Rpt. 4c

Date of writing report ..... Received London ..... Port YOKOHAMA No. 3511

13 JUL 1961

Survey held at Yokohama No. of visits Yokohama 63 First date 1 June 1960 Last date 24 Oct. 1960

FIRST ENTRY REPORT ON AUXILIARY INTERNAL COMBUSTION ENGINES

Name of Ship – *(Or Contract No. if name unknown).* *Owners (Or Consignees)* –

Ship Built at Hiroshima, Japan *by* Hiroshima Works, Mitsubishi Shipbuilding & Engineering Co., Ltd. *when* ..... *Yard No.* S144

Auxiliary Engines or Gas Turbines made at Yokohama *by* Yokohama Shipyard & Engine Works Mitsubishi Nippon Heavy Ind. Ltd. *when* 1960-10 *Eng. Nos.* D133256, D133257, D133258

Total No. of sets and description (including type name) 3 sets Yokohama M.A.N. trunk piston, solid injection, supercharged diesel engine

INTERNAL COMBUSTION RECIPROCATING ENGINES. *No. of cylinders per engine* 8 *Dia. of cylinders* 235 m/m *Stroke* 330 m/m *2 or 4 stroke cycle* 4 *Maximum approved BHP* 570 (metric) 600 *RPM* *Corresponding MIP* 9.33 kg/cm² *Maximum pressure* 68 kg/cm² *Fuel* diesel oil *Are cylinders arranged in Vee or other special formation?* No *If so, No. of crankshafts per engine* – *Is engine of opposed piston type?* No *No. and type of mechanically driven scavenge pumps or blowers per engine* – *No. of exhaust gas driven* ~~blowers~~ *or superchargers per engine* 1 set *Is welded construction used for: Bedplate?* No *Entablature?* No *Total internal volume of crankcase (if 20 cu. ft. or over)* 1.79 m³ *No. and total area of crankcase explosion relief devices* 2 & 86.5 cm² *Are flame guards or traps fitted?* No *Cooling medium for: Cylinders* fresh water *Pistons* – *No. of attached pumps: F.W. cooling* – *S.W. cooling* – *Lubricating oil* 1 set *How is engine started?* by compressed air

SHAFTING. *Is a damper* ~~*or detuner*~~ *fitted?* Yes *No. of main bearings* 9 *Are bearings of ball or roller type?* No *Distance between inner edges of bearings in way of cranks* 284 m/m *Crankshaft:* ~~*Built, semi-built*~~, *solid.* *Material of crankshaft* electric furnace steel *Approved minimum tensile strength* 53 kg/mm² *Dia. of pins* 155 m/m *Journals* 155 m/m *Breadth of webs at mid throw* 280 m/m *Axial thickness* 80 m/m *If shrunk, radial thickness around eyeholes* – *Dia. of flywheel* 1250 m/m *Weight* 1380 kg *Are balance weights fitted?* No *Total weight* – *Rad. of gyration* – *Dia. of flywheel shaft* – *Has each engine been tested in shop?* Yes *How long at full power?* 2 Hr. *Was it tested with driven machinery attached?* No *Was the governing tested and found satisfactory?* Yes *Date of approval of torsional vibration characteristics (for engines of 150 BHP and over)* 22-10-60 *Date of approval of shafting* 14-7-60 *Identification marks on shafting* NAG.S-CK3311 S.N. 2-8-60, NAG.S-CK3315 S.N. 19-8-60, NAG.S-CK3314 A.I. 12-8-60 *Particulars of driven machinery* No

487G. 9/1/61

Port and No. of Certificate for Starting Air Receivers .....

~~**AUXILIARY GAS TURBINES.**~~ *BHP per set* ..... *At* ..... *RPM of output shaft.* *Open or closed cycle?* .....

Arrangement of turbines. *(A small diagram should be attached skowing gas cycle)*

HP drives	*at*	*RPM*	*HP gas inlet temp.*	*pressure*	
IP "	*at*	"	*IP* " " "	"	
LP "	*at*	"	*LP* " " "	"	

No. of air compressors per set ..... *Centrifugal or axial flow type?* ..... *Material of turbine blades* .....

Material of compressor blades ..... *No. of air coolers per set* ..... *No. of heat exchangers per set* ..... *How are turbines started?* ..... *Are the turbines operated in conjunction with free piston gas generators?* .....

Total No. of free piston gas generators ..... *Dia. of working pistons* ..... *Dia. of compressor pistons* ..... *No. of double strokes per minute at full power* ..... *Gas delivery pressure* ..... *Gas delivery temperature* .....

Have the turbines and attached equipment been tested in shop? ..... *How long at full power?* ..... *Were they tested with driven machinery attached?* ..... *Particulars of gearing* .....

Date of approval of plans ..... *Identification marks* ..... *Particulars of driven machinery* .....

~~**ELECTRIC GENERATORS.**~~ *Port and No. of Certificate for generators of 100 Kw. and over* .....

For generators under 100 Kw., has Makers' Certificate been obtained? ..... *Are Certificates attached?* .....

The foregoing description is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable)

M Isagai

YOKOHAMA SHIPYARD & ENGINE WORKS,
MITSUBISHI NIPPON HEAVY INDUSTRIES, LTD. *Manufacturer*

Is this machinery duplicate of a previous case? No *If so, which?* –

GENERAL REMARKS. *State if the machinery has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.*

These Auxiliary Internal Combustion Engines have been constructed under the supervision of the Society's surveyors in accordance with the Rules, Approved plans and Secretary's letters.

The workmanship and materials have been found satisfactory. These Auxiliary Internal Combustion Engines have been examined during and after shop trial and found in order. Crank case explosion relief devices are fitted as per Rules. It is submitted that these Auxiliary Internal Combustion Engines are eligible in our opinion to be classed with this Society with the notation of ✠LMC with date when satisfactorily installed in the vessel.

Survey Fee ¥ 216,570.-

Expenses .....

Date when a/c rendered DEC. 12. 1960

J. Winn. Engineer Surveyor to Lloyd's Register

Declaration to be signed by Surveyor at fitting-out Port:— *The above described machinery has been fitted on board the* ..... *at* ..... *in a proper manner and found satisfactory when tested on the (date)* ..... *under full working conditions.*

..... *Engineer Surveyor to Lloyd's Register*

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