

	SECONDARY CABLE REMOVAL PROCEDURE	Transmission Western Grid
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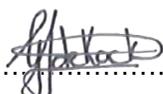
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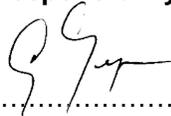
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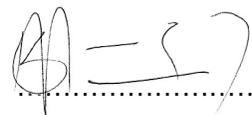
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CONTENTS

	Page
1. INTRODUCTION	3
2. SUPPORTING CLAUSES.....	3
2.1 BACKGROUND.....	3
2.2 NORMATIVE/INFORMATIVE REFERENCES.....	3
2.2.1 Normative.....	3
2.2.2 Informative	3
2.3 DEFINITIONS.....	3
2.3.1 Classification.....	4
2.4 ABBREVIATIONS.....	4
2.5 ROLES AND RESPONSIBILITIES.....	4
2.6 PROCESS FOR MONITORING.....	5
2.7 RELATED/SUPPORTING DOCUMENTS.....	5
3 DOCUMENT CONTENT	5
3.1 REMOVAL OF CABLES WHEN DECOMMISSIONING	5
3.2 REMOVAL OF OLD CABLES PREVIOUSLY DECOMISSIONED	6
3.3 REMOVAL OF CABLES BETWEEN JUNCTION BOXES AND HIGH VOLTAGE EQUIPMENT THAT IS BURIED AND NOT IN TRENCHES.....	6
3 AUTHORIZATION.....	6
4 REVISIONS	7
5 DEVELOPMENT TEAM.....	7
6 ACKNOWLEDGEMENTS.....	7

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1. INTRODUCTION

This cable removal procedure was compiled to have a standard that should be followed when removing secondary cables in a substation without introducing risk to existing plant.

2. SUPPORTING CLAUSES

2.1 BACKGROUND

In the Western Grid old/decommissioned cables was removed/cut. The removal/cutting of old/decommissioned cables causes unwanted tripping/bus stripping of live plant. After a few of these incidents the Western Grid management decided that no cables will be removed from trenches and control rooms.

Substation refurbishment is starting in the Western Grid where all protection schemes need to be upgraded/refurbished. With this activity new cables need to be installed but existing cable trenches are too full and cannot accommodate the new cables. Road crossings and trench entries into control room is also a problem.

These issues are getting more difficult to address and therefore this procedure is developed to standardize the removal of cables in a safe and low risk manner.

2.2 NORMATIVE/INFORMATIVE REFERENCES

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

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] ESKPVAEY6 Eskom Regulations for High Voltage Systems.

2.2.2 Informative

- [3] Not applicable.

2.3 DEFINITIONS

Definition	Description
Secondary Cable	Any cable with an AC or DC voltage below 1000V

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2.3.1 Classification

- a. **Public domain:** published in any public forum without constraints (either enforced by law, or discretionary).
- b. **Controlled disclosure:** controlled disclosure to external parties (either enforced by law, or discretionary).
- c. **Confidential:** the classification given to information that may be used by malicious/opposing/hostile elements to **harm** the objectives and functions of Eskom Holdings Limited.
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2.4 ABBREVIATIONS

Abbreviation	Description

2.5 ROLES AND RESPONSIBILITIES

Site supervisor:

The Project site supervisor is responsible to ensure that this document must be followed by the contractor.

Substation Engineering Assistant

Substation EA must perform spot checks to ensure the cable contractor adhere to the procedure

Secondary Plant Staff

Secondary Plant Technician need to ensure that cables are made safe according to section 3 and that Appendix A is completed and signed off.

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2.6 PROCESS FOR MONITORING

Not Applicable.

2.7 RELATED/SUPPORTING DOCUMENTS

Not Applicable.

3 DOCUMENT CONTENT

All cables in Transmission Western Grid need to be removed according to the procedure described in 3.1 to 3.3. If this procedure cannot be followed, a Grid Engineer/Advisor/Manager should be consulted on alternative methods to remove a specific cable. Alternative methods need to be presented and approved in the Grid Operations Meeting.

3.1 REMOVAL OF CABLES WHEN DECOMMISSIONING

Steps 1-4 need to be witnessed or performed by Secondary Plant:

- 1) Ensure panel AC and DC is switched off where the cable need to be disconnected.
- 2) Identify the cable and disconnect all cores of the cable on both ends
- 3) Measure all cores of the cable to be “dead” by measuring AC and DC voltage to ground on all cores of the cable on both ends of the cable and complete from in Appendix A
- 4) Remove both ends of the cable from the panels where it is installed.
- 5) Mark both ends of the cable clearly with spray paint so that the cable is uniquely marked and cannot be wrongly identified.
- 6) Start removing the marked cable from the trench so that only the marked cable that need to be removed are visible outside of the trench.
- 7) The cable can only be pulled or removed from the trench by hand. No pulling of cables with any other means is allowed (pulling cables with vehicles or winches is strictly prohibited)
- 8) Once a piece of the cable is removed from the trench, the cable needs to be marked with the same spray paint at least every 3 meters
- 9) The cable must be completely visible and must be cut in maximum lengths of 3 meters. The decommissioned cable cannot be cut if the end of cable is not marked and not lying completely outside of the trench.

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3.2 REMOVAL OF OLD CABLES PREVIOUSLY DECOMMISSIONED

In this scenario only one end of the cable is known. The first step needs to be witnessed or performed by a Secondary Plant Technician.

- 1) Measure all cores of the cable to be “dead” by measuring AC and DC voltage to ground on all cores of the cable and complete from in Appendix A.
- 2) Mark the cable clearly with spray paint so that the cable is uniquely marked and cannot be wrongly identified.
- 3) Start removing the cable from the trench so that only the cable that need to be removed are visible outside of the trench.
- 4) The cable can only be pulled or removed from the trench by hand. No pulling of cables with any other means is allowed (pulling cables with vehicles or winches is strictly prohibited)
- 5) One a piece of the cable is removed from the trench, the cable needs to be marked with the same spray paint at least every 3 meters.
- 6) The cable must be completely visible and must be cut in maximum lengths of 3 meters. The decommissioned cable cannot be cut if the end of cable is not marked and not lying completely outside of the trench

3.3 REMOVAL OF CABLES BETWEEN JUNCTION BOXES AND HIGH VOLTAGE EQUIPMENT THAT IS BURIED AND NOT IN TRENCHES

Steps 1-4 need to be witnessed or performed by a Secondary Plant Technician:

- 1) Ensure AC and DC is switched off in the panels where the cable need to be disconnected.
- 2) Disconnect all cores of the cable on both ends and complete from in Appendix A
- 3) Measure all cores of the cable to be “dead” by measuring AC and DC voltage to ground on all cores of the cable on both ends of the cable
- 4) Drop both end of the cable from the mechanism box and Junction box where it is installed.
- 5) Dig up and remove the cable. (Cable do not need to be marked and cut in 3 meter pieces, but can be done for precautionary methods)

3 AUTHORIZATION

This document has been seen and accepted by:

Name	Designation

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4 REVISIONS

Date	Rev.	Compiler	Remarks
November 2021	0	G.J. de Kock	New Document

5 DEVELOPMENT TEAM

Not applicable

6 ACKNOWLEDGEMENTS

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