

Title: **PROCEDURE FOR FIRST LINE
MAINTENANCE OF SECURITY
SYSTEMS AT SUBSTATIONS**

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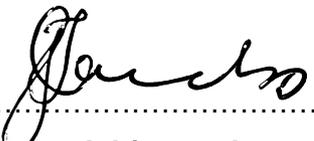
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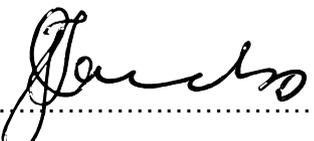
Controlled Disclosure

Compiled by

Approved by (SCOWT SC Chairperson)

pp. 

SM Dhlamini / J Martin



T Jacobs

Compiler

DC & Auxiliary Supplies SC Chairperson

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Functional Responsibility (Dx)

Authorized by





Vinod Singh

Prince Moyo

Power Plant Technologies Manager

Power Delivery Engineering GM (Acting)

Date: 29/02/2012

Date: 05/03/2012

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Foreword

Not applicable.

Revision history

This revision cancels and replaces revision no. 0 of document no. **DISPVADR2**.

Date	Rev.	Compiled By	Clause	Remarks
March 2012	0	T Jacobs		Contents of DISPVADR2 copied to new template. NO changes were made to the contents.
				Reference number changed from DISPVADR2 to DPC_34-1430.
				The approval of the document is necessary to ensure that the Distribution Division has an authorised document until such time when harmonised Eskom documents for Security Systems are available.
Jan 2004	0	SM Dhlamini		Original issue – DISPVADR2

Acceptance

This document has been seen and accepted by:	
Name	Designation
P Moyo	Power Delivery Engineering GM (Acting)
V Singh	Power Plant Technologies Manager
T Jacobs	DC & Auxiliary Supplies Study Committee Chairperson

This procedure shall apply throughout the Distribution Division of Eskom Holdings, its subsidiaries and entities wherein the Distribution Division has a controlling interest.

Development team

This document was developed by a group consisting of the following members:

Name	Region	Department
Sizwe Dhlamini	Distribution Technology	Power Technology
John Martin	Central	Security Systems
Taib Abrahams	Western	Project Engineering
Richard Krusekopf	Eastern	Project Engineering
Gavin Strelec	Central	Project Engineering
Wezi Phiri	Central	Project Engineering

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Name	Region	Department
Sipho Kumbi	North Western	Project Engineering
Johan Jordaan	North Eastern	Technology & Quality
Stan Roberts	Western	Protective Services
Johan van Staden	Central	Plant Performance

The compilers acknowledge the input and comments received nationally through the TESCO document development process.

Keywords

Security, Systems, First Line Maintenance, Substations, Fence, Gate

1 Scope

This procedure covers all aspects of first line maintenance in terms of specifying what checks/tests are to be carried out on site and when these are to be carried out.

1.1 Purpose

This document establishes procedures to be followed when performing first line maintenance at Distribution substations on security systems and associated equipment.

2 Normative references

The following documents contain provisions that, through reference in the text, constitute requirements of this procedure. At the time of publication, the edition indicated was valid. All controlled documents are subject to revision, and parties to agreements based on this procedure are encouraged to investigate the possibility of applying the most recent edition of the document listed below. Information on currently valid national and international standards and specifications can be obtained from the Information Centre and Eskom Documentation Centre at Megawatt Park.

Eskom documents:

SCSAGQBA0 REV0: 1999, *Guide on how to grade distribution substations in terms of the risk to theft of equipment*

SCSASABA8 REV 0: 1997, *Routine inspections of electrical equipment*

SCSASAAX1 REV 1: 2000, *Standard for the inspection of substations*

TRMASACG4 REV 0: 2001, *Standard for substation inspection sheets*

TRMPVACH3 REV 0: 2000, *Procedure for first line maintenance of security systems*

SCSASABK2 Rev0,2000, *Distribution standard for Part 2: earthing, Section 3: Substation Earthing*

DISPBAAT8 Rev0, 2000, *Distribution security services policy*

DISPVACE8 Rev0, 2000, *Distribution procedure for the management of electronic and physical protection measures*

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3 Definitions and abbreviations

3.1 Definitions

None.

3.2 Abbreviations

BBTC: Barbed bayonet tensile coils

BBTFW: Barbed bayonet tensile flat wire

4 Responsibilities

The Regional Manager is responsible for the overall security in his/her region. In terms of document DISPVACE8 all maintenance done on systems should be reported to security systems officer or person designated to manage security systems to ensure that records are kept regarding the availability, reliability and dependability of such a system. In terms of DISPBAAT8, the Security Manager shall be responsible for the management of Security systems.

5 Maintenance requirements

5.1 Environmental considerations

5.1.1 Vegetation

All components of the security system must be kept clear of all forms of vegetation at all times. This includes roots which could distort and damage plinths, slabs, drains and foundations. Cut material must be removed to prevent dry material blowing into the fence.

5.1.2 Foreign objects

All components must be kept clear of all foreign objects such as plastic bags, bird and spider nests, and wind-blown debris such as leaves and maize sheaves.

5.1.3 Soil erosion/Soil build-up

Soil movement around all components should be subject to immediate remedial action to prevent any undermining of or build-up against any of the systems components. This is also applicable to areas which are stoned to provide necessary insulation/isolation against shock hazards for personnel.

5.1.4 Insulator cleansing

If it is observed that any/all of the insulators are being contaminated and that contamination will result in flooding and arcing, and depending on the location and general environmental conditions, then the insulators should be cleaned using a high-pressure jet of water. Whether the use of solvents is required will depend on the type of contamination. The frequency will also depend on the severity of the problem.

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5.1.5 Observation

The entire system should be observed at regular intervals to ensure that any component degradation is detected as early as possible and that appropriate remedial action can be taken timeously if necessary. This is especially important with regard to any corrosion of any component that is observed. Note that an observation is an inspection and this action must be documented to ensure that it has weight in a management programme or in court. Comments shall be entered into the last column of the procedure checklist.

5.1.6 Testing

Testing must be carried out at regular intervals to ensure that the integrity of the entire system is sound. The overall performance (O) of each security system during operation shall be monitored on a monthly basis and kept above 88% when calculated according to the criteria listed in DISPVACE8, namely:

- a) System availability, which should be greater than 98%
- b) System dependability, which should be greater than 95%
- c) System reliability, which should be greater than 95%

where overall performance is $(O) = (a) * (b) * (c)$. If overall performance is below 88% then remedial action must be taken.

5.2 Inspection procedure checklist

5.2.1 Security fence(s)

Inspection frequency	-	2 per annum	Date:
Observations	-	Stability	
	-	Holes in barrier	
	-	Vegetation/Foreign objects	
	-	Soil erosion	
	-	Earthing connections are secure	
	-	Corrosion of all components	
Tests	-	None	
Procedure	-	Remedial actions to rectify problems	

5.2.2 Access gates and doors

- Inspection frequency - 2 per annum Date:
- Observations
- Stability
 - Damage/sagging
 - Vegetation/Foreign objects
 - Soil build-up/erosion
 - Corrosion of all components
 - All fittings tight
 - Hinges
 - Earthing connections are secure
 - Padlock on drop bolt
 - Drop bolts on barrier gates are functional
- Tests
- Gates move freely
- Procedure
- Remedial actions to rectify problems
 - Grease hinges

5.2.3 Card readers

- Inspection frequency - Weekly Date:
- Observations
- Stability/damage
 - Vegetation/foreign objects
 - Corrosion
 - Operation
- Tests
- Gate opens & closes when/as required
- Procedure
- Operate as procedure

5.2.4 Access gate motors

- Inspection frequency - 4 per annum Date:
- Observations - Stability
- Damage
 - Vegetation/Foreign objects
 - Soil build-up/erosion
 - Corrosion of all components
 - All fittings tight
 - Padlock on motor arm
 - Movement
 - Cabling
- Tests - Gates move freely
- Confirm correct operation for emergencies
 - Magnetic lock operating
 - Magnetic switch functioning
- Procedure - Remedial actions to rectify problems
- Grease all points
 - Check for water in housing

5.2.5 Floodlighting used as security lighting

- Inspection frequency - 2 per annum Date:
- Observations - Stability of posts & fixings
- Cabling
 - Vegetation/Foreign objects
 - Soil erosion
 - Corrosion of all components
 - Correct positioning of luminaires
- Tests - Switch on all luminaires to check
- Check if activated by CCTV circuit
 - Check switching operation
- Procedure - Remedial action to rectify problems

5.2.6 Infrared detectors

- Inspection frequency - Once weekly Date:
- Observations
 - Stability/damage
 - Foreign objects/dust
 - Corrosion
 - Operation
- Tests - Alarm generates within detection range
- Procedure - Block off sensors while alarm is on

5.2.7 Electrified sliding gate

- Inspection frequency - 4 per annum Date:
- Observations
 - Stability
 - Damage
 - Vegetation/Foreign objects
 - Soil build up/erosion
 - Corrosion of all components
 - All fittings tight
 - Movement
 - Cabling
 - HV connector operation
 - Limit switches
 - Insulators
 - Tension of conductors
 - Universal joint boots
 - Chain & rack, and pinion
- Tests
 - Gates move freely
 - Confirm correct operation for emergencies
 - Limit switches operating
 - Ease of crank mechanism
- Procedure
 - Remedial actions to rectify problems
 - Check gearbox oil in motor drive
 - Grease plumber flange bearings on gate and crank mechanism
 - Check for water in housing

5.2.8 Electrified fence

- Inspection frequency - Once weekly Date:
- Observations - Stability
- Tension of conductors
 - Insulator cleansing
 - Cracked or missing insulators flashovers
 - Springs on insulators in place
 - Catenary wire tension
 - BBTC/BBTFW tension
 - Concrete kerb/slab
 - Ground clearance of bottom conductor
 - Vegetation/Foreign objects
 - Soil erosion
 - Corrosion of all components
- Tests - Alarm triggers when fence is breached
- Procedure - Remedial action to rectify problems

5.2.9 Stormwater drains

- Inspection frequency - 2 per annum & after rains Date:
- Observations - No access without triggering alarm
- Vegetation/Foreign objects
 - Soil erosion/soil build up
 - Corrosion of all components
- Tests - Remove cover & replace smoothly
- Procedure - Remedial action to rectify problems

5.2.10 CCTV

- | | | |
|----------------------|---|-------|
| Inspection frequency | - 4 per annum | Date: |
| Observations | - Lenses are clear of obstacles | |
| | - Damage | |
| | - Vegetation/Foreign objects | |
| | - Corrosion of all components | |
| | - All fittings tight | |
| | - Cabling | |
| | - Earthing | |
| Tests | - Camera zooms and pans freely | |
| | - Confirm correct operation for emergencies | |
| | - Limit switches operating | |
| Procedure | - Remedial actions to rectify problems | |
| | - Check for water and debris in housing | |

Annex A – Impact Assessment (Normative)

Impact assessment form to be completed for all documents.

A1 Guidelines

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

A2 Critical points

A2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, optimised costs.

Comment: To ensure optimal functioning of Security Systems at Distribution substations.

A2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

Comment: Not applicable.

A2.3 Impact on stock holding and depletion of existing stock prior to switch over.

Comment: Not applicable.

A2.4 When will new stock be available?

Comment: Not applicable.

A2.5 Has the interchangeability of the product or item been verified - i.e. when it fails is a straight swop possible with a competitor's product?

Comment: Not applicable.

A2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

Comment: Not applicable.

A2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

Comment: Not applicable.

Annex A
(continued)

A3 Implementation timeframe

A3.1 Time period for implementation of requirements.

Comment: As soon as the document is approved.

A3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

Comment: Immediately.

A4 Buyers Guide and Power Office

A4.1 Does the Buyers Guide or Buyers List need updating?

Comment: Not applicable.

A4.2 What Buyer's Guides or items have been created?

Comment: Not applicable.

A4.3 List all assembly drawing changes that have been revised in conjunction with this document.

Comment: Not applicable.

A4.4 If the implementation of this document requires assessment by CAP, provide details under 5

A4.5 Which Power Office packages have been created, modified or removed?

Comment: Not applicable.

A5 CAP / LAP Pre-Qualification Process related impacts

A5.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

Comment: Not applicable.

A5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

Comment: Not applicable.

A5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

Comment: Not applicable.

Annex A

(continued)

A5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: Not applicable.

A5.5 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

Comment: Not applicable.

A5.6 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: Not applicable.

A5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: Not applicable.

A5.8 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

Comment: Not applicable.

A6 Training or communication

A6.1 Is training required?

Comment: Yes

A6.2 State the level of training required to implement this document. (E.g. awareness training, practical / on job, module, etc.)

Comment: Awareness training

A6.3 State designations of personnel that will require training.

Comment: Maintenance staff

A6.4 Is the training material available? Identify person responsible for the development of training material.

Comment: Yes, security system manuals, tables in this document.

A6.5 If applicable, provide details of training that will take place. (E.G. sponsor, costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

Comment: On job.

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Annex A
(continued)

A6.6 Was Technical Training Section consulted w.r.t module development process?

Comment: No

A6.7 State communications channels to be used to inform target audience.

Comment: Formal change control process

A7 Special tools, equipment, software

A7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

Comment: Not applicable.

A7.2 Are there stock numbers available for the new equipment?

Comment: Not applicable.

A7.3 What will be the costs of these special tools, equipment, software?

A8 Finances

A8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment:

Adds to the maintenance routine.....

.....
.....

Impact assessment completed by:

Name: Thomas Jacobs

Designation: DC & Auxiliary Supplies Specialist