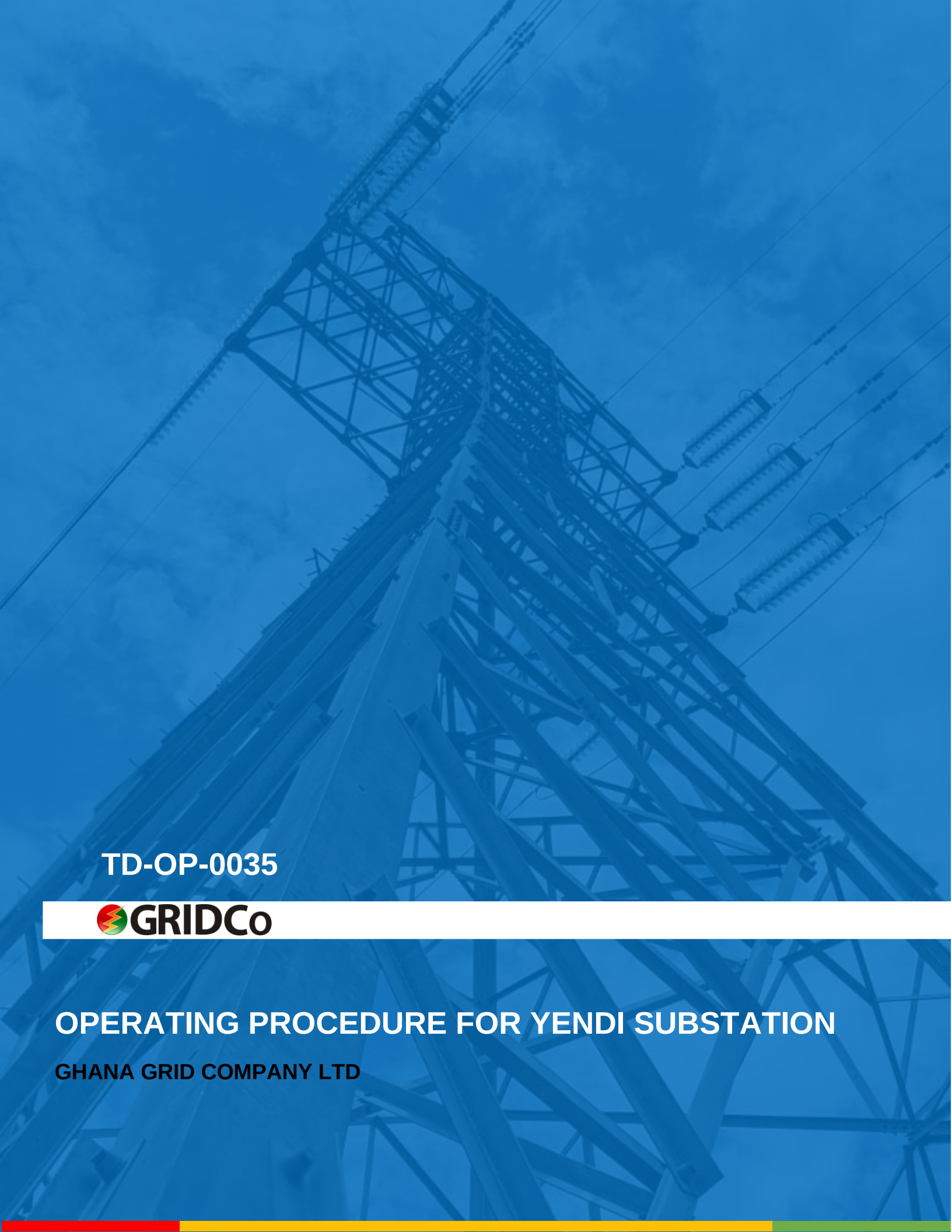

TD-OP-0035

GRIDCo

OPERATING PROCEDURE FOR YENDI SUBSTATION

GHANA GRID COMPANY LTD

TECHNICAL DIRECTIVES

Title:	**OPERATING PROCEDURE FOR YENDI SUBSTATION (YD35)**		
Issued To:	Director, System Operations Director, NNS Manager, SCC Manager, Dispatch Operations Area Manager, Tamale Operating Staff, Tamale Area Maintenance Staff, Tamale Area Dispatch Staff, SCC	**Number:**	TD-OP-0035
		Subject Area:	Operating
		Issue Date:	Trial
		Origin:	Technical Services
Key Words:	Take Out, Isolate, Prepare, Energize, Restore, Automatic Outage		

CONTENTS

TECHNICAL DIRECTIVES

1. Purpose

This directive specifies the operations to be carried out to take out of service, isolate or restore equipment at YD35 Substation to service for planned and auto outages.

2. Scope

The directive will be used by Operators at Tamale Operating Area and System Control Center (SCC) for operation of equipment at YD35 Substation.

3. Procedure

3.1. To take TM3YD line out of service

SCC shall carry out (or advise the YD35 Operator to carry out) the following:

- Open 35T1Y breaker
- Open 35L3T1 breaker

SCC shall carry out (or advise the TM28 Operator to carry out) the following:

- Check opened 28L3A-D bypass disconnect switch
- Open 28L3A breaker
- Check for no potential on TM3YD line

3.2. To take out, isolate and de-energize TM3YD line for work

- YD35 Operator shall request for Station Guarantee from TM28

SCC shall carry out (or advise the YD35 Operator to carry out) the following:

- Open 35T1Y breaker
- Open 35L3T1 breaker

SCC shall advise the TM28 Operator to carry out the following:

- Checked opened the 28L3A-D bypass disconnect switch
- Open 28L3A breaker
- Check for no potential on TM3YD line

SCC shall advise TM28 Operator to carry out the following:

- Check open 28L3-D disconnect switch and turn off its 125Vdc supply
- Open 28L3A-L3 disconnect switch and turn off its 125Vdc supply
- Close 28TM3YD-G ground disconnect switch

SCC shall advise YD35 Operator to carry out the following:

- Open 35L3T1-L3 disconnect switch and turn off its 125Vdc supply
- Close 35TM3YD-G ground disconnect switch

3.3. To restore TM3YD line to service after work

3.3.1. Prepare TM3YD line for restoration:

YD35 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 TM3YD line

SCC shall advise TM28 Operator to carry out the following:

- Check opened 28L3A breaker
- Open 28TM3YD-G ground disconnect switch
- Check opened 28L3-D disconnect switch and turn off its 125Vdc supply
- Turn on 125Vdc supply and close 28L3A-L3 disconnect switch

SCC shall advise YD35 operator to carry out the following:

- Check opened 35L3T1 breaker
- Open 35TM3YD-G ground disconnect switch
- Turn on 125Vdc supply and close 35L3T1-L3 disconnect switch

3.3.2. Restoration of TM3YD line to service:

SCC shall:

- Advise the YD35 and TM28 Operators of readiness to restore TM3YD line to service

- Close (or advise the TM28 Operator to close) 28L3A breaker
- Close (or advise the YD35 Operator to close) 35L3T1 breaker to energize Yendi substation
- YD35 Operator shall customers of readiness to restore supply
- SCC shall close (or advise YD35 Operator to close) 35T1Y breaker

3.4. To restore TM3YD line to service after automatic outage

If TM3YD line trips auto due to fault on the line:

YD35 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:

- Close (or advise the TM28 Operator to close) 28L3A breaker
- Restore (or advise the YD35 Operator to restore) the line **ONCE** by closing 35L3T1 breaker
- Energize (or advise the YD35 Operator to energize) the feeder by closing 35T1Y breaker

YD35 Operator shall:

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

3.5. To isolate 35T1 Bank for work

- YD35 Operator shall request Station Guarantee from the customer on 35F1 feeder

SCC shall advise YD35 operator to carry out the following:

- Inform customers about readiness to take off 35T1 bank

- Request customers on 35T1 Bank to take off their load
- Open AC1 Contactor/MCB to take off supply to 35T1 transformer auxiliaries
- Transfer station service supply from 35TSS1 to emergency standby generator

SCC shall carry out (or advise YD35 operator to carry out) the following:

- Open and rack-out 35T1Y breaker
- Open 35L3T1 breaker
- Open 35L3T1-T1 disconnect switch and turn off its125Vdc supply
- Check for no potential on 35T1 Bank

3.6. To restore 35T1 Bank to service after work

3.6.1. Prepare 35T1 bank for restoration:

YD35 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 35T1 Bank and temporary grounds removed
- Turn on 125Vdc supply and close 35L3T1-T1 disconnect switch
- Rack-in 35T1Y breaker
- Advise SCC of readiness to restore 35T1 Bank to service

3.6.2. Restoration of 35T1 bank to service:

- SCC shall close (or advise YD35 operator to close) the 35L3T1 breaker
- YD35 Operator shall advise Customers of readiness to restore 35F1 Feeder to service
- SCC shall close (or advise YD35 operator to close) the 35T1Y breaker

3.7. To restore 35T1 Bank to service after automatic outage

If 35T1 bank trips auto due to fault:

YD35 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 YD35 Operator to energize) the transformer **ONCE** by closing 35L3T1 breaker
- Advise customer of readiness to restore 35F1 to service
- Close (or advise YD35 operator to close) the 35T1Y breaker

YD35 Operator shall:

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

3.8 To isolate 35T1Y Breaker for work

- YD35 Operator shall request Station Guarantee from customer on 35F1

SCC shall advise YD35 Operator to carry out the following:

- Inform customers about readiness to take off 35T1 Bank
- Request customers 35T1 Bank to take off their load
- Transfer station service supply from 35TSS1 to emergency standby generator
- Open AC1 Contactor/MCB to take off supply to 35T1 transformer

SCC shall carry out (or advise YD35 Operator to carry out) the following:

- Open 35L3T1 breaker
- Open 35L3T1-T1 disconnect switch and turn off its 125Vdc supply
- Check for no potential on the 35T1 Bank

3.9 To restore 35T1Y Breaker to service after work

3.9.1. Prepare 35T1Y breaker for restoration:

YD35 Operator shall:

- Advise SCC when work on the 35T1Y breaker has been completed and permit(s) surrendered (including all Station Guarantees)
- Check for no potential on 35T1 Bank and grounds removed
- Turn on 125Vdc supply and close 35L3T1-T1 disconnect switch
- Advise SCC of readiness to restore 35T1 Bank

3.9.2 Restoration of 35T1Y breaker to service:

- SCC shall close (or advise YD35 operator to close) the 35L3T1 breaker
- YD35 Operator shall transfer station service supply from emergency stadby generator to 35TSS1
- YD35 Operator shall advise customers of readiness to restore 35F1 Feeder to service
- SCC shall close (or advise YD35 operator to close) the 35T1Y breaker

4. Explanation

Explanation 1

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 station 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. 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 on, a permanent ground switches a PC 14 to close the ground switch is not required.

The station has a single161Kv bus configuration. The main 'A' bus provides the normal point to receive supply to all equipment such as TM3YD (Tamale-Yendi) line and 55T1 transformer.

5. Approval

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Director, TDS