

	Guideline.	Transmission North East Grid
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Title: **Commissioning of new 500MVA transformer at Gumeni substation**

Document Identifier: **240-180000254**

Alternative Reference Number: **N/A**

Area of Applicability: **TX NEG**

Functional Area: **GUIDELINE**

Revision: **01**

Total Pages: **08**

Next Review Date: **31 August 2030**

Disclosure Classification: **Controlled Disclosure**

Compiled by	Supported by	Supported by	Functional Responsibility
			
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Date: 13/09/2023	Date: 13/09/2023	Date: 16/10/2023	Date: 17/10/2023

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1. Introduction

To ensure that a consistent process is followed in the commissioning of new 500MVA transformer at Gumeni substation.

2. Supporting Clauses

2.1 Scope

This document records an agreement between Transmission North East Grid Secondary Plant and EPC contractor

2.1.1 Purpose

The purpose of this guideline is to standardise the minimum requirements for Substation commissioning to clarify roles and responsibilities.

2.1.2 Applicability

This guideline is applicable to Transmission North East Grid and to any organisation external to Eskom, which carries out any commissioning and testing on behalf of Transmission.

2.2 Effective date

This guideline will commence on the day it is authorised.

2.3 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

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2.3.1 Normative

The commissioning procedures for secondary plant work must be adhered to, according to the following document:

2.3.2 Informative

- 1) ISO 9001:2015 Quality Management Systems
- 2) The South African Grid Code – Network and System Operating Codes.
- 3) TPC41-78: Commissioning of transformer and reactor bays
- 4) TPC41-139: Commissioning of current transformers.
- 5) TPC41-140: Commissioning of transformers and reactors.
- 6) TPC41-192: Commissioning of circuit breakers.
- 7) TPC41-227: Commissioning of voltage transformers.
- 8) TPC41-420: Work done by contractors on secondary plant.
- 9) TPC41-547: Commissioning of isolators.
- 10) TPC41-561: Commissioning of metering installations.
- 11) 240-107008239 SP Quality Check Tick sheet Rev 2.
- 12) 240-54615413 Standard for commissioning protection assets

2.4 Definitions

Contractor: Is a person or company contracted by Eskom to perform services at a specified price and time.

Project Manager (PM): For organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints.

Project Coordinator (PC): Is a person appointed by the project manager on site to supervise and coordinate with all parties involved in the project to ensure tasks are fulfilled according to Eskom standards within the scheduled time.

Pre-commissioning: All testing prior to applying energy, excluding all power plant supplies required for pre commissioning. Classification

This document is classified as a Controlled disclosure to external parties (either enforced by law, or discretionary).

2.5 Abbreviations

NEG	North East Grid
PM	Project Manager
RM	Recovery manager
PC	Project Coordinator
SP	Secondary Plant
HOD	Head of Department
CLN	Customer Load Network

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TX Transmission
SOW Scope of work
Eskom Side for deviation

2.6 Roles and Responsibilities

Project coordinator is responsible for ensuring supervision and coordination with all parties involved in the project and tasks are fulfilled according to Eskom standards within the scheduled time.

Project team leader is responsible for ensuring that the project is executed as per process described in this procedure and that the SOW is adhered to. All relative forms and sheets must be completed according to Eskom process. All test results filed into the commissioning file.

Technical support is responsible for ensuring that the contents of the commissioning file is correct as per sec plant procedure and oversee the general flow of the project. Witness all ratio, polarity, function test on CT's and VT's, transformer and bus zone stability tests and witness all relay to plant function check tests.

Snr technician/s will be on site only for training purposes.

3. Requirements before pre-commissioning of plant.

The following processes must be completed by the PM before contractor personnel commence on their task:

- 1) Four approved application drawings to be handed to SP Senior supervisor after checking the drawings it will be distributed as follows.
 - One set to cable contractor
 - Three set to commissioning team.
- 2) Equipment Manuals must be handed to Eskom.
- 3) Quality assessment for construction and cabling i.e., quality check sheets. All defects to be corrected before commissioning can commence.
- 4) Manufacture's test certificates must be handed to Eskom.
- 5) Manufactures electrical drawings must be handed to Eskom.
- 6) SCADA Database and protection Settings must be handed to Eskom.

4. Planning and Scheduling

- The PM will compile project plan detailing all activities with timelines using inputs from all stakeholders.
- Once the project plan has been consolidated and agreed on by all stakeholders, The PM will be responsible for arranging all relevant outages.
- The PM must confirm, in writing, all outages and changes in program to the relevant stakeholders.
- The contractor must arrange adequate manpower, materials and third-party support to carry out the consolidated project plan.
- Ensuring that all required documentation is available to those responsible for the scheduling and execution of the project tasks.

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5. Holding Points

The holding points through the project cycle are summarized as following:

Holding Point A

Before the erection of new equipment on site a meeting must be arranged by the Project leader /Project Manager and all departments involved in the Pre and Commissioning process must be invited, see attached list.

The following must be supplied by the Project Manager before any work can commence.

Full set of approved drawings to be issued to TX secondary plant personnel only. (No drawings to be issued to the cable contractor at this stage).

An approved setting sheets for the protection scheme and other equipment.

A project Gantt chart stating the time allowed for all departments involved. (Plant outage times included).

All parties involved in the project must be made aware of work that can be completed before the outage as to ensure minim outage times and risk to the system. No outage will be authorised unless the commissioning file has been checked by the senior advisor of the region to confirm that all work that can be done before an outage has been completed.

In case of work that can be done before an outage holding points B to E will be used before an outage. Holding points C to E will be repeated during the outage and holding point F will be used once all work has been completed.

Quality assurance department must check the contractor's equipment (Tools).

Holding Point B

Only when secondary plant personnel have confirmed the correctness of the drawings then can a set of drawings be handed over to the cable contractor. (Process to be controlled by Project Leader / Project Manager).

Holding Point C

After the cable contractor has completed the cable and termination the quality assurance department must check and complete an acceptance document for work done by the contractor.

Holding Point D

After contractor personnel have completed the pre-commissioning task, a list of defects will be handed over to the Project Manager.

The contractor must then be called back to site to repair the defects.

The processes will continue until all defects have been corrected.

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Holding Point E

Once the process in holding point D has been completed the quality assurance department must check and complete a final acceptance document for all work completed. This process must take place well in advance of any commissioning date as to prevent the unnecessary cancellation of the commissioning of the plant.

Holding Point F

Once all work has been completed a hand over meeting must be arranged by the PC for the completion and signing of all paperwork involved. This meeting must be held well in advance of any commissioning date as to prevent the unnecessary cancellation of the commissioning of the plant.

Handing Over

Prior the handing over of the project, the site project coordinator must ensure the following documents are in place.

Commissioning File with the following documents:

Commissioning test results

Forms and tick sheet completed and sign

Functional checks

Controls and alarms are tested to NC and, Encor database update.

The project coordinator must ensure that all parties (i.e., PROTECTION, METERING, SCASS and TELE-PROTECTION), have signed all the required documentation before handing over to the Grid representative.

6. Authorization

This document has been seen and accepted by:

Name	Designation
Humbulani Tshisevhe	Secondary Plant Manager
Keneth Nhlapo	Chief Engineer
Andre Jacobs	Senior Advisor

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7. Revisions

Date	Rev.	Compiler	Remarks
August 2023	01	Andre Jacobs	Site specific

8. Development team

Not applicable

9. Acknowledgements

Not applicable.

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