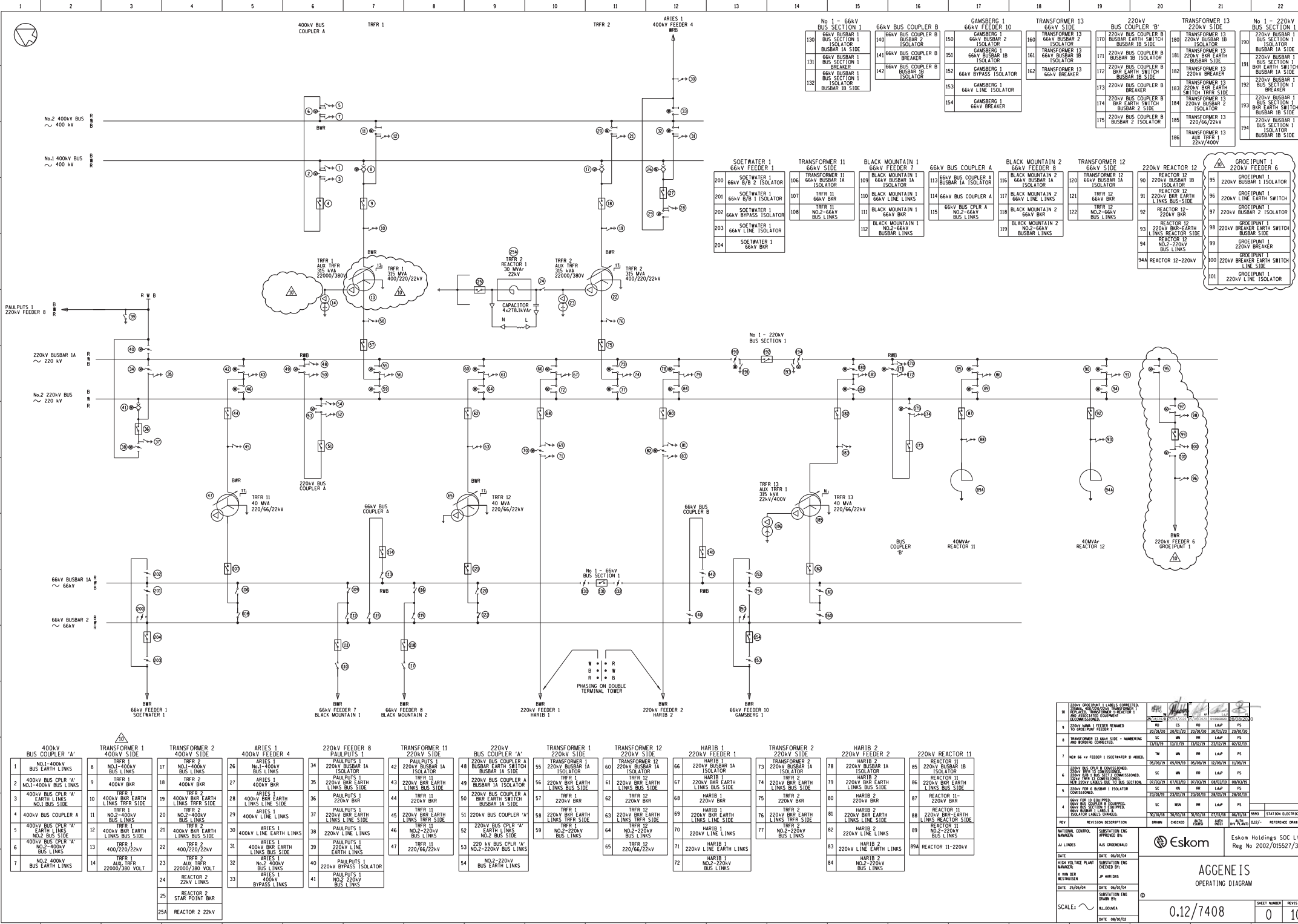


REV		WJ MOORE		093		STATION ELECTRIC	
NATIONAL CONTROL MANAGER		SUBSTATION ENG APPROVED BY		DATE		DATE	
DATE		DATE		DATE		DATE	
HIGH VOLTAGE PLANT MANAGER		SUBSTATION ENG CHECKED BY		DATE		DATE	
DATE		DATE		DATE		DATE	
SCALE: ~		WJ MOORE		SHEET NUMBER		REVISION	
				0		1	

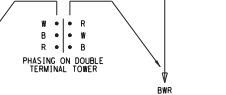
MULILO  
 IPP SELF BUILD SCOPE  
 VETLAAGTE MAIN TRANSMISSION SUBSTATION (PROPOSED)  
 22 A01 A01



No 1 - 66kV BUS SECTION 1		66kV BUS COUPLER B		GAMBERG 10 66kV FEEDER 10		TRANSFORMER 13 66kV SIDE		220kV BUS COUPLER 'B'		TRANSFORMER 13 220kV SIDE		No 1 - 220kV BUS SECTION 1					
130	66kV BUSBAR 1 BUS SECTION 1 ISOLATOR	140	66kV BUS COUPLER B BUSBAR 2 ISOLATOR	150	66kV BUSBAR 1 ISOLATOR	160	TRANSFORMER 13 66kV BUSBAR 2 ISOLATOR	170	220kV BUS COUPLER B BUSBAR 1 ISOLATOR	180	TRANSFORMER 13 220kV BUSBAR 1B ISOLATOR	190	220kV BUSBAR 1 BUS SECTION 1 ISOLATOR	191	220kV BUSBAR 1 BUS SECTION 1 BKR EARTH SWITCH	192	220kV BUSBAR 1 BUS SECTION 1 BREAKER
131	66kV BUSBAR 1 BUS SECTION 1 BREAKER	141	66kV BUS COUPLER B BUSBAR 1B ISOLATOR	151	66kV BUSBAR 1B ISOLATOR	161	TRANSFORMER 13 66kV BUSBAR 1B ISOLATOR	171	220kV BUS COUPLER B BUSBAR 1B ISOLATOR	181	TRANSFORMER 13 220kV BUSBAR 1B ISOLATOR	193	220kV BUSBAR 1 BUS SECTION 1 ISOLATOR	194	220kV BUSBAR 1 BUS SECTION 1 BREAKER		
132	66kV BUSBAR 1 BUS SECTION 1 ISOLATOR	142	66kV BUS COUPLER B BUSBAR 1B ISOLATOR	152	66kV BUSBAR 1B BREAKER	162	TRANSFORMER 13 66kV BYPASS ISOLATOR	172	220kV BUS COUPLER B BUSBAR 1B ISOLATOR	182	TRANSFORMER 13 220kV BKR EARTH SWITCH TRFR SIDE	194	220kV BUSBAR 1 BUS SECTION 1 ISOLATOR				
				153	GAMBERG 10 66kV LINE ISOLATOR	163	TRANSFORMER 13 66kV BREAKER	173	220kV BUS COUPLER B BUSBAR 2 ISOLATOR	183	TRANSFORMER 13 220kV BKR EARTH SWITCH TRFR SIDE						
				154	GAMBERG 10 66kV BREAKER			174	220kV BUS COUPLER B BKR EARTH SWITCH BUSBAR 2 SIDE	184	TRANSFORMER 13 220kV BKR EARTH SWITCH TRFR SIDE						
								175	220kV BUS COUPLER B BUSBAR 2 ISOLATOR	185	TRANSFORMER 13 220kV/66kV/22kV						

SOETWATER 1 66kV FEEDER 1		TRANSFORMER 11 66kV SIDE		BLACK MOUNTAIN 1 66kV FEEDER 7		66kV BUS COUPLER A		BLACK MOUNTAIN 2 66kV FEEDER 8		TRANSFORMER 12 66kV SIDE		220kV REACTOR 12		GROE PUNT 1 220kV FEEDER 6													
200	SOETWATER 1 66kV B/B 2 ISOLATOR	106	TRANSFORMER 11 66kV BUSBAR 1A ISOLATOR	109	BLACK MOUNTAIN 1 66kV BUSBAR 1A ISOLATOR	113	66kV BUS COUPLER A ISOLATOR	116	BLACK MOUNTAIN 2 66kV BUSBAR 1A ISOLATOR	120	TRANSFORMER 12 66kV BUSBAR 1A ISOLATOR	90	REACTOR 12 220kV BUSBAR 1B ISOLATOR	95	GROE PUNT 1 220kV FEEDER 6	96	GROE PUNT 1 220kV LINE EARTH SWITCH	97	GROE PUNT 1 220kV BUSBAR 2 ISOLATOR	98	GROE PUNT 1 220kV BKR EARTH SWITCH	99	GROE PUNT 1 220kV BREAKER	100	GROE PUNT 1 220kV LINE ISOLATOR	101	GROE PUNT 1 220kV LINE ISOLATOR
201	SOETWATER 1 66kV B/B 1 ISOLATOR	107	TRFR 11 66kV BKR	110	BLACK MOUNTAIN 1 66kV LINE LINKS	114	66kV BUS COUPLER A	117	BLACK MOUNTAIN 2 66kV LINE LINKS	121	TRFR 12 66kV BKR	91	REACTOR 12 220kV BKR EARTH SWITCH BUS-SIDE														
202	SOETWATER 1 66kV BYPASS ISOLATOR	108	TRFR 11 NO.2-66kV BUS LINKS	111	BLACK MOUNTAIN 1 NO.2-66kV BUSBAR LINKS	115	66kV BUS COUPLER A NO.2-66kV BUS LINKS	118	BLACK MOUNTAIN 2 NO.2-66kV BUSBAR LINKS	122	TRFR 12 NO.2-66kV BUS LINKS	92	REACTOR 12 220kV BKR	93	REACTOR 12-220kV												
203	SOETWATER 1 66kV LINE ISOLATOR									94	REACTOR 12-220kV																
204	SOETWATER 1 66kV BKR									94A	REACTOR 12-220kV																

No.1 400kV BUS ~ 400 kV  
 No.2 400kV BUS ~ 400 kV  
 No.1 220kV BUS ~ 220 kV  
 No.2 220kV BUS ~ 220 kV  
 No.1 66kV BUS ~ 66kV  
 No.2 66kV BUS ~ 66kV



400kV BUS COUPLER 'A'		TRANSFORMER 1		TRANSFORMER 2		ARIES 1 400kV FEEDER 4		220kV FEEDER 8		TRANSFORMER 11		220kV BUS COUPLER 'A'		TRANSFORMER 1		TRANSFORMER 12		HARIB 1 220kV FEEDER 1		TRANSFORMER 2		HARIB 2 220kV FEEDER 2		220kV REACTOR 11															
1	NO.1-400kV BUS EARTH LINKS	9	NO.1-400kV BUS LINKS	17	TRFR 2 400kV BAR	26	TRFR 1 400kV BAR	34	NO.1-400kV BUS LINKS	42	220kV BUSBAR 1A ISOLATOR	50	220kV BUSBAR 1A ISOLATOR	58	220kV BUS COUPLER 'A' BUSBAR EARTH SWITCH	66	TRANSFORMER 11 220kV BUSBAR 1A ISOLATOR	74	TRANSFORMER 12 220kV BUSBAR 1A ISOLATOR	82	HARIB 1 220kV BUSBAR 1A ISOLATOR	90	HARIB 2 220kV BUSBAR 1A ISOLATOR	98	REACTOR 11 220kV BUSBAR 1B ISOLATOR	106	REACTOR 11 220kV BUSBAR 1B ISOLATOR	114	REACTOR 11 220kV BUSBAR 1B ISOLATOR	122	REACTOR 11 220kV BUSBAR 1B ISOLATOR	130	REACTOR 11 220kV BUSBAR 1B ISOLATOR	138	REACTOR 11 220kV BUSBAR 1B ISOLATOR	146	REACTOR 11 220kV BUSBAR 1B ISOLATOR		
2	400kV BUS CLR 'A' NO.1-400kV BUS LINKS	10	TRFR 1 400kV BAR	18	TRFR 2 400kV BAR	27	TRFR 1 400kV BAR	35	220kV BAR EARTH LINKS TRFR SIDE	43	220kV BAR EARTH LINKS TRFR SIDE	51	220kV BAR EARTH LINKS TRFR SIDE	59	220kV BAR EARTH LINKS TRFR SIDE	67	220kV BAR EARTH LINKS TRFR SIDE	75	220kV BAR EARTH LINKS TRFR SIDE	83	220kV BAR EARTH LINKS TRFR SIDE	91	220kV BAR EARTH LINKS TRFR SIDE	99	220kV BAR EARTH LINKS TRFR SIDE	107	220kV BAR EARTH LINKS TRFR SIDE	115	220kV BAR EARTH LINKS TRFR SIDE	123	220kV BAR EARTH LINKS TRFR SIDE	131	220kV BAR EARTH LINKS TRFR SIDE	139	220kV BAR EARTH LINKS TRFR SIDE	147	220kV BAR EARTH LINKS TRFR SIDE	155	220kV BAR EARTH LINKS TRFR SIDE
3	400kV BUS CLR 'A' EARTH LINKS NO.1 BUS SIDE	11	TRFR 1 NO.2-400kV BUS LINKS	19	TRFR 2 400kV BAR EARTH LINKS TRFR SIDE	28	TRFR 1 400kV BAR EARTH LINKS TRFR SIDE	36	400kV LINE LINKS	44	220kV BAR EARTH LINKS TRFR SIDE	52	220kV BAR EARTH LINKS TRFR SIDE	60	220kV BAR EARTH LINKS TRFR SIDE	68	220kV BAR EARTH LINKS TRFR SIDE	76	220kV BAR EARTH LINKS TRFR SIDE	84	220kV BAR EARTH LINKS TRFR SIDE	92	220kV BAR EARTH LINKS TRFR SIDE	100	220kV BAR EARTH LINKS TRFR SIDE	108	220kV BAR EARTH LINKS TRFR SIDE	116	220kV BAR EARTH LINKS TRFR SIDE	124	220kV BAR EARTH LINKS TRFR SIDE	132	220kV BAR EARTH LINKS TRFR SIDE	140	220kV BAR EARTH LINKS TRFR SIDE	148	220kV BAR EARTH LINKS TRFR SIDE	156	220kV BAR EARTH LINKS TRFR SIDE
4	400kV BUS COUPLER A	12	TRFR 1 400kV BAR EARTH LINKS TRFR SIDE	20	TRFR 2 400kV BAR EARTH LINKS TRFR SIDE	29	ARIES 1 400kV BAR EARTH LINKS TRFR SIDE	37	400kV LINE LINKS	45	220kV BAR EARTH LINKS TRFR SIDE	53	220kV BAR EARTH LINKS TRFR SIDE	61	220kV BAR EARTH LINKS TRFR SIDE	69	220kV BAR EARTH LINKS TRFR SIDE	77	220kV BAR EARTH LINKS TRFR SIDE	85	220kV BAR EARTH LINKS TRFR SIDE	93	220kV BAR EARTH LINKS TRFR SIDE	101	220kV BAR EARTH LINKS TRFR SIDE	109	220kV BAR EARTH LINKS TRFR SIDE	117	220kV BAR EARTH LINKS TRFR SIDE	125	220kV BAR EARTH LINKS TRFR SIDE	133	220kV BAR EARTH LINKS TRFR SIDE	141	220kV BAR EARTH LINKS TRFR SIDE	149	220kV BAR EARTH LINKS TRFR SIDE	157	220kV BAR EARTH LINKS TRFR SIDE
5	400kV BUS CLR 'A' EARTH LINKS NO.2 BUS SIDE	13	TRFR 1 400kV BAR EARTH LINKS TRFR SIDE	21	TRFR 2 400kV BAR EARTH LINKS TRFR SIDE	30	ARIES 1 400kV BAR EARTH LINKS TRFR SIDE	38	400kV LINE LINKS	46	220kV BAR EARTH LINKS TRFR SIDE	54	220kV BAR EARTH LINKS TRFR SIDE	62	220kV BAR EARTH LINKS TRFR SIDE	70	220kV BAR EARTH LINKS TRFR SIDE	78	220kV BAR EARTH LINKS TRFR SIDE	86	220kV BAR EARTH LINKS TRFR SIDE	94	220kV BAR EARTH LINKS TRFR SIDE	102	220kV BAR EARTH LINKS TRFR SIDE	110	220kV BAR EARTH LINKS TRFR SIDE	118	220kV BAR EARTH LINKS TRFR SIDE	126	220kV BAR EARTH LINKS TRFR SIDE	134	220kV BAR EARTH LINKS TRFR SIDE	142	220kV BAR EARTH LINKS TRFR SIDE	150	220kV BAR EARTH LINKS TRFR SIDE	158	220kV BAR EARTH LINKS TRFR SIDE
6	400kV BUS CLR 'A' NO.2-400kV BUS LINKS	14	TRFR 1 400kV BAR EARTH LINKS TRFR SIDE	22	TRFR 2 400kV BAR EARTH LINKS TRFR SIDE	31	ARIES 1 400kV BAR EARTH LINKS TRFR SIDE	39	400kV LINE LINKS	47	220kV BAR EARTH LINKS TRFR SIDE	55	220kV BAR EARTH LINKS TRFR SIDE	63	220kV BAR EARTH LINKS TRFR SIDE	71	220kV BAR EARTH LINKS TRFR SIDE	79	220kV BAR EARTH LINKS TRFR SIDE	87	220kV BAR EARTH LINKS TRFR SIDE	95	220kV BAR EARTH LINKS TRFR SIDE	103	220kV BAR EARTH LINKS TRFR SIDE	111	220kV BAR EARTH LINKS TRFR SIDE	119	220kV BAR EARTH LINKS TRFR SIDE	127	220kV BAR EARTH LINKS TRFR SIDE	135	220kV BAR EARTH LINKS TRFR SIDE	143	220kV BAR EARTH LINKS TRFR SIDE	151	220kV BAR EARTH LINKS TRFR SIDE	159	220kV BAR EARTH LINKS TRFR SIDE
7	NO.2 400kV BUS EARTH LINKS	15	TRFR 1 400kV BAR EARTH LINKS TRFR SIDE	23	TRFR 2 400kV BAR EARTH LINKS TRFR SIDE	32	ARIES 1 400kV BAR EARTH LINKS TRFR SIDE	40	400kV LINE LINKS	48	220kV BAR EARTH LINKS TRFR SIDE	56	220kV BAR EARTH LINKS TRFR SIDE	64	220kV BAR EARTH LINKS TRFR SIDE	72	220kV BAR EARTH LINKS TRFR SIDE	80	220kV BAR EARTH LINKS TRFR SIDE	88	220kV BAR EARTH LINKS TRFR SIDE	96	220kV BAR EARTH LINKS TRFR SIDE	104	220kV BAR EARTH LINKS TRFR SIDE	112	220kV BAR EARTH LINKS TRFR SIDE	120	220kV BAR EARTH LINKS TRFR SIDE	128	220kV BAR EARTH LINKS TRFR SIDE	136	220kV BAR EARTH LINKS TRFR SIDE	144	220kV BAR EARTH LINKS TRFR SIDE	152	220kV BAR EARTH LINKS TRFR SIDE	160	220kV BAR EARTH LINKS TRFR SIDE

19	220kV GROE PUNT 1 LINE'S CORRECTED	SC	PS	02/03/20												
10	REVISION 10: 220kV FEEDER 10 RECOMMENDATION	SC	PS	02/03/20												
9	220kV HARIB 1 FEEDER RENAME TO GROE PUNT FEEDER	SC	PS	20/02/20												
8	TRANSFORMER 13 66kV SIDE - RENAME	SC	PS	13/02/20												
7	NEE 66 kV FEEDER 1 ISOLATOR IN MODEL	TR	MS	L&P												
6	220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS	SC	MS	L&P												
5	220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS	SC	MS	L&P												
4	66kV TRFR 12 EARTH LINKS 66kV TRFR 12 EARTH LINKS 66kV TRFR 12 EARTH LINKS 66kV TRFR 12 EARTH LINKS	SC	MS	L&P												
3	220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS	SC	MS	L&P												
2	220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS	SC	MS	L&P												
1	220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS 220kV TRFR 12 EARTH LINKS	SC	MS	L&P												
<table border="1"> <tr> <td>DATE</td> <td>06/09/04</td> <td>DATE</td> <td>06/09/04</td> </tr> <tr> <td>DATE</td> <td>06/09/04</td> <td>DATE</td> <td>06/09/04</td> </tr> <tr> <td>DATE</td> <td>06/09/04</td> <td>DATE</td> <td>06/09/04</td> </tr> </table>					DATE	06/09/04	DATE	06/09/04	DATE	06/09/04	DATE	06/09/04	DATE	06/09/04	DATE	06/09/04
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NATIONAL CONTROL MANAGER APPROVED BY: DATE: 06/09/04 HIGH VOLTAGE PLANT MANAGER: J.P. HERDAS DATE: 06/09/04 DATE: 06/09/04				Eskom Holdings SOC Ltd Reg No 2002/015527/30												
SCALE: 0.12/7408 SHEET NUMBER: 0 REVISION: 10				AGGENE IS OPERATING DIAGRAM												