained in the chambers? Date 7-4-59 Time 22.00 When was the Balance Test completed? Date 8-4-59 Time 4.00
Log sheets of the chamber and external temperatures, machinery operating conditions including fan and brine pump motor particulars, also a copy of the sheet showing the calculations of the estimate of the theoretical heat leakage on the average temperatures during the balance test period, to be attached to the report.

TOTAL THEORETICAL HEAT LEAKAGE DURING THE BALANCE TEST PERIOD

| | | |
|---|--------|-------------|
| Through surfaces, etc., of cargo chambers, brine rooms, cooler houses, etc. | 29,200 | kg. cal./hr |
| Through refrigerant leads | 2,489 | kg. cal./hr |
| Total | 31,689 | kg. cal./hr |

Ratio $\frac{\text{measured heat leakage}}{\text{theoretical heat leakage}} = \frac{64,840}{31,689} = 2.046$ 1.87

Maximum ratio permissible for temperature qualification desired by Owners (state head office figure). 2.0

NOTE: During the balance test, the provision chambers were also cooled simultaneously as per test project made in consideration of the owner's request and accordingly the actual ratio has thus slightly exceeded 2.

If the arrangements and details are not precisely in accordance with the approved specifications and plans, have full details of deviations been forwarded with this Report? No
Is the refrigerated cargo installation a duplicate of a previous case? No If so, state name of vessel or Yard and Yard No. Complete
If the survey is not complete, state what arrangements have been made for its completion and what remains to be done

GENERAL REMARKS. (State whether installation has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship, opinions as to class, etc.)

The Refrigerated Cargo Installation of this ship has been constructed under Special Survey in accordance with the Rules, Approved plans and Secretary's letters.

The material and workmanship are satisfactory.

The Installation has been tried under working conditions and found satisfactory, and in our opinion, is worthy for classification with the notation of +Lloyd's RMC4,59 "to maintain temp. -10°C with sea temperature 32°C maximum".

For the Survey Report on the Refrigerating machinery, please see Kobe Rpt.17(a) No.FE-6491 being sent now.

PARTICULARS FOR REGISTER BOOK

| | |
|--|------------------------------|
| MACHINERY | |
| No. of units | 2 |
| Prime movers | Electric Motor |
| Total BHP of all Compressor prime movers | 80 BHP |
| Refrigerant | NH ₃ |
| Makers | The Sabroe Co., of Japan Ltd |
| Date of Construction | 4-1959 |
| Machinery particulars | |
| 2- 2 Cylinder Single Acting Single Stage Compressors | |
| 150mm x 125mm x 550/700 r.p.m. | |
| 2- Shell & Tube Type Condensers | |
| 2- Shell & Tube Type Evaporators | |

| | |
|--------------------------------|-----------------------|
| CARGO CHAMBERS | |
| Total capacity in cubic feet | 6,184 |
| No. Independent | 2 |
| No. independently refrigerated | 2 |
| Method of Cooling | Direct expansion |
| Insulating material(s) | Cork board and Alflex |
| Insulation lining | Timber |

Survey Fee SEE RPT. 17(a) FE-6491 Fee applied for, 19
Travelling Expenses FRIDAY 7 AUG 1959 Received by me, 19
Date of Committee FRIDAY 7 AUG 1959
Class assigned + Lloyd's RMC 4,59

5m,2,58. T.

White Kob.

(See Encl. 6,7,7,59)

CERTIFICATE WRITTEN 10/8/59

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