



Date: February 13, 2023
To: All Vendors
Subject: Addendum #1

REFERENCE: B 024-23 SUBSTATION POWER TRANSFORMER FIELD SERVICE

This Addendum forms part of the contract and clarifies, corrects or modifies the original bid document.

Question 1: Do you have the recent oil test results available? Please provide a copy.

Answer 1: Airport LTC Oil Analysis Report TC 188 and South Plant TC 334, see attachments below.

Question 2: In case we do require the storage tanks, what is the capacity of the oil storage?

Answer 2: The capacities are as follows:
Airport LTC holds 467 Gallons.
Transformer tank holds 14,875 Gallons.
South Plant Transformer Tank holds 6,415 Gallons.

Question 3: Are there any known leaks currently?

Answer 3: No, there are no known oil leaks on the transformers.

Question 4: Do you have manufacturer instruction manuals for each transformer? Please submit a copy.

Answer 4: Brownsville PUB only has a hard-copy manual and we are unable to upload it electronically. Please see PDF attachment "Vacutap Type UVT LTC" as reference.

Question 5: Is Brownsville expecting inspection and replacement of contacts in the LTC at Airport Substation? Does Brownsville have a kit in inventory, or is the nameplate serial number for LTC available, so we can submit a quote for a kit?

Answer 5: Brownsville PUB is expecting an evaluation of the LTC to find out what is causing the gassing, then the vendor/contractor must recommend what actions need to be taken to resolve the problem. Brownsville PUB does not have a kit in inventory.

Question 6: On page 67 of the technical specifications, do you have the information for the Airport Substation tank? Do you have the LTC information for the South Plant Substation?

Answer 6: Attached are the pictures of the Airport Substation transformer nameplate and the South Plant Substation power transformer LTC nameplate.

Question 7: What is the manufacturer information of the tap changers from the Airport Substation?

Answer 7: The manufacturer information is VACUTAP Type UVT LTC, see attachment below.

Question 8: Is there room for a 7000- gallon tanker inside the substation?

Answer 8: Yes, both substations have room for a tanker.

Question 9: Do you have the photos/pictures available?

Answer 9: Yes, see picture attached below.

The signature of the company agent, for the acknowledgement of this addendum, shall be required. **Complete information below and return via e-mail to: hlopez@brownsville-pub.com or e-fax (956) 574-6109.**

I hereby acknowledge receipt of this addendum.

Company: _____

Agent Name: _____

Agent Signature: _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Phone Number: _____ **E-mail address:** _____

If you have any further questions about the Bid, call 956-983-6375.

Hugo E. Lopez
BY: Hugo E. Lopez
Purchasing

SOUTH PLANT TRANSFORMER

SP T1 LTC

Reinhausen



VACUTAP[®]

ON LOAD TAP-CHANGER

TYPE: RMV-II 2000

NO.: C016919

BIL PHASE TO PHASE AND TO GROUND: 400 KILOVOLTS

MEETS STANDARD: IEC 60214-1989, ANSI C57.131-1995

METHOD OF ARC INTERRUPTION: TAP SELECTOR WITH SEPARATE VACUUM INTERRUPTOR

TYPE OF TRANSITION: PREVENTATIVE AUTO (REACTOR)

MAX RATED THROUGH CURRENT [AMPS]: 2000 | OIL FILL: 345 GAL~~S~~

MAX. AND MINIMUM OPERATING TEMPERATURES : 100°C/-25°C

WITHSTAND FULL VACUUM (+/- 15 PSI) | INSTRUCTION MANUAL TL 7002

IT IS RECOMMENDED TO EQUALIZE PRESSURE WHEN VACUUM
PROCESS / FILLING MAIN TANK

DATE OF MANUFACTURE: APR. 2006

TYPE OF DRIVE MECHANISM: DIRECT DRIVE

LTC IS EQUIPPED WITH MODEL B MONITORING SYSTEM. INTERNAL
EXAMINATION IS NOT REQUIRED FOR 500,000 OPERATIONS

(REF: CI7017 REINHAUSEN STANDARD)

THIS TAP CHANGER MAY BE COVERED BY ONE
OR MORE OF THE FOLLOWING US-PATENTS:
5,107,200; 5,128,605; 5,165,295 AND
5,266,759 - ALL DOHNAL ET AL.

WARNING

**MAXIMUM COMPRESSION
OF INSPECTION DOOR
GASKET IS 5/16" (8MM)**

1A68444H01

AUTOMATIC LOAD TAP-CHANGING LIQUID FILLED TRANSFORMER

SL# 48015MA001U-HA001 3 PHASE 60 Hz CLASS: ONAN/ONAN/ONAF/ONAF/ONAF/ONAF
 HV: 69000x138000 350x550 KV BIL 55/65 °C RISE
 LV: 12470 Grd Y/7200 110 KV BIL IMPEDANCE 0.5% AT 69000-12470V & 15.0 MVA
 WINDING MATERIAL: COPPER IMPEDANCE 0.5% AT 138000-12470V & 15.0 MVA
 MVA: 15.0/16.8/20.0/22.4/25.0/28.0 MONTH/YEAR OF MANUFACTURE: 06/07
 CONTAINS NO DETECTABLE LEVEL OF PCB(<2 PPM) AT THE TIME OF MANUFACTURE

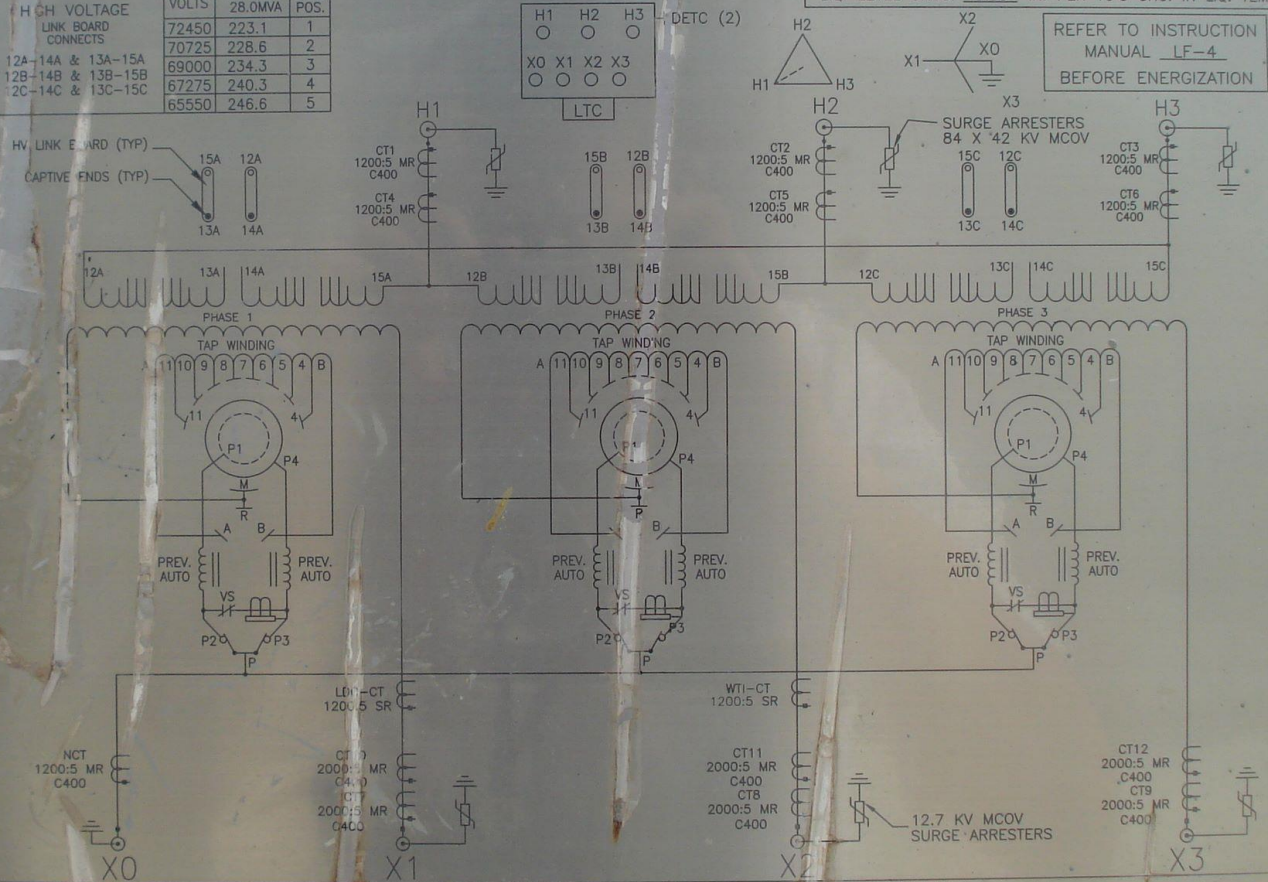
APPROXIMATE WEIGHTS (LBS)	
CORE & COILS	45430
TANK & FITTINGS	35735
TYPE II MINERAL OIL	
MAIN TANK 6415 GALS	48120
LTC TANK 345 GALS	2588
APPROX TOTAL WT	138500
UNTANKING MASS	52065

MAX. OPERATING PRESS. 9 PSI POS., 7 PSI NEG.
 TANK DESIGNED FOR 15 PSI VACUUM
 25°C OIL LEVEL TO TOP FLG. OF MANHOLE, 15.31 IN.
 LIQ. LEVEL CHGS. 0.99 IN. PER 10°C CHG. IN LIQ. TEMP.

HIGH VOLTAGE LINK BOARD CONNECTS	VOLTS	AMPS AT 28.0MVA	DETC POS.
13A - 14A	144900	1.6	1
13B - 14B	141450	14.3	2
13C - 14C	138000	117.1	3
	134550	120.2	4
	131100	123.3	5

HIGH VOLTAGE LINK BOARD CONNECTS	VOLTS	AMPS AT 28.0MVA	DETC POS.
12A-14A & 13A-15A	72450	223.1	1
12B-14B & 13B-15B	70725	228.6	2
12C-14C & 13C-15C	69000	234.3	3
	67275	240.3	4
	65550	246.6	5

LTC: REINHAUSEN MFG. RMV-II-1500			
LOAD TAP CHANGER			
P4 ON	P1 ON	R ON	POS.
11	11		16R 13706 1179
11	10		15R 13593 1189
10	10		14R 13481 1199
10	9		13R 13425 1204
9	9		12R 13369 1209
9	8		11R 13313 1214
8	8		10R 13256 1219
8	7		9R 13144 1230
7	7	B	8R 13032 1240
7	6		7R 12976 1246
6	6		6R 12919 1251
6	5		5R 12863 1257
5	5		4R 12807 1262
5	4		3R 12695 1273
4	4		2R 12582 1285
4	M		1R 12526 1291
M	M		NOM. 12470 1296
M	11		1L 12414
11	11		2L 12258
11	10		3L 12245
10	10		4L 12133
10	9		5L 12077
9	9		6L 12021
9	8		7L 11964
8	8	A	8L 11908
8	7		9L 11796
7	7		10L 11684
7	6		11L 11627
6	6		12L 11571
6	5		13L 11515
5	5		14L 11459
5	4		15L 11347
4	4		16L 11234 1296



VIRGINIA TRANSFORMER CORP.
ROANOKE, VA.



CAUTION

BOTH DETC MUST BE IN THE SAME TAP POSITION BEFORE ENERGIZING

3
2
1

4

5
4
3

OPERATE HIGH VOLTAGE NO-LOAD MANUAL TAP CHANGERS ONLY WHEN TRANSFORMER IS DE-ENERGIZED

SOUTH PLANT T1

TC 334

TC 334

NON-PCB
The following liquid is this electrical equipment has been tested to determine the concentration of polychlorinated biphenyls (PCB) content. We certify that, based on the test results, the liquid contained does not exceed the limits of PCB, and the equipment is classified as non-PCB. Non-PCB as defined in the May 31, 1975, 40 CFR, 188 of the Federal Register. State or Local regulations in California may differ.
SUNNYVALE
www.sunnyvale.com
COMMERCIAL & RESIDENTIAL AIR & VENTILATION, CHINA 02728

MANUFACTURE RECEIVING THE CERTIFICATE
SUNNYVALE
www.sunnyvale.com
COMMERCIAL & RESIDENTIAL AIR & VENTILATION, CHINA 02728

SPT1





SP T1







SP T1



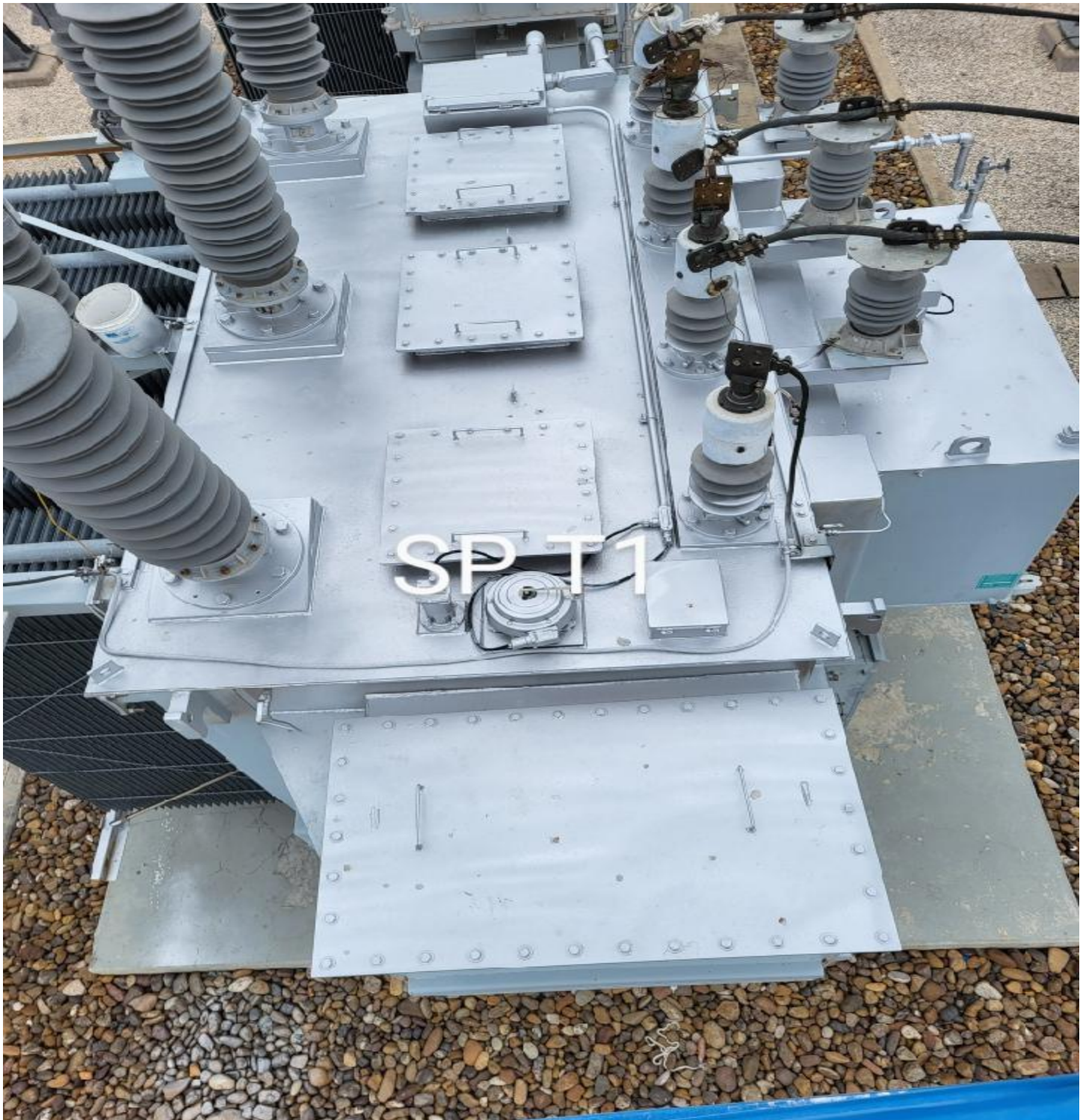
SP T1

T1


VT



SP T1



AIRPORT TRANSFORMER

Westinghouse 

<p>WINDING 138000 GRD. Y VOLTS 69000 GRD. Y VOLTS 12470 VOLTS</p> <p>THREE PHASE 60 HERTZ L SPEC. 969080 TYPE SL VACUTAP AUTO TRANSFORMER</p>	<p>56°C. RISE 36000/48000/60000 KVA 36000/48000/60000 KVA 7295/9726/12158 KVA</p> <p>65°C. RISE 67200 KVA 67200 KVA 13617 KVA</p>		
INSULOUR INSULATION CLASS OR/FA/FOA			
SERIAL 18403-1	INSTRUCTION BOOK XDS7103	DALS. LTC OIL COMP. 467	TRANS. TANK 14875
BTL: H-HDC. 550 KV., X-HDC. 350 KV., Y-HDC. 110 KV., HOXD HDC. NEUT. 150 KV., HOXD NEUT. BUSH. 150 KV.		THIS 00701	
IMPEDANCE 5.30	% AT 36000 KVA	138000 TO 69000 VOLTS	
IMPEDANCE 5.0	% AT 7295 KVA	138000 TO 12470 VOLTS	
IMPEDANCE 4.9	% AT 7295 KVA	69000 TO 12470 VOLTS	
APPROX. WEIGHT IN LBS. CORE & COILS 76900	CASE 72300	OIL 15000	TOTAL 264200
MADE IN U.S.A. WESTINGHOUSE ELECTRIC CORPORATION 245P185H01C			
FOR DIAGRAM OF CONNECTIONS SEE INSTR. PL. 245P185AND1			

CONNECTIONS																
WINDING	VOLTS	60000 KVA AMPERES	POS.	DE-ENERGIZED TAP CHANGER CONNECTS				VOLTS	KVA	POS.	LOAD TAP CHANGER CONNECTS IN EACH PHASE					
				P4 ON	F1 ON	R ON					P4 ON	F1 ON	R ON			
H- WINDING HYE	14900	239.1	1	44 - 45				54 - 55								
	141450	244.9	2	43 - 45				54 - 55								
	138000	251.0	3	43 - 45				54 - 56								
	134650	257.5	4	43 - 45				53 - 56								
	131100	264.2	5	43 - 46				53 - 56								
X- WINDING HYE	62100	502	L 16	4	4	A	56000	502		H	4		H	4	B	
	62531	502	L 15	5	4	A	65431	499		1	4		H	4	B	
	62982	502	L 14	5	5	A	66802	499		2	4		4	4	B	
	63394	502	L 13	6	5	A	70294	499		3	5		4	4	B	
	63825	502	L 12	6	6	A	70725	499		4	5		5	4	B	
	64266	502	L 11	7	6	A	71156	487		5	6		5	5	B	
	64607	502	L 10	7	7	A	71587	484	R	6	6		5	5	B	
	65119	502	L 9	8	7	A	72019	481		7	7		5	5	B	
	65550	502	H 8	9	8	A	72450	478	I	8	7		7	7	B	
	65981	502	H 7	9	9	A	72881	475	S	9	8		77	7	B	
	66412	502	R 6	9	9	A	73312	473	E	10	8		8	8	B	
	66844	502	R 5	10	9	A	73744	470		11	9		8	8	B	
	67275	502	R 4	10	10	A	74175	467		12	9		9	9	B	
	67706	502	R 3	11	10	A	74606	464		13	10		9	9	B	
	68137	502	R 2	11	11	A	75037	462		14	10		10	10	B	
	68569	502	R 1	H	11	A	75469	459		15	11		10	10	B	
69000	502	N	H	H	A	75900	456		16	11		11	11	B		
Y- WINDING DELTA	12470	12158 KVA 563														

R1 AND R2 ARE NON LINEAR RESISTORS.
 THE ARITHMETICAL SUM OF THE LOADS ON ANY TWO WINDINGS MUST NEVER EXCEED THE CAPACITY OF THE THIRD WINDING.
 THE MAXIMUM CONTINUOUS CURRENT RATING OF THE CIRCUIT WINDING IS 207 AMPERES FOR 60000 KVA RATING.
 THE 25°C. LIQUID LEVEL IS 15 INCHES BELOW TOP OF HIGHEST HANDLE FLANGE.
 LIQUID LEVEL CHANGES 1/4 INCHES FOR EACH 10°C. CHANGE IN AVERAGE LIQUID TEMPERATURE.
 THE TRANSFORMER MUST NOT BE ENERGIZED FROM ANY VOLTAGE SOURCE WHEN DE-ENERGIZED TAP CHANGERS ARE OPERATED.
 THE H & X WINDINGS NEUTRAL MUST BE PERMANENTLY GROUND OR EITHER DIRECTLY OR THROUGH A LOW IMPEDANCE.
 IF AN IMPEDANCE IS PLACED IN THE GROUND CIRCUIT, THE VOLTAGE FROM NEUTRAL TO GROUND DURING A FAULT MUST NOT EXCEED 2500 VOLTS.
 THE TRANSFORMER IS DESIGNED FOR OPERATION BETWEEN PRESSURE LIMITS OF 8.5 LBS. PER SQ. INCH POSITIVE TO 6.5 LBS. PER SQ. INCH POSITIVE.
 CONDUCTOR MATERIALS: H.V. CU., L.V. CU., R.V. CU., T.V. CU., P.A. CU. UNTANKING HEIGHT (HEAVIEST PIECE) 70500 LBS.

Airport AUTO XFMR

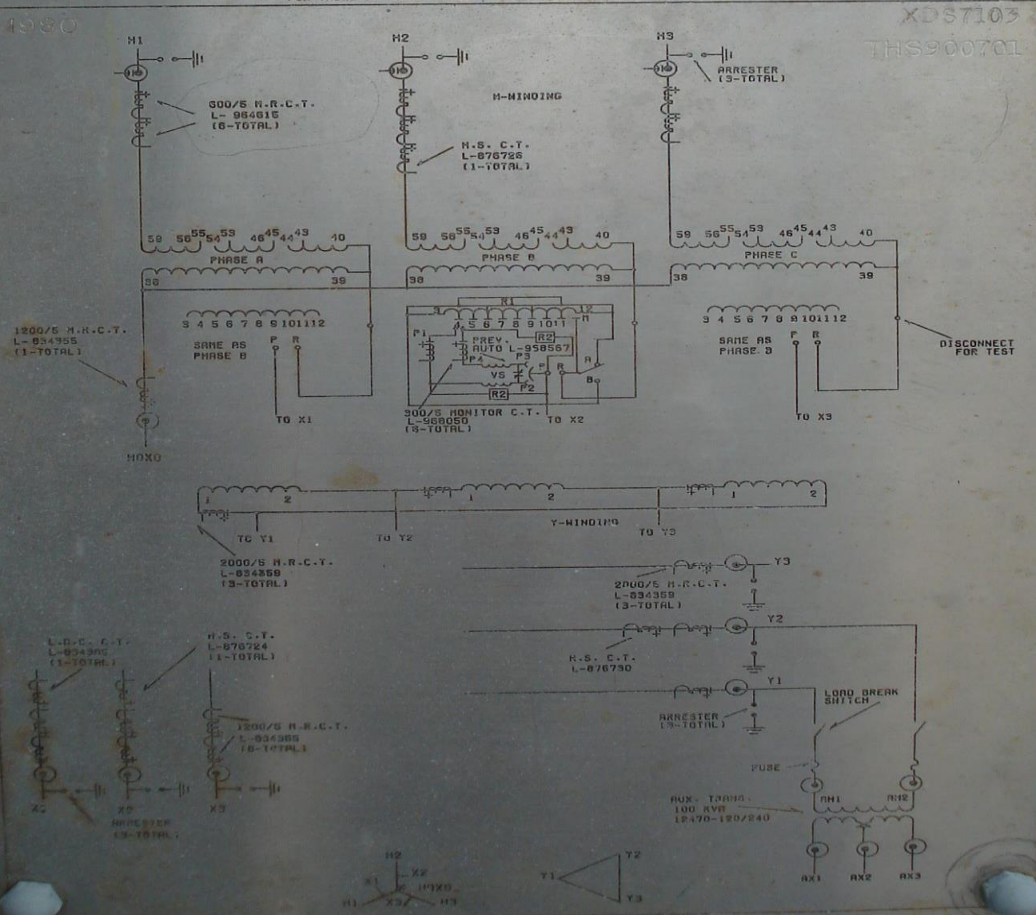
Airport AUTO XFMR

Westinghouse®



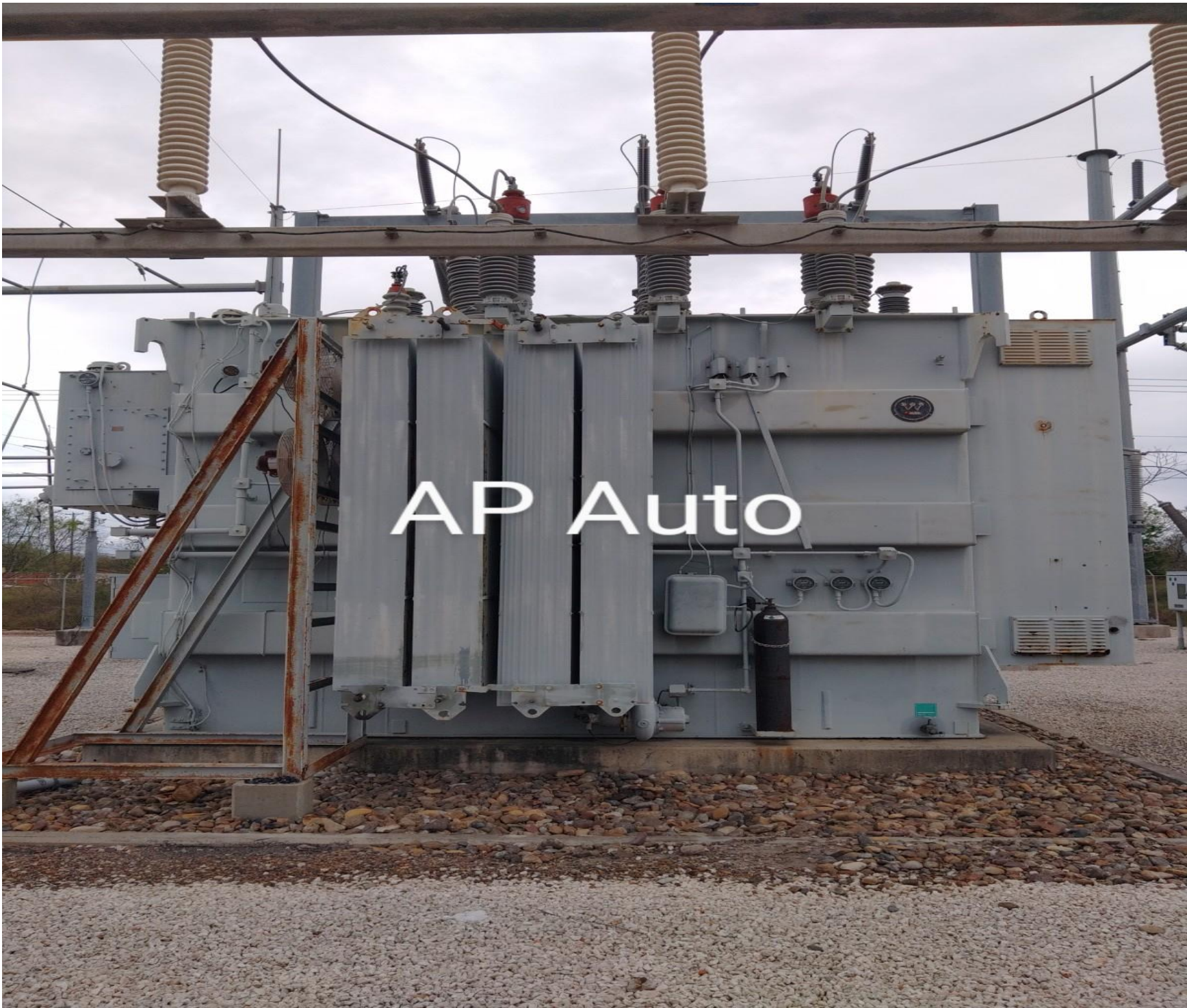
<p>WINDING 138000 GRD. Y VOLTS 69000 GRD. Y VOLTS 12470 VOLTS THREE PHASE 50 HERTZ L SPEC. 969080 TYPE SL VACUTAP AUTO TRANSFORMER INSULOUR INSULATION CLASS OA/FA/FOA</p>	<p>55°C. RISE 36000/48000/60000 KVA 36000/48000/60000 KVA 7295/ 9726/12158 KVA 65°C. RISE 67200 KVA 67200 KVA 13617 KVA</p>
---	--

WESTINGHOUSE ELECTRIC CORPORATION 245P1-4H01B
 FOR TABLE OF CONNECTIONS & NOTES SEE INSTR. PL. 245P165H01

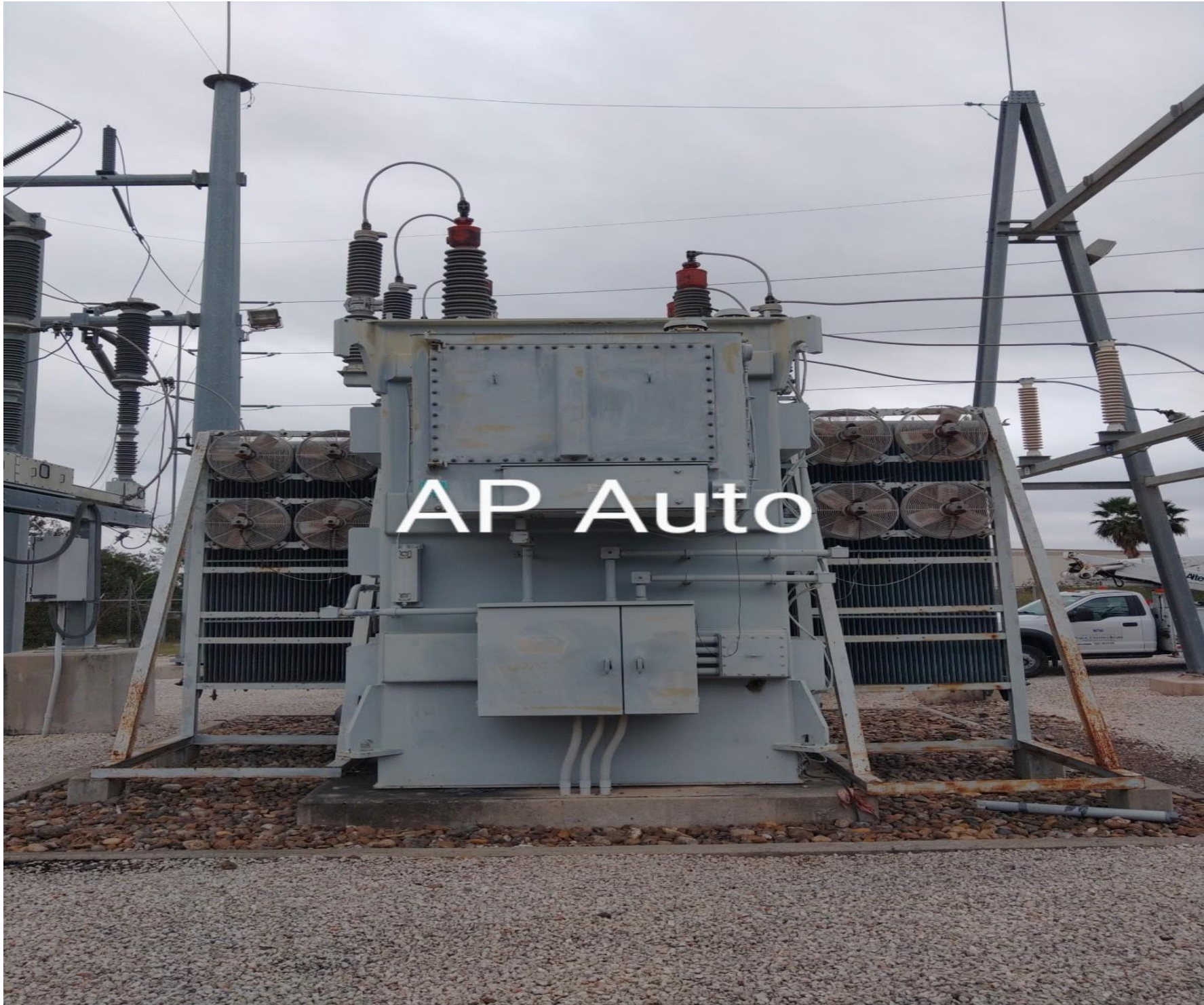




AP Auto



AP Auto



AP Auto



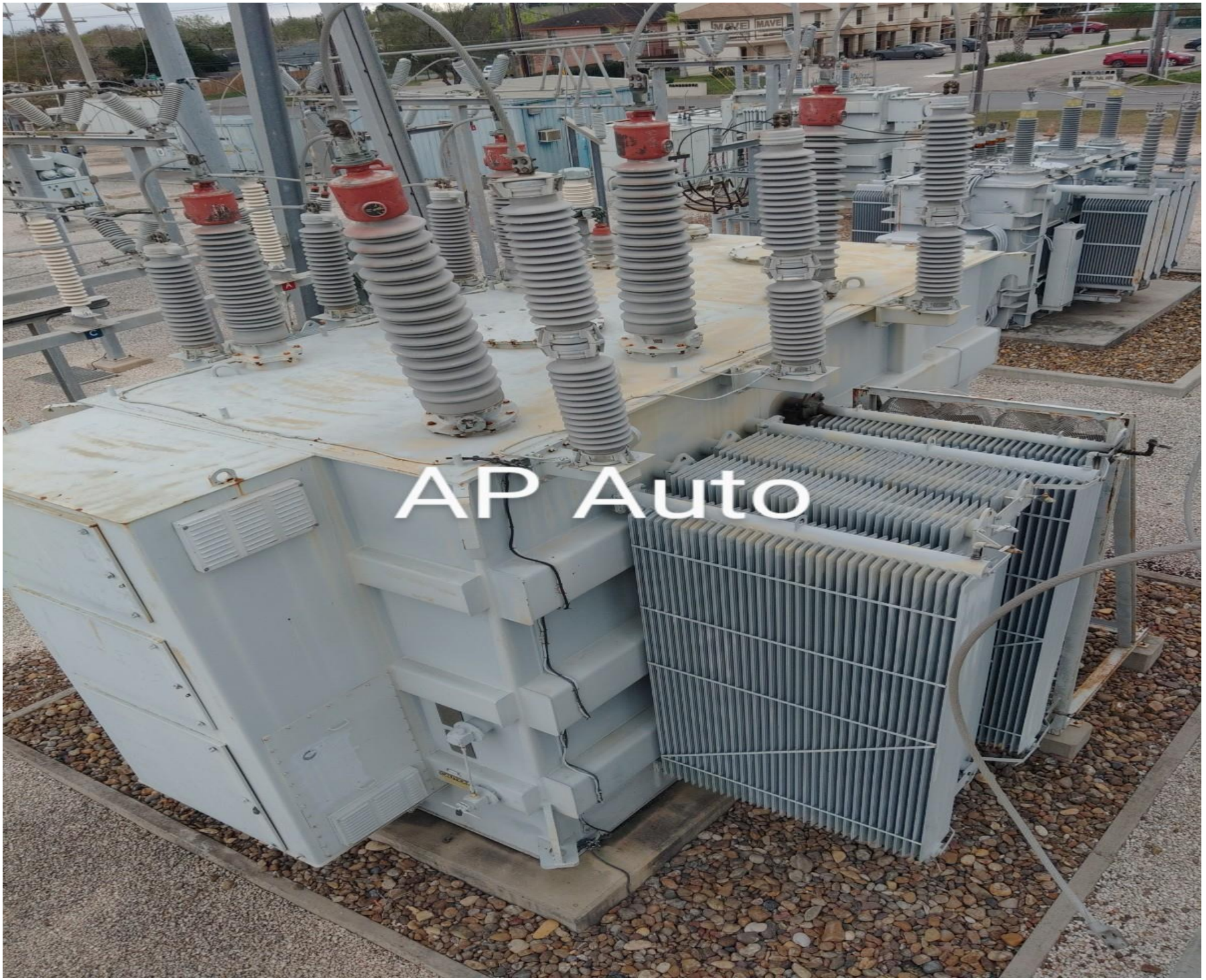
AP Auto



AP Auto



AP Auto



AP Auto



AP Auto

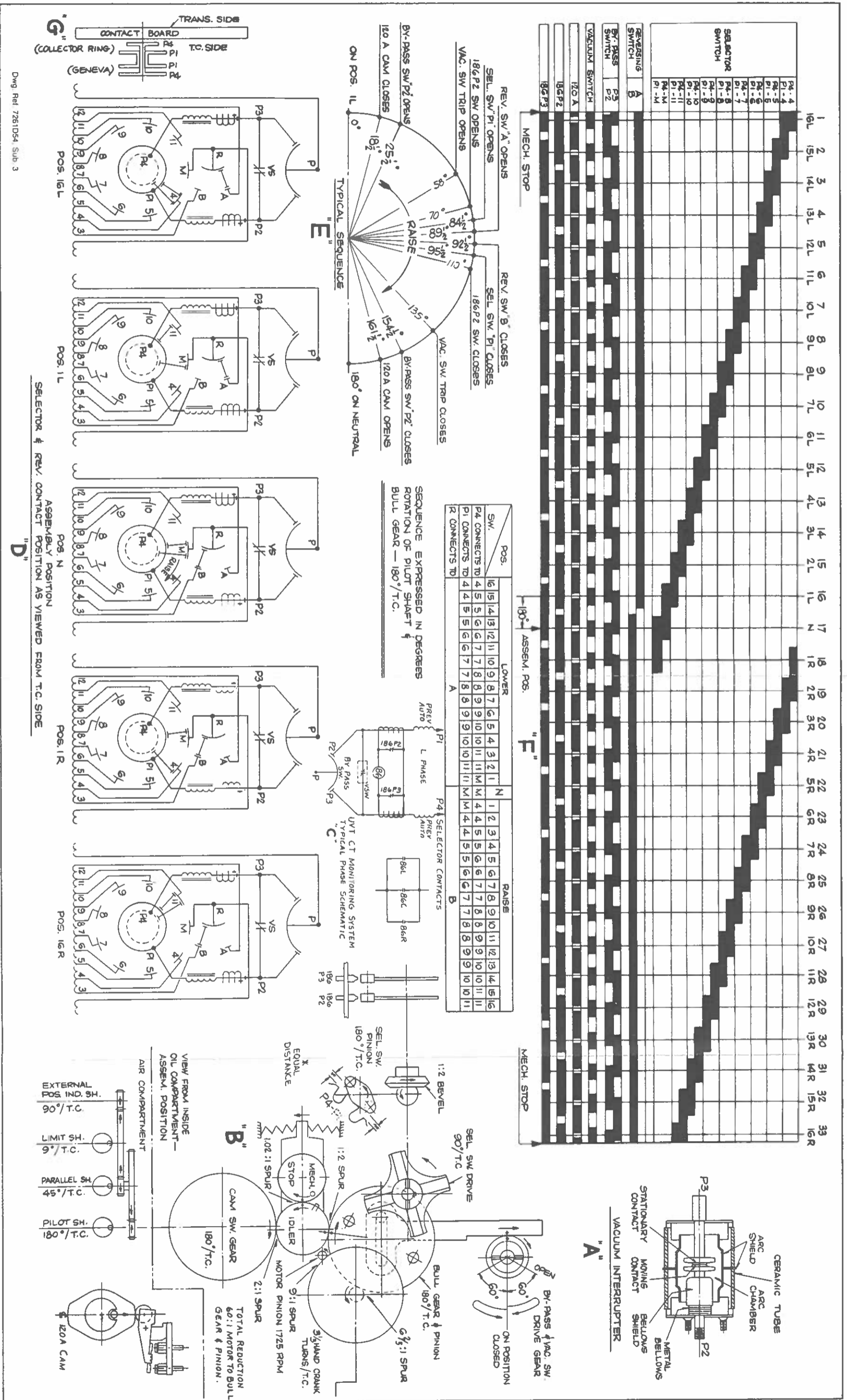


Fig. 10 Vacuum Switch Load Tap Changer, Type UVT, Schematic Sequence (33 position)

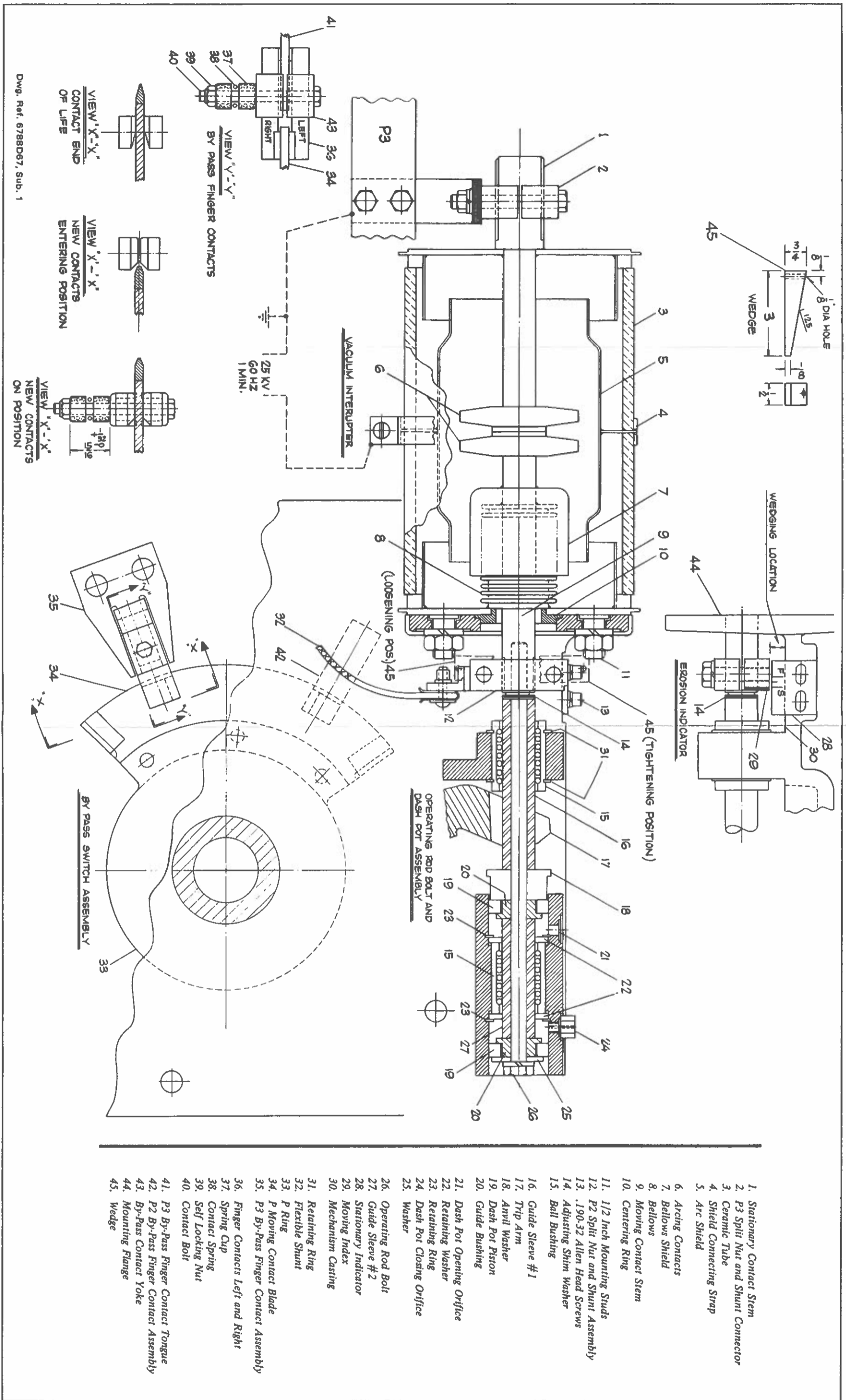


Fig. 11. Type UVT Load Tap Changer Vacuum Switch and By-Pass Switch

1. Stationary Contact Stem
2. P3 Split Nut and Shunt Connector
3. Ceramic Tube
4. Shield Connecting Strap
5. Arc Shield
6. Arcing Contacts
7. Bellows Shield
8. Moving Contact Stem
9. Centering Ring
10. 1 1/2 Inch Mounting Studs
11. P2 Split Nut and Shunt Assembly
12. 190-32 Allen Head Screws
13. Adjusting Shim Washer
14. Ball Bushing
15. Guide Sleeve #1
16. Trip Arm
17. Anvil Washer
18. Dash Pot Piston
19. Guide Bushing
20. Dash Pot Opening Orifice
21. Retaining Washer
22. Retaining Ring
23. Dash Pot Closing Orifice Washer
24. Operating Rod Bolt
25. Guide Sleeve #2
26. Stationary Indicator
27. Moving Index
28. Mechanism Casting
29. Retaining Ring
30. Flexible Shunt
31. P Ring
32. P Moving Contact Blade
33. P3 By-Pass Finger Contact Assembly
34. Finger Contacts Left and Right
35. Spring Cup
36. Contact Spring
37. Self Locking Nut
38. Contact Bolt
39. P3 By-Pass Finger Contact Tongue
40. P2 By-Pass Finger Contact Assembly
41. By-Pass Contact Yoke
42. Mounting Flange
43. Wedge

Customer 0554000 Brownsville Public Utilities
Sub-Name SOUTH PLANT

City Brownsville, TX
Unit No. T1

Location OUTDOOR/GROUND
Other 1 ft

NAMEPLATE DATA

Manufacturer	VIRGINIA	Equipment Type	TRANSFORMER
Manufacture Date	6/20/2006	Transformer Class	ONAN/ONAF
Serial No.	48015MA001U-HA001A	Impedance %	9.31
KVA Rating	150,000	Phase/Cycle	3/60
High Voltage	138,000 D	Liquid Type	OIL
Low Voltage	12,470 Y	Gallons	6,415
Weight	138,500	Other Access	TOP INSPECTION PLATE

ADDITIONAL EQUIPMENT

Radiators	Yes	Conservator Tank	No
Fans	Yes	LTC Compartment	
Water Cooled	No	Bushing Location	TOP
Oil Pumps	No	Breather	N2 SYSTEM
Top FPV (inch)	1.00 Valve	Hose Length (feet)	
Bottom FPV (inch)	2.00 Valve	Service Online	Yes
InsulationType	55/65C	Power Available	No

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
06/23/20	NORMAL	30	40	2.00	FAIR	NONE
06/10/21	NORMAL	30	44	2.00	FAIR	NONE
06/08/22	NORMAL	31	41	1.00	GOOD	NONE
11/04/22	NORMAL	45		1.01	POOR	NONE

FIELD SERVICE

DATE SERVICE

Additional Information 6/8/2022 10:41:00 AM CORROSIVE SULFUR TEST (48 HRS. @ 150 C): NON CORROSIVE 1b

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/20/11		0.020 AC	39.8 AC	49 AC			1.00 AC	0.880 AC	CLEAR AC	NONE AC
05/24/12		0.010 AC	40.8 AC	35 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
05/01/13		0.020 AC	40.2 AC	47 AC			0.75 AC	0.880 AC	CLEAR AC	NONE AC
06/29/18		0.020 AC	40.1 AC	49 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC
06/25/19		0.010 AC	40.2 AC	41 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC
06/23/20		0.020 AC	40.7 AC	40 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC
06/10/21		0.020 AC	38.8 AC	48 AC			1.50 AC	0.880 AC	CLEAR AC	NONE AC
06/08/22		0.020 AC	39.4 AC	43 AC			1.50 AC	0.884 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE PCT. BY WEIGHT

NOTE - THIS UNIT HAS A BLADDER OR CONTINUOUS N2 SYSTEM. THEREFORE, THE UNIT DOES NOT REQUIRE INHIBITED OIL. HOWEVER, HAVING INHIBITED OIL WILL PROVIDE ADDITIONAL PROTECTION AGAINST OIL OXIDATION IF THE CURRENT OIL PRESERVATION SYSTEM WERE TO EVER FAIL.

LIQUID POWER FACTOR

DATE	25 C	100 C
05/01/13	0.028 AC	0.678 AC
06/29/18	0.025 AC	0.673 AC
06/25/19	0.054 AC	1.070 AC
06/10/21	0.025 AC	1.110 AC
06/08/22	0.034 AC	1.550 AC

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer 0554000 Brownsville Public Utilities
Sub-Name SOUTH PLANT
Location OUTDOOR/GROUND

S/N 48015MA001U-HA001A
Mfg. VIRGINIA
Unit No. T1

Gallons 6,415
KVA 150,000
High Volt. 138,000
Low Volt. 12,470

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG.		PCT.		MOISTURE BY DRY	
	TEMP	PPM	SATURATION	QU	AC	WEIGHT PCT.
05/01/13	28	10	12.4	QU	AC	1.38
06/29/18	35	6	6.0	AC	AC	0.60
06/25/19	35	3	3.0	AC	AC	0.30
06/23/20	35	11	11.0	QU	AC	1.10
06/10/21	35	13	12.4	QU	AC	1.25
06/08/22	36	5	4.3	AC	AC	0.43

RECOMMENDATION RETEST 1 YEAR

The moisture content has decreased since our last analysis. If service has not been performed, this may be due to temperature and/or operational changes. Continued normal monitoring is indicated.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
05/01/13	ND	ND	2	ND	ND	2
06/29/18	ND	ND	1	ND	ND	1
06/25/19	ND	ND	1	ND	ND	1
06/23/20	ND	ND	2	ND	ND	2
06/10/21	ND	ND	4	ND	ND	4
06/08/22	ND	ND	12	ND	ND	12

RECOMMENDATION RETEST 1 YEAR

NO DIAGNOSTIC CHANGES ARE NOTED IN FURAN LEVELS SINCE THE PREVIOUS ANALYSIS. THE CELLULOSIC INSULATION APPEARS TO BE IN GOOD CONDITION.

CALCULATED DP 800 **EST. LIFE REMAINING** 100%

GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON		ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
					MONOXIDE	DIOXIDE					
06/29/18	ND	479	84,432	2	17	1,936	2	2	ND	23	86,870
06/25/19	5	919	76,524	4	17	1,846	2	1	ND	29	79,318
06/23/20	ND	4,766	82,393	3	65	2,179	2	3	ND	73	89,411
06/10/21	ND	2,222	84,103	3	80	2,558	2	5	ND	90	88,973
06/08/22	289	201	76,136	446	121	2,599	109	656	147	1,768	80,704
11/04/22	269	344	74,138	619	106	2,473	204	991	66	2,255	79,210

RECOMMENDATION INVESTIGATE

G-ELEVATED LEVELS OF ETHANE, ETHYLENE, AND ACETYLENE INDICATE OVERHEATING OF THE INSULATING LIQUID COUPLED WITH AN ARC OR SPARK. POSSIBLE CAUSES INCLUDE A LOOSE CONNECTION IN EITHER THE TAP CHANGER OR TERMINAL BOARD AREAS.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER
05/20/11	<0.1	<0.03	0.09
05/24/12	<0.1	<0.03	0.07
05/01/13	<0.1	<0.03	0.07

RECOMMENDATION RETEST 1 YEAR

THERE HAS BEEN NO DIAGNOSTIC CHANGE SINCE THE PREVIOUS ANALYSIS. THESE DATA INDICATE NORMAL OPERATION.

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL
05/20/11	ND	ND	ND	ND	ND
05/24/12	ND	ND	ND	ND	ND
05/01/13	ND	ND	ND	ND	ND
06/23/20	ND	ND	ND	ND	ND
06/10/21	ND	ND	ND	ND	ND
06/08/22	ND	ND	ND	ND	ND

COLOR LABEL: Green **CLASS:** NON-PCB

Results in mg/kg
ND means None Detected
 (<2 mg/kg per ASTM D4059)

Customer 0554000 Brownsville Public Utilities
Sub-Name AIRPORT

City Brownsville, TX
Unit No. T3

Location OUTDOOR/GROUND
Other WEST 10 ft

NAMEPLATE DATA

Equipment Type LOAD TAP CHANGER
Manufacturer WESTINGHOUSE
Serial No. XDS 7103-1
LTC Model No.
LTC for TC No. 203

Liquid Type OIL
LTC Gallons
Selector Gallons 467.00
Transfer/Diverter Gallons

ADDITIONAL EQUIPMENT

Conservator Tank No
Silica Gel Yes
Breather FREE/DESICCA
Top FPV (inch)
Bottom FPV (inch) 1.00 Valve

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	Tap Counter Reading	LEAKS
06/23/20	NORMAL	28				16740	NONE
06/08/21	NORMAL	32			POOR	167409	NONE
06/08/22	NORMAL	29			FAIR	16740	NONE
11/07/22	NORMAL	40			FAIR	167857	NONE

FIELD SERVICE

DATE SERVICE

Additional Information 6/8/2022 9:13:00 AM CORROSIVE SULFUR TEST (48 HRS. @ 150 C): NON CORROSIVE 3a

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/24/12		0.080 QU	23.4 UN	36 AC			2.50 AC	0.880 AC	CLEAR AC	NONE AC
05/01/13		0.090 QU	23.0 UN	45 AC			2.50 AC	0.880 AC	CLEAR AC	NONE AC
06/29/18		0.090 QU	23.3 UN	38 AC			3.00 AC	0.880 AC	CLEAR AC	NONE AC
06/26/19		0.070 QU	24.3 UN	50 AC			3.00 AC	0.870 AC	CLEAR AC	NONE AC
06/23/20		0.050 AC	30.2 QU	38 AC			3.00 AC	0.880 AC	CLEAR AC	NONE AC
06/08/21		0.080 QU	29.6 QU	47 AC			3.00 AC	0.870 AC	CLEAR AC	NONE AC
06/08/22		0.120 UN	29.3 QU	49 AC			3.00 AC	0.876 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE PCT. BY WEIGHT

LIQUID POWER FACTOR

DATE 25 C 100 C

05/24/12	0.038	2.881
05/01/13	0.114	3.972
06/29/18	0.119	3.820
06/26/19	0.148	4.890
06/08/21	0.146	3.800

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer 0554000 Brownsville Public Utilities
Sub-Name AIRPORT
Location OUTDOOR/GROUND

S/N XDS 7103-1
Mfg. WESTINGHOUSE
Unit No. T3

Gallons
KVA

High Volt.
Low Volt.

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG. TEMP	PPM	PCT.		MOISTURE BY DRY
			SATURATION	WEIGHT PCT.	
05/01/13		39	N/A	QU	N/A
06/29/18	39	63	N/A	UN	N/A
06/26/19	37	60	N/A	UN	N/A
06/23/20	33	52	N/A	QU	N/A
06/08/21	37	61	N/A	UN	N/A
06/08/22	34	59	N/A	QU	N/A

RECOMMENDATION RETEST 6 MONTHS

The moisture content is questionable based on the equipment class and liquid type. This condition should be monitored with a shorter test interval until it reaches an unacceptable level or until the next preventative maintenance interval.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
------	------	------	------	------	------	-------

GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON		ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
					MONOXIDE	DIOXIDE					
02/04/04	9	28,907	63,550	5	27	980	5	16	ND	62	93,499
06/29/18	6	30,072	70,343	1	53	1,811	ND	3	ND	63	102,289
06/26/19	2	30,372	71,268	1	74	2,190	ND	3	ND	80	103,910
06/23/20	ND	27,968	71,989	2	123	2,265	ND	4	ND	129	102,351
06/08/21	1	30,799	70,764	10	50	1,867	4	29	ND	94	103,524
06/08/22	207	16,526	66,626	2,097	239	4,852	1,334	7,528	68	11,473	99,477
11/07/22	1,353	23,530	61,475	12,493	94	950	5,274	20,732	47	39,993	125,948

RECOMMENDATION MAINTENANCE

YW-INCREASED OR ELEVATED LEVELS OF ETHYLENE IN THIS TYPE OF UNIT INDICATE EXCESSIVE OVERHEATING OF THE CONTACTS OR TERMINAL CONNECTIONS. OUR RECOMMENDATION IS TO PERFORM MAINTENANCE ON THIS UNIT.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER
02/04/04	<0.1	<0.03	0.20
06/29/18	<0.1	<0.03	<0.01
06/26/19	<0.1	<0.03	0.02
06/23/20	0.12	<0.03	0.03
06/08/21	<0.1	<0.03	0.01

RECOMMENDATION

NO RECOMMENDATION IS POSSIBLE FOR THIS SAMPLE. WE ARE UNAWARE OF ANY PARAMETERS OR GUIDANCE THAT WOULD ENABLE US TO INTERPRET THESE RESULTS OR DETERMINE AN APPROPRIATE MONITORING SCHEDULE.

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL
01/26/89	ND	ND	ND	ND	ND
06/23/20	ND	ND	ND	ND	ND
06/08/21	ND	ND	ND	ND	ND

COLOR LABEL: Green **CLASS:** NON-PCB

Results in mg/kg
 ND means None Detected
 (<2 mg/kg per ASTM D4059)