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REPORT OF TRANSFORMER TESTS
Form 4SL

Westinghouse Electric Corporation

U.S. Army - Corps. of Engineers

Date Test 2/7/67 Purchaser's Order No. DA-45-164 CIVENG-66-137 G.O. PO-83650 S.O. No. 1M1408

Type OA/FA Phase Single Cycles 60 Insulating Fluid Oil L. Spec. 1M1408-08 Polarity Subt.

Winding	H	Winding	X	Winding	Y
Kva	164000/218666	Kva	82000/109333	Kva	82000/109333
Voltage	500000/288684	Voltage	13200	Voltage	13200

For polarity, additional tap voltages and connections, see Instruction Plate 1M1408-10.

RESISTANCES, EXCITING CURRENT, LOSSES AND IMPEDANCE—Based on normal rating, unless otherwise stated. Losses and regulation are based on wattmeter measurements. For three-phase transformers the resistances are the sum of the three phases in series.

SERIAL NO.	RESISTANCE IN OHMS AT 75°C WINDINGS H	X	Y	% EXCITE CURRENT AT 100% RATED VOLTAGE@ 164 MVA	NO LOAD LOSS WATTS AT 100% RATED VOLTAGE	288.684 Kv TO (X) 13.200 Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	288.684 Kv TO (Y) 13.200 Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	(X) 13.2 Kv TO (Y) 13.2 Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C
7000734	.3581	.00137	.00135	.446	132775	180940	17.49	147127	17.63	335618	40.05
							Measured as Tested				
Note: The H-X & H-Y Z are listed at 50% rating on H wdg. See rear											
						TOTAL LOSS	% IMP. 75°C	TOTAL LOSS	% IMP. 75°C	TOTAL LOSS	% IMP. 75°C
AVERAGE				.446	132775	313715	17.49	279902	17.63	468393	40.05
GUARANTEE				-	165000	-	17.05	-	17.05	-	33.25

288.684 KV to 13.2 & 13.2 KV
REGULATION AT 75°C
@ 164000 KVA

	100% PF	90 % PF	80% PF	100 % PF *
AVERAGE	1.29	7.54	9.77	2.20
GUARANTEE	-	-	-	-

TEMPERATURE RISES—Average rise in degrees C., corrected to instant of shutdown, of transformer. Not indicated @ 90% PF

Serial No. 7000734 with windings connected and loaded as follows:

H Winding 281.467 Kv 582 Amp.; X Winding 13.2 Kv 6220 Amp.

Y Winding 13.2 Kv 6220 Amp. until constant temperature rise was reached.

Load Constant	RISE OF WINDINGS BY RESISTANCE H	X	Y	GUARANTEE	TOP FLUID RISE	AMBIENT TEMP. INGOING WATER	IDLER OR ROOM	WATER RISE	GALLONS PER. MIN.	POUNDS PRESSURE
100%	46.2	44.3	42.5	55	51.8		22.7			
133-1/3%	49.3	48.3	46.9	55	41.0		23.0			

INSULATION TESTS	WINDING	VOLT RATING	TEST VOLTAGE APPLIED IN Kv	DURATION OF TEST IN SECONDS
APPLIED POTENTIAL TESTS (Voltage applied between each winding and all other windings connected to core and ground.)	H	288684	34	60
	X	13200	34	60
	Y	13200	34	60
	Wiring, Fans		1.5	60

INDUCED POTENTIAL TEST ---------- times rated voltage across full winding; 630 Kv from 310.335 Kv
Line terminal to ground; at 180 cycles per second for 7200 cycles.

REMARKS

*Measured at 288.684 KV to 13.2 & 13.2 KV at 218666 KVA (FA).

See separate report for results of ASA Impulse Test and Switching Surge tests.

I hereby certify that this is a true report based on factory tests made in accordance with the latest Transformer Test Code C57.2 of the American Standards Association and that each transformer withstood the above insulation tests.

Signed [illegible] Date February 21, 1967 Approved [illegible]

Witnessed by John F. Lannon

JOHN F. LANNON, GCQCR, USAED, Detroit

REPORT OF TRANSFORMER TESTS
Form 45L

Westinghouse Electric Corporation

LM MAW

Purchaser U.S. Army Corps. of Engineers
Date of Test 9-19-67 Purchaser's Order No DA-45-164 CIVENG-66-137 G.O. PO-83650 S.O. No. 1M1408
Type OA/FA Phase Single Cycles 60 Insulating Fluid Oil L. Spec. 1M1408-08 Polarity See I.P

Winding	H	X	Y
Kva	164000/218666	82000/109333	82000/109333
Voltage	500000/288684	13200	13200

For polarity, additional tap voltages and connections, see Instruction Plate 1M1408-10.

RESISTANCES, EXCITING CURRENT, LOSSES AND IMPEDANCE—Based on normal rating, unless otherwise stated. Losses and regulation are based on wattmeter measurements. For three-phase transformers the resistances are the sum of the three phases in series.

SERIAL NO.	RESISTANCE IN OHMS AT 75°C WINDINGS H	X	Y	% EXCITE CURRENT AT 100% RATED VOLTAGE 164 MVA	NO LOAD LOSS WATTS AT 100% RATED VOLTAGE	288.684 Kv TO (X) 13.200 Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	288.684 Kv TO (Y) 13.200 Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	(X) 13.2 TO (Y) 13.2 82000 LOAD LOSS WATTS 75°C	% IMP 75°C
7000942	.3597	.0013	.0013	.448	124692	184901	17.83	146979	17.66	350532	41.28
						TOTAL LOSS	% IMP. 75°C	TOTAL LOSS	% IMP. 75°C	TOTAL LOSS	% IMP. 75°C
AVERAGE				.448	124692	309593	17.83	271671	17.66	475224	41.28
GUARANTEE				-	165000	-	17.05	-	17.05	-	38.25

288.684 KV to 13.2 KV & 13.2 KV
REGULATION AT 75°C
@ 164000 KVA

	100% PF	90 % PF	80% PF	100* % PF
AVERAGE	1.32	7.59	9.71	2.24
GUARANTEE	-	-	-	-

TEMPERATURE RISES—Average rise in degrees C., corrected to instant of shutdown, of transformer.
S No. 7000734 (Duplicate unit built on same S.O.) with windings connected and loaded as follows:
H Winding 281.467 Kv 582 Amp.; X Winding 13.2 Kv 6220 A
Y Winding 13.2 Kv 6220 Amp. until constant temperature rise was reached.

Load Constant	RISE OF WINDINGS BY RESISTANCE H	X	Y	GUARANTEE	TOP FLUID RISE	AMBIENT TEMP. INGOING WATER	OUTLER OR ROOM	WATER RISE	GALLONS PER. MIN.	POUNDS PRESSUR
100%	46.2	44.3	42.5	55	51.8		22.7			
133-1/3%	49.3	48.3	46.9	55	41.0		23.0			

INSULATION TESTS	WINDING	VOLT RATING	TEST VOLTAGE APPLIED IN Kv	DURATION OF TEST IN SECONDS
APPLIED POTENTIAL TESTS (Voltage applied between each winding and all other windings connected to core and ground.)	H	288684	34	60
	X	13200	34	60
	Y	13200	34	60
	Wiring, Fans		1.5	60

INDUCED POTENTIAL TEST: --------- times rated voltage across full winding; 630 Kv from 310.335 Kv
Line terminal to ground; at 180 cycles per second for 7200 cycle

REMARKS

*Measured at 288684 KV to 13.2 & 13.2 KV at 218666 KVA (FA).

See separate report for results of ASA Impulse Tests and Switching Surge tests.

I hereby certify that this is a true report based on factory tests made in accordance with the latest Transformer Test Code C57.2 of the American Standards Assoc
...t each transformer withstood the above insulation tests.

Signed R. S. Fogman Date October 3, 1967 Approved [illegible]

Page 1 of 3 Pages

Witnessed by John F. Lannon
JOHN F. LANNON, GCQCR, USAED, Detroit

TIA

REPORT OF TESTS
FORM 9401c

Westinghouse

DATE October 3, 1967

PURCHASER U.S. Army - Corps of Engineers

WESTINGHOUSE GENERAL ORDER NO. PO-83560

APPARATUS Class OA/FA Shell Form Power Transformer

SHOP ORDER NO. 1M1408

RATING 164000/218666 KVA - 288684 to 13200 Volts, Single Phase, 60 Cycles

Additional Load Loss and Impedance Measurements

	Voltage Connection	NLTC Pos.	KVA	Percent Impedance	Load Loss Watts
	288684 - 13200 (X) & 13200 (Y)	2	164000	14.96	324773
Guaranteed	288684 - 13200 (X) & 13200 (Y)	2	164000	15.0	-

Exciting Current and No Load Loss Measurements @ 75°C

164000 KVA Base

% Voltage	% Exciting Current	No Load Loss, Watts
90	.200	89996
110	1.19	183901

Fan Losses

3 Phase, 60 Cycles, 480 Volts

	T.W.	A.W.
Measured	12297	20400

Efficiencies @ 75°C - 100% P.F.

	164000 KVA Full	164000 KVA 3/4	164000 KVA 1/2	218666 KVA Full
Measured	99.727 99.73	99.75	99.75	99.68
Guaranteed	99.7262	-	-	-

Additional Losses

288684 KV to 13.2 KV (X) & 13.2 KV (Y)

	Load Loss Watts	324773
	No Load Loss Watts	124692
Measured	Total Loss	449465
Guaranteed	Total Loss	450300

THE ABOVE IS A TRUE AND CORRECT RECORD OF DATA OBTAINED FROM TESTS AT THE MUNCIE PLANT OF WESTINGHOUSE ELECTRIC CORPORATION.

SIGNED R. S. Farmer ENGINEER

REPORT OF TESTS
FORM 9391d

Westinghouse

DATE October 3, 1967

PURCHASER U.S. Army - Corps of Engineers

WESTINGHOUSE GENERAL ORDER NO. PO-83560

APPARATUS Class OA/FA Shell Form Power Transformer

SHOP ORDER NO. 1M1408

RATING 164000/218666 KVA - 288684 to 13200 Volts, Single Phase, 60 Cycles

Power Factor

X	Y	% P.F.	Cap MMF	Temp. °C
High to Low and Ground, Guard on Tertiary		.27	8850	30
High to Ground, Guard on Low and Tertiary		.015	12450	30
Low to Tertiary and Ground, Guard on High		.555	12100	30
Low to Ground, Guard on High and Tertiary		.42	16150	30
Tertiary to High and Ground, Guard on Low		.62	15200	30
Tertiary to Ground, Guard on High and Low		1.025	9050	30
High and Low to Tertiary and Ground		.425	26850	30
High and Tertiary to Low and Ground		.375	14650	30

Ratio Tests

Applied 250 Volts on High Voltage

NLTC Pos.	Measured on Low Voltage
5	10.63
4	10.87
3	11.13
2	11.41
1	11.70
	Measured on Tertiary
2	11.43

Cold Resistance Measurements

H - 288684 Volts	.3051 Ohms @ 28°C
X - 13200 Volts	.0011 Ohms @ 28°C
Y - 13200 Volts	.0011 Ohms @ 28°C

Polarity checked and is subtractive.

The complete unit was pressure tested for 6 hours and successfully withstood 10 LBS. pressure per square inch.

THE ABOVE IS A TRUE AND CORRECT RECORD OF DATA OBTAINED FROM TESTS AT THE MUNCIE PLANT WESTINGHOUSE ELECTRIC CORPORATION.

SIGNED R. S. Farmer ENGINEE

ASA Impulse Tests
Plus Current Measurements
for
U.S. Army Corps of Engineers

KVA - 164000-218666
H - 500000/288684 - 1425 BIL
X - 13200 - 110 BIL
Y - 13200 - 110 BIL
Single Phase, 60 Cycles

C.O. DA-45-164 CIVENG-66-137
G.O. PO-83650
S.O. 1M1408
L-Spec. 1M1408-08
Serial 7000942

Terminal Surged	Wave* Applied	Oscillogram CMU-430	Defl. In.	Sensitivity KV/In.	Crest KV	Time MS Or KV/MS	Timing Wave**
H1	RWE	416	1.63	588.0	957	2x30	5
	RWI	417	Current Measurements				20
	CW	418	1.91	882.1	1680	3.5	1
	CW	421	1.91	882.1	1680	3.5	1
	FWE	422	1.66	882.1	1460	2x30	5
	FWI	423	Current Measurements				20
H2	RWE	424	1.51	49.1	74	2-1/2x39	5
	RWI	425	Current Measurements				20
	FWE	426	1.51	73.7	111	2-1/2x39	5
	FWI	427	Current Measurements				20
	FWE	428	1.51	73.7	111	2-1/2x39	5
	FWI	429	Current Measurements				20
X1	RWE	430	1.50	49.1	73.6	2x10	5
	RWI	431	Current Measurements				20
	CW	434	1.82	73.7	134	3.6	1
	CW	436	1.82	73.7	134	3.3	1
	FWE	437	1.53	73.7	112.8	2x10	5
	FWI	438	Current Measurements				20
X2	RWE	439	1.51	49.1	74.1	4x17	5
	RWI	440	Current Measurements				20
	CW	441	1.81	73.7	133.4	4.3	1
	CW	442	1.81	73.7	133.5	5.1	1
	FWE	443	1.51	73.7	111	4x17	5
	FWI	444	Current Measurements				20

*RWE - Reduced voltage wave
RWI - Reduce current wave
CW - Chopped wave
FWE - Full voltage wave
FWI - Full current wave
RSS - Reduced switching surge
FSS - Full switching surge

**Timing waves (Films 414, 415)
.5 - 5 MS Sweep at 2000 KC
1 - 10 MS Sweep at 2000 KC
5 - 50 MS Sweep at 200 KC
20 - 200 MS Sweep at 200 KC
500 - 500 MS at 10 KC

Terminal Surged	Wave* Applied	Oscillogram CMU- 430	Defl. In.	Sensitivity KV/In.	Crest KV	Time MS Or KV/MS .	Timing Wave**
Y1	RWE	445	1.52	49.1	746	2-1/2x9	5
	RWI	446	Current Measurements				20
	CW	447	1.84	73.7	135.5	3.0	1
	CW	450	1.84	73.7	135.5	3.3	1
	FWE	451	1.52	73.7	112.0	2-1/2x9	5
	FWI	452	Current Measurements				20
Y2	RWE	453	1.55	49.1	77.9	2-1/2x9	5
	FWI	454	Current Measurements				20
	CW	455	1.81	73.7	133.4	3.3	1
	CW	457	1.83	73.7	134.8	3.9	1
	FWE	458	1.55	73.7	114.2	2-1/2x9	5
	FWI	459	Current Measurements				20
Switching Surge							
	RSS	461	1.04	592.5	616	250x3850	500
	FSS	465	1.01	1202	1215	250x2700	500
	FSS	467	1.00	1202	1202	250x2725	500

This transformer has successfully passed the impulse tests which were applied in accordance with ASA specifications. Copies of the oscillograms used are attached.

R. S. Farmer

R. S. Farmer
Fellow Engineer

ys

REPORT OF TESTS
FORM 9401G

Westinghouse

DATE April 24, 1967

PURCHASER U.S. Army - Corps. of Engineers

WESTINGHOUSE GENERAL ORDER NO. PO-83650

CATUS Class OA/FA Shell Form Power Transformer

SHOP ORDER NO. 1M1408

.NG 164000/218666 KVA - 288684 to 13200 Volts, Single Phase, 60 Cycles

Report of Current Transformer Tests

Current Transformer L-689975

Excitation Curve 513045
Ratio Curve 513046

Resistance of Current Transformer

Winding	Ohms at 75°C
X_1 to X_2	0.12
X_2 to X_3	0.06
X_3 to X_4	0.30
X_4 to X_5	0.24

Resistance of Secondary Leads and Current Transformer (X_1 to X_5)

Location of Current Transformer	Ohms at 75°C
Next to Tank Cover (W13 to W17)	0.8033
Second from Tank Cover (W19 to W23)	0.7996

Thermal One Second Current Rating 90 Times Normal

Mechanical Short Time Current Rating Unlimited.

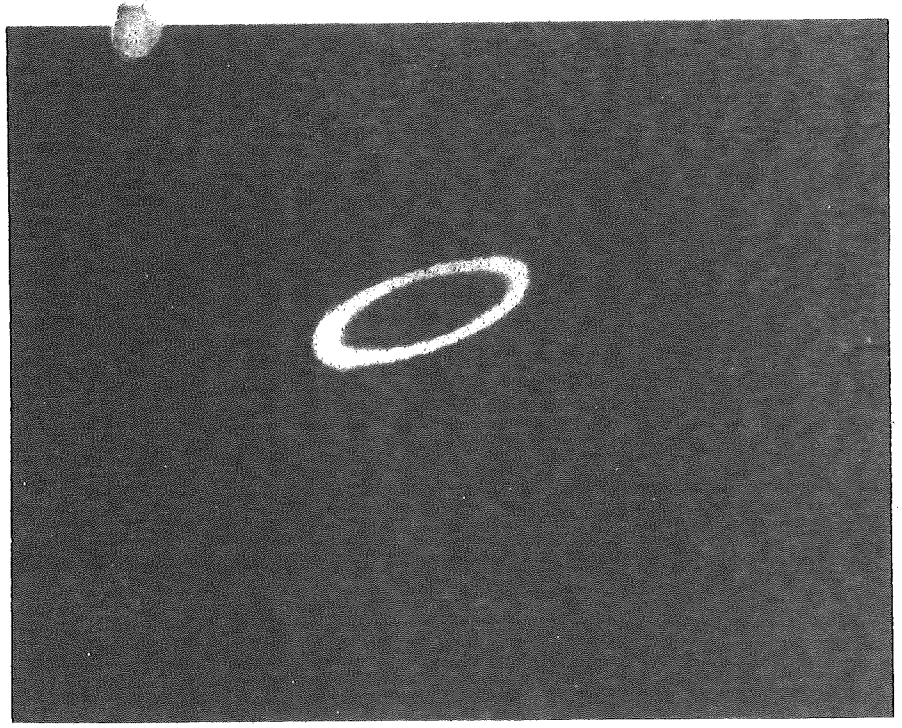
ABOVE IS A TRUE AND CORRECT RECORD OF DATA OBTAINED FROM TESTS AT THE MUNCIE PLANT OF WESTINGHOUSE ELECTRIC CORPORATION.

PAGE 1 OF 1 PAGES

SIGNED R. S. Farman ENGINEER

S.O. 1M1408 Serial 7000942

Corona was initiated on the external high voltage bushing shield during the induced voltage test on this transformer which caused the 1080 microvolt readings. This corona was both audible and visible and was witnessed by the Test and Engineering Department.



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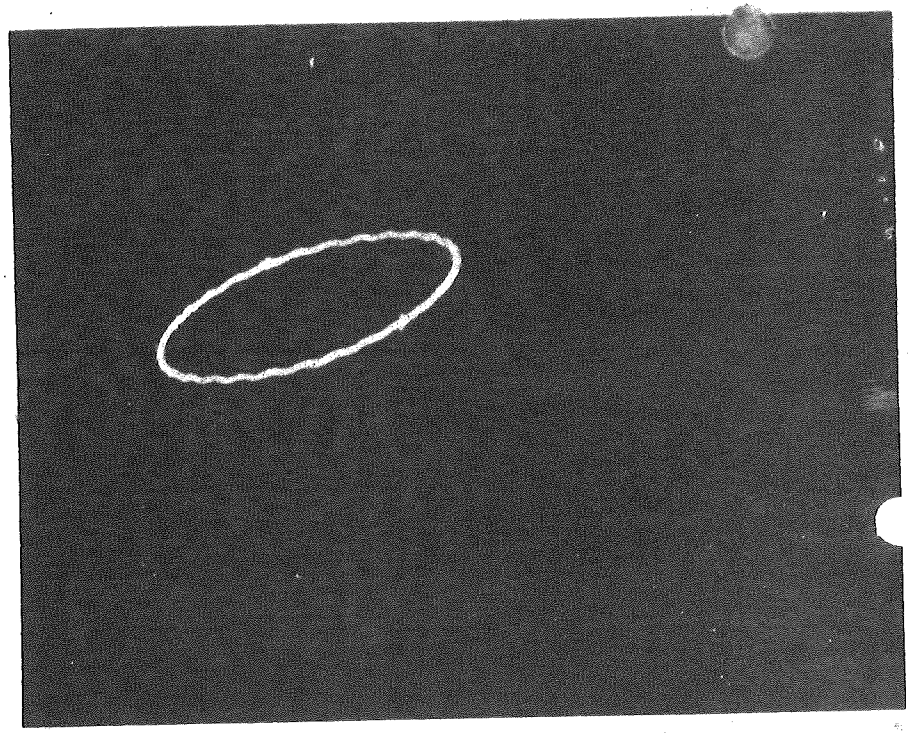

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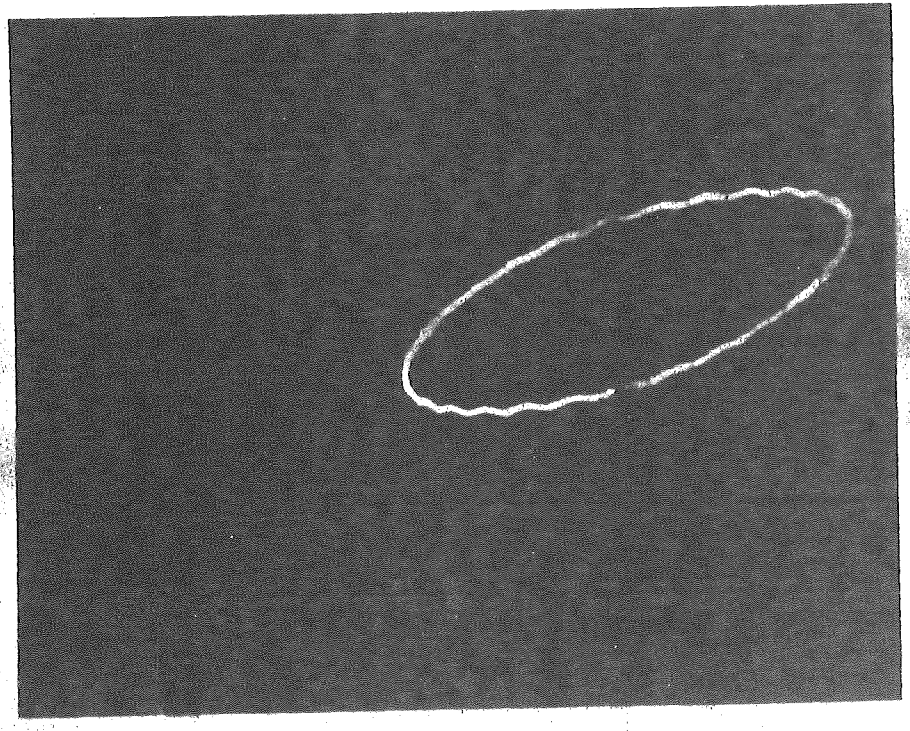

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KV Induced	% Ind. Test	Corona of	Oscillograph
365	57.9	[illegible]	51
455	72.2	[illegible]	[illegible]
[illegible]	[illegible]	100	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	73.6	53

I [illegible] a true report based on Factory [illegible]

Signed R. S. Lamer Engineer

Page 1 of 2 pages

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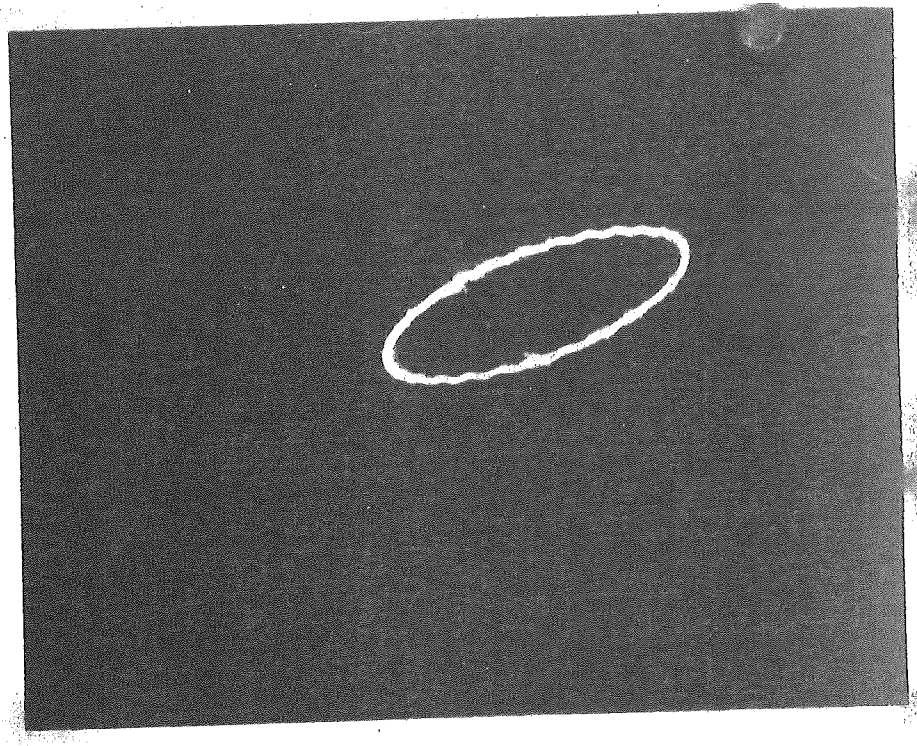

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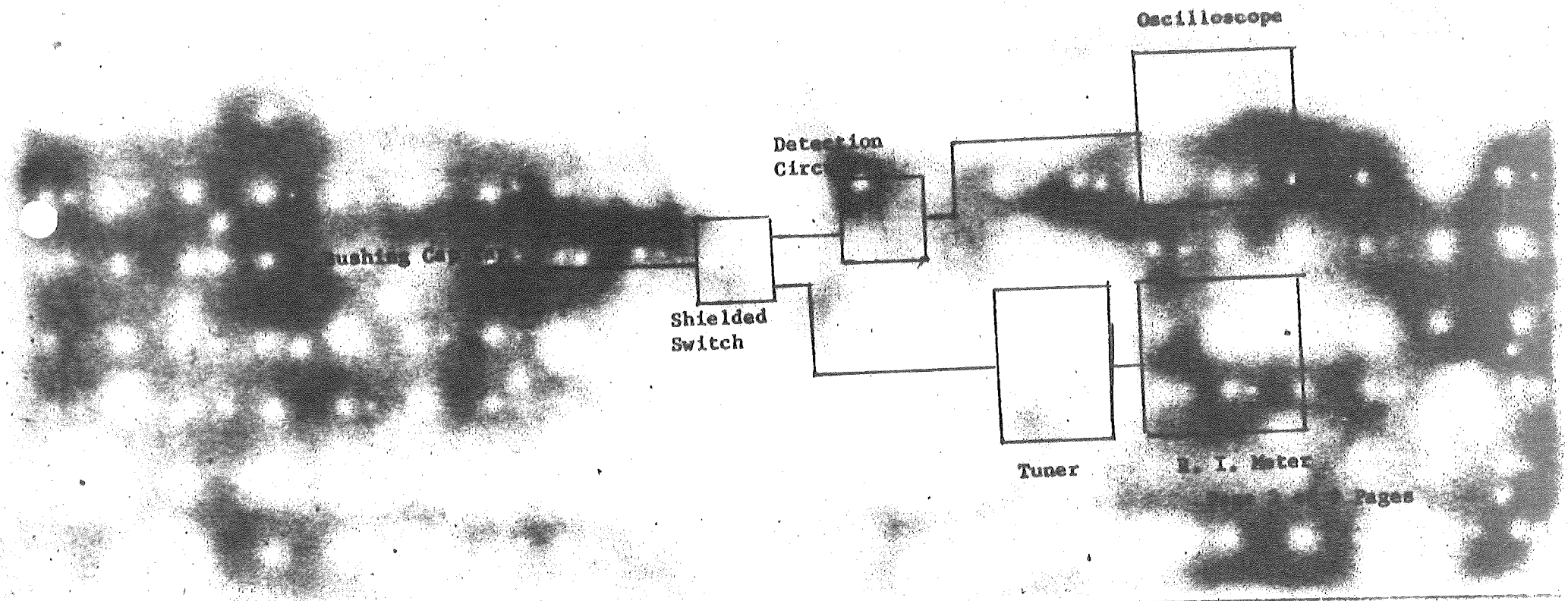

Oscilloscope
Detection
Circ
ushing Ca
Shielded
Switch
Tuner
I. I. Meter

FIN LOW IT LOWER GRANITE MAN

REPORT OF TRANSFORMER TESTS
FORM 45V

Westinghouse Electric Corporation

Purchaser: U.S. Army Corps of Engineers

Date Test: 11-17-71 Purchaser's Order No. DA-45-164CIVENG-66-138 G.O. PO-83651 S.O. No. 1M1408

Type: OA/FA Phase: Single Cycles: 60 Insulating Fluid: Oil L. Spec. 1M1408-08 Polarity: See I.P.

Winding	H	X	Y
Kva	164000/218666	82000/109333	82000/109333
Voltage	500000/288684	13200	13200

For polarity, additional tap voltages and connections, see Instruction Plate 1M1408-10.

RESISTANCES, EXCITING CURRENT, LOSSES AND IMPEDANCE—Based on normal rating, unless otherwise stated. Losses and regulation are based on wattmeter measurements. For three-phase transformers the resistances are the sum of the three phases in series.

SERIAL NO.	RESISTANCE IN OHMS AT 75°C WINDINGS H	X	Y	% EXCITE CURRENT AT 100% RATED VOLTAGE 164 MVA	NO LOAD LOSS WATTS AT 100% RATED VOLTAGE	288.684 Kv TO 13.2(X) Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	288.684 Kv TO 13.2(Y) Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C	13.2(X) Kv TO 13.2(Y) Kv 82000 Kva LOAD LOSS WATTS 75°C	% IMP 75°C
7001750	.3624	.00138	.00134	.781	135995	187934	17.38	147676	17.57	349400	40.55
AVERAGE				.781	135995	TOTAL LOSS 323929	% IMP. 75°C 17.38	TOTAL LOSS 283671	% IMP. 75°C 17.57	TOTAL LOSS 485395	% IMP. 75°C 40.55
GUARANTEE				-	165000	-	17.05	-	17.05	-	38.25

288.685KV to 13.2 & 13.2KV REGULATION AT 75°C @164000 KVA

	100% PF	90%PF	80% PF	*100 % PF
AVERAGE	1.32	7.66	9.93	2.27
GUARANTEE	-	-	-	-

TEMPERATURE RISES—Average rise in degrees C., corrected to instant of shutdown, of transformer.

Serial No. 7000734 (Duplicate unit built on same S.O.) with windings connected and loaded as follows:

H Winding 281.467 Kv 582 Amp.; X Winding 13.2 Kv 6220 Amp.;

Y Winding 13.2 Kv 6220 Amp. until constant temperature rise was reached.

Load Constant	RISE OF WINDINGS BY RESISTANCE H	X	Y	GUARANTEE	TOP FLUID RISE	AMBIENT TEMP. INGOING WATER	~~OUTER~~ OR ROOM	WATER RISE	GALLONS PER. MIN.	POUNDS PRESSURE
100%	46.2	44.3	42.5	55	51.8		22.7			
133-1/3%	49.3	48.3	46.9	55	41.0		23.0			

INSULATION TESTS	WINDING	VOLT RATING	TEST VOLTAGE APPLIED IN Kv	DURATION OF TEST IN SECONDS
APPLIED POTENTIAL TESTS (Voltage applied between each winding and all other windings connected to core and ground.)	H	288684	34	60
	X	13200	34	60
	Y	13200	34	60
	Wiring & Fans		1.5	60

INDUCED POTENTIAL TEST: -- times rated voltage across full winding; 630 Kv from 310.335 Kv Line terminal to ground; at 180 cycles per second for 7200 cycles.

REMARKS

* Measured at 288.684KV to 13.2&13.2KV at 218666 KVA (FA).

See separate report for results of ASA Impulse Tests and Switching Surge Tests.

hereby certify that this is a true report based on factory tests made in accordance with the latest Transformer Test Code C57 of the American Standards Association; and that each transformer withstood the above insulation tests.

Signed R. S. Farmer Date November 29, 1971 Approved [illegible]

REPORT OF TESTS
FORM 0491G

Westinghouse

DATE November 29, 1971

PURCHASER U.S. Army Corps of Engineers

WESTINGHOUSE GENERAL ORDER NO. PO-83651

APPARATUS Class OA/FA Shell Form Power Transformer

SHOP ORDER NO. 1M1408

RATING 164000/218666 KVA - 288684 to 13200 Volts, Single Phase, 60 Hertz

Additional Test Data

Additional Load Loss and Impedance Measurements

Voltage Connection	KVA	% Impedance	Load Loss, Watts
288684 - 13200(X)&13200(Y)	164000	15.11	298908
Guaranteed	164000	15.00	--

Exciting Current and No Load Loss Measurements @75°C
@164000 KVA

% Voltage	% Exciting Current	No Load Loss, Watts
90	.317	92038
110 ~~130~~	2.811	224213

Fan Losses
3 Phase, 60 Hertz, 480 Volts

	T.W.	A.W.
Measured	13800	20900

Efficiencies @75°C - 100% P.F.

	164000 KVA			218666 KVA
	Full	3/4	1/2	Full
Measured	99.7355	99.75	99.74	99.70
Guaranteed	99.7262	-	-	-

Additional Losses
288.684 to 13.2(X) & 13.2(Y)
@164000 KVA

	Load Loss Watts	298908
	No Load Loss Watts	135995
Measured	Total Loss	434903
Guaranteed	Total Loss	450300

THE ABOVE IS A TRUE AND CORRECT RECORD OF DATA OBTAINED FROM TESTS AT THE MUNCIE PLANT OF WESTINGHOUSE ELECTRIC CORPORATION.

PAGE 2 OF 3 PAGES

SIGNED R. S. Farmer ENGINEER

REPORT OF TESTS
FORM 54916

Westinghouse

DATE November 29, 1971

PURCHASER U.S. Army Corps of Engineers

WESTINGHOUSE GENERAL ORDER NO. PO-83651

APPARATUS Class OA/FA Shell Form Power Transformer

SHOP ORDER NO. 1M1408

RATING 164000/218666 KVA - 288684 to 13200 Volts, Single Phase, 60 Hertz

Power Factor

	% P.F.	Cap. MMF	Temp. °C
High to Low and Ground, Guard on Tertiary	.445	9150	28
High to Ground, Guard on Low and Tertiary	.125	1440	28
Low to Tertiary and Ground, Guard on High	.675	9135	28
Low to Ground, Guard on High and Tertiary	.630	8975	28
Tertiary to High and Ground, Guard on Low	.485	1630	28
Tertiary to Ground, Guard on High and Low	.590	980	28
High and Low to Tertiary and Ground	.520	21850	28
High and Tertiary to Low and Ground	.470	15200	28

Ratio Tests

Applied 250 Volts on High Voltage

NLTC Pos.	Measured on Low Voltage
5	10.61
4	10.86
3	11.13
2	11.40
1	11.69
	Measured on Tertiary Voltage
1	11.42

Cold Resistance Measurements

H - 288684 Volts	.3080 ohms	@28.5°C
X - 13200 Volts	.001175 ohms	@28.5°C
Y - 13200 Volts	.001140 ohms	@28.5°C

Polarity checked and is subtractive.

The complete unit was pressure tested for 6 hours and successfully withstood 10 lbs. pressure per square inch.

THE ABOVE IS A TRUE AND CORRECT RECORD OF DATA OBTAINED FROM TESTS AT THE MUNCIE PLANT OF WESTINGHOUSE ELECTRIC CORPORATION.

SIGNED R. S. Farmer ENGINEER

ASA Impulse Tests
Plus Current Measurements
for
U.S. Army Corps of Engineers

KVA - 164000/218666
H - 500000/288684 Volts, 1425 BIL
X - 13200 Volts - 110 BIL
Y - 13200 Volts - 110 BIL
Single Phase, 60 Hertz

C.O. DS-45-164CIVENG-66-138
G.O. PO-83651
S.O. 1M1408
L-Spec. 1M1408-08
Serial 7001750

Terminal Surged	Wave* Applied	Oscillogram CMU-430	Defl. In.	Sensitivity KV/In.	Crest KV	Time MS Or KV/MS	Timing Wave**
H1	RWE	1375	1.64	579	950	1-1/2x25	5
	RWI	1376	Current Measurements				20
	CW	1378	1.93	868	1680	4.0	1
	CW	1379	1.93	868	1680	3.7	1
	FWE	1380	1.67	868	1448	1-1/2x25	5
	FWI	1381	Current Measurements				20
H2	RWE	1382	1.52	48.43	73.4	2-1/2x40	5
	RWI	1383	Current Measurements				20
	FWE	1384	1.52	72.65	110.3	2-1/2x40	5
	FWI	1385	Current Measurements				20
	FWE	1386	1.52	72.65	110.3	2-1/2x40	5
	FWI	1387	Current Measurements				20
X1	RWE	1401	1.58	48.43	76.5	1-1/2x 8	5
	RWI	1402	Current Measurements				20
	CW	1404	1.89	72.65	137.5	2.9	1
	CW	1405	1.89	72.65	137.5	2.9	1
	FWE	1406	1.58	72.65	114.5	1-1/2x 8	5
	FWI	1407	Current Measurements				20
X2	RWE	1408	1.57	48.43	75.9	2 x 11	5
	RWI	1409	Current Measurements				20
	CW	1410	1.83	72.65	133	2.8	1
	CW	1411	1.83	72.65	133	3.4	1
	FWE	1412	1.57	72.65	114	2 x 11	5
	FWI	1413	Current Measurements				20
Y1	RWE	1388	1.55	48.43	75.1	1-1/2x 8	5
	RWI	1389	Current Measurements				20
	CW	1390	1.85	72.65	134.5	2.8	1
	CW	1391	1.85	72.65	134.5	3.8	1
	FWE	1392	1.57	72.65	114	1-1/2x 8	5
	FWI	1393	Current Measurements				20

* RWE - Reduced voltage wave
RWI - Reduced current wave
CW - Chopped wave
FWE - Full voltage wave
FWI - Full current wave
RSS - Reduced switching surge
FSS - Full switching surge

** Timing Waves (Films 1373,1374,500)
1 - 10 MS Sweep at 2000 KC
5 - 50 MS Sweep at 200 KC
20 - 200 MS Sweep at 200 KC
500 - 5000 MS Sweep at 10 KC

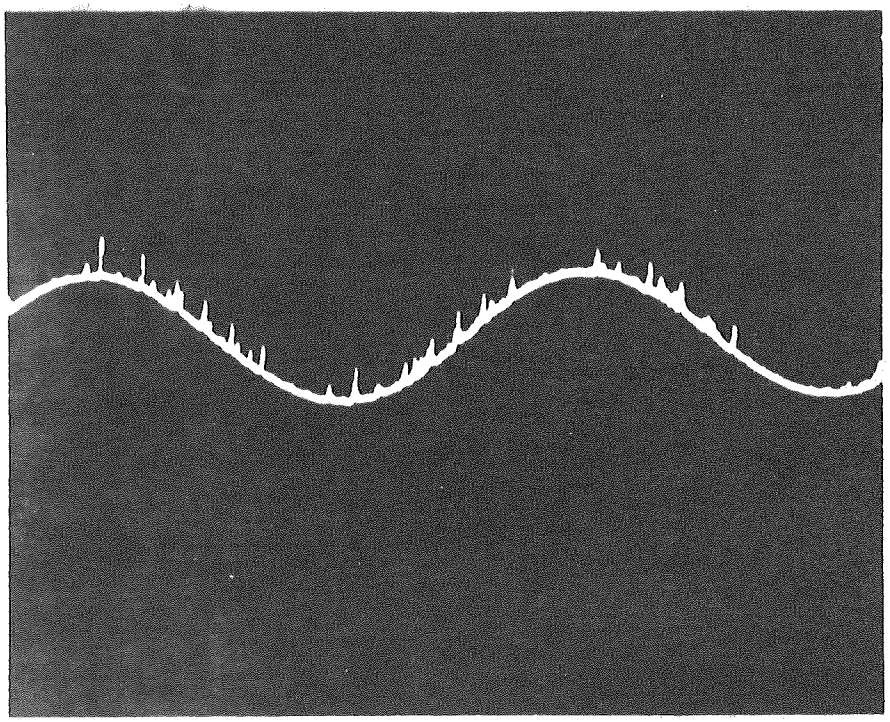
Terminal Surged	Wave* Applied	Oscillogram CMU-430	Defl. In.	Sensitivity KV/In.	Crest KV	Time MS Or KV/MS	Timing Wave**
Y2	RWE	1394	1.55	48.43	75.1	1-1/2x 8	5
	RWI	1395	Current Measurements				20
	CW	1397	1.85	72.65	134.5	3.1	1
	CW	1398	1.88	72.65	136.5	3.3	1
	FWE	1399	1.55	72.65	112.6	1-1/2x 8	5
	FWI	1400	Current Measurements				20
H1	RSS	1417	.74	1202	890	250/2600	500
	FSS	1419	1.02	1202	1230	250/1800	500
	FSS	1421	1.02	1202	1230	250/1800	500

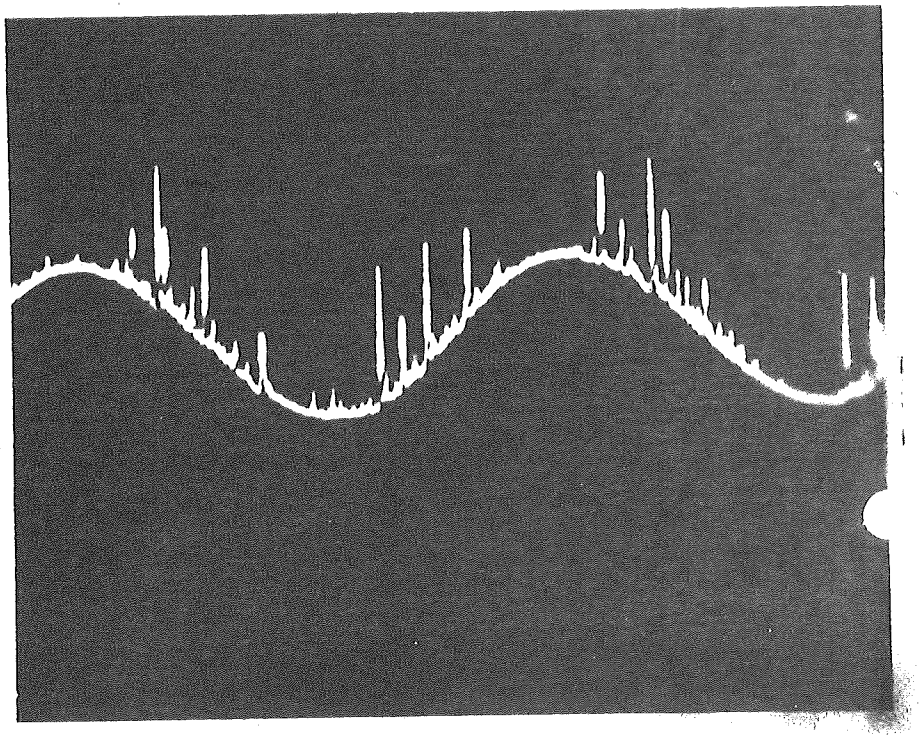
This transformer successfully passed the Impulse Tests which were applied in accordance with ASA specifications. Copies of the oscillograms used are attached.

R. S. Farmer

R. S. Farmer
Fellow Engineer

/rs





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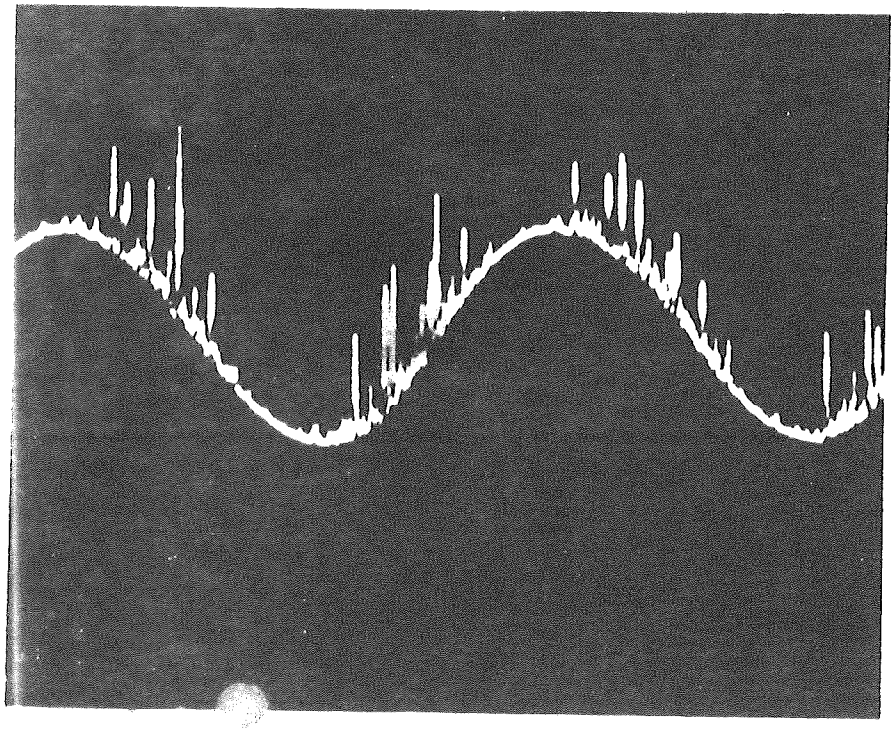

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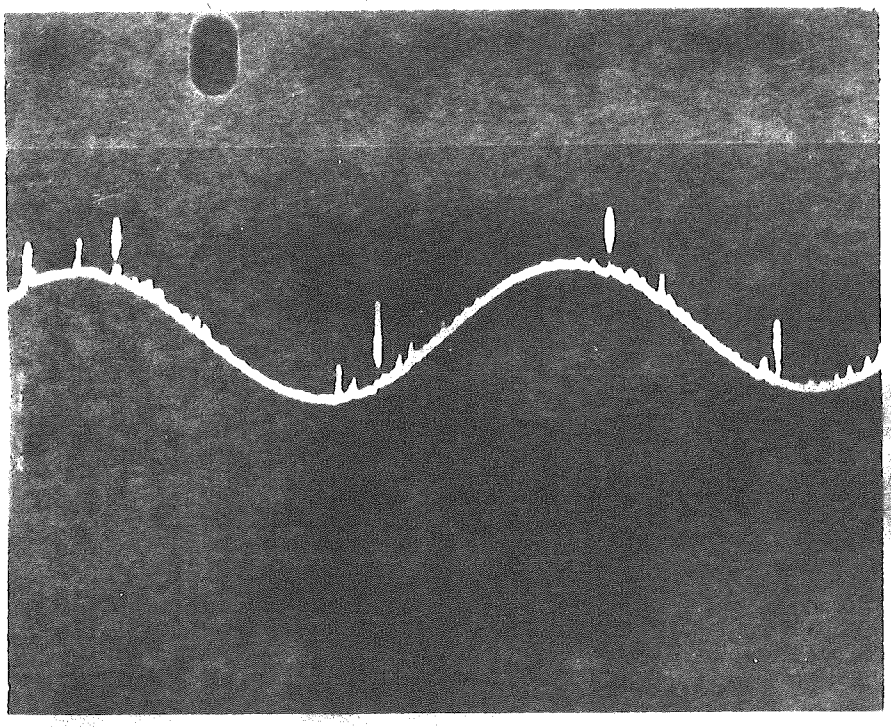
KV Induc[illegible]	[illegible]	[illegible]	Oscillograp[illegible]
365	[illegible]	[illegible]	191
455	72	[illegible]	192
630	100	[illegible]	[illegible]
Off	---	[illegible]	[illegible]
365	58	3.3	[illegible]
455	72	[illegible]	[illegible]

I hereby certify that thi[illegible]ue report [illegible] on Facto[illegible]ests.

Signed R. S. Bennet Engineer

[illegible] of 2 [illegible]ages



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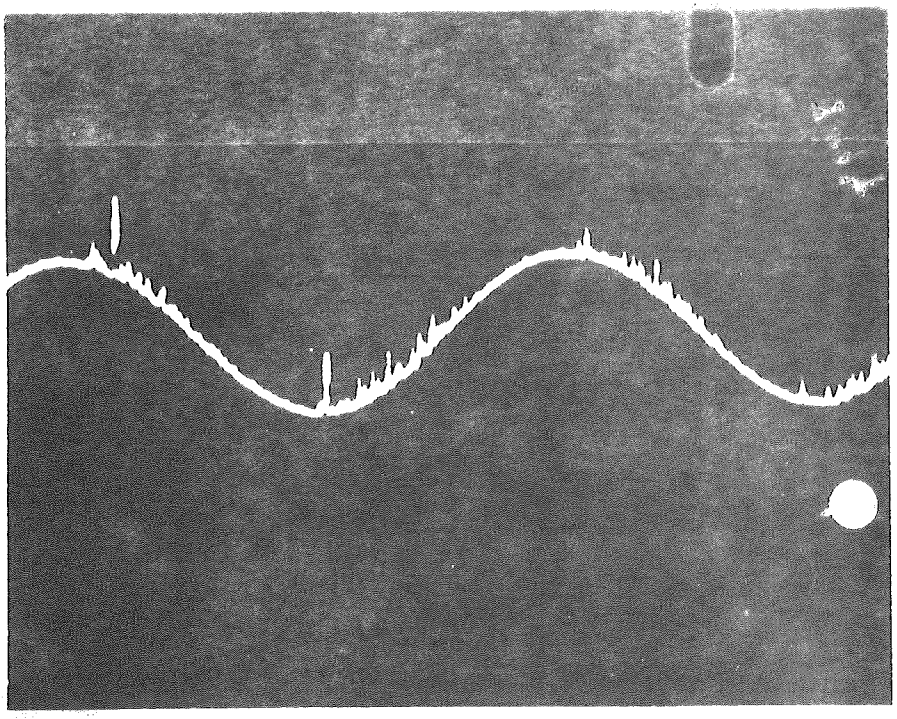
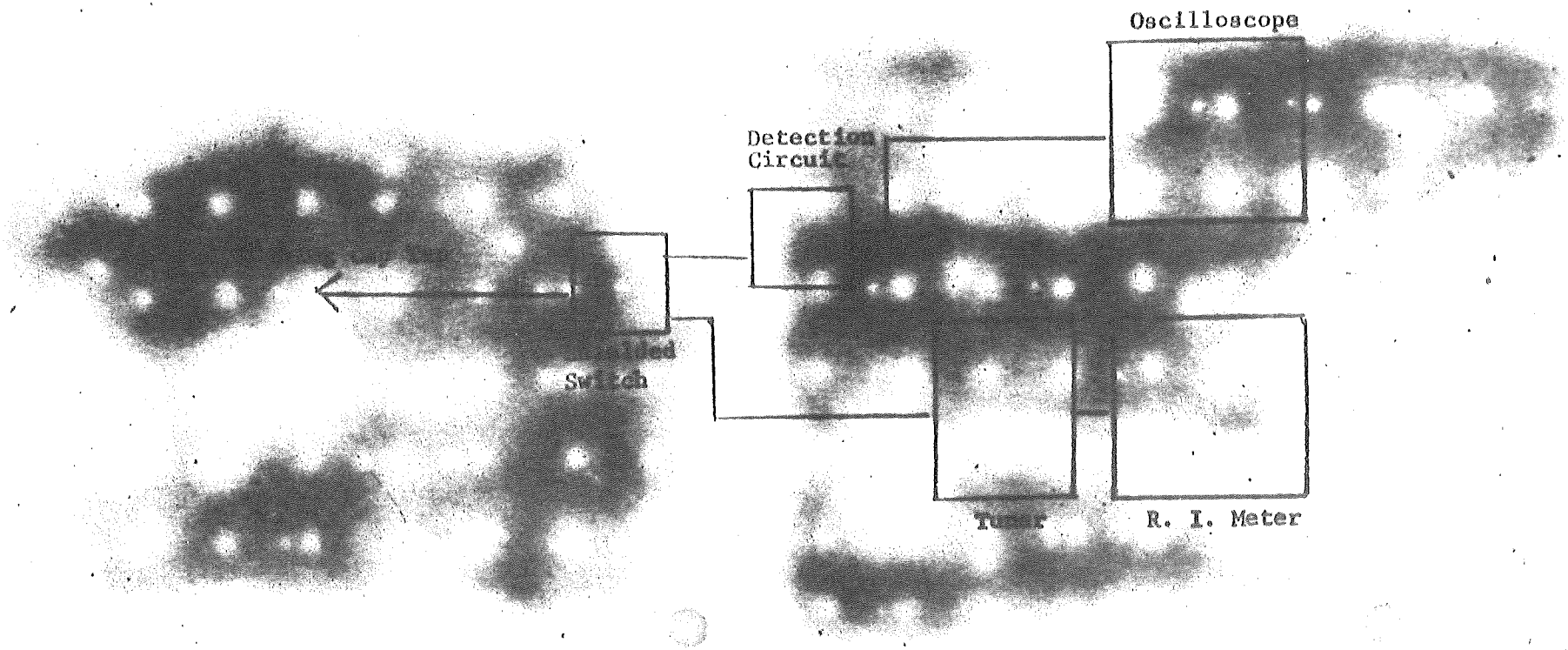
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