Rpt. 4b/4f (Inst) (Sheet 1)

REPORT ON INSTALLATION OF INTERNAL COMBUSTION MACHINERY

FOR CONSIDERATION BY THE COMMITTEE OF LLOYD'S REGISTER OF SHIPPING

Received London

Ship's Name m.s."RAPHAEL" Port GENOA

Processing Number: LR – Date of completing rpt. 25/5/1965 Rpt. No. 30070

Gross tons 31,133 Place of survey, if different from above as above

No. of visits:
In shops – First date – Last date –

On ship 50 First date 9/11/1964 Last date 22/5/1965

Owners BLACKSEA STATE STEAMSHIP LINES, U.S.S.R. Port of registry NOVOROSSISK

				Yr.	Mo.
Ship built by	S.A.ANSALDO-CANTIERE NAVALE	Yard No.	1598	When 1965	5
Main engines made by	S.A.ANSALDO-STAB.MECCANICO	Engine No.	909003	When 1965	
Gearing made by	none	Gear No.	–	When –	
Aux./~~boilers~~ boilers made by	S.A.ANSALDO STAB.MECCANICO	Boiler No.	505,506	When 1965-5	
Machinery installed by	S.A.ANSALDO-CANTIERE NAVALE			When 1965-5	

Particulars of service of ship if limited for classification: none

Particulars of vegetable oil or other special cargo notation, if required: none

If ship is to be classed for navigation in ice, state whether class 1, 2 or 3 yes – Class III –

Is ship an oil tanker? yes Is refrigerating machinery fitted? yes

If so, is it for cargo purposes? no Type of refrigerant –

Is the refrigerating machinery space isolated from the propelling machinery space? no

~~Is the refrigerated cargo installation to be classed?~~

No. of main engines one

No. of propellers one

Brief description of propulsion system: One direct reversing oil engine directly coupled to the intermediate shaft and screw-shaft.

17.9.65 Fee Lit. 800.000 Expenses (see Rpt. 1)

MAIN INTERNAL COMBUSTION RECIPROCATING ENGINE

To be reported on Rpt. 4b (Cons) Port GENOA Rpt. No. Same No.attached

~~XXXXXXXXXXXXXXXXXX~~

To be reported on Rpt. 4f (Cons) Port – Rpt. No. –

~~XXXXXXXXXXXXXXXXXX~~ (Internal combustion reciprocating engines or gas turbines)

Electrical particulars to be reported on Rpt. 4d Port – Rpt. No. –

~~XXXXXXXXXXXXXXXXXX~~ (Internal combustion reciprocating engines or gas turbines)

To be reported on Rpt. 4e Port – Rpt. No. –

*Are flame guards or traps fitted to crankcase relief devices? yes

No. of lub. oil coolers: MAIN 4 AUX. 3

*Is a ~~torsional~~ axial vibration damper ~~or detuner~~ fitted to the shafting? yes

Is engine fitted directly on tank top, or on a built-up seating? built up seating

*Where positioned? fwd.end crankshaft

*Can engine ~~XXXXXX~~ be reversed? yes

*If not, how is reversing effected? –

*Type FIAT

Is the engine equipped to operate on heavy fuel? yes

Cooling medium for: CYLINDERS fresh water; PISTONS lub.oil; FUEL VALVES fresh water

No. of fresh water coolers: MAIN 3 AUX. 4

(S.DINNEN)
Surveyor to Lloyd's Register of Shipping

NOTE.—The particulars in this report are to be given as fully and as clearly as possible. Where the answer is "NO" or "NONE", say so. Ticks and other signs of doubtful meaning are not to be used. Wording not applicable to be cancelled. Where items are marked with an asterisk* the particulars need not be repeated here if they have already been given on the relevant Rpt. 4b (Cons) or 4f (Cons).

6m,9/64 (MADE AND PRINTED IN ENGLAND)

012728-012733-0102

CLUTCHES, FLEXIBLE COUPLINGS, &c. If a clutch or other flexible connection is fitted between engine/turbine and gearing, or between engine and line shafting, give Makers' name, brief description and, for clutches, state how operated.

NONE

If main engine can be used for purposes other than propulsion when declutched, state what purpose also at what maximum B.H.P. & R.P.M.

NONE

AIR COMPRESSORS AND RECEIVERS

State No. of independently driven air compressors, also capacity of each and whether a separator or filter is provided between each compressor and the air receivers, type of prime mover, position in ship, Port and No. of cert.

2 off.405m3/hr. each electr.driven. Port comp. flat separate oil filter.LA SPEZIA M.548.
1 off. 60m3/hr. - " " " " " " " " " " M.521.
1 off. 15m2/hr hand start diesel driven " " " " " " " "

State No. of starting air receivers, both main and auxiliary, capacity of each, position in ship, Port and No. of cert.

3 off.main 9m3 each port comp.flat. Genoa M.7670.
1 off.aux.200 litres. Port E.R. Floor. Milan A/83.
1 off.aux.500 litres Fwd.comp.flat. Milan A/116.
1 off.aux.200 litres forecastle. Milan A/83.

How are air receivers first charged? Hand start diesel compressor.

Maximum working pressure of starting air system 30 Kg/cm2

Are the safety devices in accordance with the Rules? yes

Are bursting discs or flame arresters fitted at the starting air valves on each cylinder? yes

Has the starting of the main engines been tested and found satisfactory? yes

STEAM INSTALLATION

No. of aux./~~donkey~~ boilers (*see Key to R.B.*) burning oil fuel: two

Working pressure 12 Kg/cm2

Type ANSALDO FOSTER WHEELER W/T

Position Port & Stbd.aft. E.R.flat.

Enclosed space upto upper deck level

Is a superheater fitted? no

Are these boilers also heated by exhaust gas? no

No. of aux./~~donkey~~ boilers (*see Key to R.B.*) heated by exhaust gas only: one

Working pressure 8 Kg/cm2 / 12 Kg/cm2

Type CASINGHINI "DIESECON G"

Position just below funnel casing

Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil-fired boilers? yes steam at 8Kg/cm2 can be delivered to turbo alternator.

Port and rpt. or cert. Nos. for aux./~~donkey~~ boilers

Two W/T O/F-Genoa same No.attached.
One E/G Milan No. 56.

Is steam essential for the operation of the ship at sea? yes

If so, are any steam pipes over 3 ins. bore? yes

What is their material? solid drawn. M.S. " "copper.

For oil-fired boilers, is the arrangement of pipes, valves, controls, &c., in accordance with Rules? yes

No. of oil-burning pressure units two

No. of steam condensers one

No. of evaporators two

Rpt. 4/4a/4b/4f (Inst)
(Sheet 2)

Ship's Name "RAPHAEL" Port GENOA Rpt. No. 30070

Date of approval of torsional vibration characteristics of the propelling machinery system with:— 27.8.62

(a) Working propeller 30/5/1963 11-7-63

(b) Spare propeller 30/5/1963

Particulars of barred speed range(s) if imposed, with :—

(a) Working propeller none

(b) Spare propeller none

STRAIGHT SHAFTING

Max. BHP approved for each line of shafting 19,000 Corresponding RPM of propeller 122 MN 3800

THRUST SHAFT. Separate or integral with crank, shaft? separate

Diameter adjacent to collar 700 mm.

Material S.M.forged steel

Minimum approved tensile strength 55 Kg/mm2

INTERMEDIATE SHAFT Diameter 580mm.

Material S.M.

Minimum approved tensile strength 55 Kg/mm2

SCREWSHAFT. Dia. of cone at large end 625mm.

Is screwshaft fitted with a continuous liner? yes

TUBE SHAFT (*if separate*) Diameter none

Is tube shaft fitted with a continuous liner in way of stern tube? –

Thickness of screwshaft liner at bearings 55mm.

Thickness of liner between bearings 43mm.

How is the after end of the liner made watertight in the propeller boss? rubber ring

Material of screw/tube shaft S.M.steel

Minimum approved tensile strength 55 Kg/cm2

Is an oil gland fitted? no

– –

Length of bearing next to and supporting propeller 3100 mm.

Material of bearing lignum vitae

Material of sterntube S.M.steel

Is sterntube fabricated? – no –

– –

PROPELLER

If of special design, state type no

Is it of reversible pitch type? no

– –

PROPELLER	BLADE MATERIAL	TENSILE STRENGTH	BUILT OR SOLID	LEFT HAND (LH) or RIGHT HAND (RH)	NO. OF BLADES	DIAMETER	PITCH	TOTAL DEVELOPED SURFACE
Working	Ni-Al-Mn-Bronze	58Kg/mm2	Solid	Rh.	4	6480mm.	4620mm.	18.40m2
Spare	steel Aq45 - Uni3158	45Kg/mm2	Solid	Rh.	4	6480mm.	4553mm.	18.80m2

PROPELLER	DESIGN MOMENT OF INERTIA OF PROPELLER (DRY) G.D.2	FOR ICE STRENGTHENING ONLY					
		CLASS 1, 2 OR 3	THICKNESS OF BLADES AT TOP OF ROOT FILLET	THICKNESS OF BLADES AT 25% RADIUS	THICKNESS OF BLADES AT TIP	LENGTH OF BLADE SECTION AT 25% RADIUS	RAKE OF BLADES
Working	152000m2/Kg.	3	249mm.	230mm.	22mm.	1504mm.	Negative
Spare	187500m2/Kg.	3	298mm.	275mm.	22mm.	1504mm.	Negative

OIL FUEL TANKS

No. and position of oil fuel settling or service tanks not forming part of ship structure: Two boiler or sett.tanks port side blr.Rm. One stbd.E/R flat diesel fuel.

LUBRICATION

No. of lub. oil pumps and how driven: One-chain driven from inter.shaft. one electr.driven.

Can normal supply be maintained with any one pump out of action? yes

Is emergency supply automatically available as per Rule? (*turbines only*) –

Is an alarm device fitted to indicate failure or reduction of supply from the pumps? yes

No. of oil coolers four

No. of duplex oil strainers one-strainer = two-auto-clean

SUCTION	PRESSURE
one-duplex	

Are the strainers of magnetic type? duplex only yes

(S.DINNEN)
Surveyor to Lloyd's Register of Shipping

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INDEPENDENT PUMPS Name below each essential pump and state its position. Give capacities of bilge pumps	SERVICE FOR WHICH EACH PUMP IS CONNECTED TO BE MARKED THUS ×																
	SUCTION									DELIVERY							
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel Tanks	Condenser Extraction	Sea	Feed Tanks	Lub. oil		Boiler Feed	Main Condenser	Oil Fuel Burners	Oil Fuel Tanks	Fire Main	Overboard		
Cond.circ. Stbd.fwd. elect.centrif.600m3/hr						X											
Blr.feed Stbd.aft. Electr.centrif.35m3/hr.							X			X							
Atmos.cond.circ. Stbd. Electr.cent. 300m3/hr						X											
F.O.trans. Stbd.fwd. Electr.cent. 72m3/hr				X								X					
Daily service F/Otrans-Stbd.Fwd. Electr.cent. 36m3/hr				X								X					
M.E.lub.oil Stbd.aft. Electr.cent. 500m3/hr								X									
F/W & S/W circ.M.E. Stbd. Electr.cent. 800/600m3/hr						X			X								
Aux.S/W circ. Stbd. Electr.cent. 120m3/hr						X											
General service Port fwd. Electr.cent. 100m3/hr	X	X				X											
Bilge port fwd. steam duplex 40m3/hr	X					X											
Ballast and fire. Port Electr.cent. 250m3/hr						X								X			
Fire pump port Electr.cent. 250m3/hr						X								X			
Bilge port fwd. Electr.cent. 120m3/hr	X	X															
Oily water separator-port fwd. Electr.recip. 56m3/hr	X	X												oily water separator			
Diesel alt.circ. stbd. Electr.cent. 20m3/hr						X					–						
T/A cond.extract Stbd. Electr.cent. 6m3/hr																	

BILGE SUCTIONS

No. and size in each hold, deep tank, cofferdam and pump room

Pump room.One fwd.one aft. 100mm.
Fwd.pump room. One centre. 63mm.
P&S Boatswains store. 63mm.
One chain locker. 63mm.

No. and size connected to main bilge line in:—

Main engine room 1 – Aft.tunnel well 125mm.
1 – Aft.E.R. 100mm.
2 – P&S fwd. 125mm.
2 – P&S fwd.(off) 100mm.
3 –P.C.&S.fwd.(off) 50mm.

~~Aux.engine room~~

Aux.Boiler room 2 – P&S fwd. 65mm.
2 – P&S aft. 80mm.

~~Direct~~

Sizes and positions of direct suctions in machinery spaces

2 – P&S mid. E.R. – 150mm.
1 – fwd. E.R. – 100mm.

Sizes and positions of emergency suctions in machinery spaces

1 – Stbd.E.R. – 350mm.

Are all suctions of non-return type? yes

Has the bilge or ballast system means for separating oily water on the overboard discharge side ? yes

Do the pumping arrangements comply with the Rules, including special requirements for oil tankers, ~~ballast arrangements~~ classed for navigation in ice Class ~~1,2 or~~ 3? (*Strike out words not applicable*) yes

If to be classed for navigation in ice, state means provided for clearing ice from ship's side valves steam connections to valve chests & recirculation of Eng. cooling water at inlets.

STEERING GEAR. (State type, also No. of steam engines, electric motors, hydraulic pumps and other particulars, including particulars of the alternative means of steering)

Electric hydraulic. 4 Ram. 2 Elect.motors. 2 hydraulic pumps.
See Greenock certificate No.C.563 9/4/65.
The above equipment can also be actuated by hand.

0102 3/4

INDEPENDENT PUMPS Name below each essential pump and state its position. Give capacities of bilge pumps	SERVICE FOR WHICH EACH PUMP IS CONNECTED TO BE MARKED THUS ×															
	SUCTION								DELIVERY							
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel Tanks	Condenser Extraction	Sea	Feed Tanks		Boiler Feed	Main Condenser	Oil Fuel Burners	Oil Fuel Tanks	Fire Main	Overboard		
Blr.circ. Stbd.aft. Electr.cen. 50m3/hr							X		X							
Blr.F/O Blr.rm. Electr.cen.3.5x0.3m3/hr																
Blr.feed Stbd.aft. Elect.cen. 8m3/hr						X			X							
LO/ trans. Port Electr.cen. 20m3/hr							X									
M.E.F/O booster Fwd. Electr.cen. 8.6m3/hr																
M.E.fuel valve clg.Stbd.fwd. Electr.cen. 17m3/hr									M.E. fuel valves							
Comp.S/W circ. Port fwd. Electr.cen. 22m3/hr						X			Main air compressors							
Comp.S/W circ. Port fwd. Electr.cen. 1.5m3/hr						X						X				
Aux.diesel O/F fwd. Electr.cen. 1m3/hr																
Aux.diesel pre.lub.Stbd.fwd. Electr.cen. 16m3/hr																
Bilge Port fwd. Steam duplex 40m3/hr		Pumproom bilges	MAIN CARGO PUMPROOM									Overboard				
Ballast Stbd.aft. Electr.cent. 1250m3/hr			X			X										
Bilge & ballast Mid.aft. Steam duplex 250m3/hr	X		X	FWD.PUMPROOM		X						Fuel oil or ballast tks.				
Fuel oil trans. Stbd. Steam duplex 100m3/hr			X			X						X overboard				
Emerg.fire Port Diesel 250m3/hr						X							X			

Rpt. 4/4a/4b/4f (Inst)
(Sheet 3)

30070

Ship's Name "RAPHAEL" Port GENOA Rpt. No.

STEAM AND OIL ENGINE AUXILIARIES

REF	POSITION OF EACH	TYPE	MADE BY
a	PORT E.R. tank top 5813	Sulzer 6BCAH 29	C.R.D.A.,TRIESTE
b	Stbd.Inbd. " " 5819	" "	" "
c	Stbd.Outbd. " " 5820	" "	" "
d	Stbd. E.R.flat(tween dk level)	Man.W8V.17.5	M.A.N.
e	Stbd.Outbd. E.R.flat " "	Stm.turbine	ANSALDO MECCANICO
f	Stbd.boat deck aft.	026.S.6V.AR.1627	BREDA
g	Fwd.pump room.	D.V. 550	ALFA ROMEO
h			

REF	PORT & No. OF REPORT OR CERTIFICATE	DRIVEN MACHINERY (for electric generators state kw, volts & amps)	
a	TRIESTE No. 16475	690 kVA	400 Volts
b	" " 16307	690 kVA	400 Volts
c	" " 16307	690 kVA	400 Volts
d	AUGSBERG NO. 1803		400 Volts
e	MILAN NO. 58	560 kVA	400 volts
f	MILAN No. 52	188 kVA	400 Volts
g			
h			

If electric current is used for essential services at sea, state the minimum No. and capacity of generators required

(1) So that the ship may operate at sea: one 690 kVA

(2) For refrigerated cargo purposes: -

Has the spare gear required by the Rules been supplied? yes

Has all the machinery been tried under full working conditions & found satisfactory? yes

Date & duration of full-power sea trials of main engines: May,1965 - 8hrs.

Has the manœuvring of the main engines been tried and found satisfactory? yes(15/5/65)

DECLARATION TO BE SIGNED BY INSTALLING ENGINEERS

To the best of our knowledge this machinery has been installed in conformity with the Rules, Regulations and requirements of Lloyd's Register of Shipping, and the foregoing particulars of main and auxiliary machinery and pressure vessels (as shown on sheets 1, 2 & 3) are correct.

ANSALDO S.p.A. - CAN
Il Direttore

15 GIU. 1965
(date)

(signature)

A previous similar case was for (name) "GIUSEPPE VERDI" Port and Rpt. No. GENOA No. 29569.

IDENTIFICATION MARKS (*copies of certificates to be forwarded*)

Thrust shaft S.S.103 G.E.28/7/62.
" disc.S.S.105 B.83407.
Intermediate shafts LLOYD'S GEN.S.1048 G.M. & G.V. 10/8/64.

Screw ~~xxxxxx~~ shafts LLOYD'S GEN.S.1033 G.M. and G.V.7/8/64.

Propellers Working-LLOYD'S GEN.P.1208 G.M.3/11/64.
Spare -LLOYD'S DTM. 654,655 G.M.5/2/65.

Other important items Stern tube.LLOYD'S GEN.P.311 - R.E.21/2/64.
Bobbin Rece.LLOYD'S GEN.S.769 -G.M.31/8/64.

0102 4

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6m,9,64 (MADE AND PRINTED IN ENGLAND)

DATES OF APPROVAL OF PLANS

Straight shafting	23/10/62	Oil burning arrangements	12/12/63
		Compressed air system	2/7/62
		Main steam pipes	16/4/62
Air receivers	14/8/62	Boiler feed system	4/12/62
~~Clutch~~		~~Main boilers~~	
~~Reversing gear & control~~			
~~Flexible coupling~~			
Separate fuel tanks	25/10/63	~~Superheaters~~	
General pumping arrangements	12/3/63		
		Aux. boilers	Oil fired. 24/5/62 Exh.Gas 18/1/63
Bilge, ballast & oil fuel pumping arrangements in the machinery space	30/3/62	~~Donkey boilers~~	
		Feed water economisers	(exh.gas blr.)
Oil fuel piping & fittings at settling & service tanks	30/3/62	~~Steam heated steam generators~~	
		Propeller (including spare, if supplied)	working 12/10/62 spare 31/10/62
Cargo oil pumping arrangements	5/4/62	Stern gear	30/5/1963
		~~Oil-retaining gland (if not shown on shafting plan)~~	

DATES OF EXAMINATION OF:—

Fitting of stern tube	24/11/64	Alignment* of straight shafting	5/5/65
Fitting of propeller	14/1/65	Testing of pumping arrangements	15/5/65
Completion of sea connections	28/11/64	Oil fuel lines	11/5/65
Alignment* of crankshaft on board	24/3/65(UGHT)	Boiler supports	4/12/64
Alignment* of ~~turbines~~ engines & ~~gearing~~	5/5/65	Steering machinery	22/5/65
Holding down bolts & chocks	5/5/65	Windlass	15/5/65

*State if aligned when ship in light, ballast or loaded condition

† The machinery reported above has been constructed and installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters. The materials and workmanship are good, the spare gear required by the Rules has been supplied and the machinery is eligible, in my opinion, to be classed. ‡

+L.M.C. 5/65 C.L. OIL ENGINE.

(S.DINNEN)
Surveyor to Lloyd's Register of Shipping

Date of Committee FRIDAY - 3 SEP 1965

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ABS
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† (*a*) If the installation contains any features of a novel or experimental nature, give particulars.
(*b*) If centralised and/or bridge control is fitted for main propelling and/or essential auxiliary machinery, state on a Rpt.–(cont.) where the control room is situated, the machinery controlled from it and give a brief description of the control system, including any automatic system for controlling essential auxiliary machinery.
‡ Include any special notation to be assigned.

NOTE.—Where existing machinery is submitted for classification, the circumstances are to be explained as fully as possible, and the recommendation should be suitably amended.