Rpt. 4c

Date of writing report 18th Jan.61 Received London ..... Port ..... No. 381

17. MAY

Survey held at Siuro No. of visits 10 First date 10/11/60 Last date 11/12/60

FIRST ENTRY REPORT ON AUXILIARY INTERNAL COMBUSTION ENGINES

Name of Ship (Or Contract No. if name unknown). PARANAGUA Owners (Or Consignees) Lloyd Brasiliero

Ship Built at Helsingfors by Valmet Oy Helsingin Telakka when 1961 Yard No. 203

Auxiliary Engines or Gas Turbines made at Siuro by Valmet Oy Linnavuoren Tehdas when 1960 Eng. Nos. 519-20-21

Total No. of sets and description (including type name) 3 Auxiliary Engines, Burmeister & Wain

INTERNAL COMBUSTION RECIPROCATING ENGINES. No. of cylinders per engine 5 Dia. of cylinders 205 Stroke 300

2 or 4 stroke cycle 4 Maximum approved BHP 250 at 600 RPM Corresponding MIP 7.1 kg/cm^2 Maximum pressure 60 kg/cm^2

Fuel Diesel Are cylinders arranged in Vee or other special formation? No If so, No. of crankshafts per engine None Is engine of opposed piston type? No No. and type of mechanically driven scavenge pumps or blowers per engine None No. of exhaust gas driven blowers or superchargers per engine 1 Brown & Bovery Is welded construction used for: Bedplate? No Entablature? No Total internal volume of crankcase (if 20 cu. ft. or over) 1.5 m^3 No. and total area of crankcase explosion relief devices 2-366 cm^2 Are flame guards or traps fitted? Yes Cooling medium for: Cylinders F.W. Pistons None No. of attached pumps: F.W. cooling – S.W. cooling – Lubricating oil 1 How is engine started? Compressed air

SHAFTING. Is a damper or detuner fitted? No No. of main bearings 6 Are bearings of ball or roller type? No Distance between inner edges of bearings in way of cranks 266 mm Crankshaft: ~~built~~ semi-built, ~~solid~~ Material of crankshaft El steel Approved minimum tensile strength 44 kg/mm^2 Dia. of pins 135 mm Journals 135 mm Breadth of webs at mid throw 230 mm Axial thickness 76 mm If shrunk, radial thickness around eyeholes 63 mm Dia. of flywheel 1250 mm Weight 830 kgs Are balance weights fitted? Yes Total weight Cast with crakwebs Rad. of gyration 203 mm Dia. of flywheel shaft 135 mm Has each engine been tested in shop? Yes How long at full power? 6 hrs Was it tested with driven machinery attached? Yes Was the governing tested and found satisfactory? Yes Date of approval of torsional vibration characteristics (for engines of 150 BHP and over) 20/8/59 Date of approval of shafting 20/8/59 Identification marks on shafting Lloyd's Åbo Nos.1194, 1195 & 1303.

Particulars of driven machinery ASEA AC GENERATOR 440 V 60 cycles 210 kVA

Port and No. of Certificate for Starting Air Receivers

447W

2/6/61

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

Arrangement of turbines. (A small diagram should be attached showing 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 ASEA Generators SKM № 4904214, 4904215, 4904216 LR SKM Cert. № 21630

For generators under 100 Kw., has Makers' Certificate been obtained? – Are Certificates attached? No

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

Gustav Hagman VALMET Oy
Gustav Hagman Manufacturer

Is this machinery duplicate of a previous case? Yes If so, which? Valmet Linnavuori № 500-2, 505-7, 512-14

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 Engines have been built in accordance with the Rules, approved plans and Secretary's letters. The material and workmanship are good.

Survey Fee 174 300
Expenses 34 850
Date when a/c rendered 18/1/61

Å. Lindqvist 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 M.V. "PARANAGUA" at Helsinki in a proper manner and found satisfactory when tested on the (date) 22/3 & 6/4/61 under full working conditions.

S. G. Elliott
Engineer Surveyor to Lloyd's Register

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