

TABLE NO. 1
TURBINE NO. R.1862

GOVERNING

The following governing readings were obtained with a load of 100 KW. thrown off and on the generator.

Load on Generator	Governing
off	Steady speed
on	Steady speed
off	Steady speed
on	Steady speed
off	Steady speed
on	Steady speed

The maximum momentary speed variation is therefore 4.6% and the steady speed variation 1.5%.

The emergency governor tripped at :-

1st Trip	7400 RPM
2nd	7150
3rd	7100

The test was run at 125% overspeed i.e. 7475 RPM for 5 minutes.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

REPORT NO. ER.2692.

REPORT OF OFFICIAL TEST
OF
TURBINE & REDUCTION GEARS.
AT RUGBY - 22ND JUNE, 1936.

FOR: MESSRS. BARCLAY CURLE & CO. LTD. FOR THE ELLERMAN LINES LTD.

2ND MACHINE.

RATING: 100 KW. AT 6500/800 RPM. 110 VOLTS.

TYPE OF TURBINE: H.3.C-14" 3 STAGE HIGH PRESSURE HORIZONTAL CURTIS.

TYPE OF GENERATOR: COMPOUND WOUND WITH INTERPOLES. DRIP-PROOF.

TYPE OF GEARS: DOUBLE HELICAL SINGLE REDUCTION GEARS.

SHOP ORDER NOS: TURBINE B.802348. GEARS B.802351
GENERATOR 416260/2.

SERIAL NO. TURBINE R.1862. GENERATOR 416260/2/03.

TURBINE TESTS - Certified by (Signed) Ewd. H. Blade.
Designing Engineer.

REPORT APPROVED (Signed) Fred. H. Clough.
Asst. Chief Engineer.

DATE 6th July, 1936.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.
REPORT NO. R.1862

REPORT OF OFFICIAL TEST
OF
TURBINE & REDUCTION GEARS
AT HULLY - 22ND JUNE 1936

FOR: MESSRS. BARCLAY CURLE & CO. LTD. FOR THE ELLERMAN LINES LTD.

TURBINE

RATING: 100 KW. AT 6500/800 RPM. 110 VOLTS.

TYPE OF TURBINE: H.3-G-1A 3 STAGE HIGH PRESSURE PORTLAND
CEMENT.

TYPE OF GENERATOR: COMPOUND WOUND WITH INTERPOLES. BRIP-PROOF.

TYPE OF GEARS: DOUBLE HELICAL SINGLE REDUCTION GEARS.

SHOP ORDER NO.: TURBINE R.1862. GEAR R.1862.51

GENERATOR R.1862.5

SERIAL NO. TURBINE R.1862. GENERATOR R.1862.5

TURBINE TESTS - Certified by
..... (Signed) Fred. H. Blagden
..... Designing Engineer.

REPORT APPROVED
..... (Signed) Fred. H. Blagden
..... Asst. Chief Engineer.

DATE 28th July, 1936

REPORT OF OFFICIAL TEST OF A 100 KW.
GEARED TURBO GENERATOR
FOR MESSRS. BARCLAY CURLE AND CO. LTD. FOR THE ELLERMAN LINES LIMITED.

TURBINE NO. R.1862.

The official test of this machine was run on the
22nd June 1936 in the presence of Mr. Ward and Mr. Cairns of the
Ellerman Line, Mr. Laing of Lloyds, Mr. Walker of B.O.T. and
Mr. Leivesley of Metropolitan-Vickers Electrical Co. Ltd.

The test was commenced at 6 am with a load of 100 Kw.
on the generator, this load being maintained until 12 noon.
During this load run a steam consumption test was taken for
one hour.

On completion of the above, governing and overspeed
tests were made, followed by a two hours' run at 125 Kw load.

During the afternoon a short run was carried out with
a load of 70 Kw. on the generator, the turbine exhausting against
atmospheric back pressure. The load was then increased to
150 Kw. and maintained for one and a half minutes.

Before the commencement of the steam consumption test
the set was run until the conditions were steady and then
simultaneous readings, at intervals of three minutes were taken
of steam pressure, temperature and pressure at exhaust, weight
of condensed steam and output of the generator.

The figures have been analysed and tabulated in
Table No.2.

Correction curve No. TEC.3026.A is bound in with the
report, this having been used for correcting the test figures
when operating to vacuum, to the guaranteed conditions.

Table No.1 gives general details of the set.

Table No.3 gives particulars of governing trials
and overspeed tests.

REPORT OF OFFICIAL TEST OF A 100 KW.
STEAM TURBO GENERATOR
FOR MESSRS. BARCLAY CURRIE AND CO. LTD. FOR THE KILMER LINE LIMITED.

TURBINE NO. R.1862.

The official test of this machine was run on the 22nd June 1936 in the presence of Mr. Ward and Mr. Cairns of the Kilmarnock line, Mr. John of Glasgow, Mr. Walker of B.O.T. and Mr. Leivesley of Metropolitan-Vickers Electrical Co. Ltd.

The test was commenced at 8 am with a load of 100 KW. on the generator, this load being maintained until 12 noon. During this load run a steam consumption test was taken for one hour.

On completion of the above, governing and over-speed tests were made, followed by a two hours' run at 125 KW load.

During the afternoon a short run was carried out with a load of 70 KW. on the generator, the turbine exhausting against atmospheric back pressure. The load was then increased to 150 KW. and maintained for one and a half minutes.

Before the commencement of the steam consumption test the set was run until the conditions were steady and then simultaneous readings, at intervals of three minutes were taken of steam pressure, temperature and pressure at exhaust, weight of condensed steam and output of the generator.

The figures have been analysed and tabulated in Table No. 2.

Correction curve No. 1000 A is shown in this report, this having been used for correcting the test figures when operating to vacuum, to the guaranteed conditions.

Table No. 1 gives general details of the set.

Table No. 3 gives particulars of governing trials and over-speed tests.

TABLE NO. 1.

TURBINE NO. R.1862

TURBO GENERATOR

NORMAL OUTPUT 100 KW.

SPEED 6500/800 RPM

TURBINE

TYPE H3C.14 3 STAGE HIGH PRESSURE
HORIZONTAL CURTIS

TYPE OF BLADING IMPULSE

NUMBER OF ROTATING }
ROWS PER STAGE } 2 ROWS PER STAGE

SPECIFIED STEAM PRESSURE 150 LBS PER SQ. INCH GAUGE

SPECIFIED STEAM QUALITY DRY STEAM

SPECIFIED VACUUM INCHES
OF MERCURY 28"

REDUCTION GEARS

TYPE DOUBLE HELICAL SINGLE
REDUCTION GEARS.

GENERATOR

TYPE COMPOUND WOUND WITH INTERPOLES.
DRIP-PROOF.

TABLE NO.2.
TURBINE NO. R.1862

TEST NO.	1
DATE	22nd June, 1936.
DURATION	10.27 to 11.27 AM.
OUTPUT OF GENERATOR	100 KW.
SPEED	6500/800 RPM.
<u>STEAM CONDITIONS</u>	
PRESSURE AT TURBINE LBS/SQ.IN.G.	146.7
TEMPERATURE AT TURBINE °F.	394.2
SUPERHEAT °F.	30.0
<u>EXHAUST</u>	
VACUUM AT EXHAUST "HG. BAROMETER = 30"	26.84
<u>STEAM CONSUMPTION</u>	
TOTAL WATER WEIGHED PER HR.	2834 LBS.
WATER USED PER KW.HR.	28.34 LBS.
<u>CORRECTIONS</u>	
PRESSURE	$\frac{1}{1.0035}$
SUPERHEAT	$\frac{1}{0.980}$
VACUUM	$\frac{1}{1.0725}$
TOTAL	0.9480
STEAM CONSUMPTION LBS PER KW.HOUR CORRECTED TO 150 LBS/ SQ.IN.G.DRY STEAM 28" VAC.	26.86 LBS.

TABLE NO. 3.

TURBINE NO. R.1862.

GOVERNING.

The following governing readings were obtained with a load of 100 Kw. thrown off and on the generator.

Load on generator		governing	steady at	6500 Rpm.
"	off	"	momentary speed	6800 "
"	off	"	steady	6630 "
"	on	"	momentary	6480 "
"	on	"	steady	6500 "

The maximum momentary speed variation is therefore 4.62% and the steady speed variation 2%.

The emergency governor tripped at 7550 Rpm but was subsequently modified and then tripped at 7150 Rpm.

The set was run at 15% overspeed i.e. 7475 rpm for 5 minutes.