

# Report on Steam Turbine Machinery. No. 23962.

Rpt. 4a.

Received at London Office **24 MAR 1958**

Date of writing Report 10/3 1958. When handed in at Local Office 22/3 1958 Port of GOthenburg.  
 No. in Survey held at GOthenburg. Date, First Survey 12.12.56. Last Survey 11/3 1958.  
 Reg. Book (Number of Visits 72)

6/42573 on the ~~Full~~ ~~Complex~~ ~~Quadruple~~ Single Screw Vessel S/T "M E L I N E" Tons (Gross 13,405 Net 7,898)  
 Built at Gothenburg. By whom built A.-B. Götaverken Yard No. 716 When built 1958.  
 Engines made at Stockholm and Gothenburg. By whom made A.-B. De-Lavals Angturbin Engine No. 44412 When made 1958.  
 Boilers made at Gothenburg. By whom made A.-B. Götaverken Boiler No. 777/9 When made 1957.  
 Shaft Horse Power } Maximum 9800 Owners A/S Tanktransport Port belonging to Tönsberg.  
 M.N. as per Rule } Service 1960 Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted Yes.  
 Trade for which Vessel is intended General.

## STEAM TURBINE ENGINES, &c.—Description of Engines. Impulse for main propelling machinery.

No. of Turbines Ahead HP+LP (2) ~~Direct coupled~~ double reduction geared to 1 propelling shaft. No. of primary pinions to each set of reduction gearing 2.  
~~Astern~~ LP (1) ~~single reduction geared~~  
 direct coupled to { Alternating Current Generator phase periods per second } rated Kilowatts Volts at revolutions per minute;  
 Direct Current Generator }  
 for supplying power for driving Propelling Motors, Type.  
 rated Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE BLADING.	H. P.	I. P.	L. P.	ASTERN.
Impulse Blading { No. of rows				
Reaction Blading { No. of stages				
{ No. of rows in each stage				

Shaft Horse Power at each turbine { H.P. I.P. L.P. } Revolutions per minute, at full power, of each Turbine Shaft { H.P. I.P. L.P. } 1st reduction wheel main shaft

Rotor Shaft diameter at journals { H.P. I.P. L.P. } Pitch Circle Diameter { 1st pinion 2nd pinion } 1st reduction wheel main wheel. Width of Face { 1st reduction wheel main wheel }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 2nd pinion } 1st reduction wheel main wheel.

Flexible Pinion Shafts, diameter at bearings { 1st 2nd } External Internal { 1st 2nd } diameter at bottom of pinion teeth

Wheel Shafts, diameter at bearings { 1st main } diameter at wheel shroud, { 1st main } Generator Shaft, diameter at bearings Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter ~~xxxxxxx~~ Approved as fitted 440 mm. Thrust Shaft, diameter at collars ~~xxxxxxx~~ Approved as fitted 300 mm.

Tube Shaft, diameter as per rule --- as fitted --- Screw Shaft, diameter ~~xxxxxxx~~ Approved as fitted 497 mm. Is the ~~xxxxxxx~~ shaft fitted with a continuous liner { Yes. }

Bronze Liners, thickness in way of bushes ~~xxxxxxx~~ Approved as fitted 23.5 & 24 mm. Thickness between bushes ~~xxxxxxx~~ Approved as fitted 23.5 and 23 mm. Is the after end of the liner made watertight in the propeller boss. Yes. If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner. --- Fits tight.

If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive. ---  
 If two liners are fitted, is the shaft lapped or protected between the liners. --- Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft. No. If so, state type. --- Length of Bearing in Stern Bush next to and supporting propeller 2000 mm.

Propeller, diameter 5650 mm. Pitch 4815 mm. No. of Blades 4 State whether Moveable. No. Total Developed Surface 14,55 m<sup>2</sup>  
 If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine. Yes. Can the H.P. Turbine exhaust direct to the Condenser. Yes. No. of Turbines fitted with astern wheels 1 Feed Pumps { No. and size 2x257 Gall. per min. 1x166 lit./min. How driven Steam turbine El. driven }

Pumps connected to the Main Bilge Line { No. and size 1x100 m<sup>3</sup>/h. 1x50 m<sup>3</sup>/h. 1x150 m<sup>3</sup>/h. How driven El. driven El. driven Steam Driven. }

Ballast Pumps, No. and size 1 x 100 m<sup>3</sup>/h. Lubricating Oil Pumps, including Spare Pump, No. and size 2 x 65 m<sup>3</sup>/h.  
 Are two independent means arranged for circulating water through the Oil Cooler. Yes. Branch Bilge Suctions, No. and size:—In Engine and Boiler Rooms 5x75mm. c/d ER.fwd; 1x100 c/d 43-44 2x50mm. All other c/d 1x50 mm. In Pump Room Forward 1x2 1/2"

~~xxxxxxx~~ Dry Cargo Hold = 2x2 1/2": Main Pump Room: 4 x 3". Plan 2 x 3"  
 Main Water Circulating Pump Direct Bilge Suctions, No. and size 1 x 400 mm. Plan 1 x 200 Direct Bilge Suctions to the Engine and/or Boiler Room Bilges, No. and size 1x125 mm. 1x75 mm. Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes. Yes.

Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges. Yes.  
 Are all Sea Connections fitted direct on the skin of the ship. On fabr. steel boxes are they fitted with Valves or Cocks. Both.  
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates. Yes. Are the Overboard Discharges above or below the deep water line. Both. Are they each fitted with a Discharge Valve always accessible on the plating of the vessel. Yes. Are the Blow Off Cocks fitted with a spigot and brass covering plate. Yes. What pipes pass through the bunkers. No coal bunker. How are they protected. ---

What pipes pass through the deep tanks. Heating coils only. Have they been tested as per rule. Yes.  
 Are all Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times. Yes.  
 Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another. Yes. Is the Shaft Tunnel watertight. ER aft Is it fitted with a watertight door. --- worked from ---

BOILERS, &c.—Total Heating Surface of Boilers (11480) sq. feet. 15,786 ft<sup>2</sup>  
 Is Forced Draught fitted. Yes. No. and Description of Boilers 2 Babcock & Wilcox water tube Working Pressure 500 lbs/sq"  
 Is a Report on Main Boilers now forwarded? Yes.

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Is  a Donkey  an Auxiliary Boiler fitted?  No.  Yes. If so, is a report now forwarded?  ---

Is the donkey boiler intended to be used for domestic purposes only?  ---

Plans. Are approved plans forwarded herewith for Shafting 13.2.57. Main Boilers 12.7.56. Auxiliary Boilers --- Donkey Boilers ---  
(If not, state date of approval)

Superheaters 12.7.56. General Pumping Arrangements 3.12.56. Oil Fuel Burning Arrangements 5.4.57.

Geared turbines situated aft. Have torsional vibration characteristics of system been approved?  Yes. Date of approval 13.2.57.

SPARE GEAR.

Has the spare gear required by the Rules been supplied?  Yes.

State the principal additional spare gear supplied: 1 tail shaft with continuous liner.  
Complete set of bearings for turbines and gearing.

The foregoing is a correct description.

AKTIEBOLAGET GÖTAVERKEN / J. Hakansson Manufacturer.

Dates of Survey while building: During progress of work in shops 12th December, 1956 - 11th November, 1957. During erection on board vessel 17th November, 1957 - 11th March, 1958. Total No. of visits 72.

Dates of Examination of principal parts: Casings 28/8, 15/10-57. Rotors 10/9, 23/10-57. Blading 23/10-57. Gearing 18/9, 15, 23, 29/10-57. Wheel shaft 23/10-57. Thrust shaft 10/9-57. Intermediate shafts 12/10, 6/12-57. Tube shaft --- Screw shaft 20/9-1957. Propeller 20/9-1957. Stern tube 9/9-1957. Engine and boiler seatings 27/12-1957. Engine holding down bolts 4/1-1958.

Completion of fitting sea connections 29/10-57. Completion of pumping arrangements 6/3-58. Boilers fixed 4/1-58. Engines tried under steam 27/11-1957. Boiler 500 lbs/sq. Blr: 15,4 & 15,9 mm. Blr: 15,9 & 15,5 mm. Main boiler safety valves adjusted Superh. 475. Thickness of adjusting washers Port: Spt: 16,5 mm. Stbd: Spt: 16,0 mm.

Rotor shaft, Material and tensile strength Identification Mark ---

Flexible Pinion Shaft, Material and tensile strength Identification Mark ---

Pinion shaft, Material and tensile strength Identification Mark ---

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment: Identification Mark ---

1st Reduction Wheel Shaft, Material and tensile strength Identification Mark --- Same as wheel shaft.

Wheel shaft, Material --- Identification Mark ---

Intermediate shafts, Material S.M. Steel Identification Marks LLOYD'S GOT. 648 B. 6. 12. 57. Thrust shaft, Material --- Identification Mark ---

Screw shaft, Material S.M. Steel Identification Marks LLOYD'S GOT. 649 B. 12. 10. 57. Tube shaft, Material --- Identification Marks ---

Date of test 12.57 - 3.58. Is an installation fitted for burning oil fuel?  Yes.

Is the flash point of the oil to be used over 150°F?  Yes. Have the requirements of the Rules for the use of oil as fuel been complied with?  Yes.

Full description of Fire Extinguishing Apparatus fitted in machinery spaces: Eng. Room: Steam under floor. 6x12kg foam; 1x6 kg. CO<sub>2</sub>; 2x2 1/2" hose. Blr. Room: Steam under floor. 1x45kg. CO<sub>2</sub>; 15x12 kg. foam; 2x2 1/2" hose.

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo?  --- If so, have the requirements of the Rules been complied with?  ---

Is the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with?  ---

Is this machinery a duplicate of a previous case?  No. If so, state name of vessel.  ---

General Remarks. (State quality of workmanship, opinions as to class, &c.)

The machinery of this ship has been build under Special Survey in accordance with the Rules, approved plans and Secretary's letters.

The turbine rotors and details for the main gearing have been built under Special Survey as per Stockholm Surveyors Report No. 11340 dated 18.12.57. The erection has been carried out by A.-B. Götaaverken, Gothenburg, under my inspection and to my satisfaction.

When X-raying the HP and LP turbines before machining (Götaaverkens' requirement) porosities and slag inclusions were found. These defects were veed out and electrically welded and on completion of repairs stress relieved and again X-rayed and found free from defects.

Material test certificates in respect of the turbine casings are attached.

The gear casing has been fabricated by A.-B. Motala Verkstad, Motala, and on completion tested by means of magnaflux and stress relieved.

Cont. sheet 2.

The amount of Entry Fee ... £ : : When applied for  
Special dur. const. sKr. 1.705:- 22/3 1958.  
" install. sKr. 3.190:-  
Donkey Boiler Fee ... £ : : When received  
Sunday Fee sKr. 85:-  
Travelling Expenses (if any) sKr. 17:-

Committee's Minute TUESDAY - 6 MAY 1959  
Assigned See Rpt. 1.

J. Hakansson Engineer Surveyor to Lloyd's Register of Shipping.

S/T "MELINE", 13,405 tons gross, of Tönsberg, No. 6/42573 in the Supplement to Lloyd's Register Book.

Continuation GENERAL REMARKS:

The bedding of the main reduction gearing examined after full speed trials and found in order.

No gear hammering or rough running was observed at any speed.

The wear down and alignment gauges adjusted satisfactorily.

The emergency over-speed, "lack of lubr. oil", "lack of vacuum", govonors and the automatic steam shut off arrangement tested and found satisfactory.

Heaters, evaporators, steam generators, pumps etc. intended for essential services have been built under survey and certificates are attached.

Certificates covering the thrust cam, intermediate shafts, tail shafts and propeller are also attached.

Two steam generators built under survey in accordance with Hamburg Surveyors' certificates Nos. 3560/61 have also been securely fitted onboard.

The safety valves of these steam generators (2x110 mm. double spring loaded of ordinary type to each generator) have been set to open at 12,5 kg/cm<sup>2</sup>. After the valves had opened the pressure kept on rising to 15,5 kg/cm<sup>2</sup> when the primary steam was ordered to be shut off/so as not to cause any damage. The feed pumps are automatically controlled. As it appears that the safety valves are not of adequate size it is recommended that new or additional safety valves be fitted and satisfactory accumulation tests of both steam generators be carried out before the end of September, 1958, (6 mos. limit). The engineers onboard have been specially informed about the necessity of being careful when the steam generators are in use.

This machinery is, in my opinion, eligible of being classed +IMC 3.58, with the Notation of TS fitted with CL and 2 WT. boilers á 500 lbs/sq", subject to satisfactory accumulation tests of both steam generators being carried out before the end of September, 1958 (6 mos. limit).

NOTE:-

At the Builders request part of the survey was carried out by B. Jönsson on Sunday 13th October, 1957, between 10<sup>00</sup> and 12<sup>30</sup>.

B. Jönsson Surveyor to Lloyd's Register.

Yes, Gothenburg Office.

Certificate (if required) to be sent to Committee's Minute.

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