TD-OP-0008

GRIDCo

OPERATING PROCEDURE FOR TAKORADI SUBSTATION

GHANA GRID COMPANY LTD

TECHNICAL DIRECTIVES

Title:	**OPERATING PROCEDURE FOR TAKORADI SUBSTATION (T8)**		
Issued To:	Director, System Operations Director, SNS Manager, SCC Manager, Dispatch Operations Area Manager, Takoradi Operating Staff, Takoradi Area Maintenance Staff, Takoradi Area Dispatch Staff, SCC	**Number:**	TD-OP-0008
		Subject Area:	Operating
		Issue Date:	Trial
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Contents

TECHNICAL DIRECTIVES

1. Purpose

This directive specifies the operations to be carried out to take out of service, isolate or restore equipment at T8 Substation to service for planned and auto outages.

2. Scope

The directive will be used by Operators at Takoradi Operating Area and System Control Center (SCC) for operation of equipment at T8 Substation.

3. Procedure

3.0. To take R1T line out of service

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L1A and 8L1T2 breakers

SCC shall carry out (or advise the R9 Operator to carry out) the following:

- Open 9L1A and 9L1T4 breakers
- Check for no potential on R1T line

3.1. To take out, isolate and de-energize R1T line for work

- T8 Operator shall request for Station Guarantee from R9

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L1A and 8L1T2 breakers

SCC shall advise R9 Operator to carry out the following:

- Open 9L1Aand 9L1T4 breakers
- Check for no potential on R1T line

SCC shall advise R9 Operator to carry out the following:

- Open 9L1A-L1and 9L1T4-L1 disconnect switches and turn off its 125Vdc supply
- Close 9R1T-G ground disconnect switch

SCC shall advise T8 Operator to carry out the following:

- Open 8L1A-L1 and 8L1T2-L1 disconnect switches and turn off its 125Vdc supply

- Close 8R1T-G ground disconnect switch

3.2. To restore R1T line to service after work

3.2.1. Prepare R1T line for restoration

T8 Operator shall:

- Advise SCC when work on the line has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on R1T line

SCC shall advise R9 Operator to carry out the following

- Check opened 9L1A and 9L1T4 breakers

- Open 9R1T-G ground disconnect switch

- Turn on 125Vdc supply and close 9L1A-L1 and 9L1T4-L1 disconnect switches

SCC shall advise T8 Operator to carry out the following:

- Check opened 8L1A and 8L1T2 breakers

- Open 8R1T-G ground disconnect switch

- Turn on 125Vdc supply and close 8L1A-L1 and 8L1T2-L1 disconnect switches

3.2.2. Restoration of T8 line to service:

SCC shall:

- Advise the T8 and R9 Operators of readiness to restore T8 line to service

- Close (or advise the R9 Operator to close) 9L1A and 9L1T4 breakers

- Close (or advise the T8 Operator to close) 8L1A and 8L1T2 breakers

3.3. To restore R1T line to service after automatic outage

If R1T line trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall:

- Energize (or advise the R9 Operator to energize) the line **ONCE** by closing 9L1A and 9L1T4 breakers
- Close (or advise the T8 Operator to close) 8L1A and 8L1T2 breakers

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Advise maintenance men to patrol the line if the operation above is not successful

3.4. To take TT3T line out of service

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L3A and 8L3T1 breakers

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL3 and 32T2L3 breakers
- Check for no potential on TT3T line

3.5. To take out, isolate and de-energize TT3T line for work

- T8 Operator shall request for Station Guarantee from TT32

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L3A and 8L3T1 breakers

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL3 and 32T2L3 breakers
- Check for no potential on TT3T line

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL3-L3 and 32L2T3-L3 disconnect switches and turn off its

125Vdc supply

- Close 32TT3T-G ground disconnect switch

SCC shall advise T8 Operator to carry out the following:

- Open 8L3A-L3 and 8L3T1-L3 disconnect switches and turn off its125Vdc supply

- Close 8TT3T-G ground disconnect switch

3.6. To restore TT3T line to service after work

3.6.1. Prepare TT3T line for restoration

T8 Operator shall:

- Advise SCC when work on the line has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on TT3T line

SCC shall advise TT32 Operator to carry out the following

- Check opened 32DL3 and 32T2L3 breakers

- Open 32TT3T-G ground disconnect switch

- Turn on 125Vdc supply and close 32DL3-L3 and 32T2L3-L3 disconnect switches

SCC shall advise T8 Operator to carry out the following:

- Check opened 8L3A and 8L3T1 breakers

- Open 8TT3T-G ground disconnect switch

- Turn on 125Vdc supply and close 8L3A-L3 and 8L3T1-L3 disconnect switches

3.6.2. Restoration of TT3T line to service:

SCC shall:

- Advise the T8 and TT32 Operators of readiness to restore T8 line to service

- Close (or advise the TT32 Operator to close) 32DL3 and 32T2L3 breakers

- Close (or advise the T8 Operator to close) 8L3A and 8L3T1 breakers

3.7. To restore TT3T line to service after automatic outage

If TT3T line trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall:

- Energize (or advise the TT32 Operator to energize) the line **ONCE** by closing 32DL3 and 32T2L3 breakers
- Close (or advise the T8 Operator to close) 8L3A and 8L3T1 breakers

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Advise maintenance men to patrol the line if the operation above is not successful

3.8. To take TT4T line out of service

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L4A and 8L4T3 breakers

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL4 and 32T3L4 breakers
- Check for no potential on TT4T line

3.9. To take out, isolate and de-energize TT4T line for work

- T8 Operator shall request for Station Guarantee from TT32

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L4A and 8L4T3 breakers

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL4 and 32T3L4 breakers

- Check for no potential on TT4T line

SCC shall advise TT32 Operator to carry out the following:

- Open 32DL4-L4 and 32T3L4-L4 disconnect switches and turn off its 125Vdc supply

- Close 32TT4T-G ground disconnect switch

SCC shall advise T8 Operator to carry out the following:

- Open 8L4A-L4 and 8L4T3-L4 disconnect switches and turn off its125Vdc supply

- Close 8TT4T-G ground disconnect switch

3.10. To restore TT4T line to service after work

3.10.1. Prepare TT4T line for restoration

T8 Operator shall:

- Advise SCC when work on the line has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on TT4T line

SCC shall advise TT32 Operator to carry out the following

- Check opened 32DL4 and 32T3L4 breakers

- Open 32TT4T-G ground disconnect switch

- Turn on 125Vdc supply and close 32DL4-L4 and 32T3L4-L4 disconnect switches

SCC shall advise T8 Operator to carry out the following:

- Check opened 8L4A and 8L4T3 breakers

- Open 8TT4T-G ground disconnect switch

- Turn on 125Vdc supply and close 8L4A-L4 and 8L4T3-L4 disconnect switches

3.10.2. Restoration of TT4T line to service:

SCC shall:

- Advise the T8 and TT32 Operators of readiness to restore T8 line to service

- Close (or advise the TT32 Operator to close) 32DL4 and 32T3L4 breakers

- Close (or advise the T8 Operator to close) 8L4A and 8L4T3 breakers

3.11. To restore TT4T line to service after automatic outage

If TT4T line trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall:

- Energize (or advise the TT32 Operator to energize) the line **ONCE** by closing 32DL4 and 32T3L4 breakers
- Close (or advise the T8 Operator to close) 8L4A and 8L4T3 breakers

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Advise maintenance men to patrol the line if the operation above is not successful

3.12. To take T2EA line out of service

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L2A and 8DL2 breakers

SCC shall advise EA34 Operator to carry out the following:

- Open 34L2D and 34L2T1 breakers
- Check for no potential on T2EA line

3.13. To take out, isolate and de-energize T2EA line for work

- T8 Operator shall request for Station Guarantee from EA34

SCC shall carry out (or advise the T8 Operator to carry out) the following:

- Open 8L2A and 8DL2 breakers

SCC shall advise EA34 Operator to carry out the following:

- Open 34L2D and 34L2T1 breakers
- Check for no potential on T2EA line

SCC shall advise EA34 Operator to carry out the following:

- Open 34L2D-L2 and 34L2T1-L2 disconnect switches and turn off its 125Vdc supply
- Close 32T2EA-G ground disconnect switch

SCC shall advise T8 Operator to carry out the following:

- Open 8L2A-L2 and 8DL2-L2 disconnect switches and turn off its125Vdc supply
- Close 8T2EA-G ground disconnect switch

3.14. To restore T2EA line to service after work

3.14.1. Prepare T2EA line for restoration

T8 Operator shall:

- Advise SCC when work on the line has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on T2EA line

SCC shall advise EA34 Operator to carry out the following

- Check opened 34L2D and 34L2T1 breakers
- Open 32T2EA-G ground disconnect switch
- Turn on 125Vdc supply and close 34L2D-L2 and 34L2T1-L2 disconnect switches

SCC shall advise T8 Operator to carry out the following:

- Check opened 8L2A and 8DL2 breakers
- Open 8T2EA-G ground disconnect switch
- Turn on 125Vdc supply and close 8L2A-L2 and 8DL2-L2 disconnect switches

3.14.2. Restoration of T2EA line to service:

SCC shall:

- Advise the T8 and EA34 Operators of readiness to restore T2EA line to service
- Close (or advise the EA34 Operator to close) 34L2D and 34L2T1 breakers
- Close (or advise the T8 Operator to close) 8L2A and 8DL2 breakers

3.15. To restore T2EA line to service after automatic outage

If T2EA line trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall:

- Energize (or advise the EA34 Operator to energize) the line **ONCE** by closing 34L2D and 34L2T1 breakers
- Close (or advise the T8 Operator to close) 8L2A and 8DL2 breakers

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Advise maintenance men to patrol the line if the operation above is not successful

3.16. To isolate 8T1 Transformer for work

- T8 Operator shall request for Station Guarantee from Customer(s) on 8F1 Feeder

SCC shall carry out or advise T8 operator to carry out the following:

- Inform Customer(s) about readiness to take off 8T1 Bank
- Request Customer(s) on 8T1 Bank to take off their load
- Transfer Station Service supply from AC2 to AC1
- Open AC2 Contactor/MCB to take off supply to 8T1 transformer auxiliaries

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F1SC1 breaker
- Open 8T1F1 breaker
- Open 8DT1 and 8L3T1 breakers

SCC shall advise T8 Operator to carry out the following:

- Check for no potential on 8T1 Bank
- Open 8DT1-T1 and 8L3T1-T1 disconnect switches
- Open 8T1F1-F1 disconnect switch
- Open 8F1SC1-F1 disconnect switch
- Open AC control MCB to 8T1 auxiliaries and tag
- Open 125V DC MCB to 8T1 primary and secondary protection and tag with PC13

3.17. To restore 8T1 Bank to service

3.17.1. Prepare 8T1 Bank restoration:

T8 Operation shall:

- Advise SCC when work on the bank has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8T1 Bank and temporary grounds removed
- Turn on 125Vdc supply and close 8DT1-T1 and 8L3T1-T1 disconnect switches
- Turn on 125Vdc supply and close 8T1F1-F1 disconnect switch
- Turn on 125Vdc supply and close 8F1SC1-F1 disconnect switch
- Close AC control MCB to 8T1 auxiliaries and remove tag
- Close 125V DC MCB to 8T1 primary and secondary protection and remove PC13 tag
- Advise SCC and Customer(s) of readiness to energize 8T1 bank

3.17.2. Restoration of 8T1 Bank:

- SCC shall close (or advise T8 Operator to close) the 8DT1 and 8L3T1 breakers
- T8 Operator shall advise Customer(s) of readiness to restore 8T1 Bank to service
- SCC shall close (or advise T8 Operator to close) 8T1F1 breaker

3.18. To restore 8T1 Bank to service after automatic outage

If 8T1 Bank trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall energize (or advise the T8 Operator to energize) the bank **ONCE** by closing 8DT1 and 8L3T1 breakers

T8 Operator shall advise Customer(s) of readiness to restore 8T1 Bank to service

SCC shall close (or advise T8 Operator to close) 8T1F1 breaker

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Isolate the Transformer for maintenance men to work on the equipment if operation above is not successful. See Explanation.

3.19. To isolate 8T2 Transformer for work

- T8 Operator shall request for Station Guarantee from Customer(s) on 8F2 Feeder

SCC shall carry out or advise T8 operator to carry out the following:

- Inform Customer(s) about readiness to take off 8T2 Bank
- Request Customer(s) on 8T2 Bank to take off their load
- Transfer Station Service supply from AC2 to AC1
- Open AC2 Contactor/MCB to take off supply to 8T2 transformer auxiliaries

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F2SC2 breaker
- Open 8T2F2 breaker
- Open 8DT2 and 8L1T2 breakers

- Check for no potential on 8T2 Bank

SCC shall or advise T8 Operator to carry out the following:

- Open 8DT2-T2 and 8L1T2-T2 disconnect switches
- Open 8T2F2-F2 disconnect switch
- Open AC control MCB to 8T2 auxiliaries and tag
- Open 125V DC MCB to 8T2 primary and secondary protection and tag with PC13

3.20. To restore 8T2 Bank to service

3.20.1. Prepare 8T2 Bank restoration:

T8 Operation shall:

- Advise SCC when work on the bank has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8T2 Bank and temporary grounds removed
- Turn on 125Vdc supply and close 8DT2-T2 and 8L1T2-T2 disconnect switches
- Turn on 125Vdc supply and close 8T2F2-F2 disconnect switch
- Close AC control MCB to 8T2 auxiliaries and remove tag
- Close 125V DC MCB to 8T2 primary and secondary protection and remove PC13 tag
- Advise SCC and Customer(s) of readiness to energize 8T2 bank

3.20.2. Restoration of 8T2 Bank:

- SCC shall close (or advise T8 Operator to close) the 8DT2 and 8L1T2 breakers
- T8 Operator shall advise Customer(s) of readiness to restore 8F2 feeder to service
- SCC shall close (or advise T8 Operator to close) 8T2F2 breaker

3.21. To restore 8T2 Bank to service after automatic outage

If 8T2 Bank trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage

- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall energize (or advise the T8 Operator to energize) the bank ONCE by closing 8DT2 and 8L1T2 breakers

T8 Operator shall advise Customer of readiness to restore 8F2 feeder to service

SCC shall close (or advise T8 Operator to close) 8T2F2 breaker
T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Isolate the Transformer for maintenance men to work on the equipment if operation above is not successful. See Explanation.

3.22. To isolate 8T3 Transformer for work

- T8 Operator shall request for Station Guarantee from Customer(s) on 8F3 Feeder

SCC shall carry out or advise T8 operator to carry out the following:

- Inform Customer(s) about readiness to take off 8T3 Bank
- Request Customer(s) on 8T3 Bank to take off their load
- Open AC3 Contactor/MCB to take off supply to 8T3 transformer auxiliaries

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F3SC3 breaker
- Open 8T3F3 breaker
- Open 8DT3 and 8L4T3 breakers
- Check for no potential on 8T3 Bank

SCC shall advise T8 Operator to carry out the following:

- Open 8DT3-T3 and 8L4T3-T3 disconnect switches
- Open 8T3F3-F3 disconnect switch
- Open AC control MCB to 8T3 auxiliaries and tag
- Open 125V DC MCB to 8T3 primary and secondary protection and tag with PC13

3.23. To restore 8T3 Bank to service

3.23.1. Prepare 8T3 Bank restoration:

T8 Operation shall:

- Advise SCC when work on the bank has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8T3 Bank and temporary grounds removed
- Turn on 125Vdc supply and close 8DT3-T3 and 8L4T3-T3 disconnect switches
- Turn on 125Vdc supply and close 8T3F3-F3 disconnect switch
- Close AC control MCB to 8T3 auxiliaries and remove tag
- Close 125V DC MCB to 8T3 primary and secondary protecT3on and remove PC13 tag
- Advise SCC and Customer(s) of readiness to energize 8T3 bank

3.23.2. Restoration of 8T3 Bank:

- SCC shall close (or advise T8 Operator to close) the 8DT3 and 8L4T3 breakers
- T8 Operator shall advise Customer(s) of readiness to restore 8F3 feeder to service
- SCC shall close (or advise T8 Operator to close) 8T3F3 Breaker

3.24. To restore 8T3 Bank to service after automatic outage

If 8T3 Bank trips auto due to fault:

T8 Operator shall:

- Advise SCC about the outage
- Acknowledge all alarms and record relay operation details
- Reset relay targets
- Report relay operation details to SCC

SCC shall energize (or advise the T8 Operator to energize) the bank **ONCE** by closing 8DT3 and 8L4T3 breakers

T8 Operator shall advise Customer of readiness to restore 8F3 feeder to service

SCC shall close (or advise T8 Operator to close) 8T3F3 breaker

T8 Operator shall:

- Advise the Supervisor/Area Manager of operation above
- Isolate the Transformer for maintenance men to work on the equipment if operation above is not successful. See Explanation.

3.25. To isolate 8SC1 Capacitor Bank for work

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F1SC1 breaker

SCC shall advise T8 Operator to carry out the following:

- Open 8F1SC1-SC1 disconnect switch
- Close 8SC1-G ground disconnect switch

3.26. To restore 8SC1 Capacitor Bank to service after work

3.26.1. Prepare 8SC1 Capacitor Bank for restoration:

T8 Operator shall:

- Advise SCC when work on the 8SC1 Capacitor Bank has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8SC1 Capacitor Bank and temporary grounds removed
- Open 8SC1-G ground disconnect switch
- Close 8F1SC1-SC1 disconnect switch

3.26.2. Restoration of 8SC1 Capacitor Bank to service:

- SCC shall close (or advise T8 Operator to close) 8F1SC1 breaker if the voltage is below 32.8kV

3.27. To isolate 8SC2 Capacitor Bank for work

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F2SC2 breaker

SCC shall advise T8 Operator to carry out the following:

- Open 8F2SC2-SC2 disconnect switch

- Close 8SC2-G ground disconnect switch

3.28. To restore 8SC2 Capacitor Bank to service after work

3.28.1. Prepare 8SC2 Capacitor Bank for restoration:

T8 Operator shall:

- Advise SCC when work on the 8SC2 Capacitor Bank has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on 8SC2 Capacitor Bank and temporary grounds removed

- Open 8SC2-G ground disconnect switch

- Close 8F3SC3-SC2 disconnect switch

3.28.2. Restoration of 8SC2 Capacitor Bank to service:

- SCC shall close (or advise T8 Operator to close) 8F2SC2 breaker if the voltage is below 32.8kV

3.29. To isolate 8SC3 Capacitor Bank for work

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F3SC3 breaker

SCC shall advise T8 Operator to carry out the following:

- Open 8F3SC3-SC3 disconnect switch

- Close 8SC3-G ground disconnect switch

3.30. To restore 8SC3 Capacitor Bank to service after work

3.30.1. Prepare 8SC3 Capacitor Bank for restoration:

T8 Operator shall:

- Advise SCC when work on the 8SC3 Capacitor Bank has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on 8SC3 Capacitor Bank and temporary grounds removed

- Open 8SC3-G ground disconnect switch

- Close 8F3SC3-SC3 disconnect switch

3.30.2. Restoration of 8SC3 Capacitor Bank to service:

- SCC shall close (or advise T8 Operator to close) 8F3SC3 breaker if the voltage is below 32.8kV

3.31. To Isolate 8T1F1 Breaker for work

- T8 Operator shall request for Station Guarantee from Customer on 8F1 Feeder

SCC shall advise T8 Operator to carry out the following:

- Inform Customer about readiness to take off 8T1 bank

- Request Customer on 8T1 Bank to take off their load

- Transfer station service supply from AC1 to AC2

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F1SC1 breaker

- Open 8T1F1 breaker

- Open 8L3T1 and 8DT1 breakers

SCC shall advise T8 Operator to carry out the following:

- Open 8T1F1-F1 disconnect switch

- Open 8L3T1-T1 and 8DT1-T1 disconnect switch and turn off its 125Vdc supply

3.32. To restore 8T1F1 Breaker to service after work

3.32.1. Prepare 8T1F1 breaker for restoration:

T8 Operator shall:

- Advise SCC when work on the 8T1F1 breaker has been completed and permit(s) surrendered (including all Station Guarantees)

- Check for no potential on 8T1F1 Breaker and temporary grounds removed

- Turn on 125Vdc supply and close 8L3T1-T1 and 8DT1-T1 disconnect switches

- Close 8T1F1-F1 disconnect switch

3.32.2. Restoration of 8T1F1 Breaker to service:

- T8 Operator shall advise Customer of readiness to restore 8F1 feeder
- SCC shall close (or advise T8 Operator to close) the 8T1F1 breaker

3.33. To Isolate 8T2F2 Breaker for work

- T8 Operator shall request for Station Guarantee from Customer on 8F2 Feeder

SCC shall advise T8 Operator to carry out the following:

- Inform Customer about readiness to take off 8T2 bank
- Request Customer on 8T2 Bank to take off their load
- Transfer station service supply from AC2 to AC1

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8F2SC2 breaker
- Open 8T2F2 breaker
- Open 8L1T2 and 8DT2 breakers

SCC shall advise T8 Operator to carry out the following:

- Open 8T2F2-F2 disconnect switch
- Open 8L1T2-T2 and 8DT2-T2 disconnect switch and turn off its 125Vdc supply

3.34. To restore 8T2F2 Breaker to service after work

3.34.1. Prepare 8T2F2 breaker for restoration:

T8 Operator shall:

- Advise SCC when work on the 8T2F2 breaker has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8T2F2 Breaker and temporary grounds removed
- Turn on 125Vdc supply and close 8L1T2-T2 and 8DT2-T2 disconnect switches
- Close 8T2F2-T2 disconnect switch

3.34.2. Restoration of 8T2F2 Breaker to service:

- T8 Operator shall advise Customer of readiness to restore 8F2 feeder
- SCC shall close (or advise T8 Operator to close) the 8T2F2 breaker

3.35. To Isolate 8T3F3 Breaker for work

- T8 Operator shall request for Station Guarantee from Customer on 8F3 Feeder

SCC shall advise T8 Operator to carry out the following:

- Inform Customer about readiness to take off 8T3 bank
- Request Customer on 8T3 Bank to take off their load

SCC shall carry out (or advise T8 Operator to carry out) the following:

- Open 8T3F3 breaker
- Open 8L4T3 and 8DT3

SCC shall advise T8 Operator to carry out the following:

- Open 8T3F3-F3 disconnect switch
- Open 8L4T3-T3 and 8DT3-T3 disconnect switch

3.36. To restore 8T3F3 Breaker to service after work

3.36.1. Prepare 8T3F3 breaker for restoration:

T8 Operator shall:

- Advise SCC when work on the 8T3F3 breaker has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 8T3F3 Breaker and temporary grounds removed
- Turn on 125Vdc supply and close 8L4T3-T3 and 8DT3-T3 disconnect switches
- Close 8T3F3-F3 disconnect switch

3.36.2. Restoration of 8T3F3 Breaker to service:

- T8 Operator shall advise Customer of readiness to restore 8F3 feeder
- SCC shall close (or advise T8 Operator to close) the 8T3F3 breaker

4. Explanation

Transformer and Bus automatic outages may be caused by the following relay operations:

- Transformer differential lockout relay-86T
- Transformer Bucholtz relay or high temperature lockout relay-86G
- Transformer overcurrent back up relays

a. If 86T operates, the breakers which have opened auto, cannot be reclosed until the lockout relay has been reset or the lockout feature has been by-passed.

- Carry out thorough inspection of the Transformer and the 34kV and 11kV Structures looking for oil leakage, shattered insulators on the structures and dead birds or reptiles

b. 86T can be reset manually immediately after an automatic outage if the station is attended.

c. 86G cannot be reset unless transformer gas and / or temperature conditions are normal or the MCB to the transformer protective relays is off.

NOTE:

I. If it has been necessary to restore the MCB to the transformer relay in order to reset 86G and restore a healthy bank to service, they shall not be restored until the gas and /or temperature conditions on the faulted bank is rectified.

II. Operation of 86T or 86G lockout relays may be due to major transformer faults hence No attempt should be made to re-energize the bank until Electrical Maintenance staff have inspected and meggered the Transformer.

ISOLATION AND DE-ENERGIZING

1. Open the necessary breaker(s) to take the line off potential.
2. Check all three phases off potential using the Multifunction meter or Analog Voltmeter or for Pole discrepancies on the panel.
3. Open the necessary disconnect switches or MODS to isolate the line from all sources of supply.
4. Close the Grounding Switch.
5. Report completion of the isolation and de-energizing at all assisting stations, to the where the Protection Guarantee is to be issued and to System Control Centre.

6. Issue Work or Work and Test Permit to the workman.

ORDER TO OPERATE

1. An O.TO. (Order-To-Operate) to isolate a line is as follows:

    a. Line Voltage - Check all three phases off potential
    b. Line Breaker - Check Open
    c. Line Disconnect Switches - Open, lock and Tag (MCB to MOD Turn-off)

2. Due to communication difficulties arising when grounds are placed on a line it is necessary to issue a Protection Guarantee on the line before grounds are placed. A work and Test Permit allows for closing and opening permanent grounds switches while the Permit is in effect.

3. If work is to be done a permanent ground switches a PC 14 to close the ground switch is not required.

The station has two 161Kv buses. The main 'A' and 'D' buses, a breaker and half configuration provide the normal points of supply to all circuits/equipment such as R1T, T2EA, TT3T, TT4T lines, 8T1, 8T2, 8T3 transformers, 8SC1, 8SC2 and 8SC3 Capacitor Banks.

5. Approval

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Director, Technical Services