

Date of writing report 12th Sept. 1963 Received London 26 SEP 1963 Port Rotterdam No. 56831

Survey held at FLUSHING No. of visits in shop 27 First date 19-10-1962 Last date 11-9-1963

FIRST ENTRY REPORT ON MAIN ENGINE REDUCTION GEARING

Name of Ship "POOLSTER" Owners Royal Netherlands Navy

Hull built at Rotterdam by Rotterdam Drydock Comp. Yard No. 307 Year

Main engines made at by Engine No. Year

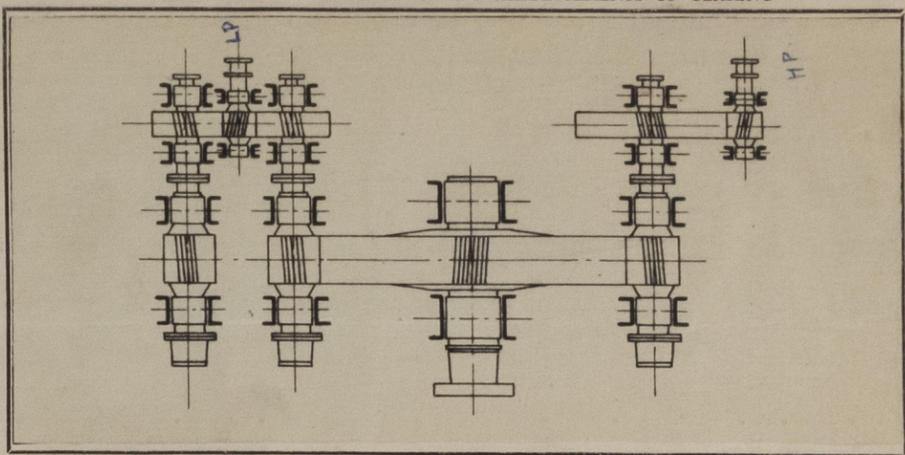
Reduction gearing made at FLUSHING by Kon. Mij. "de Schelde" Gear No. 6556 Year 1963

Type of engine with which gearing is to be used steam turbines State if for Class 1 or 2 ice strengthening

The following particulars are to be given as fully and clearly as possible. Wording not applicable should be cancelled by a black line.

Description of gearing, including reversing arrangements and clutches, if any, and No. of sets (state if ball or roller bearings)

DIAGRAMMATIC SKETCH SHOWING ARRANGEMENTS OF GEARING



Double reduction single helical, tandem type with L.P. part dual tandem gearing

If single helical, what is the position of the gear thrust bearing? Primary pinions and primary wheels at forward end.

Helix angle, primary HP 12° LP 11° secondary 4° 30°

Type of involute tooth form pressure angle 15° "Maag" principle Approved maximum total S.H.P. 22500 at 145 R.P.M. of main wheel

PINIONS

Maximum S.H.P. to be delivered to primary pinions ...
 Revolutions per minute ...
 Diameter of pitch circle, inches/mm. ...
 No. of teeth ...
 Total width of face, parallel to axis, inches/mm. ...
 Width of gap, inches/mm. ...
 Diameter of shaft at bearings, inches/mm. ...
 No. of bearings ...
 Span of bearing centres, inches/mm. ...
 Material, state nominal composition and heat treatment ...
 Tensile strength, tons per sq. in./kg. per sq. mm. ...

	PRIMARY			SECONDARY		
	HP	MP	LP	HP	MP	LP
Maximum S.H.P. to be delivered to primary pinions	8440 ✓		14060 ✓			
Revolutions per minute	7430 ✓		3000 ✓	1034		1320
Diameter of pitch circle, inches/mm.	240, 250 ✓		390, 423 ✓	451, 392 ✓		388, 197 ✓
No. of teeth	47 ✓		73 ✓	50 ✓		43 ✓
Total width of face, parallel to axis, inches/mm.	230 ✓		230 ✓	450 ✓		450 ✓
Width of gap, inches/mm.	-		-	-		-
Diameter of shaft at bearings, inches/mm.	149,70 with 80 mm. central hole ✓		184,64 with 100 mm. central hole ✓	319,66 - with 220 mm. central hole		319,66
No. of bearings	2		2	2		2x2
Span of bearing centres, inches/mm.	510		510	990		990
Material, state nominal composition and heat treatment	heat treatment 1 hour at 850° C, furnace cooled, subsequently raised to 600° C and air cooled, case hardened and stress relieved.					
Tensile strength, tons per sq. in./kg. per sq. mm.	EN 36 C		EN 36 C	EN 36 C		EN 36 C
	93.5 - 103		91.9 - 99	84.3 - 94.8		88.9 - 95.7
QUILL SHAFTS						
Diameter, inches/mm.				150		
Material, state nominal composition				1.34 Cr. Ni, Mo 6		
Tensile strength, tons per sq. in./kg. per sq. mm.				98.1	98.1	
FLEXIBLE COUPLINGS						
Type of coupling				fixed	fixed	
Material, driving member				S.M. steel		
Tensile strength, tons per sq. in./kg. per sq. mm.				52	52	
Material, driven member						
Tensile strength, tons per sq. in./kg. per sq. mm.						

Do couplings permit axial float of pinions? ✓ Have primary pinions been dynamically balanced? yes Have secondary pinions been dynamically or statically balanced? dynamically

WHEELS

Revolutions per minute ...
 Diameter of pitch circle, inches/mm. ...
 No. of teeth ...

	PRIMARY			MAIN
	HP	MP	LP	
Revolutions per minute				112 ✓
Diameter of pitch circle, inches/mm.	1574, 404 ✓		887, 812 ✓	3511, 827 ✓
No. of teeth	308 ✓		166 ✓	389 ✓



11/11/63

01370-01374-0125

WHEELS (continued)

	PRIMARY			MAIN
	HP	MP	LP	
Material of rims, state nominal composition ...	EN 28		EN 28	EN 28
Tensile strength, tons per sq. in./kg. per sq. mm. ...	130		117.6 - 120.2	135 - 140
Diameter of shaft at bearings, inches/mm. ...	219.26 ✓		219.26 ✓	589.54 ✓
Material of shaft ...	S.M. steel		S.M. steel	S.M. steel
Tensile strength, tons per sq. in./kg. per sq. mm. ...	51.3		48.7 - 52	48.4 - 49.6

Have wheels been statically balanced? primary dynamically, main wheel: statically
 Are wheel bodies connected to the shafts by bolts? H.P. prim+ main wheel Material of wheel bodies S.M. steel
 Are rims shrunk on, or bolted to bodies, or attached by welding? HP prim + main & bolted, LP prim: shrunk Are radial or axial dowels fitted? no
 If shrunk, has the shrinkage allowance been checked and found as approved? yes How were the teeth cut? cut and ground
 If hobbed, name and serial no. of hobbing machine - What post-hobbing process was applied? -
 Name and serial no. of machine used for finishing process pinions and prim wheels Maag HSS 90 P, main wheel Maag HSS 360 If teeth are surface hardened, state method Pinions: case hardened Were teeth cut under conditions of temperature control? yes
 Is gearcase of cast or welded construction? yes If welded, has it been stress relieved? yes Have trammels or other means been supplied for verifying that gearcase is free from distortion when secured in ship? yes Diameter of shaft at thrust collar ✓ Has gearing been run light/under load in the shop and the tooth contact found satisfactory? yes
 What is the backlash? (state whether measured circumferentially or normal to the teeth) HP prim 0.44 - L.P. prim upper 0.37 lower 0.35 (normal to the teeth)
 H.P. sec. 0.80 - L.P. sec. upper 0.93 lower 0.87 mm. If undulation records were taken, state maximum height from crest to trough and wave length, pinions ✓ wheels ✓

Maximum adjacent pitch error normal to teeth, if measured, pinions 0.002 mm.
 wheels prim 0.002 mm, main 0.003 mm Date of approval of plans 10-7-'62, 14-11-'62
 If gearing is a duplicate of a previous case, state name of ship - N.V. Koninklijke Mij. "De Schelde"
 The foregoing description of reduction gearing is correct. p. proc. *[Signature]*

GENERAL REMARKS

State if the gearing has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship. This report should be forwarded to the Head Office with the First Entry report on the machinery. When gearing is made at a Port other than the Port of installation, the Surveyors at the former should send this report to the Surveyors at the Port of installation as soon as possible after completion of the gearing. The latter should complete the Declaration below and send the report to the Head Office with their First Entry report on the machinery.

The gearing has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. Materials found good and tested as required. Workmanship found good throughout. The gearing merits in my opinion the approval of the Committee.

Survey fee FLS 1202 =
 Expenses 170 =
 Turnover tax 157.17
 Date when a/c rendered 24 SEP 1963

IDENTIFICATION MARKS

PRIMARY PINIONS H.P. LLOYD'S WIN. F. 6088-66090-3 J.H. 6-11-'62 A.v.B. 2-9-'63 L.P. LLOYD'S WIN. F. 6088-66090-2 J.H. 6-11-'62 A.v.B. 2-9-'63
 PRIMARY QUILL SHAFTS H.P. LLOYD'S WIN. 6088-66090-1 J.H. A.v.B. 2-9-'63 L.P. upper: LR WIN. 6088-66090-4 JH-A.v.B. 2-9-'63 L.P. lower: LR WIN. 6088-66090-5 JH-A.v.B. 2-9-'63
 SECONDARY PINIONS
 SECONDARY QUILL SHAFTS H.P. LLOYD'S HNO. 91-GS A.v.B. 2-9-'63 LP upper: LLOYD'S HNO. 93-GS-A.v.B. 2-9-'63 LP lower: LLOYD'S HNO. 92-GS-A.v.B. 2-9-'63
 FLEXIBLE COUPLINGS LLOYD'S VIN. 4183-A.W.H. A.v.B. 2-9-'63
 PRIMARY WHEEL RIMS H.P. LLOYD'S HNO. 443-GS-A.v.B. 2-9-'63 L.P. upper: LR HNO. 481-G.S.-A.v.B. 2-9-'63 L.P. lower: LR HNO. 131 GS-A.v.B. 2-9-'63
 PRIMARY WHEEL SHAFTS HP; LLOYD'S HNO. 25-GS-A.v.B. 2-9-'63 LP upper: LR HNO. 98-GS-A.v.B. 2-9-'63 LP lower: LR HNO. 246-GS-A.v.B. 2-9-'63
 MAIN WHEEL RIM LLOYD'S HNO. 68-GS-A.v.B. 2-9-'63 MAIN WHEEL SHAFT LLOYD'S ROT. No. 1734 EMD-A.v.B. 2-9-'63

DECLARATION TO BE COMPLETED AND SIGNED BY THE SURVEYOR AT THE PORT OF INSTALLATION

The above reduction gearing has been fitted on board the *De Poolster* at *Rotterdam*
 in a proper manner and found satisfactory when tested on the (date) *16th until 19th June 1964* under full-power working conditions for *24 hrs. at 12,500 SHP and 2 hrs. at 22,500 SHP.*
 hours and when examined subsequently.

DATE OF COMMITTEE WEDNESDAY 23 DEC 1964
 DECISION *See Ret. 1*

[Signature]
 Engineer Surveyor to Lloyd's Register of Shipping
 © 2021 Lloyd's Register Foundation

11 OCT 1963

Is a Report also sent on the Hull of the Ship? If not, state whether, and when, one will be sent?

MADE AND PRINTED IN ENGLAND. Im.0.55-Copyable Ink.