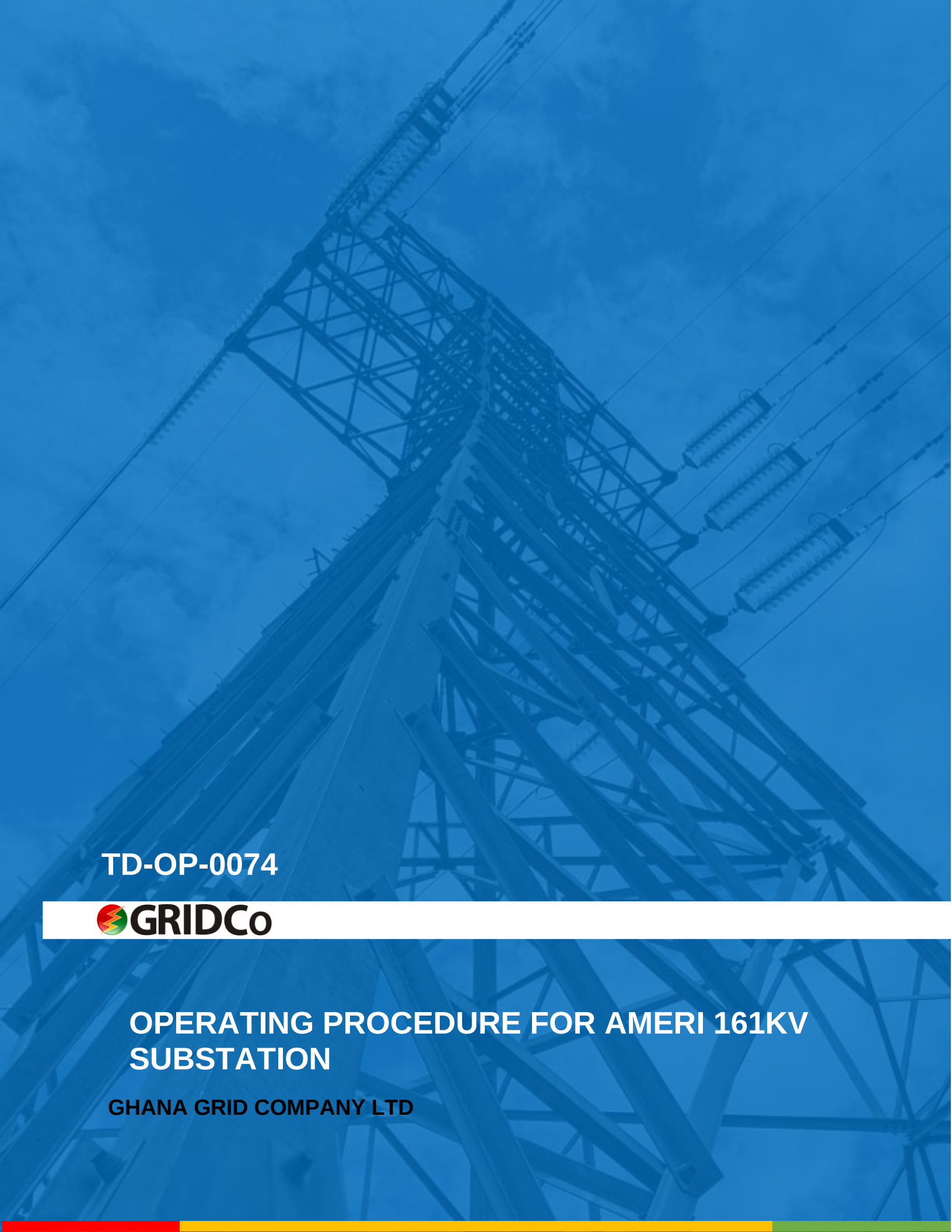

TD-OP-0074

GRIDCo

OPERATING PROCEDURE FOR AMERI 161KV SUBSTATION

GHANA GRID COMPANY LTD

OPERATING PROCEDURE FOR AMERI 161kV SUBSTATION (AG74)		
Director, System Operations Director, SNS Manager, SCC Manager, Dispatch Operations Manager, Ameri Operating Staff, Ameri Area Maintenance Staff, Ameri Area Dispatch Staff, SCC	**Number:**	TD-OP-0074
	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 AG74 161KV Substation to service for planned and auto outages.

2. Scope

The directive will be used by Operators at Ameri and System Control Center (SCC) for operation of equipment at AG74 161kV Substation.

3. Procedure

1.1. To take AG1TT line out of service

SCC shall carry out (or advise the AG74 Operator to carry out) the following:

- Open 74AL1 breaker

SCC shall carry out (or advise the TT32 Operator to carry out) the following:

- Open 32L1T4 and 32L1D breakers
- Check for no potential on AG1TT line

1.2. To take out, isolate and de-energize AG1TT line for work

- AG74 Operator shall request for Station Guarantee from TT32

SCC shall carry out (or advise the AG74 Operator to carry out) the following:

- Open 74AL1 breaker

SCC shall carry out (or advise the TT32 Operator to carry out) the following:

- Open 32L1T4 and 32L1D breakers
- Check for no potential on AG1TT line

SCC shall advise the AG74 Operator to carry out the following:

- Open 74AL1-L1 disconnect switch and turn off 125Vdc supply
- Close 74AG1TT-G ground disconnect switch

SCC shall advise the TT32 Operator to carry out the following:

- Open 32L1T4-L1 and 32L1D-L1 disconnect switches and turn off 125Vdc supply

- Close 32AG1TT-G ground disconnect switch

1.3. To restore AG1TT line to service after work

1.3.1. Prepare AG1TT line for restoration

AG74 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 AG1TT line

SCC shall advise TT32 Operator to carry out the following:

- Open 32AG1TT-G ground disconnect switch

- Turn on 125Vdc supply and close 32L1A-L1 disconnect switch

SCC shall advise AG74 Operator to carry out the following:

- Check opened 74AL1 breaker

- Open 74AG1TT-G ground disconnect switch

- Turn on 125Vdc supply and close 74AL1-L1 disconnect switch

1.3.2. Restoration of AG1TT line to service:

SCC shall:

- Advise the AG74 and TT32 Operators of readiness to restore AG1TT line to service

- Close (or advise TT32 operator to close) 32L1T4 and 32L1D breakers

- Close (or advise AG74 operator to close) 74AL1 breaker

1.4. To restore AG1TT line to service after automatic outage

If AG1TT line trips auto due to fault:

- 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 AG74 Operator to energize) the line **ONCE** by closing 74AL1 breaker
- Close (or advise TT32 operator to close) 32L1T4 and 32L1D breakers

AG74 Operator shall:

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

1.5. To take AG2TT line out of service

SCC shall carry out (or advise the AG74 Operator to carry out) the following:

- Open 74AL2 breaker

SCC shall carry out (or advise the TT32 Operator to carry out) the following:

- Open 32L2T9 and 32L2D breakers
- Check for no potential on AG2TT line

1.6. To take out, isolate and de-energize AG2TT line for work

- AG74 Operator shall request for Station Guarantee from TT32

SCC shall carry out (or advise the AG74 Operator to carry out) the following:

- Open 74AL2 breaker

SCC shall carry out (or advise the TT32 Operator to carry out) the following:

- Open 32L2T9 and 32L2D breakers
- Check for no potential on AG2TT line

SCC shall advise the AG74 Operator to carry out the following:

- Open 74AL2-L2 disconnect switch and turn off 125Vdc supply

- Close 74AG2TT-G ground disconnect switch

SCC shall advise the TT32 Operator to carry out the following:

- Open 32L2T9-L2 and 32L2D-L2 disconnect switches and turn off 125Vdc supply

- Close 32AG2TT-G ground disconnect switch

1.7. To restore AG2TT line to service after work

1.7.1. Prepare AG2TT line for restoration

AG74 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 AG2TT line

SCC shall advise TT32 Operator to carry out the following:

- Open 32AG2TT-G ground disconnect switch

- Turn on 125Vdc supply and close 32L2T9-L2 and 32L2D-L2 disconnect switches

SCC shall advise AG74 Operator to carry out the following:

- Check opened 74AL2 breaker

- Open 74AG2TT-G ground disconnect switch

- Turn on 125Vdc supply and close 74AL2-L2 disconnect switch

1.7.2. Restoration of AG2TT line to service:

SCC shall:

- Advise the AG74 and TT32 Operators of readiness to restore AG2TT line to service

- Close (or advise TT32 operator to close) 32L2T9 and 32L2D breakers

- Close (or advise AG74 operator to close) 74AL2 breaker

1.8. To restore AG2TT line to service after automatic outage

If AG2TT line trips auto due to fault:

- 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 AG74 Operator to energize) the line **ONCE** by closing 74AL2 breaker
- Close (or advise TT32 operator to close) 32L2T9 and 32L2D breakers

AG74 Operator shall:

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

2. 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 Generating station has two 161Kv buses. The main 'A' and 'D' buses, configuration provides the normal points of supply to all circuits/equipment such as AG1TT and AG2TT lines.

3. Approval

……

Director, Technical Services