

TD-OP-0051



OPERATING PROCEDURE FOR ASOGLI 161KV SUBSTATION

GHANA GRID COMPANY LTD

TECHNICAL DIRECTIVES

Title: OPERATING PROCEDURE FOR ASOGLI 161kV SUBSTATION (SG51)	
Director, System Operations Director, SNS Manager, SCC Manager, Dispatch Operations Area Manager, Asogli Operating Staff, Asogli Maintenance Staff, Asogli Dispatch Staff, SCC	Number: TD-OP-0051
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1. Purpose

This directive specifies the operations to be carried out to take out of service, isolate or restore equipment at SG51 161KV 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 SG51 161KV Substation.

3. Procedure

3.1. To take SG4KC line out of service

SCC shall carry out (or advise the SG51 Operator to carry out) the following:

- Open 51ADL4 breaker

SCC shall carry out (or advise the KC75 Operator to carry out) the following:

- Open 75L4A and 75L4T1 breakers
- Check for no potential on SG4KC line

3.2. To take out, isolate and de-energize SG4KC line for work

- SG51 Operator shall request for Station Guarantee from KC75

SCC shall carry out (or advise the SG51 Operator to carry out) the following:

- Open 51ADL4 breaker

SCC shall carry out (or advise the KC75 Operator to carry out) the following:

- Open 75L4A and 75L4T1 breakers
- Check for no potential on SG4KC line

SCC shall advise the SG51 Operator to carry out the following:

- Open 51ADL4-L4 disconnect switch and turn off 125Vdc supply
- Close 51SG4KC-G ground disconnect switch

SCC shall advise the KC75 Operator to carry out the following:

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- Open 75L4A-L4 and 75L4T1-L4 disconnect switches and turn off 125Vdc supply
- Close 75SG4KC-G ground disconnect switch

3.3. To restore SG4KC line to service after work

3.3.1. Prepare SG4KC line for restoration

SG51 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 SG4KC line

SCC shall advise KC75 Operator to carry out the following:

- Open 75SG4KC-G ground disconnect switch
- Turn on 125Vdc supply and close 75L4A-L4 and 75L4T1-L4 disconnect switches

SCC shall advise SG51 Operator to carry out the following:

- Check opened 51ADL4 breaker
- Open 51SG4KC-G ground disconnect switch
- Turn on 125Vdc supply and close 51ADL4-L4 disconnect switch

3.3.2. Restoration of SG4KC line to service:

SCC shall:

- Advise the SG51 and KC75 Operators of readiness to restore SG4KC line to service
- Close (or advise KC75 operator to close) 75L4A and 75L4T1 breakers
- Close (or advise SG51 operator to close) 51ADL4 breaker

3.4. To restore SG4KC line to service after automatic outage

If SG4KC line trips auto due to fault:

- Advise SCC about the outage

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

SCC shall

- Energize (or advise the SG51 Operator to energize) the line **ONCE** by closing 51ADL4 breaker
- Close (or advise KC75 operator to close) 75L4A and 75L4T1 breakers

SG51 Operator shall:

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

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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.

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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 'H' and 'K' buses, configuration provides the normal points of supply to all circuits/equipment such as SG4KC line, 36T1 transformer.

5. Approval

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Director, Technical Services