TD-OP-0014

GRIDCo

OPERATING PROCEDURE FOR NKAWKAW SUBSTATION

GHANA GRID COMPANY LTD

Title:	**OPERATING PROCEDURE FOR NKWAKAW SUBSTATION (N14)**		
Issued To:	Director, System Operations Director, SNS Manager, SCC Manager, Dispatch Operations Area Manager, Akosombo Operating Staff, Akosombo Area Maintenance Staff, Akosombo Area Dispatch Staff, SCC	**Number:**	TD-OP-0014
		Subject Area:	Operating
		Issue Date:	Trial
		Origin:	Technical Services
Key Words:	Take Out, Isolate, Prepare, Energize, Restore, Automatic Outage		

Contents

1. Purpose

This directive specifies the operations to be carried out to take out of service, isolate or restore equipment at N14 Substation to service for planned and auto outages.

2. Scope

The directive will be used by Operators at Akosombo Operating Area and System Control Center (SCC) for operation of equipment at N14 Substation.

3. Procedure

3.3. To take F1N line out of service

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14L1A and 14L1L3 breakers

SCC shall carry out (or advise the F15 Operator to carry out) the following:

- Open 15DL1 and 15L1L7 breakers
- Check for no potential on F1N line

3.4. To take out, isolate and de-energize F1N line for work

- N14 Operator request for Station Guarantee from F15

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14L1A and 14L1L3 breakers

SCC shall carry out (or advise F15 Operator to carry out) the following:

- Open 15DL1 and 15L1L7 breakers
- Check for no potential on F1N line

SCC shall advise F15 Operator to carry out the following:

- Open 15DL1-L1 and 15L1L7-L1 disconnect switches and turn off 125Vdc supply
- Close 15F1N-G ground disconnect switch

SCC shall advise N14 Operator to carry out the following:

- Open 14L1A-L1 and 14L1L3-L1 disconnect switches and turn off 125Vdc supply
- Close 14F1N-G ground disconnect switch

3.5. To restore F1N line to service after work

3.5.1. Prepare F1N line for restoration:

N14 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 F1N line

SCC shall advise F15 Operator to carry out the following:

- Check opened 15DL1 and 15L1L7 breakers
- Open 15F1N-G ground disconnect switch
- Turn on 125Vdc supply and close 15DL1-L1 and 15L1L7-L1 disconnect switches

SCC shall advise N14 Operator to carry out the following:

- Check opened 14L1A and 14L1L3 breakers
- Open 14F1N-G ground disconnect switch
- Turn on 125Vdc supply and close 14DL2-L1 and 14L1L3-L1 disconnect switches

3.5.2. Restoration of F1N line to service:

SCC shall:

- Advise the F15 and N14 Operators of readiness to restore F1N line to service
- Close (or advise the F15 Operator to close) 15DL1 and 15L1L7 breakers

- Close (or advise the N14 Operator to close) 14L1A and 14L1L3 breakers

3.6. To restore F1N line to service after automatic outage

If F1N line trips auto due to fault on the line:

N14 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 F15 Operator to energize) the line **ONCE** by closing 15DL1 and 15L1L7 breakers
- Close (or advise the N14 Operator to close) 14L1A and 14L1L3 breakers

N14 Operator shall:

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

3.7. To take N2AW line out of service

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL2 and 14L12L2 breakers

SCC shall carry out (or advise the AW58 Operator to carry out) the following:

- Open 58L2A and 58L1L2 breakers
- Check for no potential on N2AW line

3.8. To take out, isolate and de-energize N2AW line for work

- N14 Operator shall request for Station Guarantee from AW58

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL2 and 14L12L2 breakers

SCC shall carry out (or advise the AW58 Operator to carry out) the following:

- Open 58L2A and 58L1L2 breakers
- Check for no potential on N2AW line

SCC shall advise AW58 operator to carry out the following:

- Open 58L2A-L2 and 58L1L2-L2 disconnect switches and turn off 125Vdc supply
- Close 58N2AW-G ground disconnect switch

SCC shall advise N14 operator to carry out the following:

- Open 14DL2-L2 and 14L12L2-L2 disconnect switches and turn off 125Vdc supply
- Close 14N2AW-G ground disconnect switch

3.9. To restore N2AW line to service after work

3.9.1. Prepare N2AW line for restoration:

N14 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 N2AW line

SCC shall advise AW58 Operator to carry out the following:

- Check opened 58L2A and 58L1L2 breakers
- Open 58N2AW-G ground disconnect switch
- Turn on 125Vdc supply and close 58L2A-L2 and 58L1L2-L2 disconnect switches

SCC shall advise N14 Operator to carry out the following:

- Check opened 14DL2 and 14L12L2 breakers
- Open 14N2AW-G ground disconnect switch
- Turn on 125Vdc supply and close 14DL2-L2 and 14L12L2-L2 disconnect switches

3.9.2. Restoration of N2AW line to service:

SCC shall:

- Advise the AW58 and N14 Operators of readiness to restore N2AW line to service
- Close (or advise the AW58 Operator to close) 58L2A and 58L1L2 breakers
- Close (or advise the N14 Operator to close) 14DL2 and 14L12L2 breakers

3.10. To restore N2AW line to service after automatic outage

If N2AW line trips auto due to fault on the line:

N14 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 AW58 Operator to energize) the line **ONCE** by closing 58L2A and 58L1L2 breakers
- Close (or advise the N14 Operator to close) 14DL2 and 14L12L2 breakers

N14 Operator shall:

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

3.11. To take N3J line out of service

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL3 and 14L1L3 breakers

SCC shall carry out (or advise the J18 Operator to carry out) the following:

- Open 18N3J breaker

- Check for no potential on N3J line

3.12. To take out, isolate and de-energize N3J line for work

- N14 Operator request for Station Guarantee from J18

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL3 and 14L1L3 breakers

SCC shall carry out (or advise J18 Operator to carry out) the following:

- Open 18N3J breaker
- Check for no potential on N3J line

SCC shall advise J18 Operator to carry out the following:

- Verify opened 18N3J-S transfer disconnect switch and turn off its 125Vdc supply
- Open 18N3J-L3 disconnect switch and turn off its 125Vdc supply
- Close 18N3J-G ground disconnect switch

SCC shall advise N14 Operator to carry out the following:

- Open 14DL3-L3 and 14L1L3-L3 disconnect switches and turn off 125Vdc supply
- Close 14N3J-G ground disconnect switch

3.13. To restore N3J line to service after work

3.13.1. Prepare N3J line for restoration:

N14 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 N3J line

SCC shall advise J18 Operator to carry out the following:

- Check opened 18N3J-S transfer disconnect switch and turn off its 125Vdc supply
- Check opened 18N3J breaker
- Open 18N3J-G ground disconnect switch
- Turn on 125Vdc supply and close 18N3J-L3 disconnect switch

SCC shall advise N14 Operator to carry out the following:

- Check opened 14DL3 and 14L1L3 breakers
- Open 14N3J-G ground disconnect switch
- Turn on 125Vdc supply and close 14DL3-L3 and 14L1L3-L3 disconnect switches

3.13.2. Restoration of N3J line to service:

SCC shall:

- Advise the J18 and N14 Operators of readiness to restore N3J line to service
- Close (or advise the N14 Operator to close) 14DL3 and 14L1L3 breakers
- Close (or advise the J18 Operator to close) 18N3J breaker

3.14. To restore N3J line to service after automatic outage

If N3J line trips auto due to fault on the line:

N14 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 N14 Operator to energize) the line **ONCE** by closing 14DL3 and 14L1L3 breakers
- Close (or advise the J18 Operator to close) 18N3J breaker

N14 Operator shall:

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

3.15. To take N4NA line out of service

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL4 and 14L4T2 breakers

SCC shall carry out (or advise the NA61 Operator to carry out) the following:

- Open 61L4A and 61L4T1 breakers
- Check for no potential on N4NA line

3.16. To take out, isolate and de-energize N4NA line for work

- N14 Operator request for Station Guarantee from NA61

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14DL4 and 14L4T2 breakers

SCC shall carry out (or advise NA61 Operator to carry out) the following:

- Open 61L4A and 61L4T1 breakers
- Check for no potential on N4NA line

SCC shall advise NA61 Operator to carry out the following:

- Check open 61L4A and 61L4T1 breakers
- Open 61L4A-L4 and 61L4T1-L4 disconnect switches and turn off 125vdc supply
- Close 61N4NA-G ground disconnect switch

SCC shall advise N14 Operator to carry out the following:

- Open 14DL4-L4 and 14L4T2-L4 disconnect switches and turn off 125Vdc supply
- Close 14N4NA-G ground disconnect switch

3.17. To restore N4NA line to service after work

3.17.1. Prepare N4NA line for restoration:

N14 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 N4NA line

SCC shall advise NA61 Operator to carry out the following:

- Check opened 61L4A and 61L4T1 breakers
- Open 61N4NA -G ground disconnect switch
- Turn on 125Vdc supply and close 61L4A-L4 and 61L4T1-L4 disconnect switches

SCC shall advise N14 Operator to carry out the following:

- Check opened 14DL4 and 14L4T2 breakers
- Open 14N4NA-G ground disconnect switch
- Turn on 125Vdc supply and close 14DL4-L4 and 14L4T2-L4 disconnect switches

3.17.2. Restoration of N4NA line to service:

SCC shall:

- Advise the NA61 and N14 Operators of readiness to restore N4NA line to service
- Close (or advise the NA61 Operator to close) 61L4A and 61L4T1 breakers
- Close (or advise the N14 Operator to close) 14DL4 and 14L4T2 breakers

3.18. To restore N4NA line to service after automatic outage

If N4NA **line** trips auto due to fault on the line:

N14 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 NA61 Operator to energize) the line **ONCE** by closing 61L4A and 61L4T1 breakers

- Close (or advise the N14 Operator to close) 14DL4 and 14L4T2 breakers

N14 Operator shall:

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

3.19. To take A12N line out of service

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14L12A and 14L12L2 breakers

SCC shall carry out (or advise the A1 Operator to carry out) the following:

- Open 1AL12 and 1T7L12 breakers
- Check for no potential on A12N line

3.20. To take out, isolate and de-energize A12N line for work

- N14 Operator request for Station Guarantee from A1

SCC shall carry out (or advise the N14 Operator to carry out) the following:

- Open 14L12A and 14L12L2 breakers

SCC shall carry out (or advise A1Operator to carry out) the following:

- Open 1AL12 and 1T7L12 breakers
- Check for no potential on A12N line

SCC shall advise A1Operator to carry out the following:

- Open 1AL12-L12 and 1T7L12-L12 disconnect switches and turn off 125Vdc supply
- Close 1A12N-G ground disconnect switch

SCC shall advise N14 Operator to carry out the following:

- Open 14L12A-L12 and 14L12L2-L12 disconnect switches and turn off 125Vdc supply
- Close 14A12N-G ground disconnect switch

3.21. To restore A12N line to service after work

3.21.1. Prepare A12N line for restoration:

N14 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 A12N line

SCC shall advise A1 Operator to carry out the following:

- Check opened 1AL12 and 1T7L12 breakers
- Open 1A12N-G ground disconnect switch
- Turn on 125Vdc supply and close 1AL12-L12 and 1T7L12-L12 disconnect switches

SCC shall advise N14 Operator to carry out the following:

- Check opened 14L12A and 14L12L2 breakers
- Open 14A12N-G ground disconnect switch
- Turn on 125Vdc supply and close 14L12A-L12 and 14L12L2-L12 disconnect switches

3.21.2. Restoration of A12N line to service:

SCC shall:

- Advise the NB21 and N14 Operators of readiness to restore A12N line to service
- Close (or advise the A1 Operator to close) 1AL12 and 1T7L12 breakers
- Close (or advise the N14 Operator to close) 14L12A and 14L12L2 breakers

3.22. To restore A12N line to service after automatic outage

If A12N line trips auto due to fault on the line:

N14 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 **A1** Operator to energize) the line **ONCE** by closing 1AL12 and 1T7L12 breakers
- Close (or advise the N14 Operator to close) 14L12A and 14L12L2 breakers

N14 Operator shall:

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

3.23. To isolate 14T1 Bank for work

SCC shall advise N14 Operator to carry out the following:

- Inform customers about readiness to take off 14T1 bank
- Request customers on 14T1 Bank to take off their load
- Open AC1 Contactor/MCB to take off supply to 14T1 transformer auxiliaries
- Transfer Station Service from AC1 to AC2, if station service is on 14T1 transformer

SCC shall carry out (or advise N14 Operator to carry out) the following:

- Open 14T1F1 breaker
- Open 14AT1 and 14DT1 breakers
- Open 14T1F1-T1 disconnect switch
- Open 14AT1-T1 and 14DT1-T1 disconnect switches and turn off 125Vdc supply
- Open AC control MCB to 14T1 auxiliaries and tag
- Open 125VDC MCB to 14T1 primary and secondary protection and tag with PC13

- Check for no potential on 14T1 Bank

3.24. To restore 14T1 Bank to service after work

3.24.1. Prepare 14T1 bank for restoration:

N14 Operator shall:

- Advise SCC when work on the transformer has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 14T1 Bank and temporary grounds removed
- Close 14T1F1-T1 disconnect switch
- Turn on 125Vdc supply and close 14AT1-T1 and 14DT1-T1 disconnect switches
- Close AC control MCB to 14T1 auxiliaries and tag
- Close 125VDC MCB to 14T1 primary and secondary protection and tag with PC13
- Advise SCC of readiness to restore 14T1 Bank to service

3.24.2. Restoration of 14T1 bank to service:

- SCC shall close (or advise N14 Operator to close) the 14AT1 and 14DT1 breakers
- N14 Operator shall advise customers of readiness to restore 14T1 Bank to service
- SCC shall close (or advise N14 Operator to close) the 14F1 feeder
- SCC shall close (or advise N14 Operator to close) 14T1F1 breaker

3.25. To restore 14T1 Bank to service after automatic outage

If 14T1 bank trips auto due to fault:

N14 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 N14 Operator to energize) the transformer ONCE by closing 14AT1 and 14DT1 breakers
- Advise customer of readiness to restore 13F1 feeder to service
- Close 14F1 breaker
- SCC shall close (or advise N14 Operator to close) 14T1F1 breaker

N14 Operator shall:

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

3.26. To isolate 14T2 Bank for work

SCC shall advise N14 Operator to carry out the following:

- Inform customers about readiness to take off 14T2 bank
- Request customers on 14T2 Bank to take off their load
- Open AC1 Contactor/MCB to take off supply to 14T2 transformer auxiliaries
- Transfer Station Service from AC2 to AC1, if station service is on 14T2 transformer

SCC shall carry out (or advise N14 Operator to carry out) the following:

- Open 14T2F2 breaker
- Open 14AT2 and 14L4T2 breakers
- Open 14T2F2-F2 disconnect switch
- Open 14AT2-T2 and 14L4T2-T2 disconnect switches and turn off 125Vdc supply
- Open AC control MCB to 14T2 auxiliaries and tag
- Open 125VDC MCB to 14T2 primary and secondary protection and tag with PC13

- Check for no potential on 14T2 Bank

3.27. To restore 14T2 Bank to service after work

3.27.1. Prepare 14T2 bank for restoration:

N14 Operator shall:

- Advise SCC when work on the transformer has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 14T2 Bank and temporary grounds removed
- Close 14T2F2-F2 disconnect switch
- Turn on 125Vdc supply and close 14AT2-T2 and 14L4T2-T2 disconnect switches
- Close AC control MCB to 14T2 auxiliaries and tag
- Close 125VDC MCB to 14T2 primary and secondary protection and tag with PC13
- Advise SCC of readiness to restore 14T2 Bank to service

3.27.2. Restoration of 14T2 bank to service:

- SCC shall close (or advise N14 Operator to close) the 14AT2 and 14L4T2 breakers
- N14 Operator shall advise customers of readiness to restore 14T2 Bank to service
- SCC shall close (or advise N14 Operator to close) the 14F2 feeder
- SCC shall close (or advise N14 Operator to close) 14T2F2 breaker

3.28. To restore 14T2 Bank to service after automatic outage

If 14T2 bank trips auto due to fault:

N14 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 N14 Operator to energize) the transformer ONCE by closing 14AT2 and 14L4T2 breakers
- Advise customer of readiness to restore 14F2 feeder to service
- Close 14F2 breaker
- SCC shall close (or advise N14 Operator to close) 14T2F2 breaker

N14 Operator shall:

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

3.29. To Isolate 14T1F1 Breaker for work

- N14 Operator shall request Station Guarantee from customer on 14F1 Bus

SCC shall advise N14 Operator to carry out the following:

- Inform customers about readiness to take off 14T1 bank
- Request customers on 14T1 Bank to take off their load
- Open AC1 Contactor/MCB to take off supply to 14T1 transformer auxiliaries
- Transfer Station Service from AC1 to AC2, if station service is on 14T1 transformer

SCC shall carry out (or advise N14 Operator to carry out) the following:

- Open 14T1F1 breaker
- Open 14AT1 and 14DT1 breakers

SCC shall advise N14 Operator to carry out the following:

- Open 14T1F1-T1 disconnect switch
- Open 14T1F1-F1 disconnect switch
- Open 14AT1-T1 and 14DT1-T1 disconnect switches and turn off its 125Vdc supply

- Check for no potential on 14T1 Bank

3.30. To restore 14T1F1 Breaker to service after work

3.30.1. Prepare 14T1F1 breaker for restoration:

N14 Operator shall:

- Advise SCC when work on the 14T1F1 breaker has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 14T1F1 Breaker and temporary grounds removed
- Close 14T1F1-T1 disconnect switch
- Close 14T1F1-F1 disconnect switch
- Check for no potential on 14T1 Bank

3.30.2. Restoration of 14F1 breaker to service:

- SCC shall close (or advise N14 Operator to close) the 14AT1 and 14DT1 breakers
- N14 Operator shall advise customers of readiness to restore 14T1 Bank to service
- SCC shall close (or advise N14 Operator to close) the 14F1 feeder
- SCC shall close (or advise N14 Operator to close) 14T1F1 breaker

3.31. To Isolate 14T2F2 Breaker for work

- N14 Operator shall request Station Guarantee from customer on 14F2 Bus

SCC shall carry out (or advise N14 Operator to carry out) the following:

- Open 14T2F2 breaker
- Open 14AT2 and 14AT2 breakers

SCC shall advise N14 Operator to carry out the following:

- Open 14T2F2-T2 disconnect switch
- Open 14T2F2-F2 disconnect switch
- Open 14AT2-T2 and 14AT2-T2 disconnect switches and turn off 125Vdc supply
- Check for no potential on 14T2 Bank

3.32. To restore 14T2F2 Breaker to service after work

3.32.1. Prepare 14T2F2 breaker for restoration:

N14 Operator shall:

- Advise SCC when work on the 14T2F2 breaker has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 14T2F2 Breaker and temporary grounds removed
- Close 14T2F2-T2 disconnect switch
- Close 14T2F2-F2 disconnect switch
- Turn on 125Vdc supply and close 14AT2-T2 and 14AT2-T2 disconnect switches

3.32.2. Restoration of 14T2F2 breaker to service:

- SCC shall close (or advise N14 Operator to close) the 14AT2 and 14AT2 breakers
- N14 Operator shall advise customers of readiness to restore 14T2 Bank to service
- SCC shall close (or advise N14 Operator to close) the 14F2 feeder
- SCC shall close (or advise N14 Operator to close) 14T2F2 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 provides the normal points of supply to all circuits/equipment such as F1N, N2AW, N3J, N4NA, A12N lines, 14T1 and 14T2 transformers.

5. Approval

……

Director, TSD