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Unit 1

FOR INFORMATION ONLY

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RESERVE AUXILIARY TRANSFORMERS

REVISION 3

FOR INFORMATION ONLY

1.0 PURPOSE

This procedure provides the necessary instructions for energizing and operating the Reserve Auxiliary Transformer (RAT). Procedure instructions include the following sections.

- 4.1.1 Energizing The RAT
- 4.2.1 Transferring RAT Cooling Fan Electrical Power Source
- 4.2.2 Cooling Fan Auto Operation
- 4.3.1 De-energizing The RAT
- 4.4.1 Cooling Fan Manual Operation
- 4.4.2 Restoring A RAT To Service

2.0 PRECAUTIONS AND LIMITATIONS

2.1 PRECAUTIONS

- 2.1.1 System Operator shall be responsible for providing proper switching instructions for energizing the RAT.
- 2.1.2 The Unit 2 Unit Shift Supervisor (USS) should be notified whenever switching operations for the RATs are to be performed.

2.2 LIMITATIONS

- 2.2.1 Two physically independent circuits between the offsite transmission network and the onsite Class 1E Distribution System shall be operable per Technical Specification 3.8.1.1.
- 2.2.2 One circuit between the offsite transmission network and the onsite Class 1E Distribution System shall be operable per Technical Specification 3.8.1.2.

- 2.2.3 The maximum permissible continuous loading for the RAT is:
- a. Primary winding is rated at 67,200kVA at 65°C rise,
 - b. Secondary winding (13.8kV) is rated at 39,200kVA at 65°C rise,
 - c. Secondary winding (4160V) is rated at 28,000kVA at 65°C rise.

3.0 PREREQUISITES AND INITIAL CONDITIONS

- 3.1 The System Operator shall be notified of preparations being made to energize the RAT.
- 3.2 The 125V DC control power is available to the RAT Circuit Switcher.
- 3.3 The Fire Protection Deluge System for the RAT's is available.

4.0 INSTRUCTIONS

4.1 STARTUP

4.1.1 Energizing The RAT

- 4.1.1.1 Prior to energizing the RAT, VERIFY the following parameters and conditions by visually inspecting the transformer:
- a. Liquid level indication - WITHIN NORMAL BAND,
 - b. Winding temperature indication - WITHIN NORMAL BAND,
 - c. Oil temperature indication - WITHIN NORMAL BAND,
 - d. Bushing oil level indication - WITHIN NORMAL BAND,
 - e. Transformer cooling fans in the AUTO position,
 - f. No transformer oil leaks,
 - g. Transformer Nitrogen Pressure - 0.5 to 6.5 psig.

- 4.1.1.2 VERIFY OPEN the following Bus Feeder Breakers for the transformer to be energized:
- a. RAT 1NXRA
 - (1) 1NAA01 13.8kV Switchgear 1NAA,
 - (2) 1NA0101 4160V Switchgear 1NA01,
 - (3) 1NA0501 4160V Switchgear 1NA05,
 - (4) 1AA0205 4160V Switchgear 1AA02.
 - b. RAT 1NXRB
 - (1) 1NAB01 13.8kV Switchgear 1NAB,
 - (2) 1BA0301 4160V Switchgear 1BA03,
 - (3) 1NA0401 4160V Switchgear 1NA04.
- 4.1.1.3 ENSURE electrical power to the RAT cooling fans for the transformer to be energized is available as required.
- a. RAT 1NXRA
 - (1) Normal Supply - MCC 1NBN-05, and/or
 - (2) Alternate Supply - MCC 1NBA-04,
 - (3) PLACE the Normal/Alternate Transfer Switch 1NBNO5T in NORMAL or ALTERNATE as required.
 - b. RAT 1NXRB
 - (1) Normal Supply - MCC 1NBA-04, and or
 - (2) Alternate Supply - MCC 1NBN-05,
 - (3) PLACE the Normal/Alternate Transfer Switch 1NBA04T in NORMAL or ALTERNATE as required.
- 4.1.1.4 CLOSE the RAT Cooling Fan Main Circuit Breaker at the RAT Control Cabinet 1NCPXRA (1NCPXRB).
- 4.1.1.5 CLOSE the RAT Cooling Fan Control Circuit Breaker at 1NCPXRA (1NCPXRB).
- 4.1.1.6 PLACE the Cooler Control Switch 43-1 and 43-2 at 1NCPXRA (1NCPXRB) in AUTO.

- 4.1.1.7 PLACE the Cooler Transfer Switch 43C at INCPXRA (INCPXRB) in POSITION 1.
- 4.1.1.8 PLACE the Heater Switch at INCPXRA (INCPXRB) in ON.
- 4.1.1.9 ENERGIZE the RAT INXRA (INXRB) high side per System Operator switching instructions.
- 4.2 SYSTEM OPERATION
 - 4.2.1 Transferring RAT Cooling Fan Electrical Power Source
 - 4.2.1.1 Transferring from Normal to Alternate Source
 - a. RAT INXRA
PLACE the Normal and Alternate Power Feed Transfer Switch INBN05T to the ALTERNATE position,
 - b. RAT INXRB
PLACE the Normal and Alternate Power Feed Transfer Switch INBA04T to the ALTERNATE position.
 - 4.2.1.2 Transferring from Alternate to Normal Source
 - a. RAT INXRA
PLACE the Normal and Alternate Power Feed Transfer Switch INBN05T in NORMAL,
 - b. RAT INXRB
PLACE the Normal and Alternate Power Feed Transfer Switch INBA04T in NORMAL.

4.2.2 Cooling Fan Auto Operation

NOTE

Placing the Cooler Transfer Switch 43C at 1NCPXRA (1NCPXRB) in POS 1 selects Cooling Fan Group 1 (4-1) in lead and group 2 (4-2) in lag. Placing 43C in POS 2 selects Group 2 (4-2) in lead and Group 1 (4-1) in lag.

- 4.2.2.1 VERIFY the Cooler Control Switch 43-1 and 43-2 at 1NCPXRA (1NCPXRB) in AUTO.
- 4.3 SHUTDOWN
- 4.3.1 De-energizing The RAT
- 4.3.1.1 ALIGN the 13.8kV AC Electrical Distribution per the following:
- If the RAT is supplying the 13.8kV Switchgear 1NAA (1NAB) and the UAT is available, ALIGN the 13.8kV switchgears from the UAT per 13420-1, "13.8kV AC Electrical Distribution System".
 - If the RAT is supplying the 13.8kV Switchgear 1NAA (1NAB) and the UAT is not available, DE-ENERGIZE the 13.8kV switchgear per 13420-1, "13.8kV AC Electrical Distribution System".
- 4.3.1.2 TRANSFER the RAT Cooling Fan from the Normal to the Alternate electrical power source per Step 4.2.1.1 of this procedure.
- 4.3.1.3 ALIGN the 4160V AC Non 1E Electrical Distribution per the following:
- If the RAT is supplying the 4160V AC Switchgear 1NA01, 1NA05 (1NA04) and the UAT is available, ALIGN the 4160V AC switchgears from the UAT per 13425-1, "4160V AC Non 1E Electrical Distribution System".
 - If the RAT is supplying the 4160V AC Switchgear 1NA01, 1NA05 (1NA04) and the UAT is not available, DE-ENERGIZE the 4160V AC switchgear per 13425-1, "4160V AC Non 1E Electrical Distribution System".
- 4.3.1.4 If the unit is operating in Mode 4 or above, ALIGN the 4160V AC 1E Switchgear 1BA02 (1BA03) from the Diesel Generator per 13427-1, "4160V AC 1E Electrical Distribution System".

- 4.3.1.5 If the unit is operating in Modes 5 or 6, DE-ENERGIZE the 4160V AC 1E Switchgear 1AA02 (1BA03) per 13427-1, "4160V AC 1E Electrical Distribution System".
- 4.3.1.6 DE-ENERGIZE the RAT 1NXRA (1NXRB) high side per System Operator switching instructions.
- 4.4 NON PERIODIC OPERATION
- 4.4.1 Cooling Fan Manual Operation
- 4.4.1.1 PLACE the Cooler Control Switch 43-1 at 1NCPXRA (1NCPXRB) in MAN.
- 4.4.1.2 PLACE the Cooler Control Switch 43-2 at 1NCPXRA (1NCPXRB) in MAN.
- 4.4.1.3 VERIFY the appropriate Cooling Fans are running.
- 4.4.2 Restoring A RAT To Service
- 4.4.2.1 DETERMINE the probable cause of the loss of power as follows:
- a. CHECK Annunciator Panels ALB-30 and ALB-32 on QEAB,
 - b. CHECK the RAT Relays on the QPRP,
 - c. If the Interposing Relay has tripped, DISPATCH an operator to the Switch House to:
 - (1) CHECK for relay targets,
 - (2) DEPRESS the MANUAL FAULT Pushbutton on the SWYD Fault Recorder. RECORD time in Fault Recorder Log.
- 4.4.2.2 As directed by the USS, TRANSFER the common 480V AC and 4160V AC switchgears to the alternate power supply per the applicable system operating procedure.
- 4.4.2.3 When directed by the USS, RESET the applicable tripped relays. (Reference 10007-C, "Reset Of Lockout Relays And Relay Targets", as required.)

4.4.2.4 ENSURE OPEN the following Bus Feeder Breakers for the RAT to be energized and NORMALIZE handswitch targets:

a. RAT 1NXRA

- (1) 1NAA-01 13.8kV Switchgear 1NAA,
- (2) 1NA01-01 4160V Switchgear 1NA01,
- (3) 1NA05-01 4160V Switchgear 1NA05,
- (4) 1AA02-05 4160V Switchgear 1AA02 (or
1BA03-05 4160V Switchgear 1BA03 if in
service).

b. RAT 1NXRB

- (1) 1NAB-01 13.8kV Switchgear 1NAB,
- (2) 1NA04-01 4160V Switchgear 1NA04,
- (3) 1BA03-01 4160V Switchgear 1BA03 (or
1AA02-01 4160V Switchgear 1AA02 if in
service).

4.4.2.5 If the RAT was lost due to a fault on a Unit 2 bus, CONTACT the Unit 2 Control Room to perform the following:

a. For a trip of PCB's 161820 and 161920:

- (1) OPEN Switcher 2IM1A,
- (2) RESET Lockout Relay 486TA4 on Panel 2QPRP.

b. For a trip of PCB's 161860 and 161960:

- (1) OPEN Switcher 2IM1B,
- (2) RESET Lockout Relay 486TB4 on Panel 2QPRP.

4.4.2.6 ENERGIZE the RAT high side per System Load Dispatcher switching instruction. REFER to Table 1 as required for PCB synchronizing select switch positions.

5.0	<u>REFERENCES</u>	
5.1	ELEMENTARIES	
5.1.1	AX3D-BA-L50R	230kV PCB No. 161720
5.1.2	AX3D-BA-L50X	230kV PCB No. 161820
5.1.3	AX3D-BA-L51T	230kV PCB No. 161960
5.1.4	AX3D-BA-L52H	230kV PCB No. 161760
5.1.5	AX3D-BA-L52P	230kV PCB No. 161860
5.1.6	AX3D-BA-L53B	230kV PCB No. 161920
5.1.7	1X3D-BH-B53A	RAT 1NXRA Cooling
5.1.8	1X3D-BH-B54A	RAT 1NXRB Cooling
5.2	FSAR Section 8.1.2	
5.3	Technical Manual 1X3AA02B-27 Type SL Core Form Substation Transformer	
5.4	PROCEDURES	
5.4.1	10007-C,	"Reset Of Lockout Relays And Relay Targets"
5.4.2	11903-C,	"Fire Water Protection System Normal Alignment"
5.4.3	13406-1,	"125V DC Non 1E Electrical Distribution System"
5.4.4	13420-1,	"13.8KV AC Electrical Distribution System"
5.4.5	13425-1,	"4160V AC Non 1E Electrical Distribution System"
5.4.6	13426-C,	"4160V AC Common Non 1E Electrical Distribution System"
5.4.7	13427-1,	"4160V AC 1E Electrical Distribution System"
5.4.8	13428-C,	"480V AC Common Non 1E Electrical Distribution System"
5.4.9	13430-1,	"480V AC Non 1E Electrical Distribution System"

- 5.5 Technical Specification 3.8.1.1 & 3.8.1.2
- 5.6 ONE LINE DIAGRAMS
- 5.6.1 1X3D-AA-A01A Main One Line Unit 1
- 5.6.2 1X3D-AA-A01B Main One Line Unit 1 and Common
- 5.6.3 1X3D-AA-L50A 500KV and 230KV Substation

END OF PROCEDURE TEXT

TABLE 1

NOTE

Synchronizing Select switches may be selected to either Incoming (I) or Running (R) positions.

1. To close a PCB, PLACE the listed Synchronizing Select switches to either of the listed positions:

<u>ICB</u>	<u>Synchronizing Select Switch</u>	<u>POSITION</u>
161860	OFF-SITE SOURCE #1 WILSON	I or R R or I
161960	OFF-SITE SOURCE #1 230 Bus 2	I or R R or I
161760	230 Bus 1 WILSON	I or R R or I
161820	OFF-SITE SOURCE #2 AUTO TRANSFORMER #1	I or R R or I
161920	OFF-SITE SOURCE #2 230 BUS 2	I or R R or I
161720	AUTO BANK 1 230 Bus 1	I or R R or I

2. PLACE Synchronize Select switches in OFF after PCB is closed.