TRANSMITTAL NO. 39-B

WESTMINSTER COMPANY

SEC. 16335 - PAD-MOUNTED TRANSFORMERS

UNACCOMPANIED ENLISTED PERSONNEL HOUSING

MARINE CORPS BASE

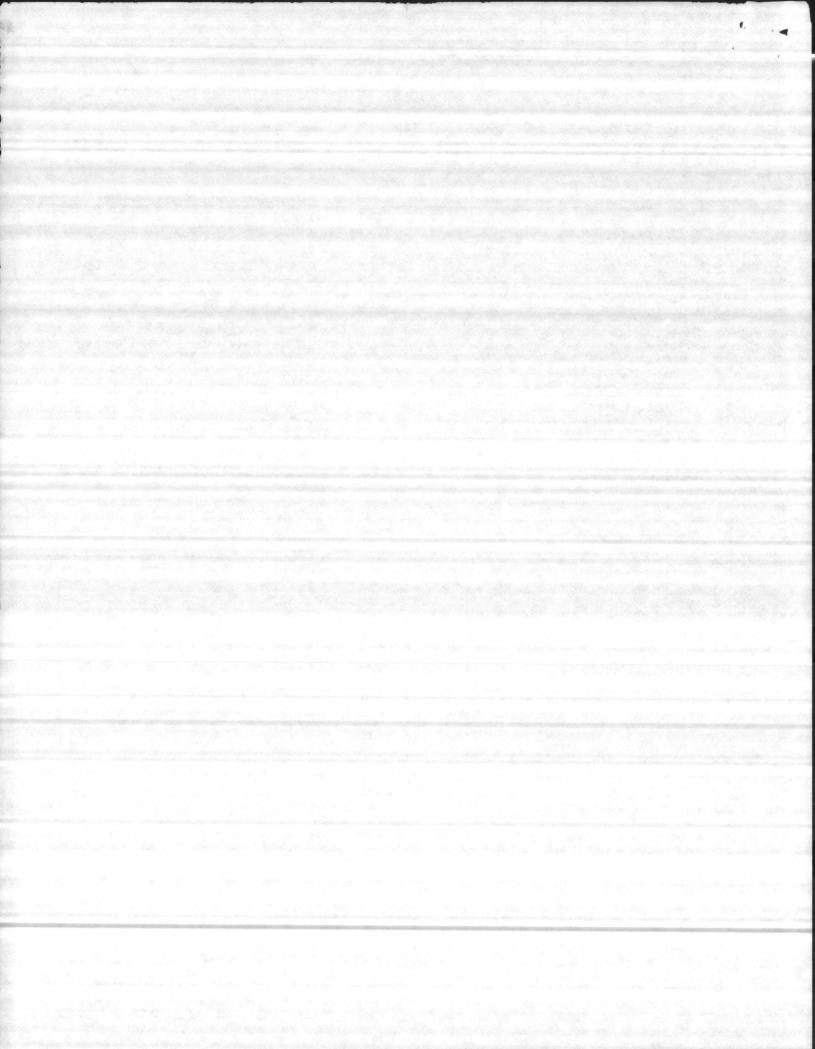
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT NO. N62470-82-C-2244

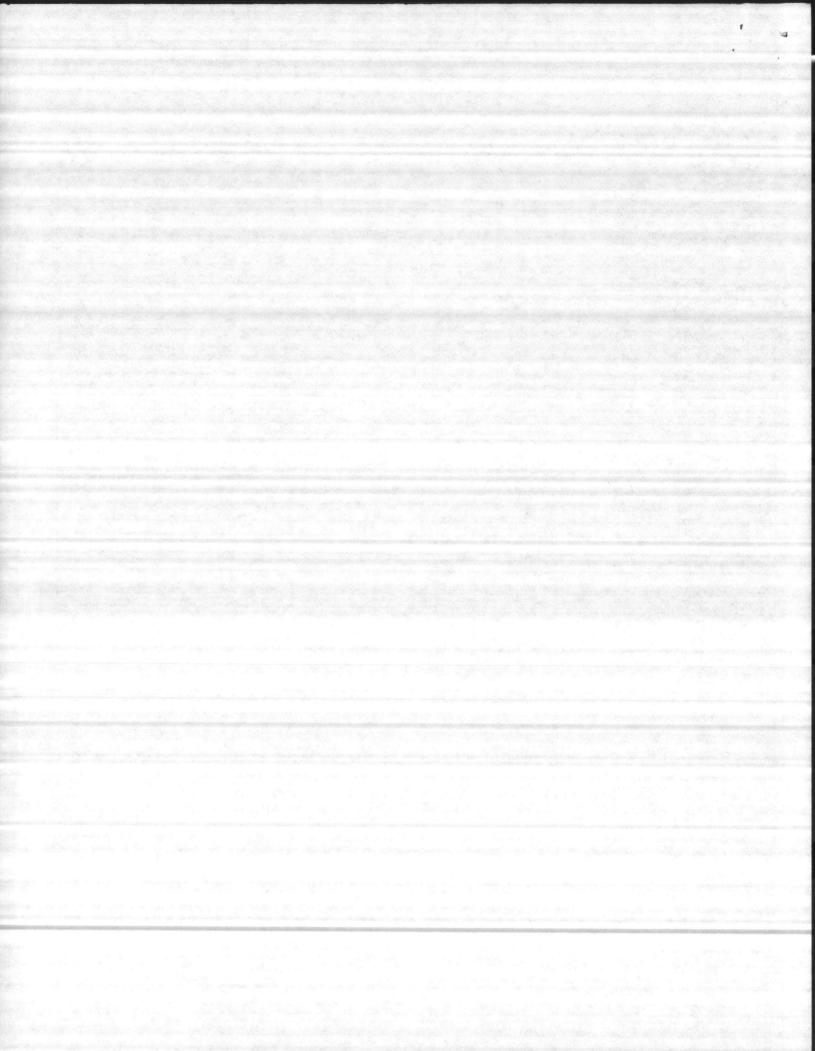
P. O. BOX 3424 BURLINGTON, N. C. 27215

BSTATION: 22	P JOHNSON		FEEDER	IDENT: DID	POLE
					POLE 1480
					NO. SPLICES:
EATHER CONDITI	ons <u>CLOUDY</u>	TEMPERATURE	78°	HUMIDIT	v: <u>73 %</u>
MEGGER	READINGS @	VOLTS			
			øв		ø/c
					øc
	Company of the second				
TEST	TIME (MIN.)	LEAKAGE PHASE A	(MICROAMPS) PHASE B	(MILLIAMPS) PHASE C	REMARKS
10 KU	1 MIN	1.6	1.3	1,8	COLOR CODING:
20 KU	1 MIN	3,1	2.9	3,2	DA-BROWN
30 KU	1 Min	5,0	4.1	5.5	OB-OAANGE OC YELLOW
50 KU	1 Min	9,9	8.0	10.1	77.22000
56 KU	15 min	12.5	11.0	13.0	CWARE NO X CHING CO.
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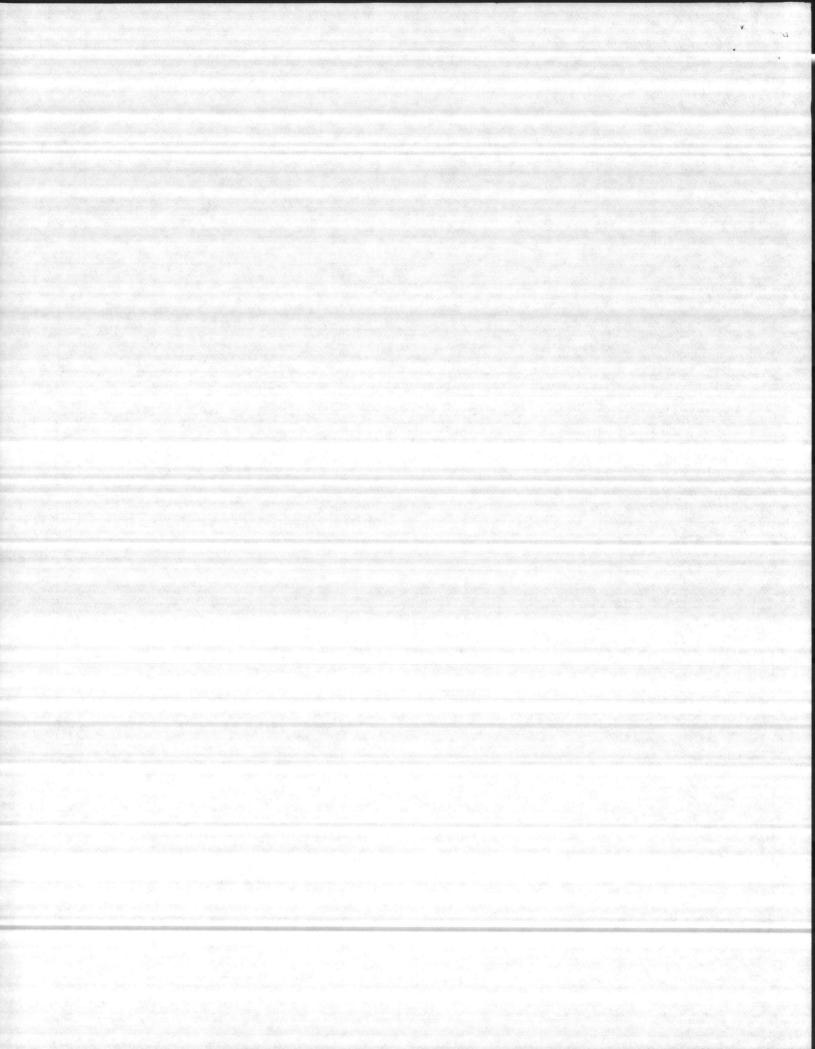
THIS IS A TEST ONLY - NOT A GUARANTEE



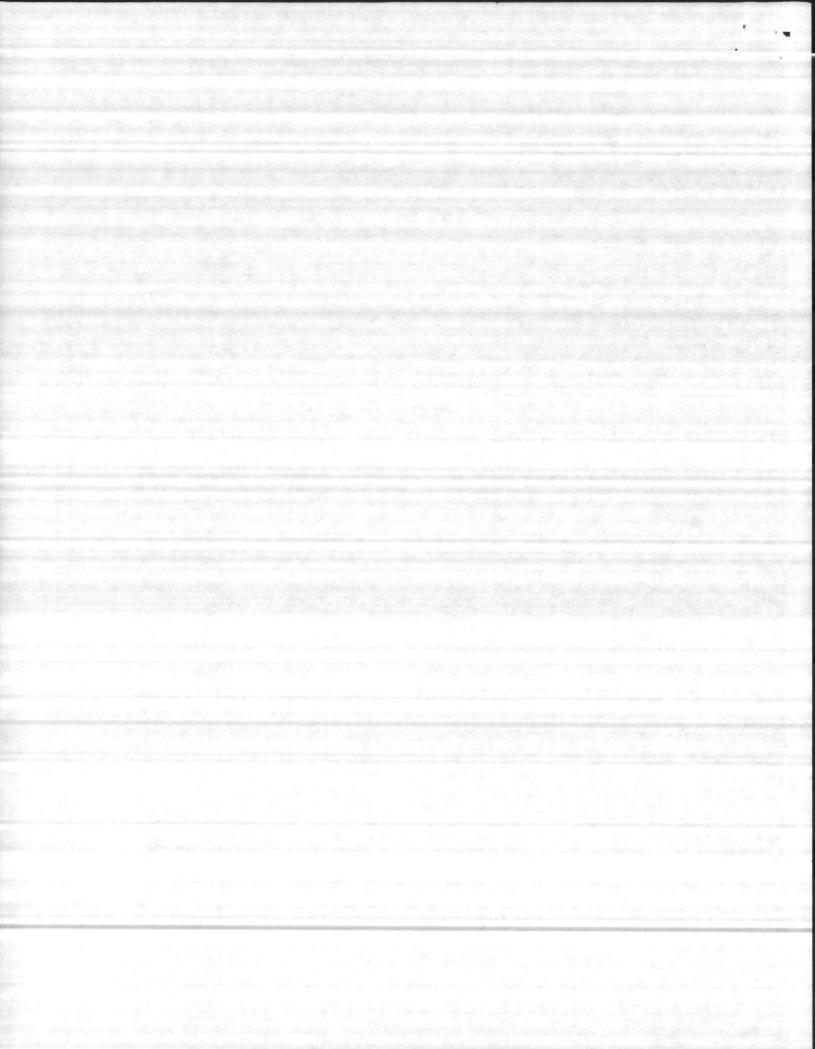
TATION: 2	AIN		FEEDER	IDENT: MAI	N DIP POLE
e type: <i>PA</i>	ILLIPS	_ RATING: 25	KU SIZE:	#2 COPPL	FR LENGTH: 1500
[일본 중요] [1] [1] [1] [1] [1] [1] [1] [1] [1] [1	그들은 전에 보면 있는 바로에 얼마를 되고 말했다. 그는 것이 되었습니다 그는 것들은 술을		[14] 사이트 : 그렇게 하다 그 중에 전혀 되고 있었다면 다 되었다.		NO. SPLICES:
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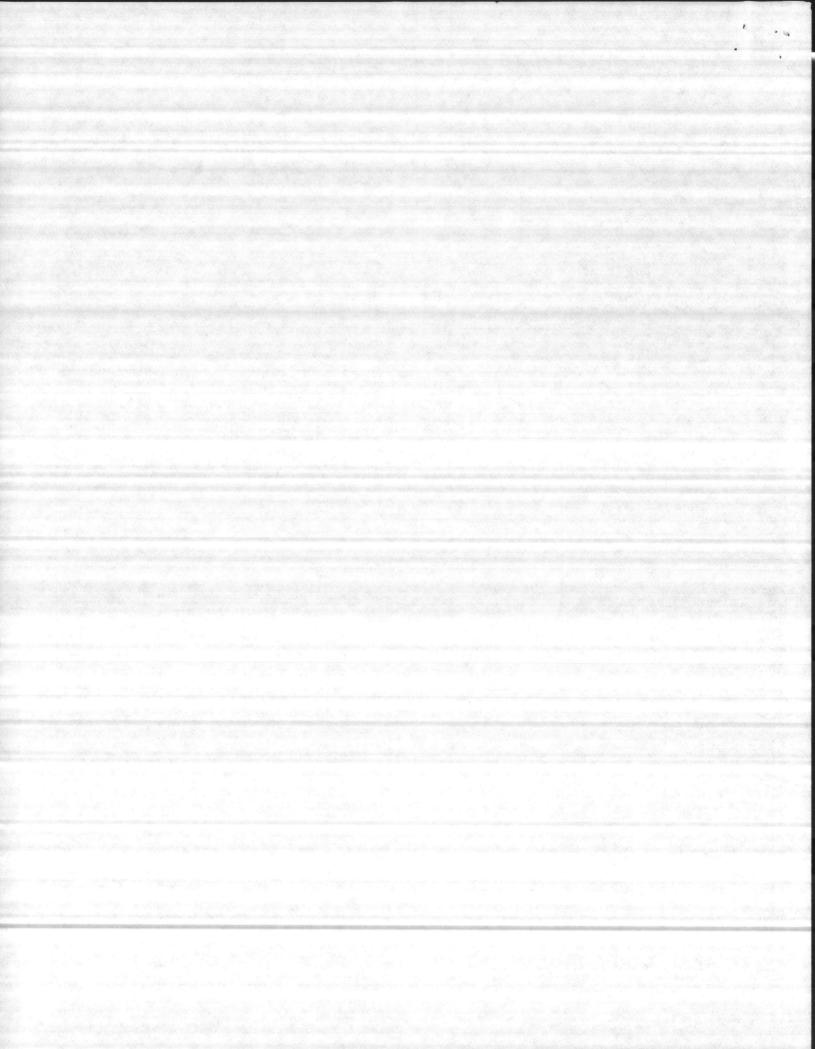
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OCATION: LA	MP JOHN	ISON U	- PH C-224	4 TEST SET:	2 A
	기가 있다면 되었어야고 없다 하는 아이를 내려면 가게 되었다.				POLE
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10 KU	1 MIN	1.9	2.1		COLOR CODING:
20 KU	1 MIN	1.7	40	5.9	DA-BROWN
30 KU	1 MIN	50	6.5	8.0	DE YELLOW
40 KU	1 MIN		8,5	13.5	FLLOW
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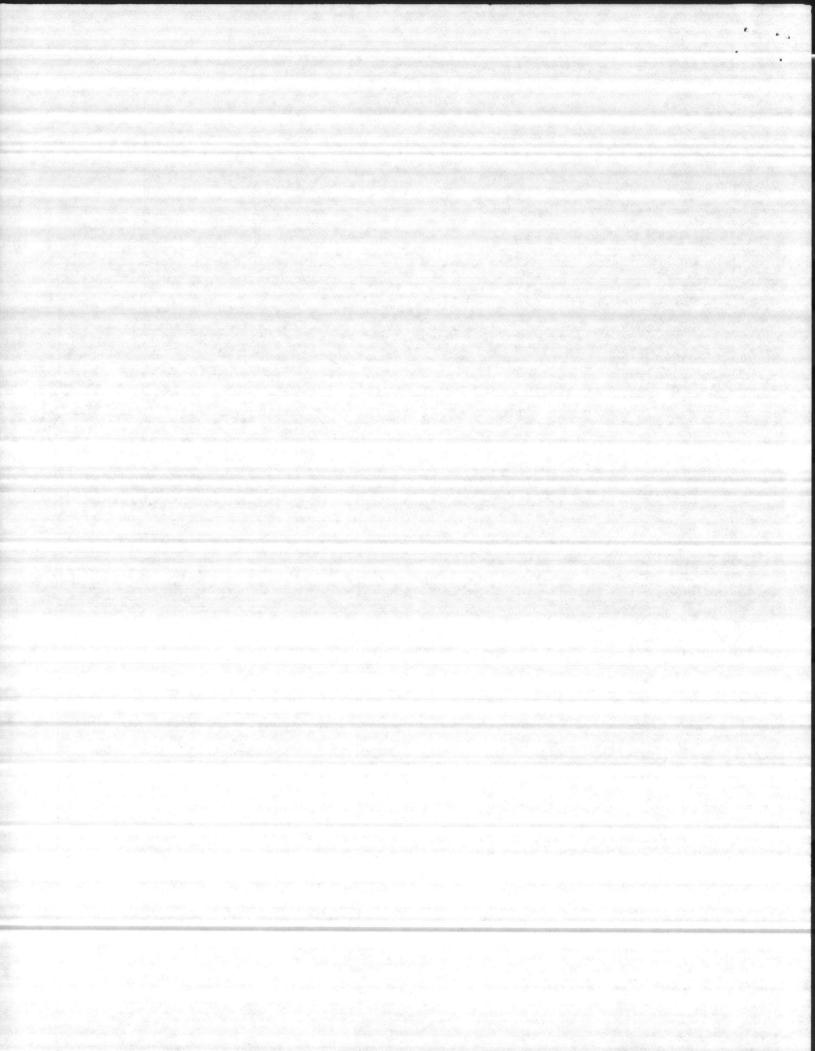
TATION: 2	MP JOHNSO MAIN		FEEDER	IDENT: DIA	POLE
E TYPE: Z	4116185	_ RATING:25_	KU SIZE:	#2 COPPL	R LENGTH: 598
AINATED-TEST	END: TAAN #	5	OPPOSITE E	VD 742	NO. SPLICES:
THER CONDIT	IONS GOOD	TEMPERATUR	E: 726	HUMIDIT	y: 69%
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	TER TEST: Ø				øc
TEST	ELAPSED TIME (MIN.)	PHASE A	(MICROAMPS) PHASE B	(MILLIAMPS) PHASE C	REMARKS
OKU	1 Min	1.3	1.8	_ 3	COLOR CODING:
OKU	1 MIN	21	3,0	1 9	ØB-ORANGE
OKU	1 MIN	5.5	7.0	4.5	OC YELLOW
o KU	1 min	6.9		6.0	
KU	15 min	9.0	11.0	8.5	
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AY VOLIA	GE (AFTER 1 MIN)	7.0 KU	1 6.3 K	1-0 K	



	MP JOHNS				
STATION:	7/1/M		FEEDER	IDENT: /JP	POLE R LENGTH: 275
BLE TYPE:	HILLIPS	_ RATING: 25	KU SIZE:	L COPPE	LENGTH: 2/5
RMINATED-TEST	END: LAANS	• 43	OPPOSITE EI	ND 1-4	NO. SPLICES:
ATHER CONDITI	ONS 6000	TEMPERATUR	E: 63	HUMIDIT	NO. SPLICES:
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TEST VOLTAGE	TIME (MIN.)	PHASE A	(MICROAMPS) PHASE B	(MILLIAMPS) PHASE C	REMARKS
10 KU	1 Min	2.5	3.0	1.5	COLOR CODING:
OKU	min	7.1	7.9	1.9	DA-BROWN
OKU	MIN	13.5	15.5	7.5	OB-ORANGE OC YELLOW
OKU	1 min	20,5		11.0	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
6 KU	15 min	24.5	27.0	17.0	THE STREET, MICH.
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CAY VOLTAG	SE (AFTER 1/2 MIN				
	SE (AFTER 1 MIN)	5.5 KU	5.5 KV	6.080	
distant				01	1000
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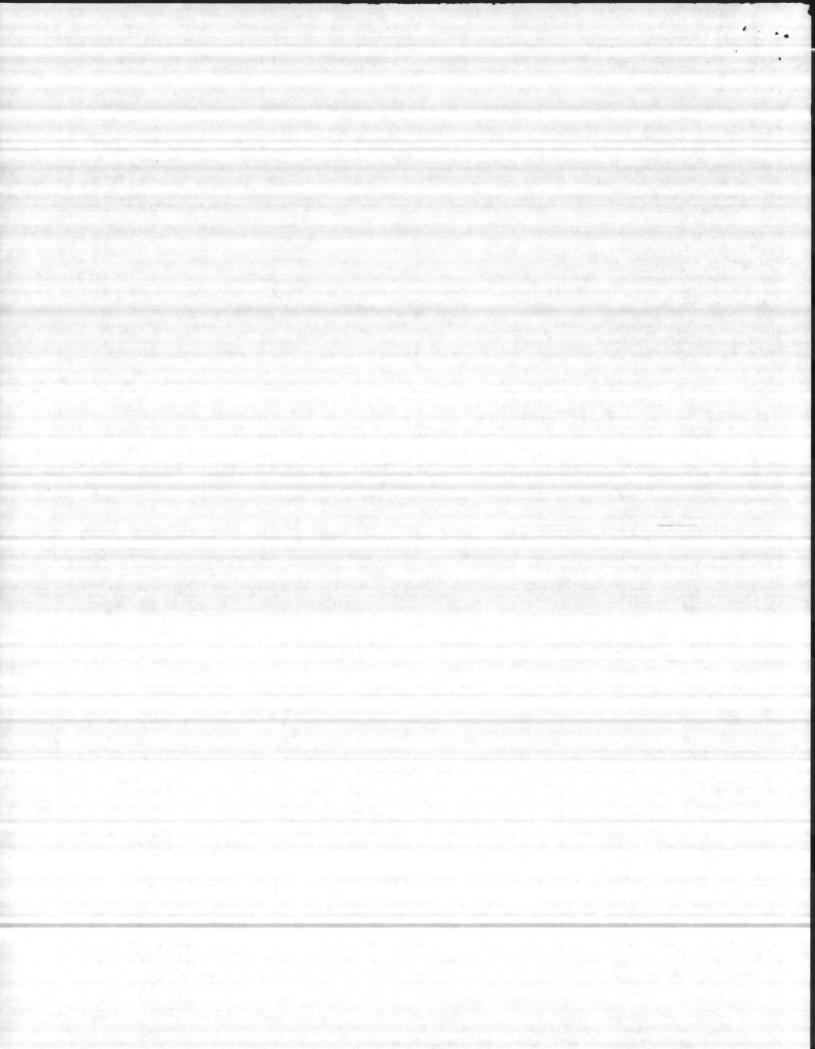
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MEGGER READ				HUMIDIT	
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BEFORE 1		VOLTS			
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	ST: Ø	A	øb		øc
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	1 MIN	1.1	2.3	2,1	COLOR CODING:
O KU	min	3.7	4.5	3.9	DA-BROWN
	MIN	9.5		9.0	OB OARNGE
O KU	MIN	12.5	다시 그 전화가 되었다. 하는 사는 이 성원이 는 원이 중에는 유리를 하고 있다. 나는 경기	13.6	po / Flow
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CAY VOLTAGE (AF			0 1 11	0.4111	
CAY VOLTAGE (AF	TER 1 MIN)	8.5 KU	8.5 KU	8.0KU	



P. O. BOX 3424 BURLINGTON, N. C. 27215

	DUTHERLA DONNS				
IRSTATION: M	9IN		FEEDER	IDENT: DID F	2015
ADIE TUDE PH	11.1.105	PATING: 25	KU SIZE:	#2 COPPE	R LENGTH: 802
	END: TRANS	[10] [10] [10] [10] [10] [10] [10] [10]			
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MEGGER	READINGS @	volts			
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	ER TEST: Ø				øc
٨٢١	ER TEST.	Comment to the second			
TEST	ELAPSED TIME (MIN.)	LEAKAGE PHASE A	(MICROAMPS) PHASE B	(MILLIAMPS) PHASE C	REMARKS
10 KU	1 Min	16	-6	15	COLOR CODING:
20 KU	1 MINI	1.7	6.1	1.9	OB- ORANGE
40 KV	IMIN	9.0	9.0	8-5	OC YELLOW
50 KU	IMIN	11.0	13.0	16,5	
56 KU	15 MIN	18.0	21.0	22.5	
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ECAY VOLTAG	E (AFTER 1 MIN)	10.0KU	10.3 80	0.010	
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STED BY	18/1/11	he 1	ktorik krijidania Stationalija orak und "A	DATE_	11-6-03

THIS IS A TEST ONLY - NOT A GUARANTEE





REFERENCE TO MATERIAL CERTIFICATION

PROJECT

Unaccompanied Enlisted Personnel Housing

MARINE CORP BASE

Camp Lejune, North Carolina

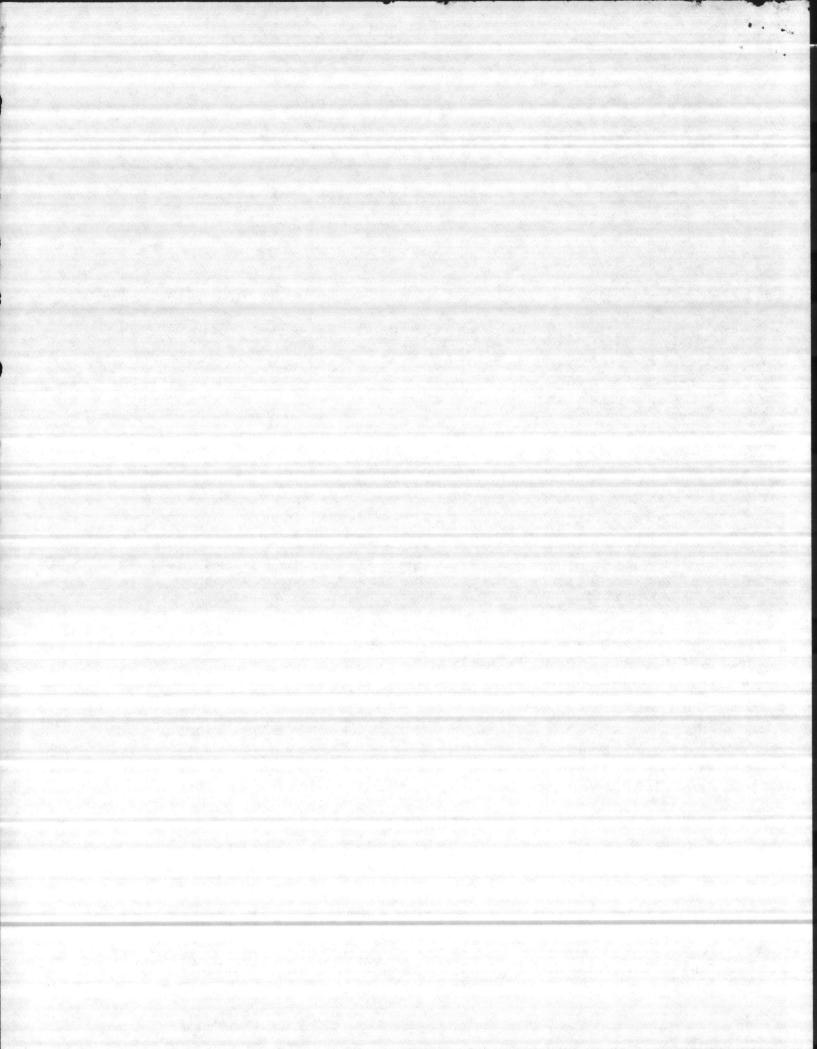
N62470-82-C-2244

Specification Section 02821 - Turf

Specification Section 02490 - Trees, Plants, Ground Cover

This is to certify that the fertilizer to be used for the above reference project, conforms to all requirments specified.

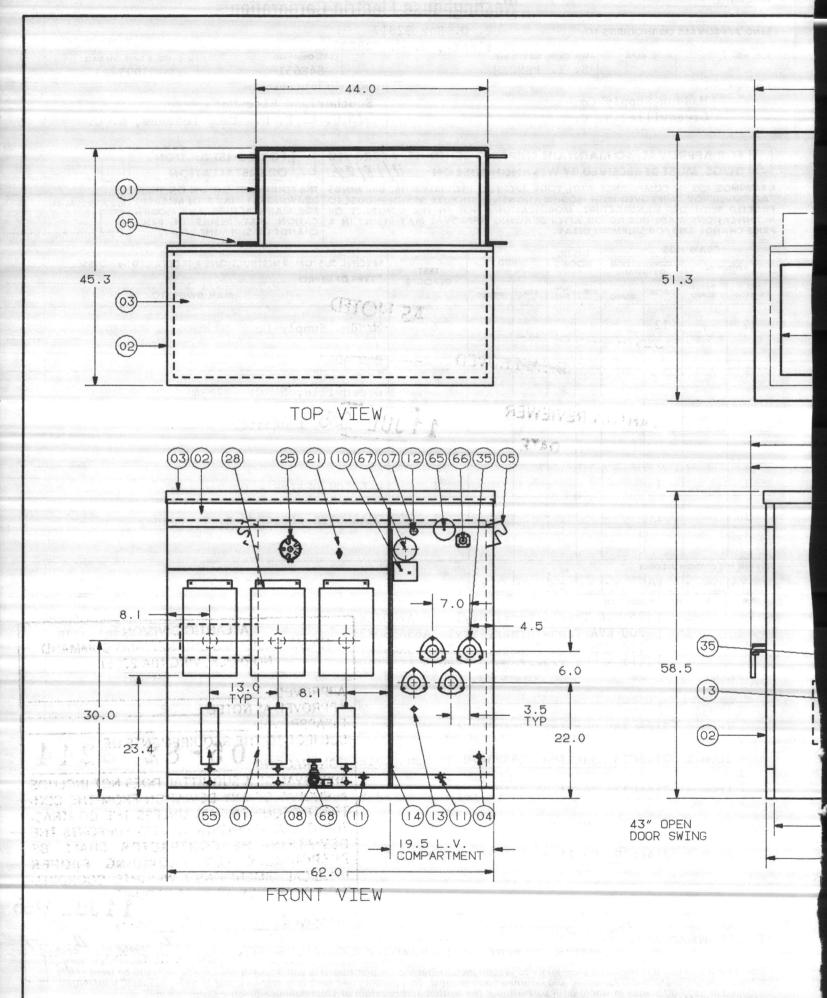
Doud Rowson
David Dawson
Manager FCX Blend Plant

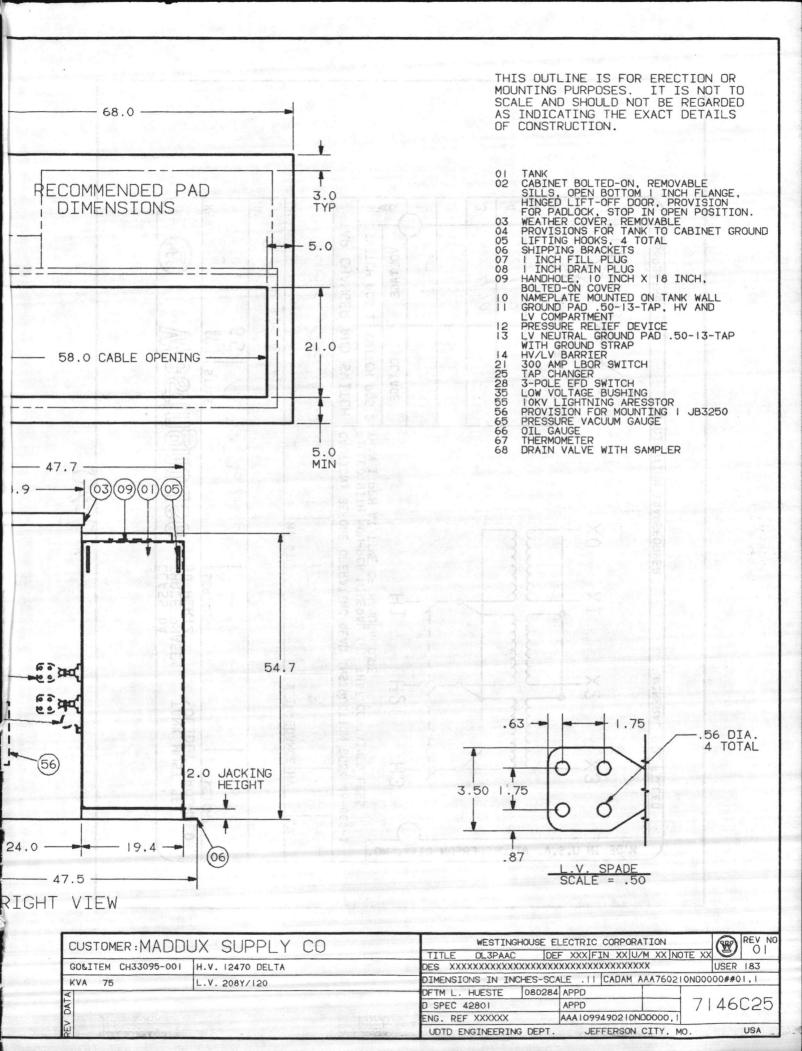


Westinghouse Electric Corporation

	PROVAL			=			Charlo	tte, N. C.	28232			TRANSMITTAL DATE	
O. NO.		PROD.	CODE	1		PENI PENI	E REP.		CUS	84E651	G. O. NO. & D		
TOMER				⊥ 5.		T 171/1	DEK			AND/OR MARKINGS	CH-330	132-KJ	
	Mad Gre	dux S envil	upply le, N	Co . C.					Southe	rland Elec Co E. P. H. Car		N. C.	
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ITEM	QUANT	109.10	SCRIPTION					in the little of					
1	1							yle A65A76		Item 5 Qt	1 500 KV	A Transformer A65E560X2P	
2	2							tyle A65A5		VAVAL FACILITIE	S ENCINEED	A65E560X2P	
3	1							tyle A65A4		NAVAL FACILITIE	K, VIRGINIA	23511	
	. NO.		SUB	AVA	II		ing title	Style A65	DWG. I		DRAWIN		
	-12-17								The second secon	PROVED			
						V			API	PROVED AS NOT	8		
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I	tem 2	714	6C26	Out	lin	e 26	6P347	H43 Namep		SJECT TO THE R	5-82	2244	
							1-48-4		APP	PROVAL OF A SU	BMITTAL DO	S NOT INCLUD	
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[&]quot;This drawing contains information proprietary to Westinghouse Electric Corporation; it is submitted in confidence and is to be used solely for the purpose for which it is furnished and returned upon request. This drawing and such information is not to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written authorization of Westinghouse Electric Corporation."





	(3)	Wesing	ghouse	CLASS OA THREE PHASE 60 HERTZ	TANK SOL I	MUST BE	NDED
KVA		CONT STYLE RISE A65		SERIAL		WEIG	
	75	65 A65	A760X2K			269	15
47	12470 D	ELTA					
_V	Statement American Control Control Openion Control	and the property of the control of t	HV B	IL	% IMPED	ANCE HY	LV
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T	AP CHANGER	AND SWITCH C	AUTION: BEFORE	PERATING READ	INSTRUCTION	N BOOK 46-	060-1
1	SWITCH POS 1		TILLED WITH NON-F	CB MINERAL OIL	THAT CONT	AINED LESS	Г
A L	VOLTAGE	VOLTAGE		H1	H2	НЗ	
1	13095				/	7	9
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2	12 785			•	4	•	
-	12785			-		1	
3							T 17 0500 550
3	12470				m m		
2 3 4 5	12470 12160 11850	DIAGRAM					
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3	12470 12160 11850 H2PHASOR		×0		X2	X3	

FEATURE AND DIMENSION LIST

GENERAL DRDER NUMBER CH33095 OCI MADDUX SUP CO TYPE POW-R-PAD 75.0 KVA. 3 PHASE PAD MOUNTED TRANSFORMER STYLE A65A760X2K 60 HERTZ ERECTION DUTLINE 7146C25 NAMEPLATE DRAWING 8438454HU1 WIRING DIACRAM IMF= 3.9 PERCENT WT= 2705 HV 12470 TAPS + DR - (2) 2 1/2 PERCENT 1ST 13095 2ND 12785 3NL 12470 4TH 12160 5TH 11850 LV 208Y/120 WT= 2705 LBS DIL= 165 GAL FEATURES 3 PHASE PRIMARY DELTA CONNECTED LCOP FEED HV AIR SWITCH OR PROVISION FOR SAME (SELECT SWITCH IN FIELDS 19-20) HV EUSHING INTERNALLY CLAMPED

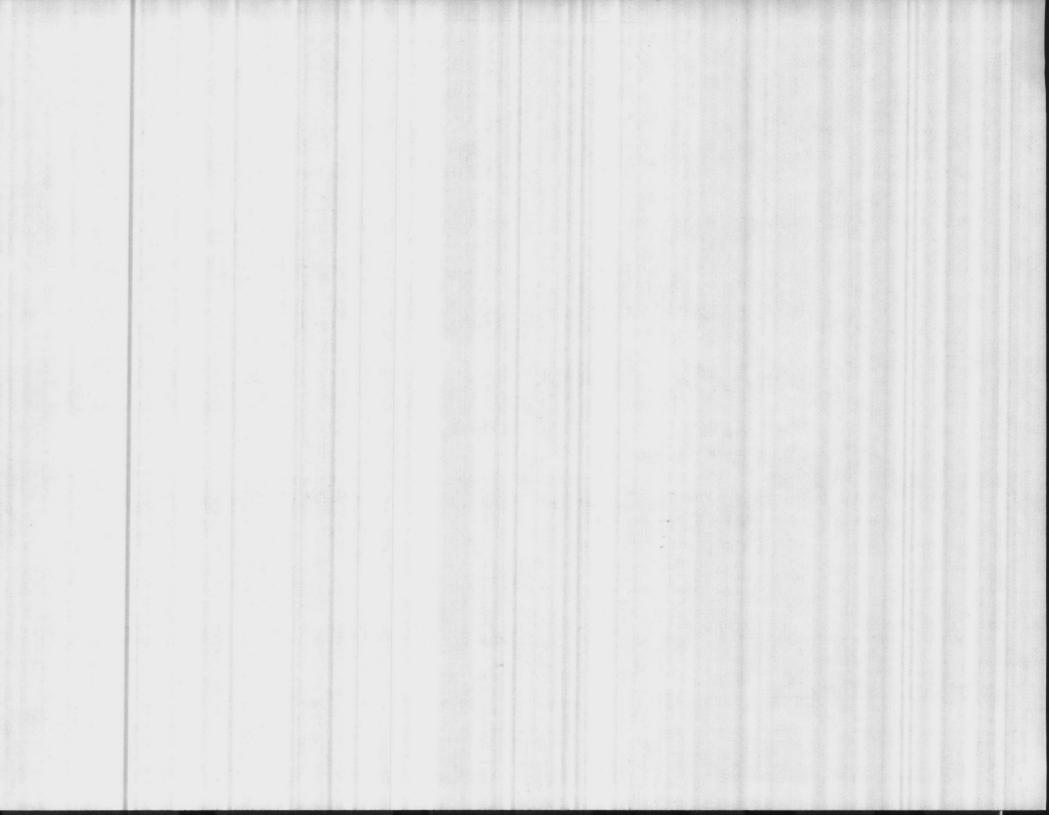
25 = TAP CHANGER EXTERNALLY OPERATED FROM HV COMPARTMENT 27 = 300 AMP LEGR 28 = W 3 POLE EFD A1R SWITCH (15 KV - 95 BIL) WITH (2) #6 TO 4/0 CONNECTORS 3 PHASE LIVE FRONT LOOP HV PATTERN

STANDARD LY BUSHING (EXTERNALLY CLAMPED) SPACE LV BUSHING TERMINATION STANDARD LOW VOLTAGE SPACE TERMINATION PER ANSI STANDARDS LV EUSHINGS, STAGGERED PATTERN, ANSI C57.12.26, FIG 3 & 4A, MIN DIMS W CURRENT-LIMITING HV CLT FUSE FOR EFD SWITCH (STANDARD KVAPPLICATION STANDARD CLT FUSE APPLICATIONFOR SINGLE OR CENTER POLE HV LIGHTNING ARRESTER 10 KV HV LIGHTNING ARRESTER

STANDARD LIGHTNING ARRESTER LOCATION
PROVISIONS TO MOUNT TYPE JB AIR BREAKERS

1 HERMOMETER, LIQ LEV GAUGE, VACUUM PR GAUGE LV - DRN VAL W/SAMPLER HV
3.50 MINIMUM - 9.59 MAXIMUM IMPEDANCE MTR 24"DP, 1/2" HEX BOLTS HY DOOR & HANDLE, HINGED IF BAYONET FUSED
BENELEX TOP AND WALL BARRIERS (INCLUDES HI-LOW BARRIER)
REFERENCE DRAWING = 7146C25F01

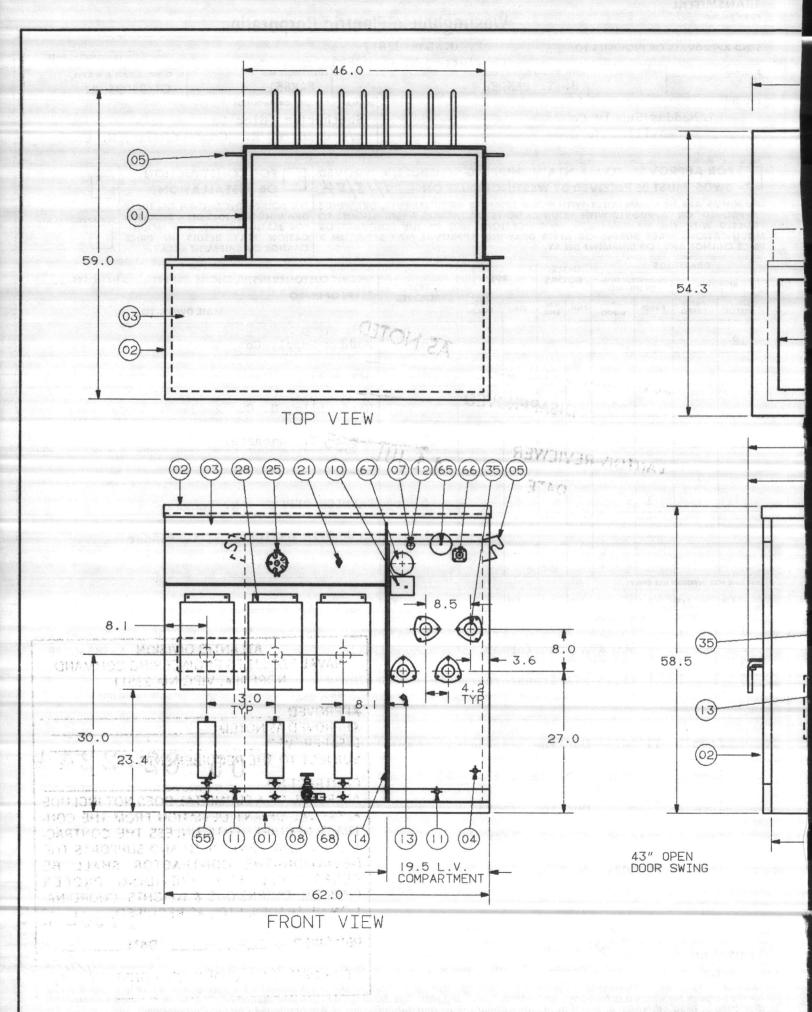
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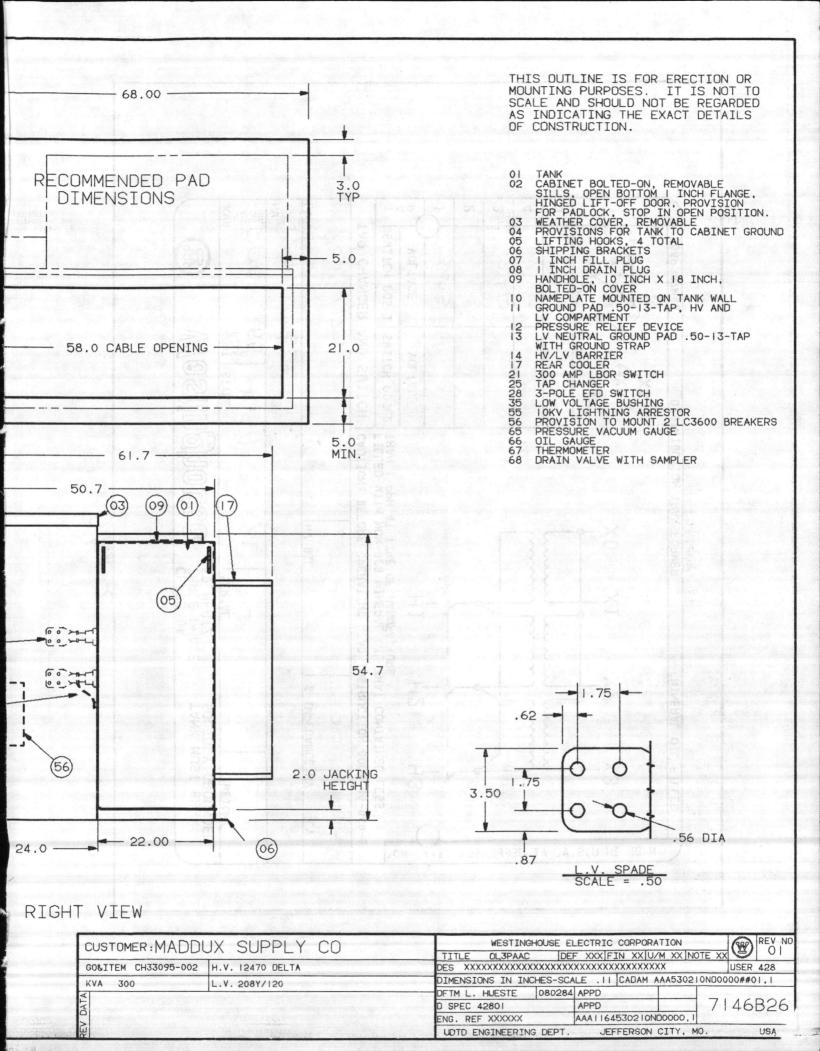


TRANS		L		eveniment.			Westi	nghouse I	Electric Corporation
SEND AP	PROVAL	S OR IN	QUIRIES	S TO:				O. Box 328	317
S. O. NO.		PROD.	cont	٦		R SERVIC	Charlo	tte, N. C.	
s. O. NO.		PROD.	CODE			PEN			CUST. ORDER NO. G. O. NO. & DATE-C/N DATE CH-33095-R.T
USTOMER				1-		- 111	DIII		ULTIMATE USER AND/OR MARKINGS
	Mad	ldux S	Supply	Co					Southerland Elec Co
			lle, N		•				c/o U. E. P. H. Camp LeJeune, N. C.
APPROV	GS, M S ARE ED" OR WITH	UST BE IN COM "APPROTHE MA MADE I	RECEIVAPLIANCE OVED WILLIAMS ANUFACTOURING	E WITH M	H YO ODIFI MOE AFTER	ESTIN	PECIFIED I	SCHEDULE, ASE ON	DRAWINGS THE EQUIPMENT SHOWN ON THESE IGHOUSE TO DRAWINGS(S) HAS BEEN RELEASED RED APPROVAL BY:
	DRAWI		SIIII ME	T		T			CHARGE OR SHIPMENT DELAY.
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STD./ SKETCH	PAPER REPRO	PAPER	* REPRO	BND.	UN- BND.	STD.	REC. PRICED	REPORTS	MAIL DWGS. TO
12		12						A56NOT	Maddux Supply Co
					175	UVE	4		Box 4067
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IIS LINE FO	R DIVISIO	N USE ONL	Y	_				1.7	
T/S	T/S	T/S	T/S	T/S	T/S	T/S	T/S	T/S	
ITEM	QUANT	TITY DE	SCRIPTION				Late.		
1	1	3000						yle A65A76	
2	2							tyle A65A5	30X2L ATLANTIC DIVISION A65E560X2P
3	1	bin.	150 K	VA I	ran	sfor	ner, S	tyle A65A4	90x2MAVAL FACILITIES ENGINEERING COMMAND

112.5 KVA Transformer, Style A65E120X2N NORFOLK, VIRGINIA 23511 DWG. NO. DRAWING TITLE DWG. NO. DRAWING TITLE APPROVED AS NOTED Nameplate SAPPROVED Item 1 7146C25 Outline 266P347H43 SUBJECT TO THE Item 2 7146C26 Outline 266P347H43 Namepla CONTRACT NO APPROVAL OF A SUBMITTAL DOES NOT INCLUDE Item 3 7146C27 Outline 266P347H43 Namepla PPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRAC-Item 4 7146C28 Outline 266P347H43 Namepla TOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION .. THE CONTRACTOR SHALL BE Item 5 7146C29 Outline 266P347H43 Namep14 GESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA-TION OF TRADES COMPLETE *THIS TRANSMITTAL IS PARTIAL With Drawings Noted Above Or On Attached Sheet to be sent by

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KVA	300	CONT STYLE	A 53 0 X 7	SERIAL		WEIGHT 3830
٧		DELTA *	, , , , , , , , , , , , , , , , , , ,			3030
.V	2084/12		·	95	\$ IMPEDANG	CE HV LV
		AND SWITCH		RE OPERATING REA	D INSTRUCTION E	
	SWITCH POS 1	SWITCH POS 2	THAN 1 PPM AT	ON-PCB MINERAL O TIME OF MANUFAC	TURE CONTAIN	ED LESS
	VOLTAGE	VOLTAGE		H1	H2	H3 ~
14	13095					-7
2	12785			•	4	
\dashv	12785					
3						
3 4	12470	45 (1998)				
2 3 4 5	12470	DIAGRAN X2				ຶ່ງ
3	12470 12160 11850 H2PHASOR	DIAGRAM X2		X0 X1		

FEATURE AND DIMENSION LIST

GENERAL DRDER NUMBER. CH33095 GOZ MADDUX SUP CO 300.0 KVA 3 PHASE PAD MOUNTED TRANSFORMER STYLE A65A530XPB 60 HERTZ ERECTION OUTLINE 7146C26 NAMEPLATE DRAWING 8438A54H01 WIRING DIAGRAM IMP= 3.8 PERCENT WT= 3868 LBS DIL= 190 GAL HV 12470 TAPS + DR - (2) 2 1/2 PERCENT 1ST 13095 2ND 12785 3RL 12470 4TH 12160 5TH 11850 CONDUCTOR AL BIL 30

FEATURES

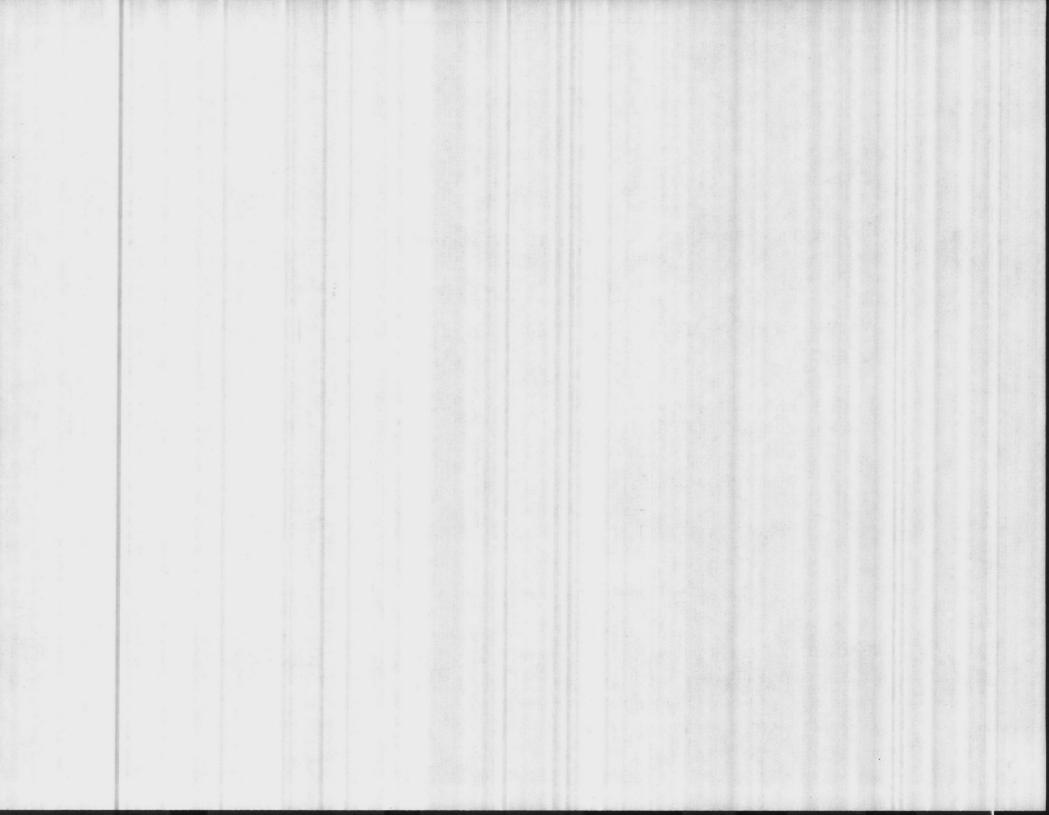
- 3 PHASE PRIMARY DELTA CONNECTED
- 21 = HV AIR SWITCH OR PROVISION FOR SAME (SELECT SWITCH IN FIELDS 19-20)
 HV BUSHING INTERNALLY CLAMPED
- TAP CHANGER EXTERNALLY OPERATED FROM HV COMPARTMENT 27 = 300 AMP LBOR

- W 3 POLE EFD AIR SWITCH (15 KV 95 BIL) WITH (2) #6 TO 4/O CONNECTORS
 3 PHASE LIVE FRONT LOOP HV PATTERN
 STANDARD LV BUSHING (EXTERNALLY CLAMPED)
 SPACE LV BUSHING TERMINATION STANDARD LOW VOLTAGE SPADE TERMINATION PER ANSI STANDARDS
 LV BUSHINGS, STAGGERED PATTERN, ANSI C57.12.26, FIG 3 & 4A, MIN DIMS
 W CURRENT-LIMITING HV CLT FUSE FOR EFD SWITCH (STANDARD KVAPPLICATION
 STANDARD CLT FUSE APPLICATIONFOR SINGLE OR CENTER POLE
 HV LIGHTNING ARRESTER

- 10 KV HV LIGHTNING ARRESTER
 10 KV HV LIGHTNING ARRESTER
 STANDARD LIGHTNING ARRESTER LOCATION
 PROVISIONS TO MOUNT TYPE LC AIR BREAKER

 65 = THERMOMETER, LIQ LEV GAUGE, VACUUM PR GAUGE LV DRN VAL W/SAMPLER HV
 3.50 MINIMUM 9.99 MAXIMUM IMPEDANCE
 MTR 24"DP, 1/2" HEX EDLTS HV DOOR & HANDLE, HINGED IF BAYONET FUSED
 REFERENCE DRAWING = 7146C26F01

THIS CUTLINE IS FOR ERECTION OR MOUNTING PURPOSES. IT IS NOT TO SCALE AND SHOULD NOT BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.

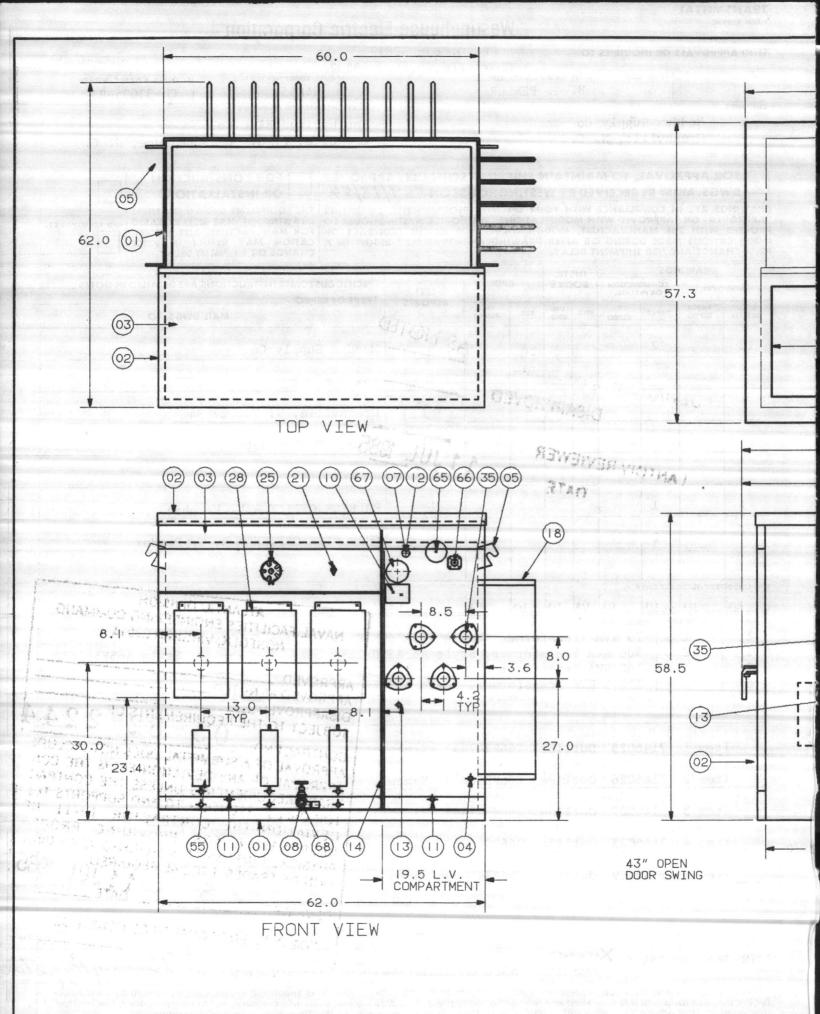


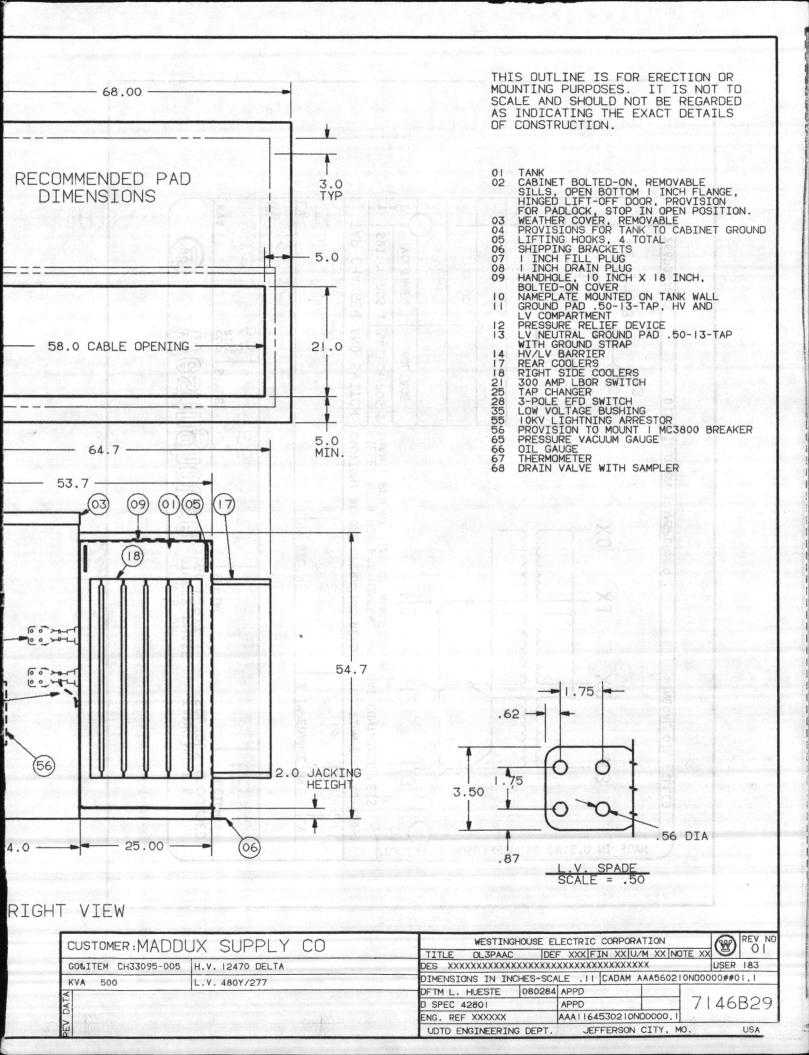
TRANSMITTAL FORM 34576C

Westinghouse Electric Corporation

registration of	PROVAL		al in the west of	_			Charlo	0. Box 328	28232			TRANSMITTAL DATE
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TEM	QUANTI	TY DE	CRIPTION			T			T	TACH ITIES	ENGINEERING	COMMAND
1	1		75 KV	A Tr	ansf	orme	er, St	yle A65A76	OX K NA	VAL FACILITIES	YVIRGINO RY	A Transformer
2 3	2										Style .	A65E560X2P
4	1							tyle A65A4 Style A65		OVED	3	
DWG.			UB				ING TITLE	Jejie Roj	DOM S	BOYEU AD	DRAWIN	G-HTLE
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I	tem 2	714	6C26	Out	line	26	66P347	H43 Namep	late APP	ROYAL OF A SU	DEVIATION	THE CONTRACT
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				PART	IAL	W	ith Draw	ings Noted Abo	ve Or On At	tached Sheet to be	ent by Asses	nary Hugus

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	(R)		ghouse	THREE PHAS	E TANK M SOLIDL	Y GROU	
KVA	_	CONT STYLE		SERIAL		WEI	
	500	65 A65	E560XZP			533	0
14	12470 7	DELTA					
٧			HV B	IIL	% IMPEDANCE	EHV	LV
	480 Y/2	.77		95	4.6	cu	AL
	TAP CHANGER	AND SWITCH			INSTRUCTION B		
1	SWITCH POS 1	SWITCH POS 2		PCB MINERAL OF MANUFACT	IL THAT CONTAIN	ED LESS	
3	VOLTAGE	VOLTAGE		H1	H2	H3	7
7	13095					-7	9
2	12785					1	
3	12470	41-5 (100 OF)				1	
4	12160	THE TOP OF SHARE	ييا اير	سا لسب	L	<u>س</u>	
5	11850						2 54
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		< 1 	X0	X1	X2	X3	
	H 1 	Х3					
	ADMINISTRATION OF THE PROPERTY						

FEATURE AND DIMENSION LIST

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TYPE POW-R-PAD
GENERAL GREER NUMBER CH33095 005 MADDUX SUP CU TYPE POW-R-PAD 500.0 KVA 3 PHASE PAD MOUNTED TRANSFORMER STYLE 4656560XP9 60 HERTZ ERECTION DUTLINE 7146C29
                                                                                            WT= 5358 LBS OIL= 285 GAL
                                       WIRING DIAGRAM IMP= 4.8 PERCENT
NAMEPLATE DRAWING 8438A54H01
                                                                   CONDUCTOR = CU BIL 95
 HV 12470
 TAPS + OR - (2) 2 1/2 PERCENT 1ST 13095 2ND 12785 3RD 12470 4TH 12160 5TH 11850
                                                                 EUNDUCTOR BIL 30
 LV 480Y/277
FEATURES
             3 PHASE PRIMARY DELTA CONNECTED ..
             LOOP FEED
          HV AIR SWITCH OR PROVISION FOR SAME (SELECT SWITCH IN FIELDS 19-20)
             HV BUSHING INTERNALLY CLAMPED
             TAP CHANGER EXTERNALLY OPERATED FROM HY COMPARIMENT
             300 AMP LBOR
            W 3 POLE EFD AIR SWITCH (15 KV - 95 BIL) WITH (2) #6 TO 4/O CONNECTORS 3 PHASE LIVE FRONT LOOP HV PATTERN
     28 =
             STANDARD LY BUSHING (EXTERNALLY CLAMPED)
             SPADE LY BUSHING TERMINATION
             STANDARD LOW VOLTAGE SPADE TERMINATION PER ANSI STANDARDS
             LV BUSHINGS, STAGGERED PATTERN, ANSI C57.12.26, FIG 3 & 4A, MIN DIMS W CURRENT-LIMITING HV CLT FUSE FOR EFD SWITCH (STANDARD KVAPPLICATION STANDARD CLT FUSE APPLICATIONFOR SINGLE OR CENTER POLE
     55 = HV LIGHTNING ARRESTER
10 KV HV LIGHTNING ARRESTER
STANDARD LIGHTNING ARRESTER LOCATION
             PROVISIONS FOR MOUNTING ONE MC3800 AIR BREAKER FIELD MOUNTED
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PROVISIONS FOR MOUNTING ONE MC3800 AIR BREAKER FIELD MOUNTED

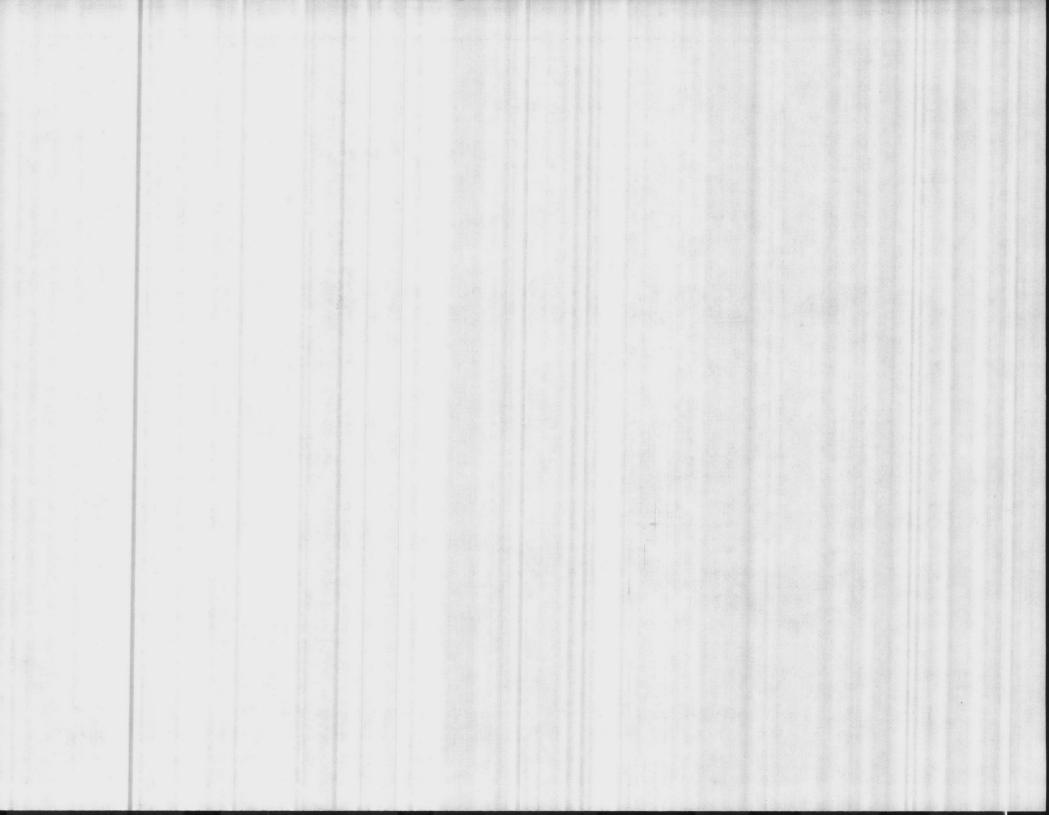
THERMUMETER, LIQ LEV GAUGE, VACUUM PR GAUGE LV - DRN VAL W/SAMPLER HV

3.50 MINIMUM - 9.59 MAXIMUM IMPEDANCE

MTR 24"CP, 1/2" HEX BOLTS HV DOOR & HANDLE, HINGED IF BAYONET FUSED

REFERENCE DRAWING = 7146C29F01

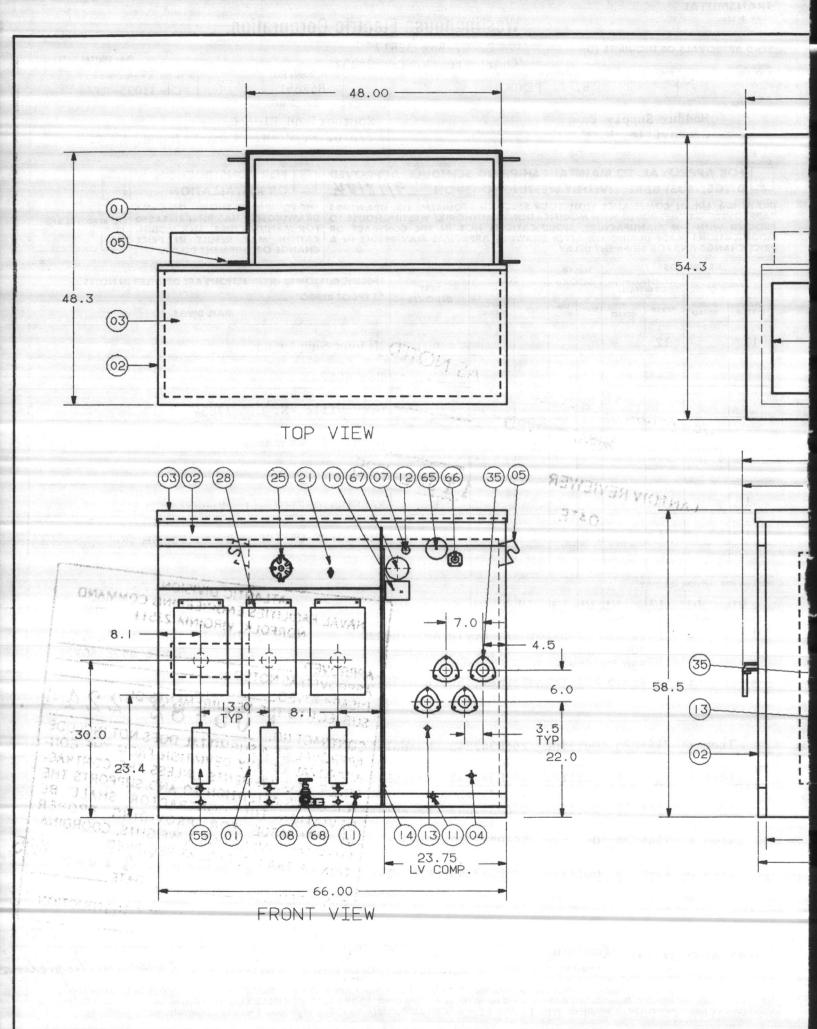
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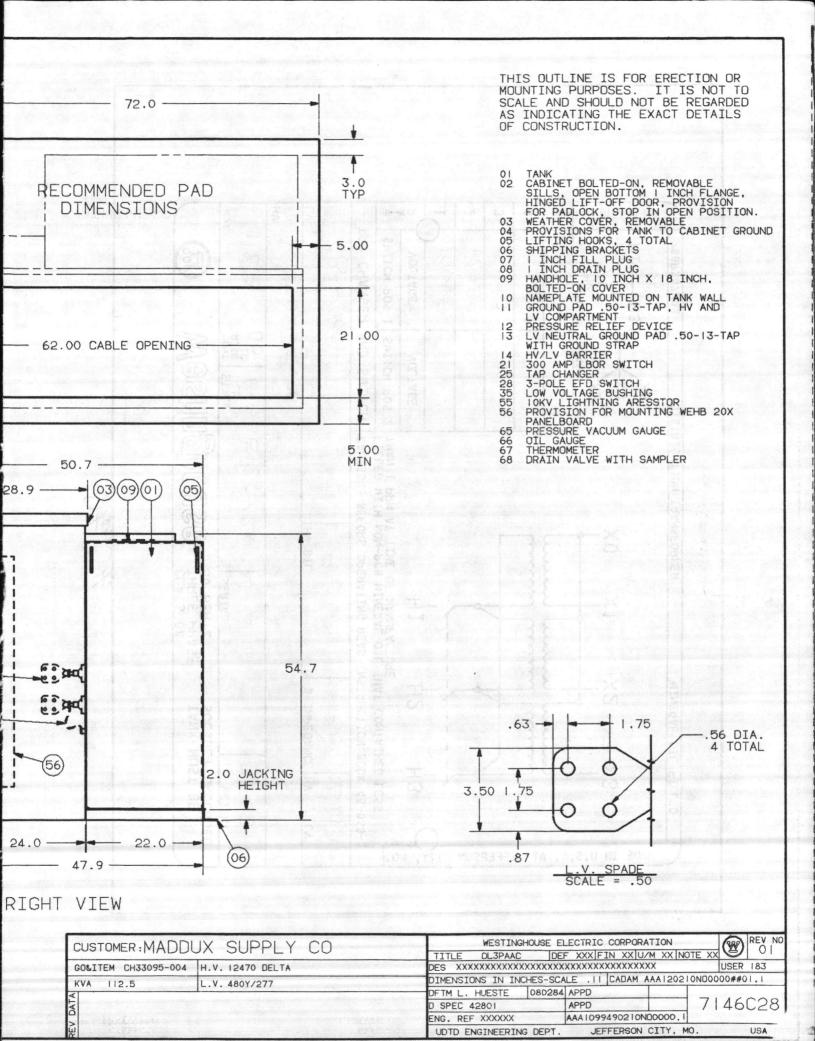


Westinghouse Electric Corporation

END API	PROVAL	S OR IN	QUIRIES	TO:				0. Box 328		2			TRANSMITTAL DATE	
s. O. NO.		PROD. CODE		Charlotte, N. C. ATTN. ORDER SERVICE REP. B. T. PENDER					2023	CUST. ORDE		G. O. NO. & D		
JSTOMER				10.		T EW	JEK .		LILTIMATE		R MARKINGS	CH-330	JAD-KJ	
			upply le, N						Sout	herlan	d Elec Co	np LeJeune	N. C.	
							processors book				Maria Carrier	.P Leocuite	4	
A DW RAWING APPROVI	GS, MI S ARE I ED" OR WITH T	N COM	PLIANCE OVED WI NUFACT	WITTH MURE,	H YO ODIFIC MOD	UR SPICATION	GHOU ECIFIED I NS" AUT IONS NO	REQUIREMENTS, HORIZE WESTIN OT IN THE CO	DRAWING GHOUSE ONTRACT	SS THE I	WINGS(S) HAS MANUFACTUR	LATION OWN ON THESE BEEN RELEASEE E, ANY MODIFI	RPD APPROVAL BY:	
ICE CHA	DRAWII	ND/OR	SHIPMEN	NT DE	LAY.	DRAW	ING API	PROVAL MAY R	ESULT IN		NGE OR SHIPM	BULT IN PRICE		
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1		1		U.				1	CHARLO	TTE OI	FFICE - B.	T. Pender		
	R DIVISION								- ATSENCE - NO		ATLANTIC	INEERING C	OMMAND	
T/S	T/S	T/S		T/S	T/S	T/S	T/S	T/S		10	TITLES ENG	INEERING	J.	
ITEM 1	QUANT		SCRIPTION						NAV	AL FAU	OPEQI K. VIE	RGINIA 2351 1 500 KV		
1 2	1		75 KVE	A II	ansı	orme	r, St	yle A65A76	MAZK	OB!	em 5 Qty	T 200 KA	A Transformer,	
3	2							tyle A65A5				Style	A65E560X2P	
4			130 K	AI	rans	siorn	er, S	tyle A65A4	Language Company	Access to the second	CNOTED			
DWG.	1		112.5	KVA	Tra	insic	rmer,	Style A65	ZUX	OVEDI	D tur		F-0 1 1 -	
50	25/5/1					DRAW	NG IIILE		AND TOWN		THE REUL	IREMENENTE OF	2244	
I	tem 1	714	6C25	Out	line	26	6P347	H43 Namep	1001	TRACT	NO	TTAL DOES	NOT THE CON-	
I	tem 2	714	6C26	Out	line	26	6P347							
	tem 3		6C27		line		6P347	H43 Names	170	CALL	SATTENTIO	ONTRACTO	R SHALL	
	tem 4		6C28					II/2 Maillep.	INC		CIRIL FU	- WEICH	ITS. COUNTY	
					line		6P347		P	TYSICAL	TRAPAS, ET	C., SREQU	11 JUL 19	
	tem 5	/140	5C29	Out	line	26	6P347	H43 Namep		ON OI	A .	-		
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	B		nghouse		TANK MUST BE SOLIDLY GROUNDED				
KVA		FISE A65	0-40.	SERIAL		WEIGHT			
	112.5	65 1465	E120X2N			3255			
10	12470	DELTA		u.					
.V			HV	BIL	IMPEDAN	% IMPEDANCE HV			
	4804/2	277		95	4.30 Cu				
T	AP CHANGER	AND SWITCH	CAUTION: BEFORE	OPERATING READ 1			060-1		
1	SWITCH POS 1	SWITCH POS 2	THAN 1 PPM AT	N-PCB MINERAL OIL TIME OF MANUFACTUR		INED LESS	Γ		
	VOLTAGE	VOLTAGE		H1	H2	H3	7		
1	13095					-7	4		
2	12785			4	4	*			
-	12785		Г		1	1			
3									
2 3 4 5	12470					<u>/</u>			
3 4	12470	DIAGRAM X2							
3 4	12470 12160 11850 H2PHASOR	12		0 X1		×3			
3 4	12470 12160 11850 H2PHASOR	1/4		0 X1	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	×3			

FEATURE AND DIMENSION LIST

GENERAL ORDER NUMBER CH33095' 004 MADDUX SUP CO 112.5 KVA 3 PHASE PAD MOUNTED TRANSFORMER STYLE A65E120X2N 60 HERTZ ERECTION OUTLINE 7146C28 NAMEPLATE DRAWING 8438A54HG1

WIRING DIAGRAM IMP= 3.2 PERCENT HV 12470 WT= 3287 LBS DIL= 205 GAL TAPS + OR - (2) 2 1/2 PERCENT 1ST 13095 2ND 12785 3KD 12470 4TH 12160 5TH 11850 LV 486Y/277 GUNDUCTOR AL BIL 30

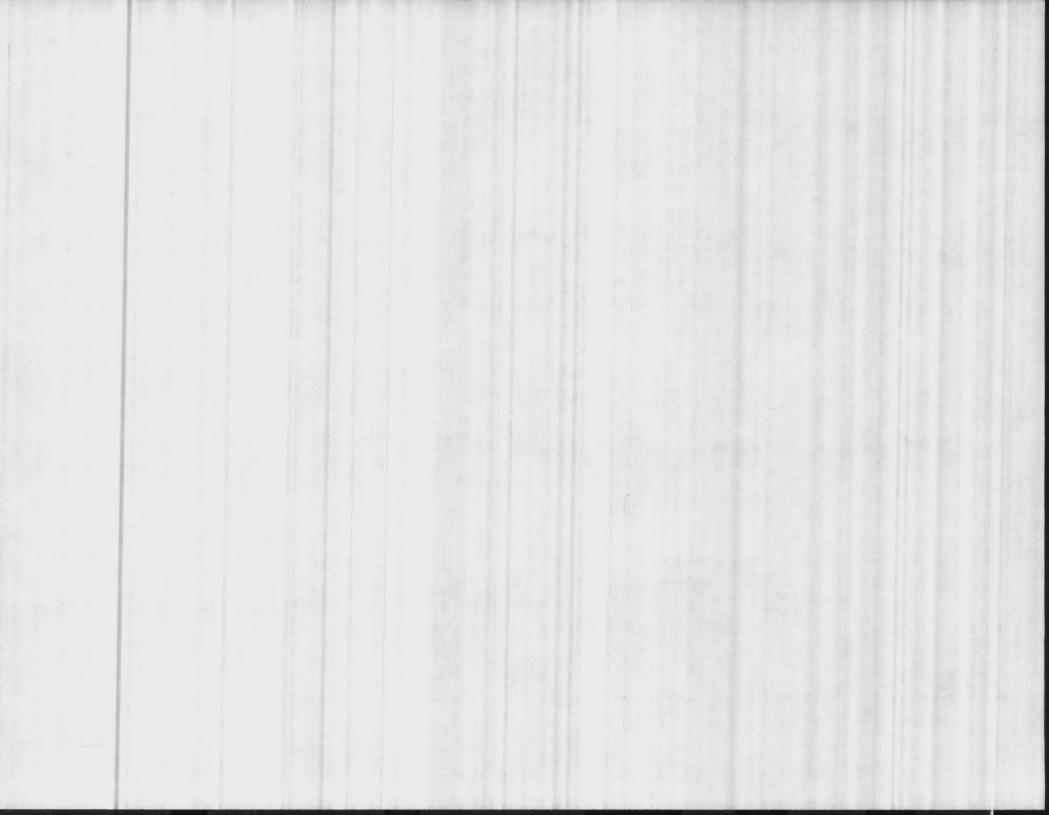
FEATURES

3 PHASE PRIMARY DELTA CONNECTED LCOP FEED

- HV. AIR SWITCH OR PROVISION FOR SAME (SELECT SWITCH IN FIELDS 19-20)
- HV BUSHING INTERNALLY CLAMPED TAP CHANGER EXTERNALLY OPERATED FROM HV. COMPARTMENT SOO AMP LEOR
- W 3 POLE EFD AIR SWITCH (15 KV 95 BIL) WITH (2) #6 TO 4/0 CONNECTORS 3 PHASE LIVE FRONT LOOP HV PATTERN STANDARD LV BUSHING (EXTERNALLY CLAMPED) SPADE LV BUSHING TERMINATION STANDARD LOW VOLTAGE SPADE TERMINATION PER ANSI STANDARDS
 LV BUSHINGS, STAGGERED PATTERN, ANSI C57-12-26, FIG 3 & 4A, MIN DIMS
 W CURRENT-LIMITING HV CLT FUSE FOR EFD SWITCH (STANDARD KVAPPLICATION
 STANDARD CLT FUSE APPLICATIONFOR SINGLE OR CENTER POLE
 HV LIGHTNING ARRESTER
- 10 KV HV LIGHTNING ARRESTER LOCATION
- STANDARD LIGHTNING ARRESTER LUCATION
 PROVISIONS FOR WEHB PANEL MODULE 20X

 65 = THERMOMETER, LIQ LEV GAUGE, VACUUM PR GAUGE LV DRN VAL W/SAMPLER HV
 3.50 MINIMUM 9.99 MAXIMUM IMPEDANCE
 MTR 24"DP, 1/2" HEX BOLTS HV DOOR & HANDLE, HINGED IF BAYONET FUSED
 REFERENCE DRAWING = 7.146C28FC1

THIS OUTLINE IS FOR ERECTION OR MOUNTING PURPOSES. IT IS NOT TO SCALE AND SHOULD NOT BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.



Instructions for Oil-Immersed Distribution Transformers



Section D: Pad-Mounted, 75-1500 KVA, Three-Phase ED

These instructions apply to three phase oil-immersed distribution transformers Read these instructions are millionated attempting to install, operate, maintain arefully before attempting to install, operate, maintain, or store the transformers.

The equipment covered by these instructions subject be operated and serviced only by competent personnel tamiliar with good safety practices. These instructions are written for such personnel and are not intended as a substitute for adequate training and experience in the use of this equipment. These instructions do not purport to provide for every possible contingency that might be encountered in the installation, operation and maintenance of this equipment. Should clarification or further information be required or should problems arise which are not covered sufficiently for the user's purposes, refer the matter to the Westinghouse Electric Corporation.

Westinghouse is not responsible for the adequacy of instructions provided by suppliers of non-Westinghouse components and any additionable information required should be obtained from such supplies.

INTRODUCTION

WAYAL FAROREOLE.

rormer is designed for outdoor mounting of and the infinity property of the many property openings in the pad. All live parts are compared by prices of the many present compartments with provision for fecking.

RECEIVING

Westinghouse three-phase pad-mounted distribution transformers are normally shipped completely assembled and ready to install. Each transformer should be carefully inspected upon receipt and the transportation company notified of any damage that had been incurred. The shipping list should be checked for possible another transformers rated 500 kVA and below are shipped on a pallet, being securely attached to the pallet by means of straps banded to the lifting lugs. Palletized transformers in the ratings may be moved readily by a lift truck, crane, or cart. The lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs supplied on the sides of the transformer enable it to lifting lugs and lugger lugge

Three-phase transformers rated 750 kVA and above are shipped on flat bed or open topped trucks due to the size and configuration of the transformer. Similar lifting lugs on the sides of the transformer enable it to be lifted by crane.

Lift the transformer utilizing all the lugs and use proper spreaders to obtain a vertical lift.

UTION: DO NOT LIFT THE TRANSFORMER BY USING RANES OR JACKS ON ANY PART OF THE TRANSFORMER THEN THAN THE LIFTING LUGS OR JACKING AREAS ROVIDED FOR THE PURPOSE. IMPROPER LIFTING OR ASKING, MAY RESULT IN SERIOUS PERSONAL INJURY NO DAM SE TO PROPERTY.

Lifting Hooks

or other foreign matter into the transformer. For access, first vent the transformer, then remove the weather cover and the handhole cover, placing the nuts and washers in storage for reuse.

To remove the weather cover, both left and right hand doors must be open. Loosen the wing nut assembly inside the cabinet near each top front corner. Lift the front of the cover and rotate about the hinges mounted at the rear of the tank, then support the cover or slide it off of the hinges to remove it.

These instructions do not purport to cover all possible contingencies which may arise during installation, operation, or maintenance, and all details and variations of this equipment. If further information is desired by the purchaser regarding his particular installation, operation or maintenance of his equipment, the local Westinghouse Electric Corporation representative should be contacted.

17.24 03VOH99A2IO 200 TOUTE REWSING THE

When re-assembling the handhole, replace the gasket if there is evidence of damage or its thickness is less than 0.12 inches. The gasket should be compressed to a thickness of from 0.12 to 0.15 inches; however, the nuts should not be tightened greater than 20 ft-lbs.

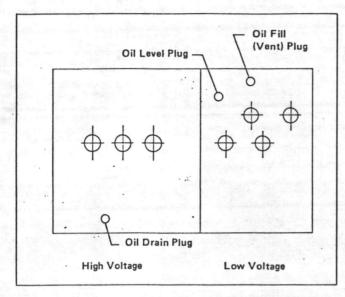


Fig. 2 Oil Plugs

STORAGE

No unusual precautions for storing need to be taken because padmounted transformers are built for outdoor service. However, the transformer should be stored with the tank sealed and filled with oil and the units must not be stacked on top of one another. The compartment doors should be in the closed position to protect the bushings and other accessories from damage. Care must be exercised to prevent submersion in water.

The purchaser should perform a final inspection of each transformer prior to installation.

MAINTENANCE

A periodic visual inspection of the external parts of the transformer is desirable. At such times, the general condition of the following should be noted:

- 1. High voltage bushings and leads
- 2. Low voltage bushings
- 3. Arresters (if provided)
- Tamper resistance of cabinet, especially cabinet hinges and latching provisions
- 5: Any signs of oil leakage
- 6. Finish on tank
- 7. Ground connections
- 8. Accessories including warning and instruction labels.

Where parts have been broken, or where any sign of oil leakage is observed, the transformer should be removed from service until repairs can be made. CAUTION: WHEN BROKEN PARTS, LEAKING OIL OR OTHER POTENTIALLY HAZARDOUS CONDITIONS ARE OBSERVED, REMOVE THE TRANSFORMER FROM SERVICE UNTIL REPAIRS CAN BE COMPLETED. FAILURE TO DO SO MAY RESULT IN VIOLENT FAILURE OF THE TRANSFORMER CAUSING HAZARD TO LIFE AND PROPERTY.

Where tanks show evidence of rusting or deterioration of the finish, they may be cleaned and retouched with paint available for that purpose. When bare metal is exposed, a primer should be also applied.

Periodically, the condition of the oil should be inspected and, if necessary, the oil should be removed and replaced with good, clean, dry oil per ASTM D3487.

A periodic check of the load should be made to insure that the transformer is not being unduly overloaded. Planned overloading should be in accordance with the ANSI Loading Guiding (C57.91).

Whenever replacement parts or information regarding existing transformers are required, complete nameplate data including kVA rating, style number, serial number, and a description of the part should be given to Westinghouse.

INSTALLATION

Installation should comply with the latest edition of the National Electrical Safety Code.

Mounting

The transformer should be mounted on a level pad strong enough to support the weight of the transformer. The unit should not be tilted in any direction greater than 1.5 degrees. Tilt of the transformer should be kept to a minimum, especially when it will cause deviations in oil level near drawout fuses, pressure relief devices, or other accessories specifically located with respect to the 25 °C oil level.

Brackets are supplied for bolting the transformer securely to the pad.

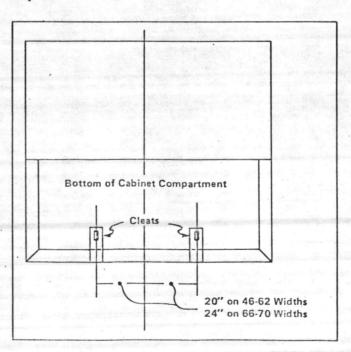
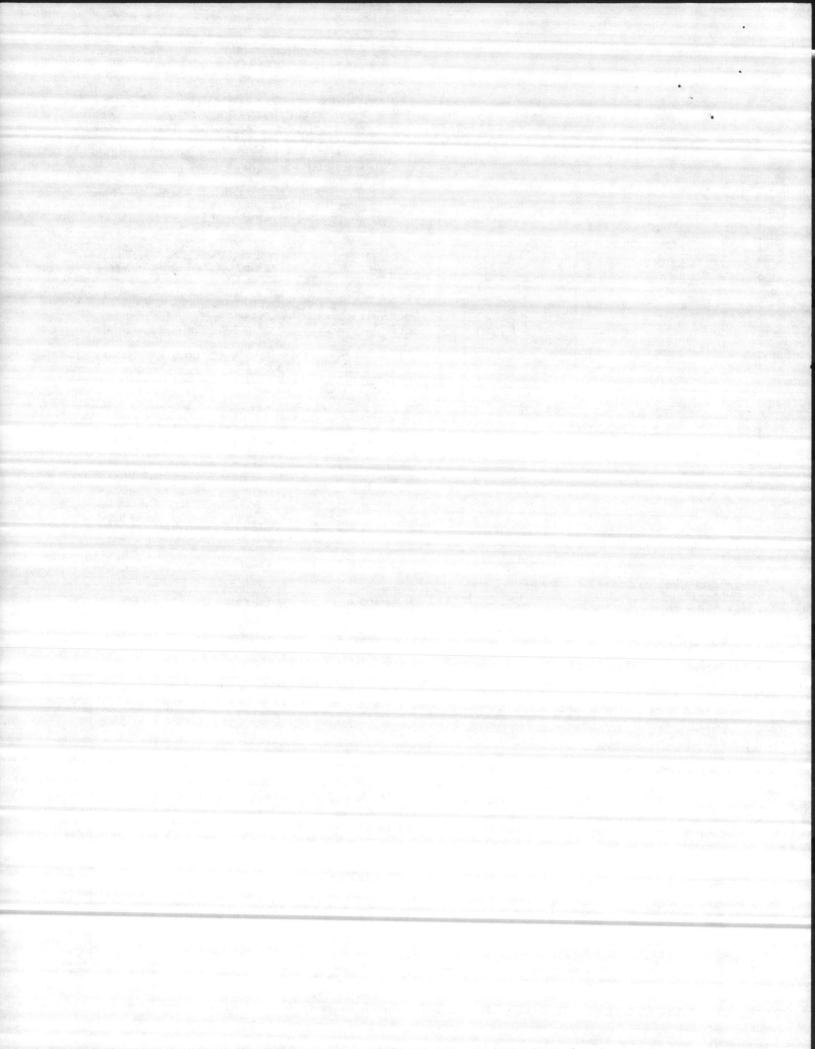


Fig. 3 Mounting Provision



The transformer cabinet should sit flush on the pad allowing no gaps which would compromise the tamper resistance of the transformer.

CAUTION: SINCE THESE TRANSFORMERS CONTAIN A FLAMMABLE INSULATING FLUID (MINERAL OIL), TRANSFORMER FAILURE CAN RESULT IN FIRE AND/OR EXPLOSION. THIS POSSIBILITY SHOULD BE CONSIDERED WHEN LOCATING THESE TRANSFORMERS IN CLOSE PROXIMITY TO BUILDINGS OR PUBLIC THOROUGHFARES.

Venting

The transformer should be vented to the atmosphere before it is placed in service if it has been pressurized for leak test or if the unit has been opened and resealed when the temperature was above or below 25°C. Venting should take place at approximately 25°C to prevent excessive operating pressures or vacuums from developing. Vent the transformer by removing the vent plug or by operating the pressure relief device normally provided.

Grounding

-A good permanent low impedance ground connection must be made to the tank by means of the ground pad provided for this purpose near the bottom of the tank.

CAUTION: IMPROPER GROUNDING CAN CAUSE HIGH VOLTAGE ON METALLIC PARTS OF THE TRANSFORMER TANK AND TRANSFORMER SECONDARY TERMINALS RESULTING IN DANGER TO LIFE AND PROPERTY.

Transformers which are designed for use on a grounded wye system, that is one having a solidly grounded neutral, must have the tank and other available neutrals permanently and solidly grounded to the common neutral of the system before the transformer energized.

CAUTION: TRANSFORMERS WITH UNGROUNDED SEC-ONDARY WINDINGS, SUCH AS WITH THE DELTA, OPEN DELTA, AND FLOATING WYE CONNECTIONS, MAY UNDER CERTAIN CONDITIONS HAVE VOLTAGES AS HIGH AS THOSE OF THE PRIMARY SUPPLY SYSTEM APPEARING . FROM TERMINAL-TO-GROUND. SUCH VOLTAGES CAN RE-SULT IN DANGER TO LIFE AND PROPERTY.

Connections

CAUTION: ALWAYS ASSUME THAT TERMINALS ARE ENERGIZED UNLESS CHECKED AND GROUNDED. DO NOT RELY ON FUSE REMOVAL, SWITCH POSITION INDICATORS, OR OTHER VISUAL INDICATIONS. CONTACT WITH AN UNGROUNDED TERMINAL MAY RESULT IN ELECTRICAL SHOCK AND BURNS.

CAUTION: MAKE ONLY THE CONNECTIONS AND OPERATE ONLY AT THE VOLTAGES AUTHORIZED BY THE DIAGRAMS AND INFORMATION GIVEN ON THE TRANSFORMER NAMEPLATE. FAILURE TO DO SO CAN CAUSE DAMAGE TO THE TRANSFORMER AND DANGER TO NEARBY PERSONNEL.

CAUTION: THE TRANSFORMER MUST BE DE-ENERGIZED BEFORE CHANGING CONNECTIONS BY EITHER TAP CHANGER OR DUAL VOLTAGE SWITCH. FAILURE TO DO SO CAN CAUSE DANGER TO LIFE AND DAMAGE TO PROPERTY.

During installation, the recommended sequence of connections is to first make all ground connections, then the low voltage connections, and finally the high voltage connections. The trans-

former should be removed from service by reversing the above sequence of connections.

Line connections must not place such strain on the bushing terminals or insulators that would loosen the contact joints or damage the insulators.

Three-phase transformers are only designed for proper operation with all three-phases energized; operating with one or more phases open can result in unbalanced service voltages and singlephasing of the load.

Three-phase transformers may exhibit abnormal voltage and current behavior when switched one phase at a time. Three-phase switching is recommended whenever available or possible - particularity when conditions susceptable to ferroresonance exist. The highest probability of ferroresonant overvoltages occurs when ungrounded primary windings fed by underground cable circuits are switched remotely one phase at a time.

Security

Before leaving the site of an energized transformer, make sure that the cabinet is completely closed and all locking provisions are properly installed. Be certain that the terminal compartment is secured against unauthorized entry.

CAUTION: FAILURE TO SECURE THE TERMINAL COM-PARTMENT COULD ALLOW ACCESS BY UNAUTHORIZED PERSONNEL RESULTING IN DANGER TO LIFE.

OPERATION

The pad-mounted transformer is an integral part of the distribution system and consideration must be given to proper protection from system disturbances. Protection from excessive voltage transients and severe overcurrents should be provided. To allow proper operation of overcurrent devices that may be supplied with the transformer, coordination with system overcurrent protection must be achieved.

HIGH VOLTAGE ACCESSORIES

CAUTION: THE TRANSFORMER AND ITS ACCESSORIES MUST BE OPERATED WITHIN THEIR RATINGS. FAILURE TO OBSERVE THESE RATINGS COULD RESULT IN SERIOUS PERSONAL INJURY AND DAMAGE TO PROPERTY.

Consult Westinghouse for the ratings of specific accessories.

Porcelain Bushings

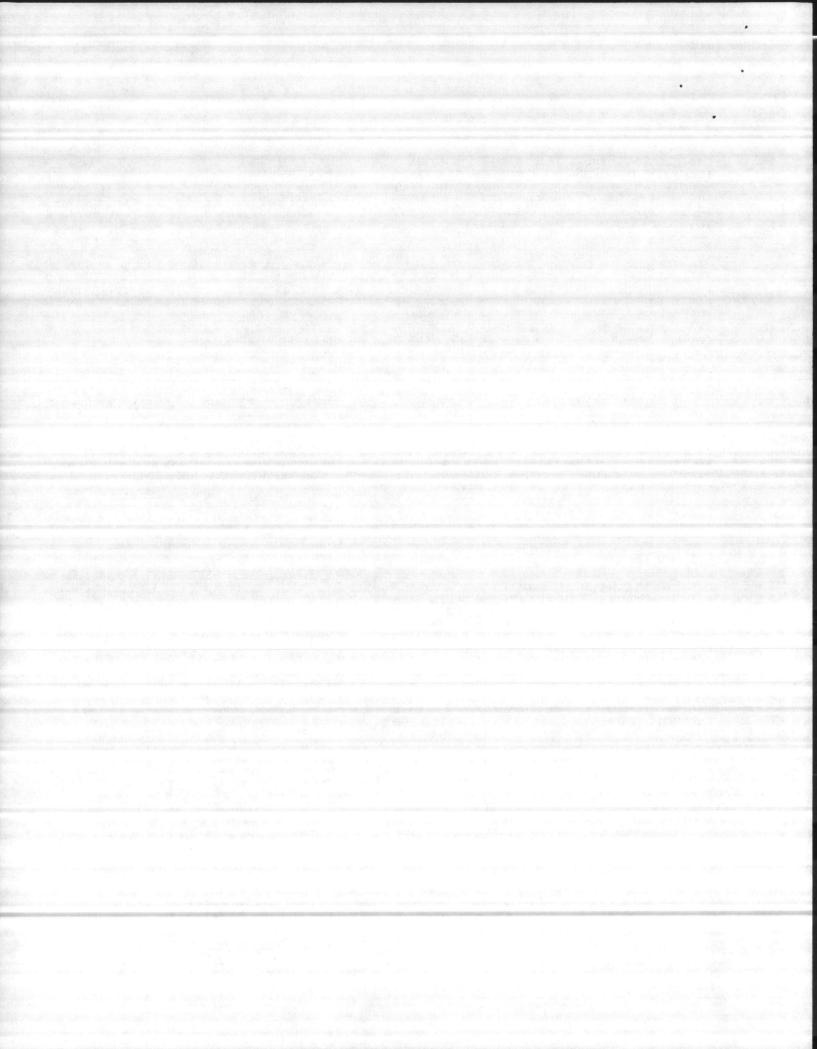
The standard high-voltage porcelain bushing is a gasketed bushing with clamp type terminals. The clamp type terminal arrangements accommodate cables ranging from No. 8 to 250 kcmil. The high voltage terminals are oriented for vertical takeoff of primary cables entering the compartment from below.

Separable Insulated Connectors

Separable insulated connector components may be universal bushings wells, integral bushings or bushing wells with inserts installed.

All separable connector components must be dry and clear of any contaminations before connecting. Unused terminals must be capped before energizing the unit.

The separable insulated connectors may be either livebreak or deadbreak. Follow the manufacturer's instructions and warnings on the use of these terminations.



Fusing

When a protective device on the primary side of the transformer has operated, the possibility of an internal transformer fault exists.

CAUTION: OPERATION OF A PRIMARY PROTECTIVE DE-VICE MAY INDICATE A FAULTED TRANSFORMER. DO NOT RE-ENERGIZE IF ANY SIGN OF FAILURE IS OBSERVED. RE-ENERGIZING SHOULD BE PERFORMED FROM A RE-MOTE LOCATION UNLESS THE CAUSE OF DEVICE OPERA-TION IS POSITIVELY IDENTIFIED AND CORRECTED. TO DO OTHERWISE PRESENTS A HAZARD OF VIOLENT TRANS-FORMER FAILURE RESULTING IN DANGER TO LIFE AND PROPERTY.

To assure proper operation and coordination, a fuse device should only be replaced by one with equivalent characteristics.

Protective Links

Protective links are oil-immersed high voltage expulsion fuses designed to isolate the transformer from the distribution system in the event of a transformer fault inside the tank on the load side of the link; not to provide overload or secondary fault current protection for the transformer.

Inspection or replacement of the internal link can be accomplished by using the handhole cover.

These internal fuses can be replaced utilizing the following procedures:

- 1. De-energize the transformer by disconnecting all power sources from the transformer (including any secondary power sources) to avoid danger to life and property. Take proper care to prevent the entrance of moisture or other foreign matter into the transformer. The transformer should be vented prior to removing the handhole cover. Remove the weather cover and then the handhole cover, placing the nuts and washers in storage for reuse.
- 2. Lower the oil level below the protective links.
- 3. The transformer should be checked for visible arcing damage and for electrical integrity such as continuity, turns ratio and insulation strength.
- 4. If no signs of internal failure are observed, replace with new fuse taking care to maintain electrical clearances.
- 5. Reassemble the weather cover and handhole. (See "Inspection"
- 6. Refill with good, clean, dry oil per ASTM D3487.

Air-Insulated Loadbreak Drawout Current-Limiting Fuse

Three-phase pad-mount transformers are supplied with an airinsulated drawout current-limiting fuses when specified. The fuse holder is a single-pole loadbreak and load make device, allowing the transformer to be de-energized by withdrawing the fuse from the transformer with a hot line tool.

High-voltage current-limiting fuses are designed to limit the flow of current (and energy) to a low impedance fault. Like protective links, their purpose is to isolate the transformer from the distribution system in the event of an internal transformer fault. Current-limiting fuses are applied when the available system fault current exceeds the interrupting capability of the protective links.

To open primary – Attach a hot line tool to the hookeye, stand to one side and rapidly pull the fuse completely from the holder.

To replace fuse – Disassemble parts from spent fuse. Assemble detail parts to new fuse per instruction decal on transformer. Replace any worn or damaged parts.

To close primary — Attach a hot line tool to the hookeye. Insert the end of the fuse into the opening until the upper contacts just enter the fuse tube. Stand to one side and rapidly push the assembly straight into the holder until the dust cap seats into the spring retainers.

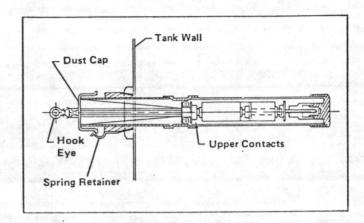


Fig. 4 Drawout Current-Limiting Fuse

Bayonet 1 Oil Fuse

Three-phase transformers are supplied with bayonet oil fuses when specified. The bayonet isself is a way of replacing an under oil expulsion fuse link in the field, and has single-pole loadbreak capability allowing it to be used as a switch to energize and deenergize a transformer.

It is recommended that the initial energization of transformers be accomplished through the use of loadbreak terminators, switches, cutouts, and other line sectionalizing devices.

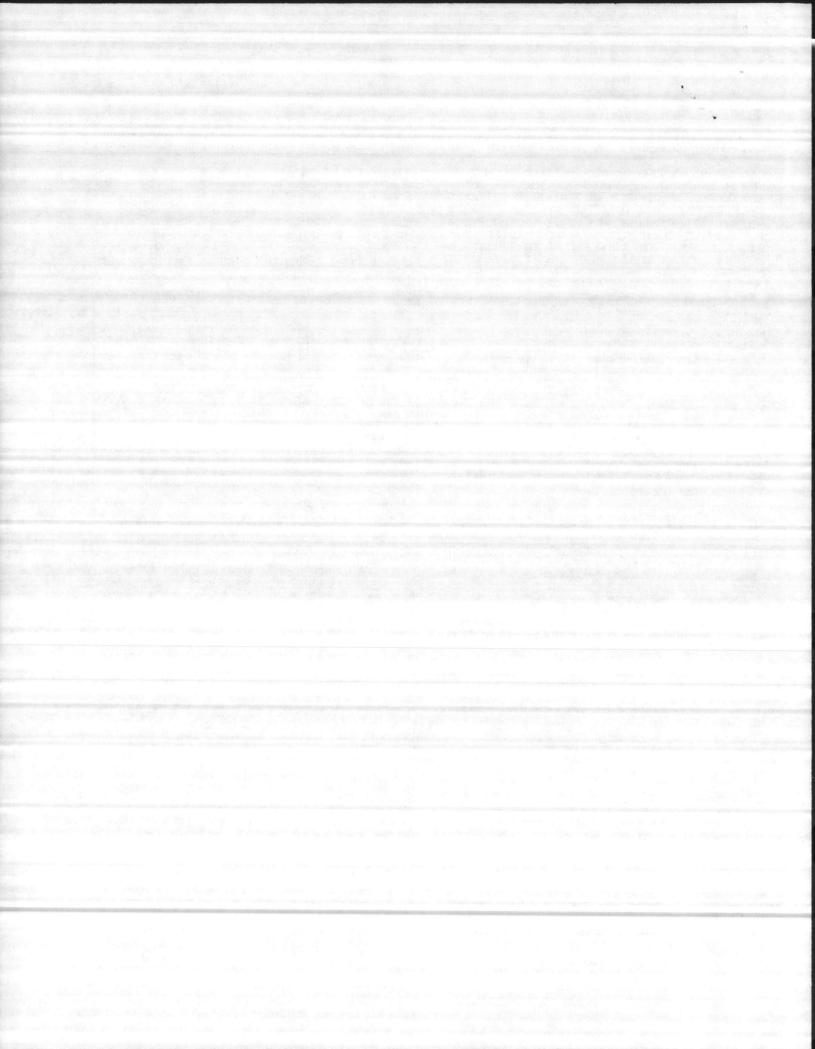
CAUTION: ANY LOADBREAK DEVICE IS SUBJECT TO VIOLENT FAILURE. WE THEREFORE RECOMMEND RE-ENERGIZING, WHENEVER POSSIBLE FROM A REMOTE LOCATION INSTEAD OF USING THE BAYONET TO CLOSE IN ON POTENTIAL FAULT CURRENT. VIOLENT FAILURE CAN CAUSE PERSONAL INJURY AND PROPERTY DAMAGE.

When replacing a blown fuse, re-energize from a remote location. This procedure is an added precaution when picking up load and after a fuse has blown. When the transformer is refused under energized conditions, it is possible the fuse would be closed in on the system's maximum fault current. This is always of concern, and any transformer showing the slightest evidence of failure could be dangerous.

To Remove Fuse

- 1. Lift the weather cover and hold in position with locking support bracket.
- 2. Relieve any pressure in the tank using the pressure relief device.

¹ Bay-O-Net is a trademark of the RTE Corporation



- 3. Attach universal hot line tool, or hook stick to fuse handle eye stand to one side unlock handle.
- 4. Push down and rotate the handle 90° clockwise in the tube. The 90° rotation of the fuse holder breaks any adhesion between the seal gasket and the outer tube assembly.
- 5. Pull the fuse holder out six inches. This opens the primary circuit. Wait a few seconds for oil to drain into the tank.

DANGER: IF ANY ARCING, RUMBLING, OR OTHER UNUSUAL NOISE IS HEARD, CURRENT IN EXCESS OF THE BAYONET'S LOADBREAK RATING IS LIKELY PRESENT. SLAM HOME THE BAYONET, LATCH AND DE-ENERGIZE FROM A REMOTE LOCATION.

6. The inner fuse holder assembly can now be removed without dripping excess oil. The total length of the inner fuse holder assembly, including fuse element cartridge, is fourteen inches.

To Replace Fuse

Instructions for replacing the fuse on the fuse holder are packed with each replacement fuse or may be obtained from the fuse manufacturer.

To Reinstall Fuse Holder

- 1. Attach the handle eye of the inner fuse holder assembly to the hot stick.
- 2. Place it into the outer assembly and slam home.
- 3. When the inner fuse holder assembly is inserted as far as possible, push down and rotate the locking handle, hooking it over the shoulder of the outer tube assembly. When the handle is in the locked position, make sure the cover is seated against the shoulder of the outer tube assembly.

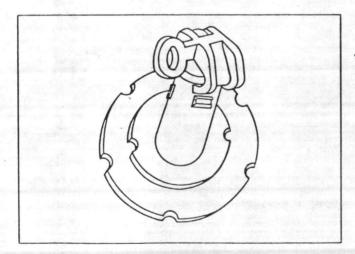


Fig. 5 Bayonet Oil Fuse

Internal Partial Range Current-Limiting Fuse

The partial range current-limiting fuse is used in series with an expulsion fuse to provide full range protection. The partial range fuse is designed to clear high current faults and the expulsion link to clear low current faults. These fuses are located under oil. Either internal expulsion fuses or bayonet fuses are available as the series expulsion fuse.

High Voltage Switches

CAUTION: ALWAYS ASSUME THAT TERMINALS ARE ENERGIZED UNLESS CHECKED AND GROUNDED. DO NOT RELY ON FUSE REMOVAL, SWITCH POSITION INDICATORS, OR OTHER VISUAL INDICATORS. CONTACT WITH AN UNGROUNDED TERMINAL MAY RESULT IN ELECTRICAL SHOCK OR BURNS.

EFD Switch

The Westinghouse type EFD loadbreak (single-phase switching) air switch is available for either loop feed (three pole) or radial feed (single pole) application on live front transformers. A current-limiting fuse or a solid blade can be provided in the transformer connecting pole. The switch contacts are opened by drawing out the insulated switch pole so that they are completely free of the switch housing, leaving a visible disconnect. The switch poles should be drawn out or inserted quickly and uniformly with an ordinary hook stick. A schematic diagram decal is mounted on the front of the switch. The current-limiting fuse is replaced by removing the four nylon screws in the switch pole to expose the fuse.

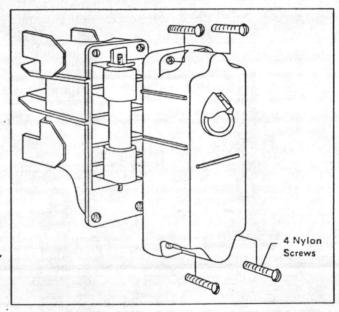


Fig. 6 EFD Switch

LBOR Switch

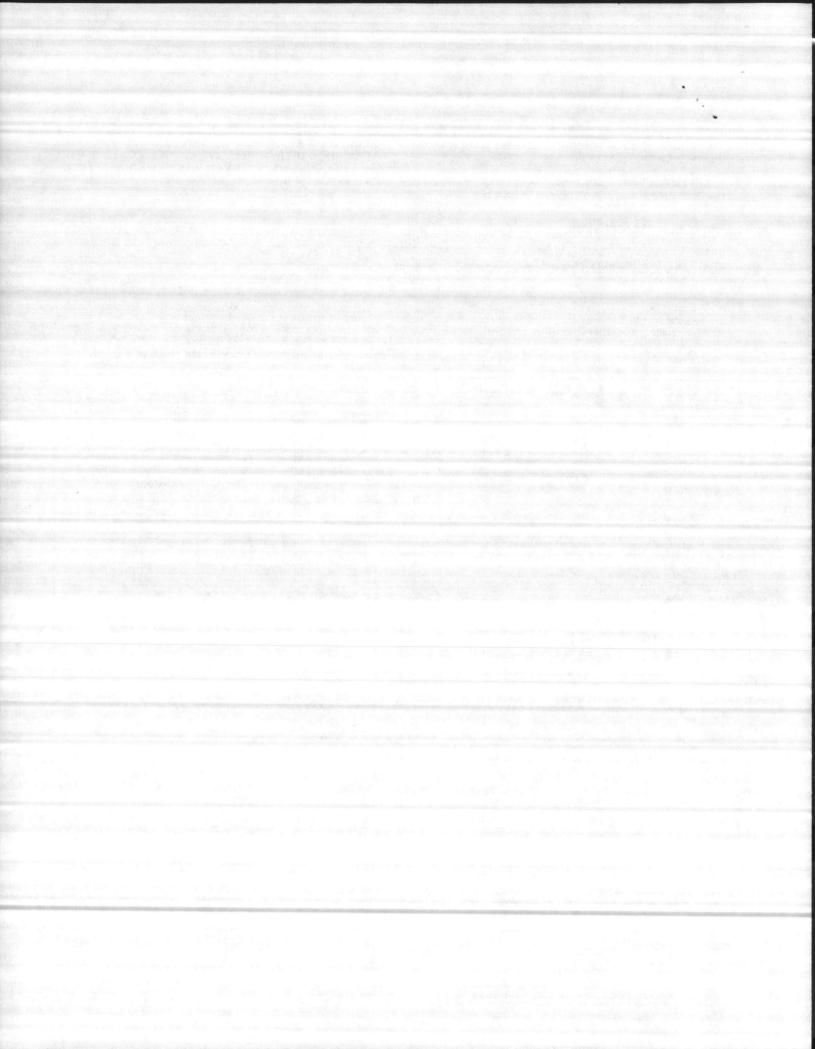
The Westinghouse type LBOR switch is an internal rotary threepole loadbreak oil switch available for either loop feed or radial connection. For radial operation, a single two-position switch is supplied. Two two-position switches are provided for loop operation. The operating handles, which can be rotated with a hook stick or hot line tool, are located in the high voltage compartment with a position indicator showing the "closed" and "open" positions.

Circuit connections are shown on the transformer nameplate.

Tap Changers (De-energized operation only)

The tap changer provides a means of changing the voltage ratio of a transformer. It can only be operated with the transformer deenergized. The tap changer operating handle is generally located in

Bay-O-Net is a trademark of the RTE Corporation



the upper left-hand corner of the high voltage compartment. To change taps, proceed as follows:

1. De-energize the transformer.

CAUTION: THE TAP CHANGER MUST NOT BE OPERATED WHILE THE TRANSFORMER IS ENERGIZED. TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY AND DAMAGE TO PROPERTY.

- 2. After de-energizing the transformer, pull the tap changer handle out until the end of the handle shaft clears the tap changer dial plate.
- 3. Turn the handle to the desired tap position.
- 4. When the shaft is over the slot in the dial plate for the desired position, apply a slight inward force and rotate the shaft within the confines of that slot until the end of the shaft moves inward beyond the face of the dial plate. This inward movement insures proper contact engagement.

Some large-size units are furnished with a power-transformer tap changer drive which requires pulling of a locking pin and a full turn of the handle for each change in tap position.

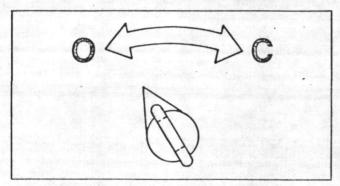


Fig. 7 LBOR Switch

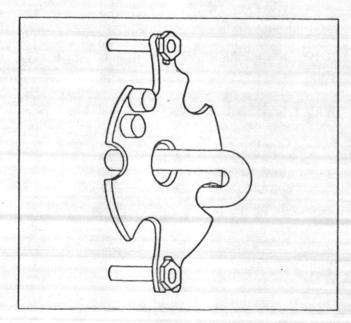


Fig. 8 Tap Changer

Dual Voltage Switch (De-energized operation only)

The dual voltage switch permits the transformer to be operated on either of two primary voltages. The dual voltage switch handle is generally located in the upper left-hand corner of the high voltage compartment. Since considerable torque is required, a wrench should be used to rotate the handle.

To change voltages, proceed as follows:

1. De-energize transformer.

CAUTION: THE DUAL VOLTAGE SWITCH MUST NOT BE OPERATED WHILE THE TRANSFORMER IS ENERGIZED. TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY AND DAMAGE TO PROPERTY.

- 2. Back out the locking screw.
- 3. Rotate the switch handle in the direction of the arrows to the new position.
- 4. Reinsert locking screw to discourage unauthorized movement.

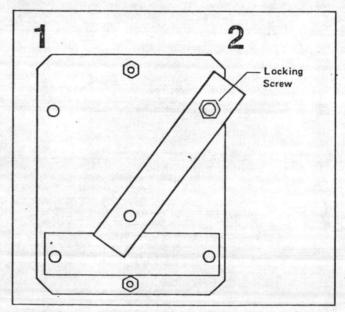


Fig. 9 Dual Voltage Switch

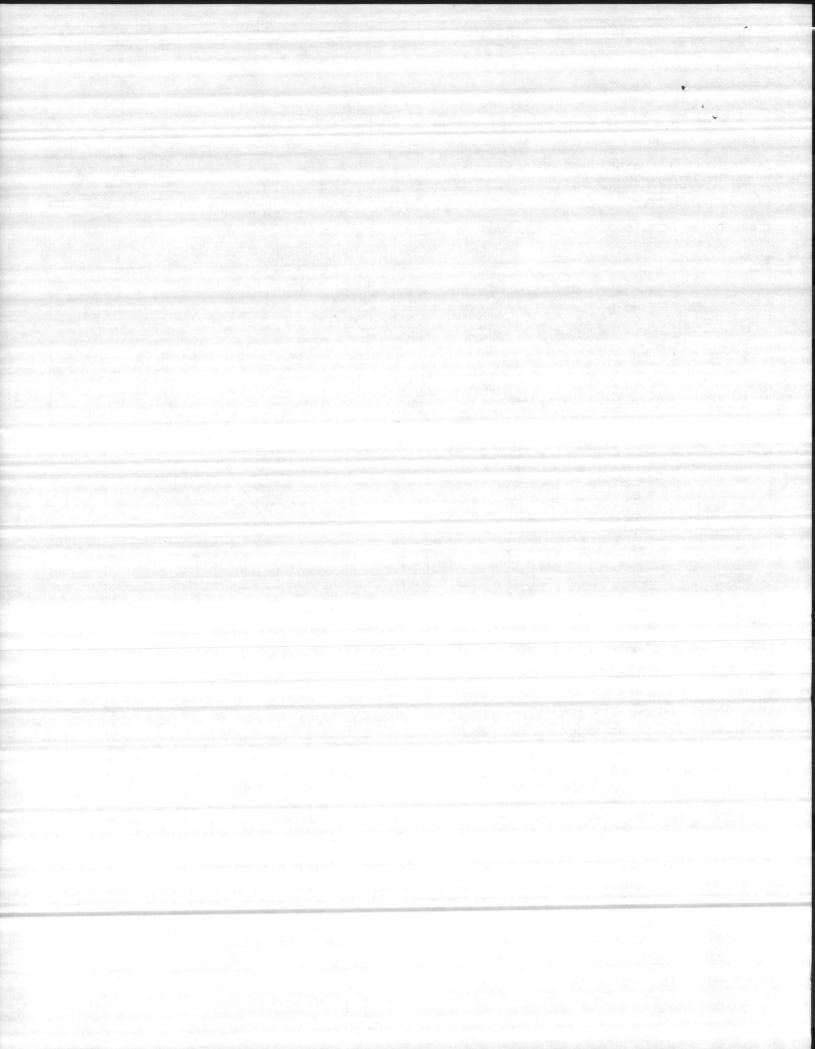
On a dual voltage transformer, position 1 is the low or multiple connected position while position 2 is the high or series connected position. On delta/wye rated transformers position 1 is the delta connected position and position 2 is the wye connected position.

CAUTION: TRANSFORMERS SUPPLIED WITH REMOVABLE FUSES MAY REQUIRE REPLACEMENT OF FUSES WITH THOSE OF THE PROPER RATING WHEN CHANGING VOLTAGE POSITIONS. USE OF AN IMPROPERLY RATED FUSE MAY CAUSE VIOLENT FUSE FAILURE RESULTING IN DANGER TO LIFE AND DAMAGE TO PROPERTY.

McGraw Edison Arc Strangler² and Switch

Transformers may be equipped with either radial or loop feed arc strangler² and switches mounted in the high voltage compartment. The fuses are current limiting fuses. The arc strangler² must be cocked before closing a switch or fuse assembly. Follow the McGraw Edison instructions for operating these devices which provide the loadbreak function using either fuses or blades.

² Arc strangler is a trademark of the McGraw Edison Company



S and C Pad-Mounted Gear

When S and C air switches or fused disconnects are used, follow the manufacturer's instructions for operating this equipment. When operated with the S and C loadbuster³ tool, these disconnects function as a loadbreak switch.

CAUTION: USE THE S AND C LOADBUSTER TOOL TO OP-ERATE THE SWITCH OR FUSED DISCONNECT. FAILURE TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY.

Surge Arresters

Surge arresters are to be mounted in the high voltage compartment. Their function is to intercept and divert to ground various overvoltage transients (such as lightning surges) which occur on the distribution system.

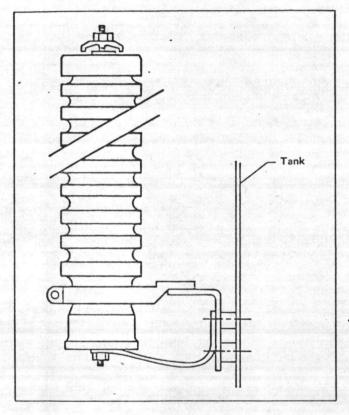


Fig. 10 Surge Arrester Mounting

LOW VOLTAGE ACCESSORIES

Low Voltage Oil-Immersed Circuit Breaker

CAUTION: WITH THE SECONDARY CIRCUIT OPEN, THERE MAY BE SUFFICIENT COUPLING TO THE SECONDARY WINDINGS THAT PERCEPTIBLE SHOCK MAY BE OBTAINED FROM THE SECONDARY TERMINALS. GROUND THE OPEN SECONDARY TERMINALS BEFORE WORKING ON THE SECONDARY SERVICE.

The three-pole secondary circuit breaker is designed to open the low voltage circuit on secondary faults or severe overloads. The breaker is located inside the tank under the oil. The handle is located in the low voltage compartment and may be operated with a hot line tool. To open the low voltage circuit breaker manually, rotate the handle so that the pointer moves from the "C" (closed) to the "O" (open).

To close the breaker, rotate the handle past the open position to reset the breaker, then back through the open position to the closed position.

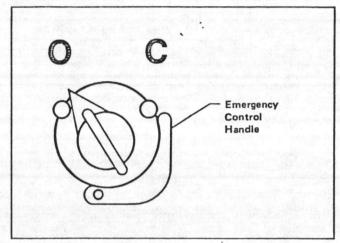


Fig. 11 Oil Breaker Operator

The breaker will reopen if a fault or excessive overload exists even though the handle may be held in the closed position.

Following a circuit breaker tripout due to an overload condition, the transformer oil may not have had time to cool sufficiently to allow the breaker latch to be reset, making it impossible to reclose the breaker immediately.

An emergency control handle is provided to recalibrate the breaker to a higher trip temperature. The emergency trip setting of the breaker should be used only when absolutely necessary and for as short a duration as possible because its use may result in a subsequent reduction in transformer life.

The breaker is recalibrated to the emergency position by removing the meter seal and rotating the emergency control handle approximately one-quarter turn down and away from the breaker operating handle. It is recommended that a new seal be applied to the handle when it is returned to the normal position after an emergency operation to avoid inadvertent operation of the emergency control.

Thermometer

A thermometer is available to indicate the top liquid temperature in the tank. The temperature sensitive element is mounted in a leak-proof well, permitting removal of the thermometer without lowering the liquid level. The device is furnished with an additional red pointer to show the highest temperature attained since last reset.

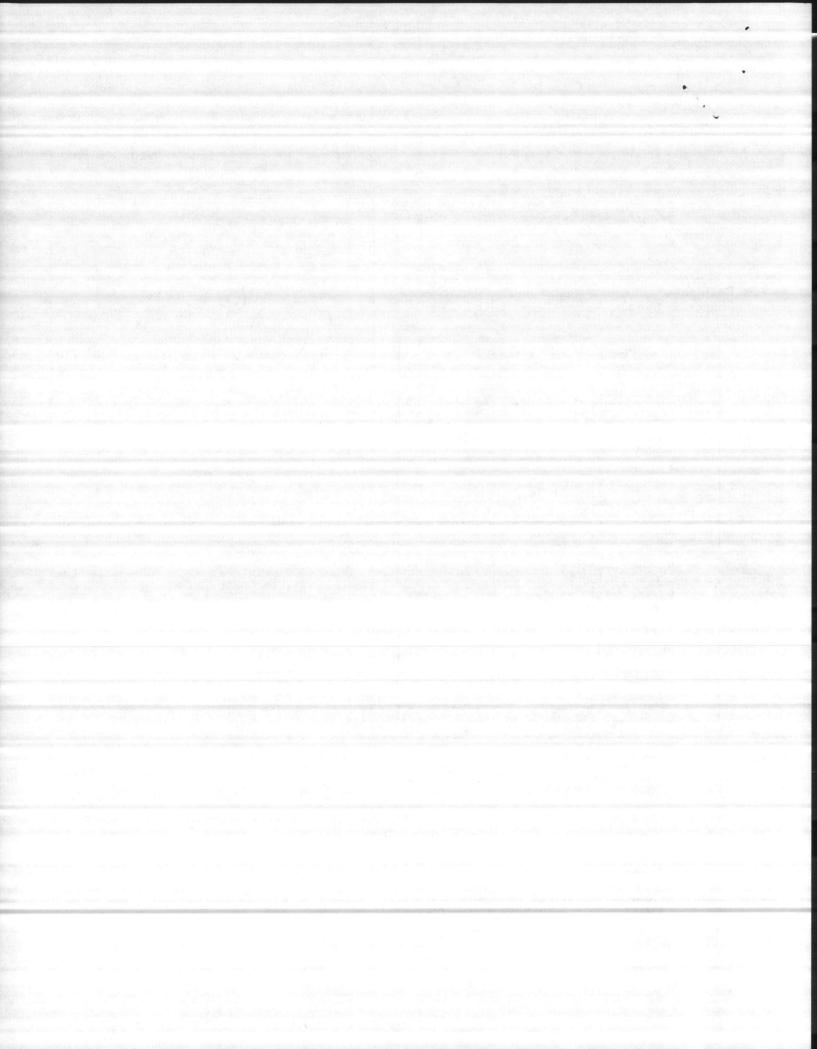
Liquid Level Gauge

A liquid level gauge is available located in the low voltage compartment, to indicate the variation from the 25°C oil level.

Pressure-Vacuum Gauge

A pressure gauge is available located in the low voltage compartment above the bushings in the air space. The gauge indicates whether the gas space in the tank is under positive or negative pressure.

³ Loadbuster is a trademark of the S and C Electric Company



Pressure Relief Device

The automatic pressure relief device relieves excessive internal tank pressure and reseals at a lower positive pressure.

Molded Case Breakers

Westinghouse molded case breakers, when provided are located in the low voltage compartment. Contact the nearest Westinghouse Sales Office for data regarding this equipment.

Metering

Current transformers, potential transformers, kilowatt-hour meters or provisions for these items are mounted in or on the low voltage compartment when supplied.

APPLICATION LIMITATIONS

The transformers described herein are designed for the application conditions normally encountered on electric utility power distribution systems. As such they are suitable for use under the "usual service conditions" described in ANSI C57.12.00 (General Requirements for Liquid-Immersed Distribution, Power and Regulating Transformers). All other conditions are considered unusual service and should be avoided unless specific factory approval is obtained.

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HERTZ

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GENERAL ORDER CH33095 003

1/ 7/85

STYLE NO: A65A490X2M

60

SERIAL NO 85JA345169

DATE OF TEST

TYPE PADMOUNT

DEVIATION: APPROVED KVA 150

PHASE 3

H.V. WINDING 12470

L.V. WINDING 208Y/120

LANTDIV REVIEWER

JUL 1985

PER-CENT EXCITING CURRENT AT 100 PER-CENT RATED VOLTAGE .26

DATE NO LOAD LOSS WATTS AT 100 PER-CENT RATED VOLTAGE 335.7
NO LOAD LOSS VALUES SHOWN AT 85 DEGREES C -- LOAD LOSS VALUES AT 85 DEGREES C

RISE OF WINDINGS BY RESISTANCE 65 DEGREE-C GUARANTEE

UNIT RATIO AND POLARITY TESTED

----- INSULATION TESTS -----

IMPULSE TEST APPLIED POTENTIAL TEST APPLIED TO HV

VOLT RATING: 12470 TEST VOLTAGE APPLIED IN KY:

TEST SECS=60

APPROVED

L.V. WINDING-APPLIED POTENTIAL TEST VOLT RATING: 208

TEST VOLTAGE APPLIED IN KY: 10 APPROVED AS NOTED

TESDISALES CALD

INDUCED POTENTIAL TEST:

2.0 TIMES RATED VOLTAGE ACROSS FULL WINDINGNARRETINED. FOR 18 SECONDS AT 400 HERTZ

I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY TESTS THADE REQUIREMENTS UNLESS THE CONTRACTORY ACCORDANCE WITH THE LATEST TRANSFORMER TEST CODE C57-12-90-1980 OF TRUE ATTENTION TO AND SUPPORTS THE AMERICAN NATIONAL STANDARDS INSTITUTE, AND THAT THE TRANSFORMER STOOD THE ABOVE TRANSFORMER TESTS.

ENGINEERING APPROVAL

JAN 8 1985 DATE

SUBJECT TO THE REQUIREMENTS OF

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NORFOLK, VIRGINIA 23511

APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE COM THECALLS ATTENTION TO AND SUPPORTS THE DEVIATION THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA TION OF TRADES, ETC. AS REQUIRED.

REVIEWER

FOR OFFICER IN CHARGE OF CONSTRUCTION

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ANTIDIA REVIEWER

DIENT-ROM I

THE STATE OF THE S

PURCHASER:

GENERAL DRDER CH33095 005 STYLE NO: A65E560XP9

SERTAL NO 85 JA346043

DATE OF TEST 1/ 8/85

TYPE PADMOUNT DEVIATION: APPROVED

PHASE 3

HERTZ

KVA . 500

12470 H.V. WINDING

L.V. WINDING 480Y/277

LANTDIV REVIEWER

PER-CENT EXCITING CURRENT AT 100 PER-CENT RATED VOLTAGE -72

NO LOAD LOSS WATTS AT 100 PER-CENT RATED VOLTAGE 1147.0

NO LOAD LOSS VALUES SHOWN AT 85 DEGREES C -- LOAD LOSS VALUES AT 85 DEGREES C
RISE OF WINDINGS BY RESISTANCE 65 DEGREE-C GUARANTEE

UNIT RATIO AND POLARITY TESTED

----- INSULATION TESTS -----

IMPULSE TEST 95 KV FULL WAVE IMPULSE TEST APPLIED TO HV H.V. WINDING-APPLIED POTENTIAL TEST VOLT RATING: 12470 TEST VOLTAGE APPLIED IN KV: 34

L.V. WINDING-APPLIED POTENTIAL TEST

VOLT RATING: 480 TEST VOLTAGE APPLIED IN KV: 10

TEST SEAL SHOOL DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NORFOLK, VIRGINIA 23511 TEST SECS=60

INDUCED POTENTIAL TEST:

2.0 TIMES RATED VOLTAGE ACROSS FUL FOR 18 SECONDS AT 400 HERTZ

I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY TESTS MADE IN USACCORDANCE WITH THE LATEST TRANSFORMER TEST CODE C57.12.90-1980NTOACTHE A SUBMITTAL DOES NOT INCLUDE AMERICAN NATIONAL STANDARDS INSTITUTE, AND THAT THE TRANSFORMER PROTECTION FROM THE CONTRACTOR OF THE CO STOOD THE ABOVE TRANSFORMER TESTS.

JAN 9 1985

ENGINEERING APPROVAL

DATE

SUBJECT TO THE REQUIREMENTS OF APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRAC-TOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION-THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA TION OF TRADES ETC LAS REQUIRED 1 JUL

FOR OFFICER IN CHARGE OF CONSTRUCTION

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UNITRIVIREVIEWER

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DEMONSTRUCTURE OF

PURCHASER:

GENERAL ORDER CH33095 001 STYLE NO: A65A760X2K

SERIAL NO 85JA350029

DATE OF TEST 1/15/85

PADMOUNT

DEVIATION. APPRO

PHASE 3

HERTZ

KVA . 75

AS NOTED

H.V. WINDING 12470 .

L.V. WINDING 208Y/120

LANTDIV REVIEWER

PER-CENT EXCITING CURRENT AT 100 PER-CENT RATED VOLTAGE

NO LOAD LOSS WATTS AT 100 PER-CENT RATED VOLTAGE 304.4
NO LOAD LOSS VALUES SHOWN AT 85 DEGREES C -- LOAD LOSS VALUES AT 85 DEGREES C
RISE OF WINDINGS BY RESISTANCE 65 DEGREE-C GUARANTEE

UNIT RATIO AND POLARITY TESTED

----- INSULATION TESTS -----

IMPULSE TEST 95 KV FULL WAVE IMPULSE TEST APPLIED TO HV

VOLT RATING: 12470 TEST VOLTAGE APPLIED IN KV:

TEST SECS=60

L.V. WINDING-APPLIED POTENTIAL TEST

VOLT RATING: 208 TEST VOLTAGE APPLIED IN KV:

ATLANTIC DIVISION TEST NAVAL FACILITIES ENGINEERING COMMAND

INDUCED POTENTIAL TEST:

2.0 TIMES RATED VOLTAGE ACROSS FULL WINDING APPLIED FOR 18 SECONDS AT 400 HERTZ

I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY TEST SMARETHO THE REQUIREMENTS OF 2 2 STOOD THE ABOVE TRANSFORMER TESTS.

ENGINEERING APPROVAL

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APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRAC-TOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION-THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA-TION OF TRANES, ETC., AS REQUIRED.

FOR OFFICER IN CHARGE OF CONSTRUCTION

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NAVAL ENGIL TIES ENGINE SE NGIC SYMMAND MODSOMK, VIRGINIA (25)

CHARACTER THE REQUIREMENTS OF C. C. M. C.

TOUGH CHARLES OF CONSTRUCT

500 WESTINGHOUSE DRIVE JEFFERSON CITY MISSOURI 65101

REPORT OF TRANSFORMER TESTS

PURCHASER:

GENERAL ORDER CH33095 004 STYLE NO: A65E120X2N

SERIAL NO 85JA346163

DATE OF TEST

1/14/85

TYPE PADMOUNT

PHASE 3

HERTZ -60 KVA LITATION: APPROVED

AS NOTED

H.V. WINDING 12470

L.V. WINDING 480Y/277

PER-CENT EXCITING CURRENT AT 100 PER-CENT RATED VOLTAGE 1.10

LANTDIV REVIEWER NO LOAD LOSS WATTS AT 100 PER-CENT RATED VOLTAGE 479-3 RISE OF WINDINGS BY RESISTANCE 65 DEGREE-C GUARANTEE

UNIT RATIO AND POLARITY TESTED

----- INSULATION TESTS -----

IMPULSE TEST 95 KV FULL WAVE IMPULSE TEST APPLIED TO HV

VOLT RATING: 12470 TEST VOLTAGE APPLIED IN KV:

TEST SECS=60

L.V. WINDING-APPLIED POTENTIAL TEST

VOLT RATING: 480 TEST VOLTAGE APPLIED IN KV:

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND

INDUCED POTENTIAL TEST:

2.0 TIMES RATED VOLTAGE ACROSS FULL PHENEING APPLIED FOR 18 SECONDS AT 400 HERTZ

APPROVED AS NOTED

I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY LESS TO THE REQUIREMENTS OF ACCORDANCE WITH THE LATEST TRANSFORMER TEST CODE C57-12-90-1980 OF THE 55-82 AMERICAN NATIONAL STANDARDS INSTITUTE, AND THAT THE TRANSFORMERRACTHO. STOOD THE ABOVE TRANSFORMER TESTS.

ENGINEERING APPROVAL

DATE JAN 1 5 1985 APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRAC-TOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION-THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA-TION OF TRADES, ETC., AS REQUIRED

FOR OFFICER IN CHARGE OF CONSTRUCTION

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Date

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PURCHASER:

GENERAL - ORDER CH33095 002 STYLE NO: A65A530XPB

SERIAL NO 85 JA342164

DATE OF TEST 1/ 3/85 TYPE PADMOUNT

300

PHASE 3

H.V. WINDING 12470

L.V. WINDING 208Y/120

LANTDIVREVIEWER

PER-CENT EXCITING CURRENT AT 100 PER-CENT RATED VOLTAGE .67

NO LOAD LOSS WATTS AT 100 PER-CENT RATED VOLTAGE 809.4
NO LOAD LOSS VALUES SHOWN AT 85 DEGREES C -- LOAD LOSS VALUES AT 85 DEGREES C
RISE OF WINDINGS BY RESISTANCE 65 DEGREE-C GUARANTEE DATE

UNIT RATIO AND POLARITY TESTED

----- INSULATION TESTS -----

IMPULSE TEST 95 KV FULL WAVE IMPULSE TEST APPLIED TO HV

VOLT RATING: 12470 TEST VOLTAGE APPLIED IN KV:

L.V. HINDING-APPLIED POTENTIAL TEST

VOLT RATING: 208
TEST VOLTAGE APPLIED IN KV:

INDUCED POTENTIAL TEST:

2.0 TIMES RATED VOLTAGE ACROSS FULL WIN FOR 18 SECONDS AT 400 HERTZ

I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY TEST SPRENDAL OF A SUBMITTAL DOES NOT INCLUDE ACCORDANCE WITH THE LATEST TRANSFORMER TEST CODE C57.12.90-1980 OF PHENDAL OF ANY DEVIATION FROM THE CONSTITUTE, AND THAT THE TRANSFORMER WARREDVAL OF ANY DEVIATION FROM THE CONTRACT STOOD THE ABOVE TRANSFORMER TESTS.

ENGINEERING APPROVAL

DATE

ATLANTIC DIVISION E STANAL CENTRES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511

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SUBJECT TO THE REQUIREMENTS OF

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DATE

11JUL 1985

FOR OFFICER IN CHARGE OF CONSTRUCTION

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PURCHASER: GENERAL ORDER CH33095 002 STYLE NO: A65A530XPB SERIAL NO DATE OF TEST 1/11/85 TYPE - PADMOUNT PHASE 3 H.V. WINDING 12470	85JA342206
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I HEREBY CERTIFY THAT THIS IS A TRUE REPORT BASED ON FACTORY TEST ACCORDANCE WITH THE LATEST TRANSFORMER TEST CODE C57.12.90-1960 G ACCORDANCE WITH THE LATEST TRANSFORMER WAMERICAN NATIONAL STANDARDS INSTITUTE, AND THAT THE TRANSFORMER WASTOOD THE ABOVE TRANSFORMER TESTS.	APPROVAL OF ANY DEVIATION FROM THE CON-
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NAME FACILITIES ENCRET THE COMPANION

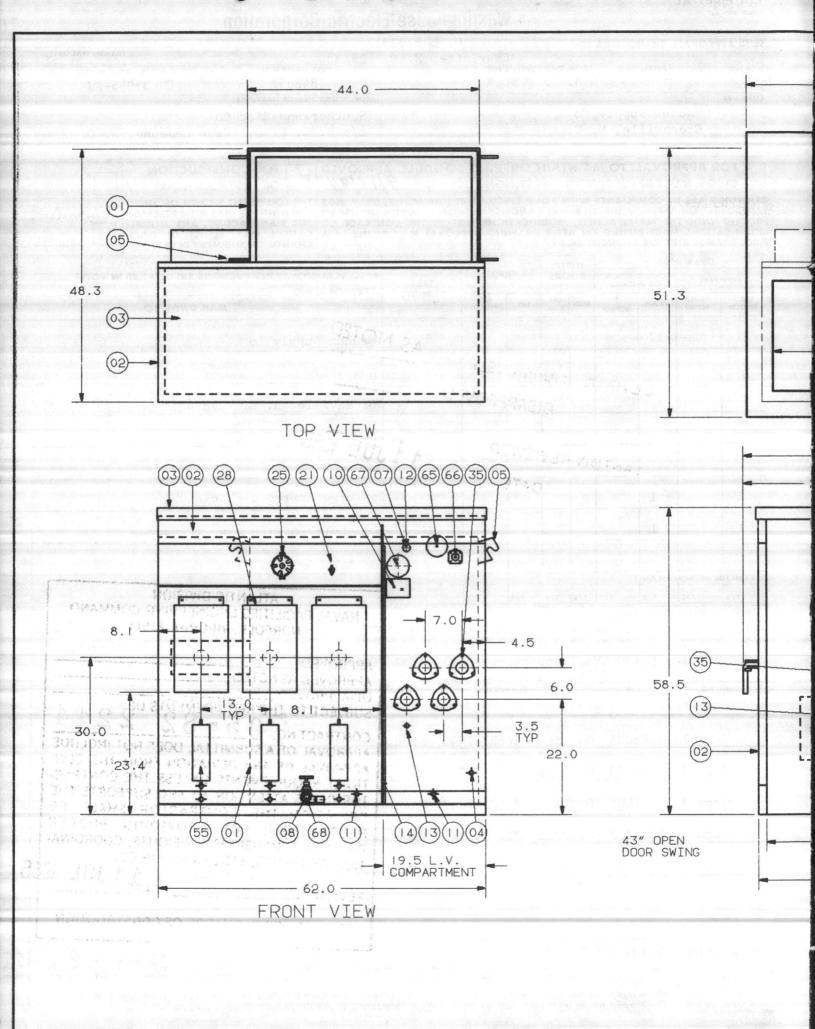
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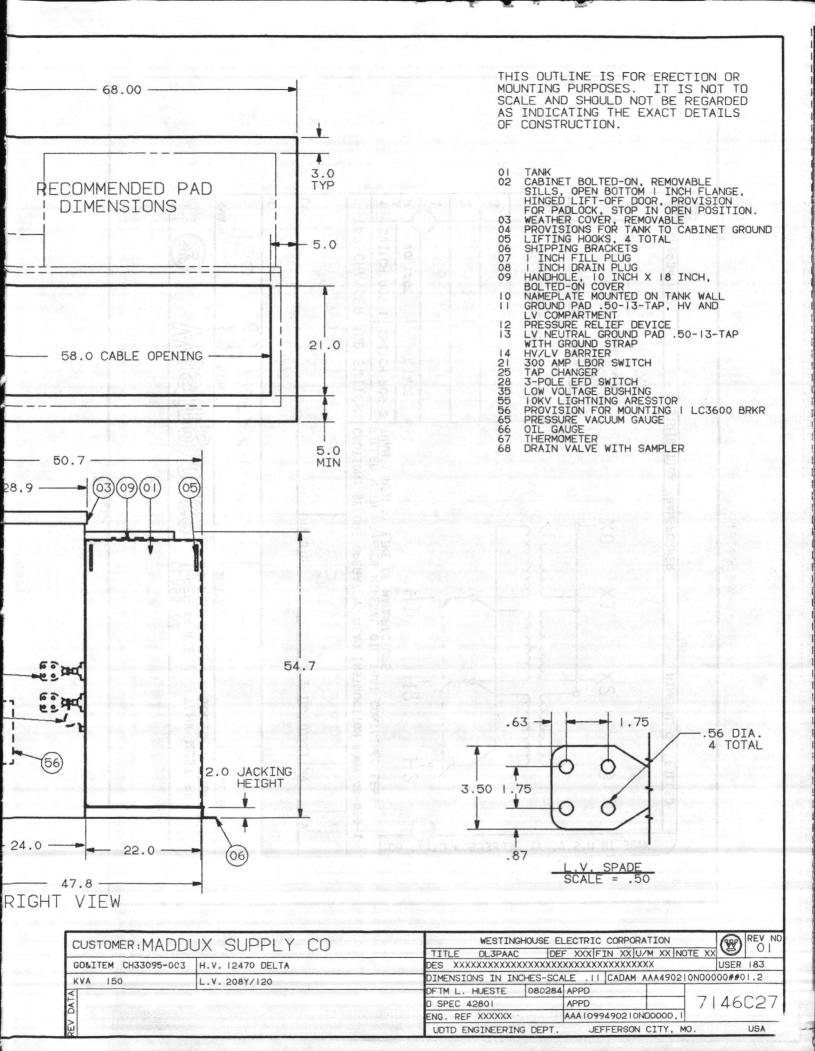
FORM 34576C

Westinghouse Electric Corporation

DATE I PROCESS WITH THE MODIFICATIONS NOT IN THE CONTRACT OR FOR MANUFACTURE, ANY MODIFICATIONS MADE DURING OR AFTER MODIFICATIONS NOT IN THE CONTRACT OR SHIPMENT DELAY. DRAWINGS NOT SHIPMENT DELAY. NISTR. PRODUCE SHIPMENT DELAY. NAIL DWGS. TO BOX 4067 CONSTRUCTION SHIPMENT DELAY. ANT DIV REVIEWER TO THE PRODUCE SHIPMENT DELAY. ANT DIV REVIEWER TO THE PRODUCE SHIPMENT DELAY. 1 1 1	DATE	TRANSMITTAL DAT		Box 3281		Ch			10:	QUIRIES	- OK 114		
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Maddux Supply Co Greenville, N. C. FOR APPROVAL, TO MAINTAIN SHIPPING SCHEDULE, APPROVED MOWS, MUST BE RECEIVED BY WESTINGHOUSE ON 7/8/3/4 OR INSTALLATION AWINGS ARE IN COMPLIANCE WITH YOUR SPECIFIED REQUIREMENTS, DRAWINGS ON SHIPPING SCHEDULE, APPROVED OR INSTALLATION AWINGS ARE IN COMPLIANCE WITH YOUR SPECIFIED REQUIREMENTS, DRAWINGS ON SHIPPING SCHEDULE, APPROVED OR INSTALLATION THE MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR DOCKED WITH THE MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR DOCKED WITH THE MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR DOCKED WITH THE MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR DOCKED WITH THE MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR DOCKED WITH THE MANUFACTURE, MODIFICATIONS NOT BY THE ST. BRAWNINGS MANUFACTURE, MODIFICATIONS NOT IN THE CONTRACT OR TEST. TEST. TEST. THEORY MAIL DWGS. TO APPROVAL TO FRIED MAIL DWGS. TO BOX 4067 COMPLIANCE AND DV REVIEWER 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		CH-33095-RJ			las di	ENDE	PEN	т.	В.				1)40
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TYPE OF REPRO MAIL DWGS. TO MAIL D		RE DETAILED IN NOTES	STOMER INSTRUCTIONS AR	TEST	S.L.	RPD					CONSTR		APPR
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1 150 KVA Transformer, Style A65A4 CVANCOULD 112.5 KVA Transformer, Style A65F1 PARKVED AS NOTED DWG. NO. SUB DRAWING TITLE Item 1 7146C25 Outline 266P347H43 Namepla CONTRACT NO. 10 - 82 2 2 4 Item 2 7146C26 Outline 266P347H43 Namepla CONTRACT NO. 10 - 82 2 2 4 Item 3 7146C27 Outline 266P347H43 Namepla CONTRACT REQUIREMENTS UNLESS THE CONTRACT REQUIREMENTS			(totali os ridey, 1	A65A5B	Sty	rmei	sfor	rans	ΑΤ	300 KV	3		
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FOR O TIGER IN CHARGE OF CONSTRUCTIO	100	11JUL	TRADES ETC., AS F	Namep1a	47H43	266P	e 20	line	Out	C29	7146	tem 5	I
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[&]quot;This drawing contains information proprietary to Westinghouse Electric Corporation; it is submitted in confidence and is to be used solely for the purpose for which it is furnished and returned upon request. This drawing and such information is not to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written authorization of Westinghouse Electric Corporation."





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FEATURE AND DIMENSION LIST

GENERAL ORDER NUMBER CH33095 003 MADDUX SUP CO 150.0 KVA 3 PHASE PAD MOUNTED TRANSFORMER STYLE A654490X2M 60 HERTZ ERECTION DUTLINE 7146C27

NAMEPLATE DRAWING 8438A54H01 WIRING DIAGRAM IMP= 5.0 PERCENT WT= 3462 HV 12470 CUNDUCTOR= CW BIL 95 TAPS + OR - (2) 2 1/2 PERCENT' 1ST 13095 2ND 12785 3RD 12470 4TH 12160 5TH 11850' WT= 3462 LBS DIL= 190 GAL CUNDUCTOR= ALM BIL 30 -LV 208Y/120

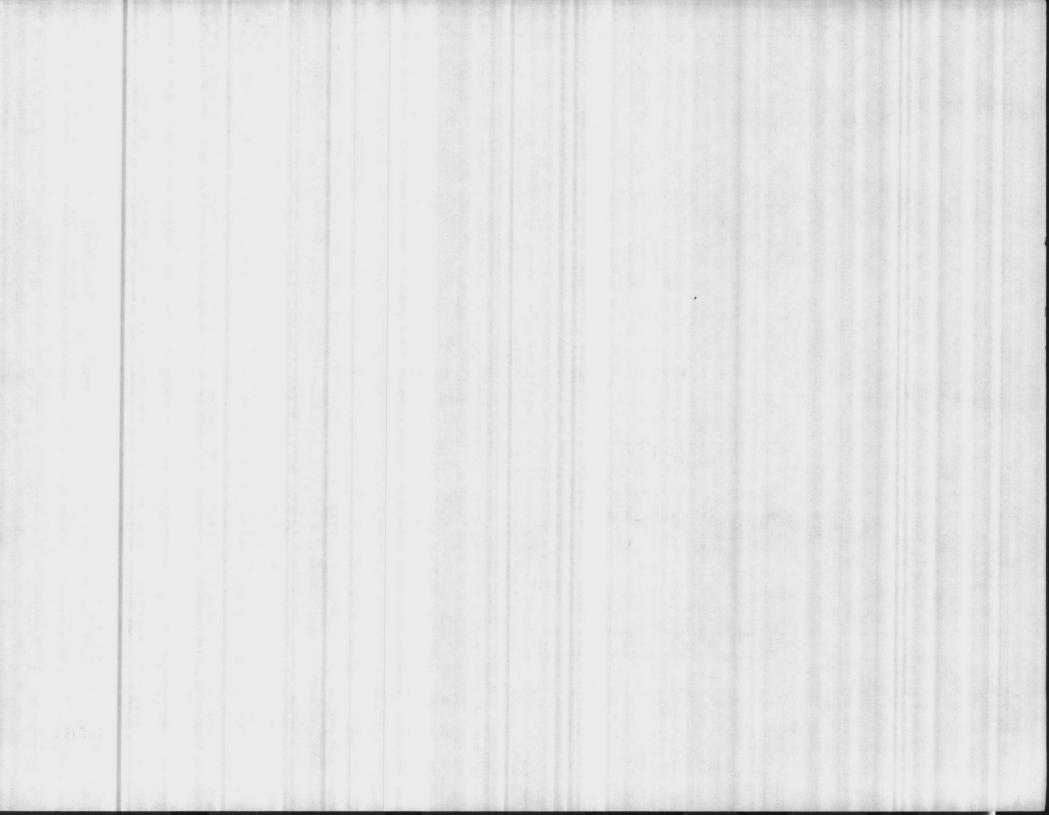
FEATURES

3 PHASE PRIMARY DELTA CONNECTED

- LOOP FEED HV AIR SWITCH OR PROVISION FOR SAME (SELECT SWITCH IN FIELDS 19-20) HV BUSHING INTERNALLY CLAMPED
- TAP CHANGER EXTERNALLY OPERATED FROM HV COMPARTMENT
- 27 = 300 AMP LBOR W 3 POLE EFD AIR SWITCH (15 KV - 95 BIL) WITH (2) #6 TO 4/0 CONNECTORS 3 PHASE LIVE FRONT LOOP HV PATTERN 28 =
- STANDARD LY BUSHING (EXTERNALLY CLAMPED)
 - SPADE LV BUSHING TERMINATION STANDARD LOW VOLTAGE SPADE TERMINATION PER ANSI STANDARDS LV BUSHINGS, STAGGERED PATTERN, ANSI C57. 12.26, FIG 3 & 4A, MIN DIMS W CURRENT-LIMITING HV CLT FUSE FOR EFD SWITCH (STANDARD KVAPPLICATION
- STANDARD CLT FUSE APPLICATIONFOR SINGLE OR CENTER POLE
- 55 = HV LIGHTNING ARRESTER

- 10 KV HV LIGHTNING ARRESTER
 STANDARD LIGHTNING ARRESTER LOCATION
 PROVISIONS TO MOUNT TYPE LC AIR BREAKER
 THERMOMETER, LIC LEV GAUGE, VACUUM PR GAUGE LV DRN VAL W/SAMPLER HV
 3.50 MINIMUM 9.99 MAXIMUM IMPEDANCE MTR 24"CP, 1/2" HEX BOLTS HY DOOR & HANDLE, HINGED IF BAYONET FUSED REFERENCE DRAWING = 7146C27FG1

THIS OUTLINE IS FOR ERECTION OR MOUNTING PURPOSES. IT IS NOT TO SCALE AND SHOULD NOT BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.



Introduction:

WEMCO "C" oil, PDS 55822AG, is the Westinghouse trade name for insulating oil which is a refined mineral oil obtained from the fractional distillation of crude petroleum. It is low in moisture content, inorganic acid, alkali, sulphur, asphalt, tar, vegetable, animal oils or any other substances which will injuriously affect its electrical insulating properties. "CI" oil contains a minimum of 0.15% D.B.P. inhibitor.

Approved Brands of oil:

Westinghouse approved brand insulating oils may be purchased directly from the suppliers. A list of approved brands will be supplied upon request. These insulating oils may be used in any combination from the above sources, since they comply with Westinghouse insulating oil specifications.

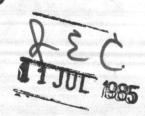
Oil Characteristics:

Coefficient of expansion at 0°C (32°F)	0.000725
100°C (212°F)	0.000755
Dielectric constant	
Fire point (A.S.T.M.D-92)	160°C (320°F) min.
Inorganic chlorides or sulfates (A.S.T.M.D-878)	None
Specific heat	0.488 approx.
Weight per gallon	7.5 pounds

Westingh

ours Oil Specifications		
nouse Oil Specifications:		
Color (A.S.T.M.D-1500)	Wemco C	.5 max.
	Wemco CI	.5 max.
Dielectric strength (A.S.T.M.D-8	77)	30 kv min.
Dielectric strength (A.S.T.M.D-18 (of processed oil)		28 kv min.
Flash point (A.S.T.M.D-92)		-145°C (293°F) min.
Free or sombined sometime sulfine		
(A.S.T.M.D-1275) Interfacial tension (A.S.T.M.D-97 Moisture content (A.S.T.M. 1533) Neutralization number: (mg. KOH per gr. oil) (A.S.T.M.D-20) Oxidation stability (A.S.T.M.D-20)		Non-corrosive
Interfacial tension (A.S.T.M.D-97	1) dynes/com an anMAI	40 min.
Moisture content (A.S.T.M. 1533)	WISIONG COM	\35 ppm max.
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(A.S.T.M.D445) (PACT)	SIL TRAT.	ON CSt max.
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LANTDIV REVIEWER



Port of the Way 45 NO. D NEW STATES 4160 500 TITE

DISTRIBUTION TRANSFORMER DIVISION

REPORT NO. 85-13

USE OF ADDITIONAL POWDERCOAT AS REPLACEMENT
OF BITUPLASTIC 28 FOR BOTTOMCOAT ON PADMOUNTED
DISTRIBUTION TRANSFORMERS

BY

D. J. STRUEMPH

FEBRUARY 5, 1985

APPROVED: APPROVED: 7. R. Miller, Manager 2/5 Design Implementation J. D. Borst. Manager Engineering Operations NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 SUBJECT TO THE REQUISENERS OF JEVIATION: APPROVED DISTRIBUT 1905 PROVAL OF ANY DEVIATION FROM THE CON-JEFFERMA TRACT REQUIREMENTS UNLESS THE CONTRAC TOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION THE CONTRACTOR SHALL BE LANTDIV REVIEWER RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINA. DATE TION OF TRADES ETC. AS REQUIRED. 2938e-skh FOR OFFICER IN CHARGE OF CONSTRUCTION REVIEWER

DISAPPROVEO LATTON REVIEWER STAG

WESTINGHOUSE ELECTRIC CORPORATION

DISTRIBUTION TRANSFORMER DIVISION

USE OF ADDITIONAL POWERCOAT AS REPLACEMENT OF BITUPLASTIC 28 FOR BOTTOMCOATING ON PADMOUNTED DISTRIBUTION TRANSFORMERS

SYNOPSIS

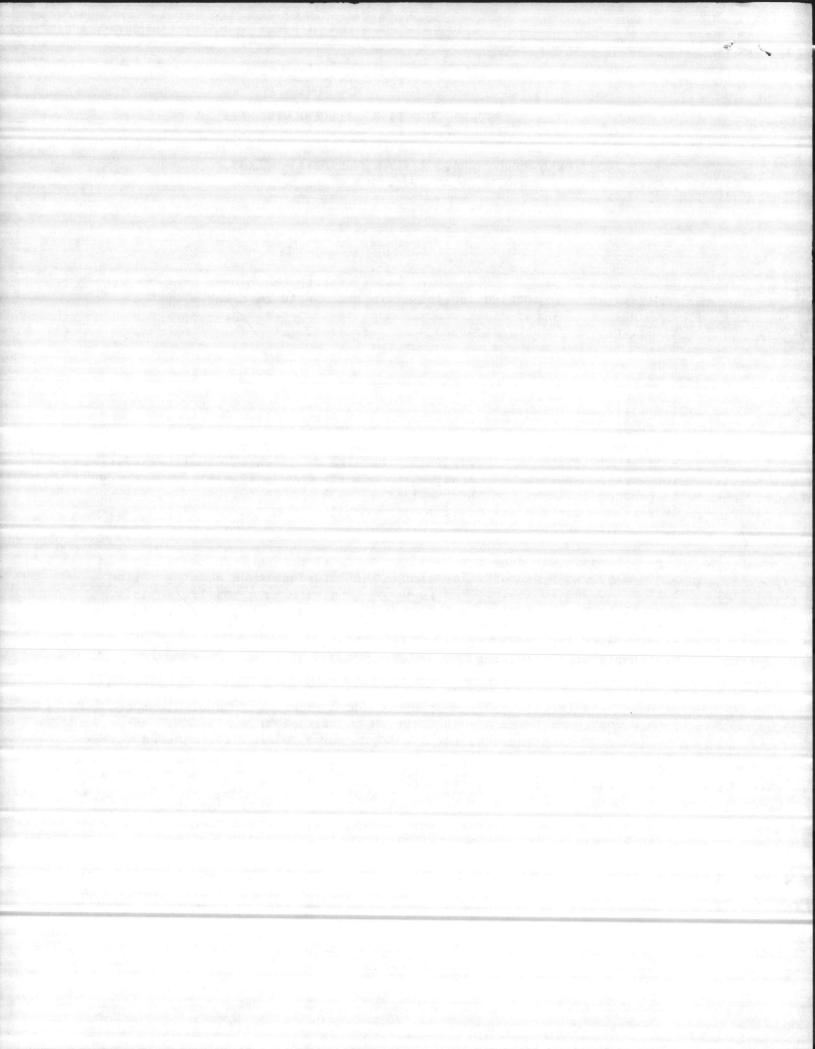
Bituplastic 28 and other coal tar based coatings have been used as undercoating on distribution transformers. Tests have shown that a combination of epoxy electrocoat and polyester powder provides greater resistance to impact, abrasion, and corrosion.

EXPERIMENTAL RESULTS

DTD Engineering Report 81-13 investigated the abrasion and impact resistance of Bituplastic 28 vs. polyester powder. Abrasion testing was done using a Taber abraser with H-22 wheels and 1000 gm weights. The H-22 wheel is a much coarser wheel than the CS-10 wheel usually specified for abrasion testing and greatly reduces the number of cycles necessary to produce failure. In this testing Bituplastic 28 failed in less than 10 cycles while a 3 mil coating of powder lasted a minimum of 100 cycles and as many as 190 cycles before failure.

Impact testing was done for 81-13 using a Gardner IG-1120 impact tester and a 0.625 inch diameter impacter. The Bituplastic 28 coating failed between 40 and 60 in-1b. The powdercoating withstood the 160 in-1b capability of the impact tester without failing. Subsequent testing has shown that heavier builds of powder (sometimes as low as 6-7 mils) may produce outgassing and honeycombing, which greatly reduce the impact resistance of the coating.

In salt spray testing conducted at Jefferson City, panels coated with the standard electrocoat and powder system were shown to be equivalent to panels coated with the standard system and Bituplastic 28. Salt spray testing conducted on tanks for DTD Engineering Report 81-17 showed better results on a powdercoated tank than on a tank which had an additional coat of Bituplastic 28. Corrosion resistance depends more on substrate preparation and the primer used than on film build. The phosphate system and epoxy electrocoat used at Jefferson City provide excellent corrosion resistance. DTD Engineering Report 83-12 shows that the standard Jefferson City paint system meets or exceeds all requirements of the EEI Finishing Guidelines for padmounted equipment, including the 1500 hour salt spray requirement.



Exposure tests conducted on Galveston Island have shown that Bituplastic 28 may actually reduce the corrosion resistance of the standard finish. After approximately 1.5 years of exposure, a panel coated with only the standard finish had 0.10 inch of underfilm corrosion from scribes made to bare metal. A section of the same panel which had an additional coat of Bituplastic 28 had up to 0.5 inch of underfilm corrosion. The Bituplastic 28 may have trapped moisture, leading to the increased corrosion. Other coal tar based coatings on test at the site cracked and lost adhesion after exposure.

EQUIPMENT MODIFICATIONS

In order to increase the powder build and insure complete coverage on tank bases modifications have been made in the Jefferson City paint system.

Two stationary guns were added to the three phase powder booth in July, 1982 to provide additional coverage to the bottom of three phase tanks.

During 1983 a change in the electrocoat solvent was made to increase the film thickness of the cationic epoxy electrocoat applied to all parts before powder coating. The film build of the electrocoat was improved from 0.5-0.7 mils to 0.8-1.0 mils.

An extra gun was added to the reciprocator on each side of the single phase powder booth during July of 1983. This increased the powder film thickness and improved coverage on all parts coated on this line.

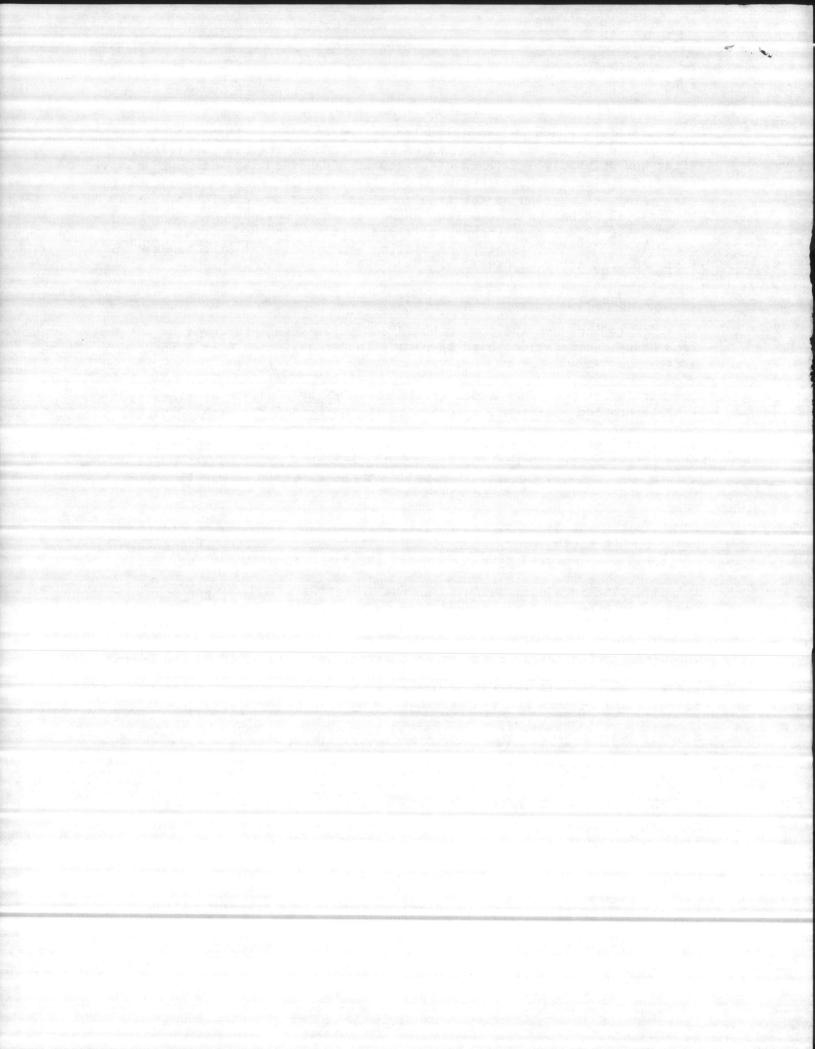
In July, 1984 an additional handgun was installed at the single phase powder booth to reinforce coverage on tank bases and other difficult to coat areas.

The most significant improvement in coverage and film build on the bottom of single phase tanks occurred when the single phase product line was redesigned. The old front load design tank was coated in an upright position whereas the new topload version is hung in an upside down position. This provides easier access for handgun reinforcement and allows powder to float down onto the tank base.

The result of all of these modifications is increased film build on areas near the pad on the completed units. Quality Assurance audits have shown the film build on the bottom of tanks is maintained at the desired 3-5 mil range.

CONCLUSION

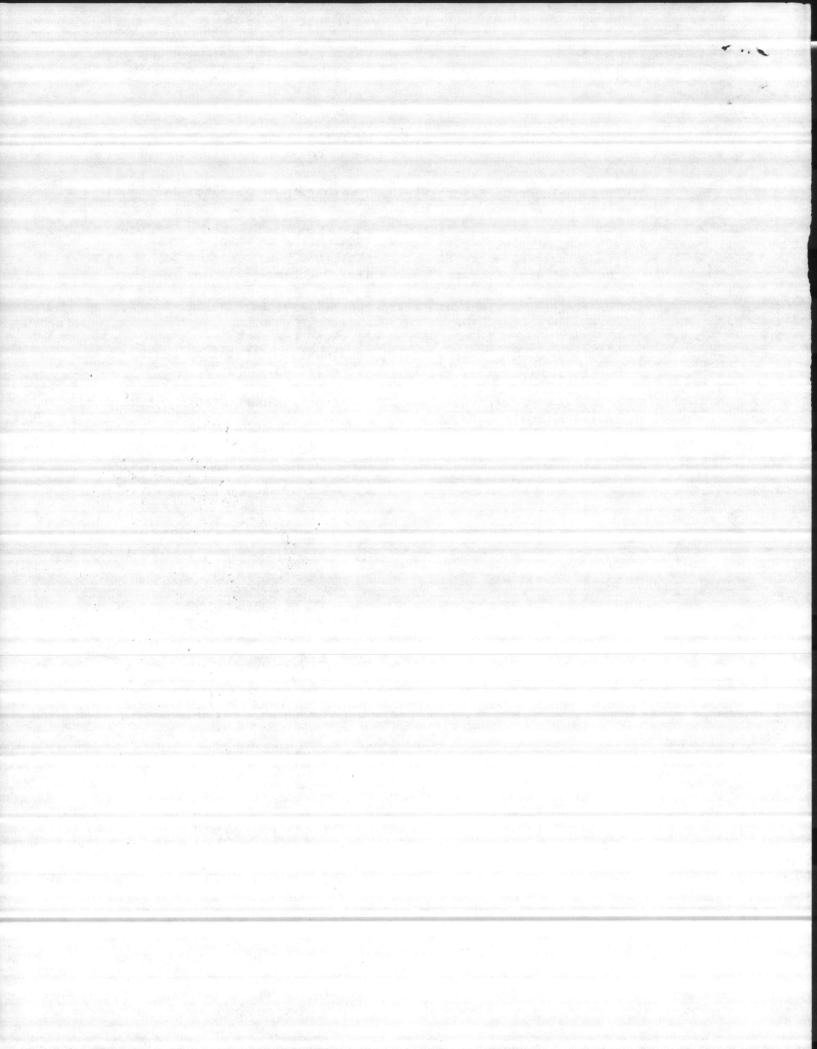
Based on laboratory testing and test site exposure an extra build of polyester powder provides more impact, abrasion and corrosion resistance than the use of Bituplastic 28 coal tar as bottomcoat for padmounted distribution transformers.



REFERENCES

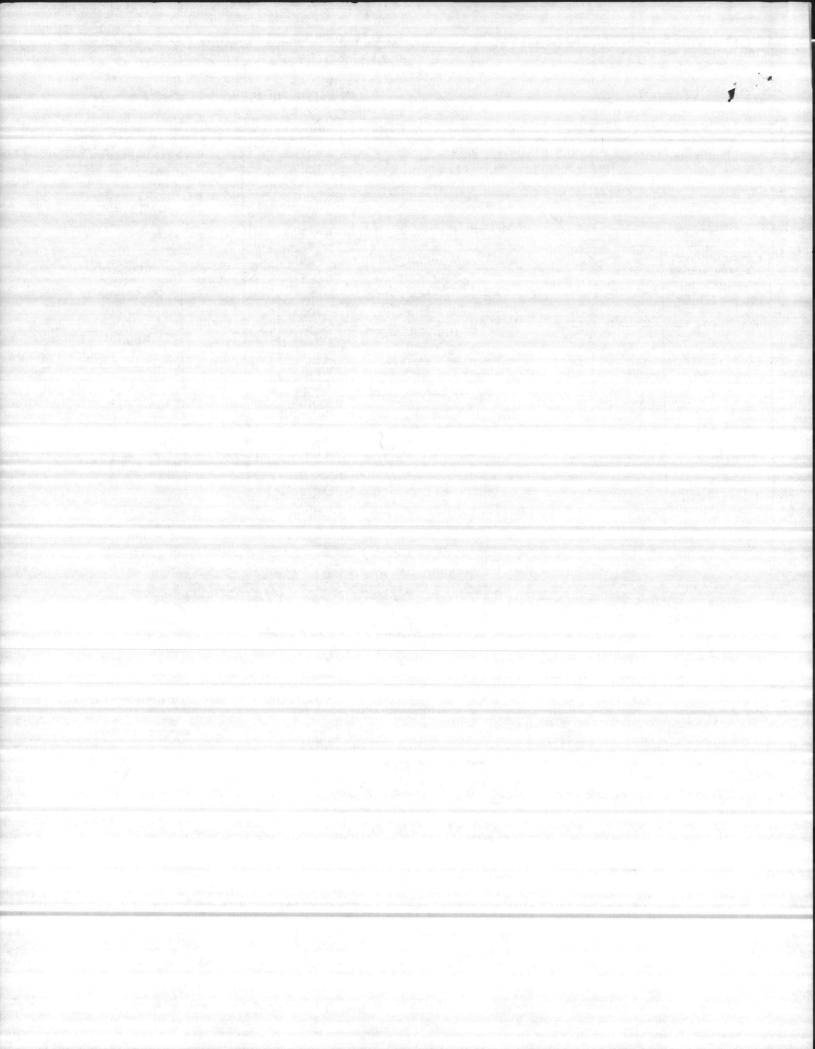
- DTD Engineering Report 81-13, "Evaluation Of Selected Jefferson City Bottomcoats," J. M. Donley, June 1981.
- 2. DTD Engineering Report 81-17, "Evaluation of Extra Build Thermoset Polyester Powder For Possible Use As Bottomcoating on Padmount Transformers," J. Hilko, October, 1981.
- 3. Westinghouse Permanent Record Book 161619, Page 30-32, D. J. Struemph, March, 1983.
- DTD Engineering Report 83-12, "Evaluation Of Paint System For Jefferson City," J. Hilko, November, 1983.
- Proposed EEI Finishing Guidelines for Padmounted Equipment, Draft 6, October, 1983.

2938e-skh



CONTRACTOR'S SUBMITTAL TRANSMITTAL LANTDIV NORFOLK 4-4355/3 (Rev. 11-80) FROM CONTRACTOR WESTMINGSTER COMPANY TO OHCC, Camp Lejeune, NC			N62470-82-C-2244 39-A			04-16-8	04-16-85	
			UNACCOMPANIED ENLISTED PERSONNEL HOUSING MARINE CORPS BASE, CAMP JOHNSON CAMP LEJEUNE, NORTH CAROLINA					
		CONTRACTOR USE ONLY			I	TEWER USE ONLY		
Contractor Ap		*List only one specification division per List only one of the following categories on each t and indicate which is being submitte OICC Approval	ransmittal form.	titution	A-App D-Dis AN-Ap RA-Re	ACTION CODES proved approved as noted proved as noted accept acknowledged		
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SOUTHERLAND ELECTRIC COMPANY

ELECTRICAL CONTRACTORS

HIGHWAY 17, NORTH — P. O. BOX 626

JACKSONVILLE, NORTH CAROLINA 28540

Westminister P.O. Box 1167 Jacksonville, N.	"It is hereby Marchill 1985 the (material) (equipment marked in this submittal, shop dustings, catalog cut(s approved/proposed to be inscripted into Contract Number	the contract
Re: N62470-82-0 UEPH-CLNC Camp Johnso	on Authorized Reviewer Allell Date 4/15/85	
Gentlemen:	Signature CQC Rep Date"	

After a careful review and inspection of the pad mt. transformers for this job we find it has become necessary to submit three items as deviations from specifications.

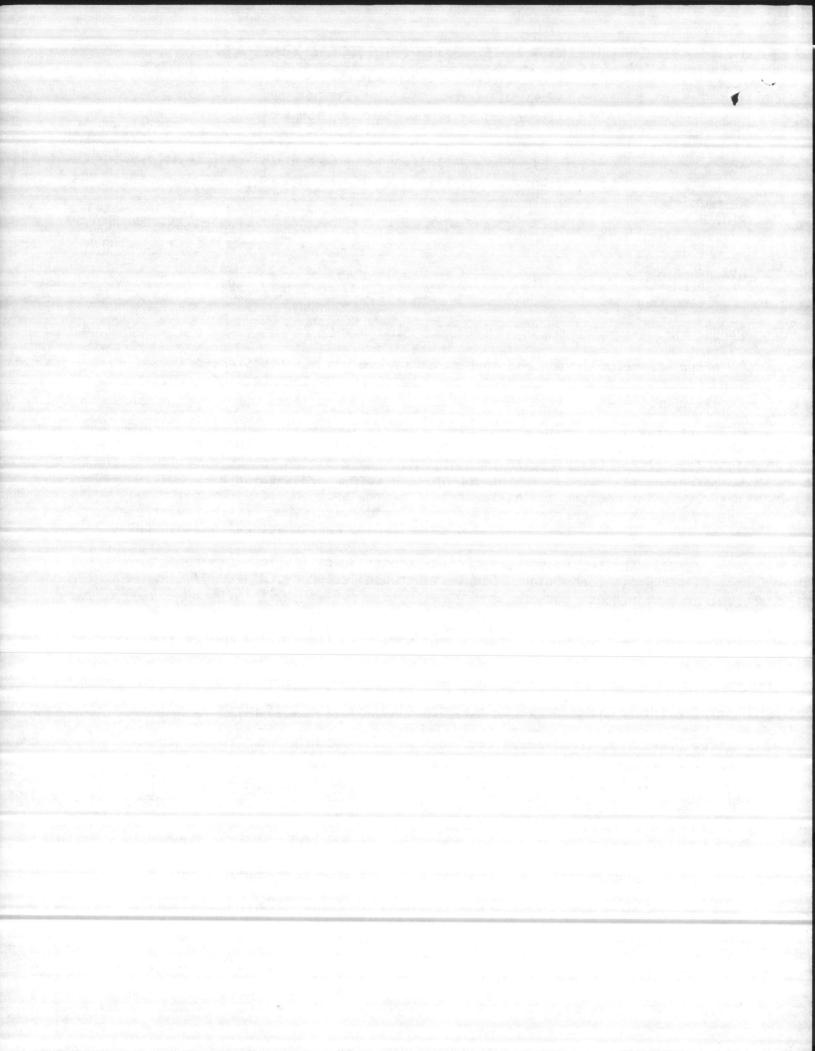
First of all the drain and sampler valve is located in the H.V. compartment in lieu of the L.V. compartment. See Westinghouse letter dated March 6, 1985 item #1 for their explanation of this. In addition to their comments we offer the following: In the low voltage compartments there are circuit breakers being mounted in the lower half of the section. If the drain and sampler valve were located in the L.V. side also, then it would be inaccessible. We feel that Westinghouse design is more practical in this case.

Secondly, the top filter press connection: Specifications call for a top filter press connection. See Westinghouse letter Pg.;3 item #7. We feel as Westinghouse does on this item. They provided a 1" threaded opening which may be used as a top filter press connection. It also can be used as a fill hole and location of the relief valve. Westinghouse uses this opening for these purposes when filling the transformer at the factory.

The deviation here, if any, would be in the fact that there is no separate filter press connection used exclusively for that purpose.

The third item is a low voltage neutral bushing in the high voltage compartment. Westinghouse did not provide this for the reasons given in their letter Pg.4. We are receptive to the idea of bonding the neutral and ground together with a lug mounted in the high voltage compartment. A low voltage neutral bushing with ground strap is provided in the low voltage section of the subject transformers.

We ask that these deviations be approved and that these transformers be used on this project. Approval of these deviations will not affect contract cost or completion, however, since these transformers are already on the jobsite it is very important to all concerned that we get these matters resolved.



March 6, 1985

Mr. Floyd Woods
Maddux Supply Company
P. O. Drawer 4067
Greenviille, N. C. 27834

UEPH Job CH 33095 Southerland Electric Your Order 84E-651

The state of the s

Dear Floyd:

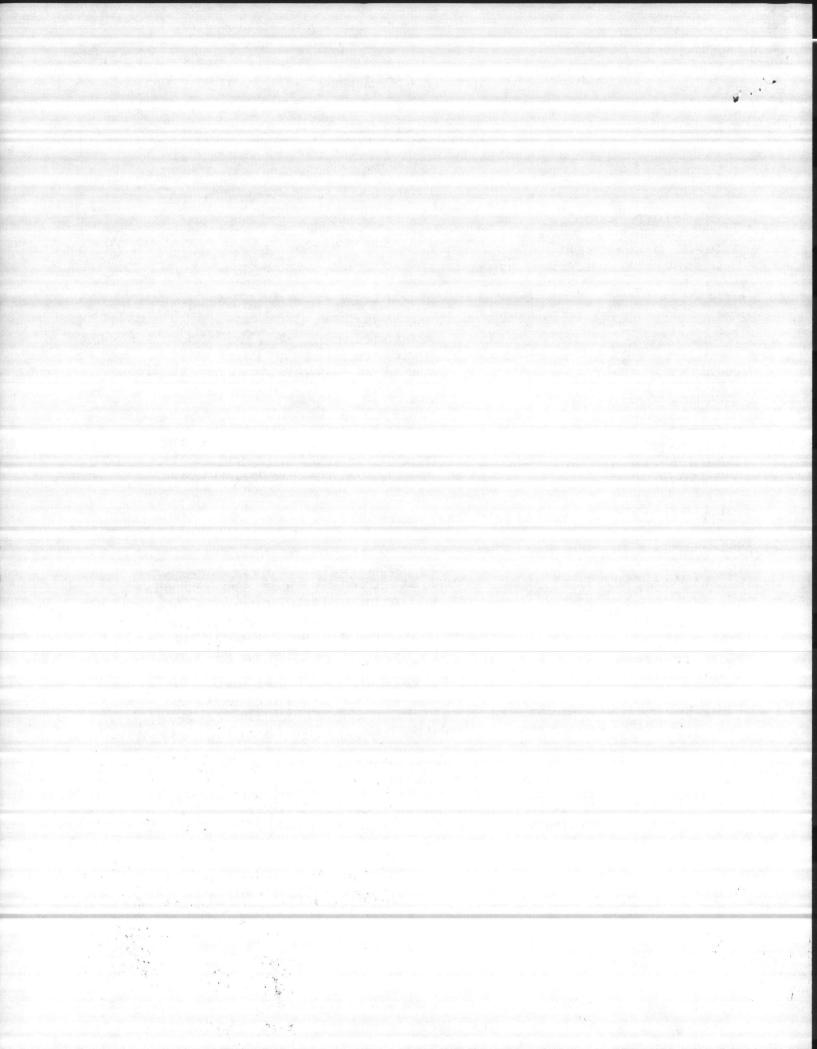
In response to your letter of February 15, 1985 concerning the rejection of the pad mounted transformers on the above referenced project, I would like to address each point as follows:

1. Report #169 - 4(A) Drain sample valve location

We locate our drain sample valve in the high voltage compartment as there is more room for customer when utilizing this valve. ANSI standards do not specify that this be located in either the high voltage or low voltage compartments and our design conveniently locates it in the high voltage compartment. We have been supplying this valve in this location for years. The specification in Paragraph 2.6.12 does state that the low voltage compartment contain gauges, valves, thermometers, low voltage bushings, etc., but this was interpreted as a general statement since all of these items are located in this compartment except the sampler drain valve.

 Report #169-4(B) Interrupting capacity of the fuses as minimum 10,000 AIC

We have utilized CLT type fuses and as is indicated these fuses are minimum 25,000 AIC, which is better than minimum specified. (See attached literature PDL 46-300-13B).





Westinghouse **Electric Corporation**

June 18, 1985

3701 National Drive Box 10386 Raleigh, North Carolina 27605-0386

Mr. Eddie G. Holland Southerland Electric Co. P. O. Box 626 Highway 17N Jacksonville, N.C. 28540

> U.E.P.H. Camp LeJeune Contract No. N6247082-C-2244 Our Order CH 33095 Maddux Supply Order 84E-651 Pad Mounted Transformers

Dear Eddie:

LANTDIV REVIEWER

DATE

We are in receipt of the 5/10/85 transmittal from LANTDIV-Norfolk (copy attached) which rejected our pad mounted transformers on the above referenced project.

As you know, we have submitted several times and I believe all items in question heretofore have been cleared up and approved with the exception of those listed on this transmittal of 5/10/85.

I am attaching our drawings and literature which address the ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND points in question as follows: NORFOLK, VIRGINIA 23511 1. Weight: Item 1 75 KVA Unit 300 KVA Unit Item 2 Item 3 PRUS 287 REQUIREMENTS OF Item 4 112 1/2 KVA Operating Instruction Reference ALLS ATTENTION TO AND SUPPORTS THE ATTACHMENTS OF SHALL BE TOR CALLS ATTENTION TO AND SUPPORTS THE ATTACHMENTS OF SHALL BE TOR CALLS ATTENTION TO AND SUPPORTS THE TOR CALLS ATTENTION TO AND SUPPORTS THE TOR CALLS ATTENTION TO AND SUPPORTS THE TOR CALLS ATTENTION. THE CONTRACTOR SHALL BE TOR CALLS ATTENTION. THE CONTRACTOR SHALL BE TOR CALLS ATTENTION. THE CONTRACTOR SHALL BE TOR CALLS ATTENTION. 500 KVA Unit SUBJECT 5958 Attached is I.B. 46-060-1-Seeviation. The Contractor Shall BE TOR CALLS ATTENTION TO AND SUPPORTS BE TOR CALLS ATTENTION TO AND SUPPORTS BE TOR CALLS ATTENTION TO AND SUPPORTS BE TO A SUPPORTS BE TO A SUPPORT TO A JEYMINUM AFFRUYEL FOR OFFICER IN CHARGE OF CONSTRUCTION REVIEWER

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June 18, 1985 Page 2

Insulating Oil:

Type WEMCO "C" per attached PDL 46-300-22A

4. Undercoating Not By Manufacturer:

See attached Report 85-13 concerning our undercoating which is superior to undercoating specified.

5. Type of Conductors:

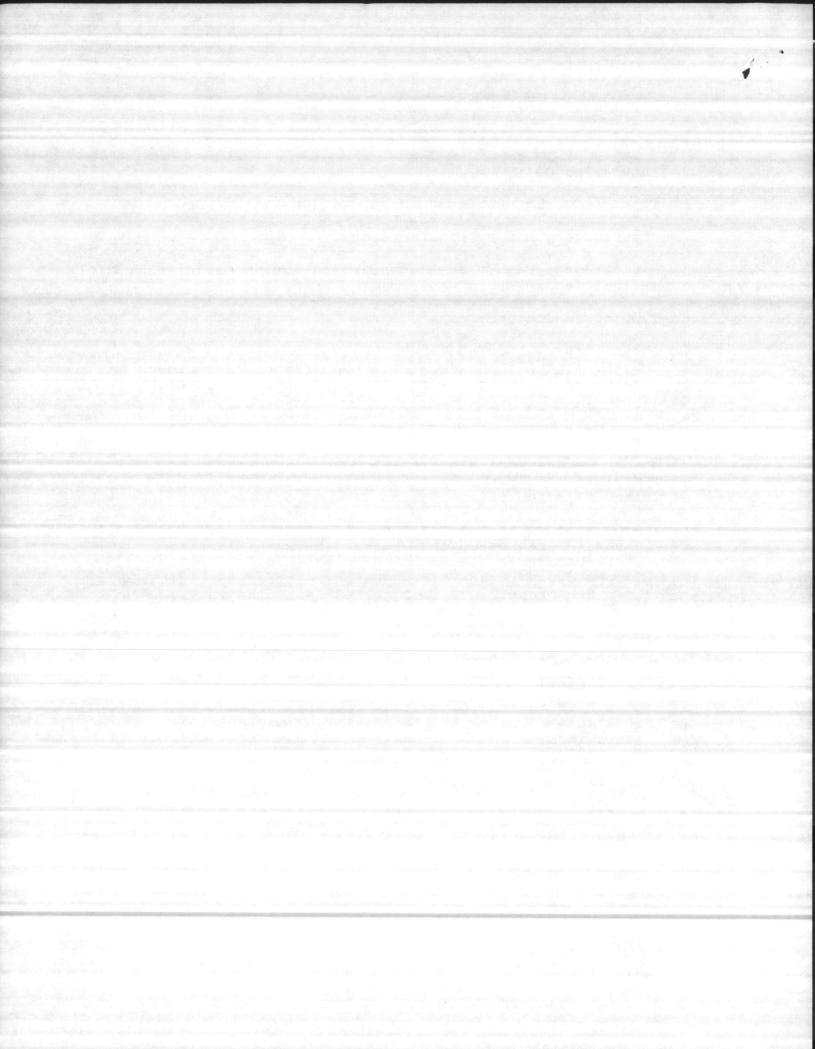
Shown either AL or cu for HV or LV depending on transformer. This is shown on attached "Feature and Dimension List dated 11/19/84 for each transformer, and is highlighted.

6. Drain Valve in High Voltage Compartment.

We have addressed this problem before and requested a deviation. (See your letter March 13, 1985; our letter of March 6, 1985, Item 1 - copies of both attached.)

On this point, we ask for reconsideration of our earlier requested deviation. The specifications are defective and cannot be performed in what we consider a reasonable manner. We refer specifically to Paragraph 2.6.1.2, Page 16335-5. The valves were mentioned in a general statement to be in the low voltage compartment in the first sentence. However, the last sentence states that the valves be readily accessible. Based on our interpretation and normal procedure, we mount the drain valve in the high voltage compartment when breakers and/or panels are mounted in the low voltage compartment such that the valve will be readily accessible. Our original drawings which were submitted showed this valve in the high voltage compartment, but we failed to note it as a deviation originally. Based on the way we build transformers when breakers and/or panels are located in the secondary, we consider it physically impossible and commercially impractical to mount the drain valve in the low voltage compartment.

Based on the above and the knowledge that we have



June 18, 1985 Page 3

shipped other transformers to Camp Lejeune which are now in service and which have the drain in the high voltage compartment, and the fact that the government possessed a "doctrine of greater knowledge" regarding a specification change from previous jobs requiring the drain valve to be in the low voltage compartment, we request the government accept these transformers, as they now exist on the job site and are ready to be energized.

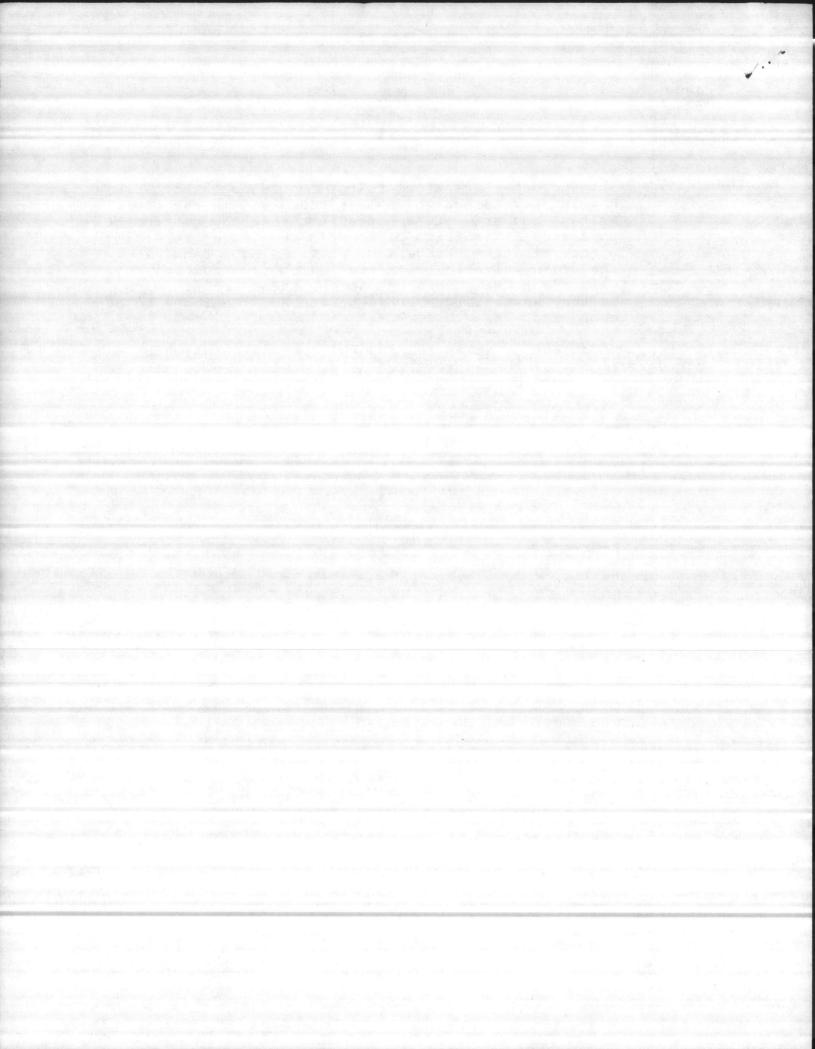
Your prompt attention in addressing this reconsideration of our deviation would be appreciated as we would like to get this matter resolved.

Yours truly,

J. L. Vaughan Sales Engineer

JLV: js

CC - Mr. Floyd Woods
 Maddux Supply Company
 Greenville, N.C.



ELECTRIC DUTONIPANNAND

FLECTRICAL CONTRADION SUBSINION 23511

JACKSONVILLE AND THE CONTRADION 28540 SOUTHERLAND ELECTRIC

PPPOWER S NOTE

CONTRACT NO.

HIGHWAY 17 NORTH

SUBJECT TO THE REQUIREMENTS OF 224

Westminster Company P.O. Box 1167 Jacksonville, N. C. 28540

Re: N62470-82-C-2244 UEPH, CLNC Pad Mounted Transformers

Gentlemen:

TOR CALLS ATTENTION TO AND SUPPORTS THE BE SHALL BE TOR CALLS ATTENTION TO AND SUPPORTS THE BE SHALL B We have received more information and partification conserving the pad ted transformers on this job.

A copy of the reviewers comments is FOR OFFICER! mounted transformers on this job.

As you can see in Westinghouse's letter dated June 18, 1985, each item has been addressed. Item No. 6, which concerns the location of the drain and sampler valve, seems to be the major discrepancy. Westinghouse has ask for a reconsideration. Norfolk has already stated before that this is not acceptable.

We are concerned about this, and offer the following. If ROICC in Norfolk holds to their previous position on the location of the drain and sampler valve, but is satisfied with the other aspects of these transformers then we would like to see an "approved as noted" come back on the transmittal. We feel that with a note to "locate drain and sampler in low voltage compartment" we could resolve this problem.

We have knowledge that the device could be relocated; however, it would not be easily accessable in the low voltage side because of panelboards located there.

In any event, it is our wish to see the matter resolved without any delay to the project. Thank you for your cooperation.

AS NOTED

DEVIATION: APPROVED

EGH:pi Enclosure LANTDIV REVIEWER

DATE

CONTRACT NO. LASUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM CONTRACTOR TRACT REQUIREMENTS UNLESS THE CONTRACT

TRACT REQUIREMENTS UNLESS THE CUNTRACT TOR CALLS ATTENTION TO AND SUPPORTS THE

Eddie D. Tolland

Eddie G. Holland

HAVAL FACILITIES ENGINEERING COMMAND

HAVAL FACILITIES ENGINEERING 23514

HAVAL FACILITIES VIRGINIA 23514 AND STATE OF THE PROPERTY OF T PROVIDENCE OF CONSTRUCTION OF

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BISAPPROVED.

ANTOIV REVIEWER

BILAG

1 1 JUL 1385

TRANSMITTAL NO. 39-B WESTMINSTER COMPANY

SECTION 16335 - EXTERIOR TRANSFORMERS, SUB-STATIONS, AND SWITCHGEAR

ITEM #1

PAD-MOUNTED TRANSFORMERS - RESUBMISSION

The is hereby certified that the (material of in this submittal, shop drawings	, catalog out(s), etc., and
Number No.2470-82-C-2244, is in odrowings and apecifications, and can be	installed in the allocated
space and isapproved for use_X_	_submitted for Coverment
approval.	6/27/85
Authorised Reviewer All Miller	
Signature 000 Rep Ale Cngli	6/26/85

AMMA -