

Title: **ROAD CROSSING OVERHEAD
LINES (STRAIN POLES ON
BOTH SIDES)**

Unique Identifier: **34-222**

Part **11 - Maintenance**

Area of Applicability: **Distribution Engineering
Transmissions Engineering**

Documentation Type: **Task Manual**

Revision: **1**


Total Pages: **14**

Next Review Date: **February 2023**

Disclosure Classification:

Controlled Disclosure

Compiled by



Fanie de Bruin

Senior Supervisor

Date: 02/03/2012.....

Approved by (SCOWT SC Chairperson)



David M Ntombela

Consultant

Date: 02/03/2012.....

**Functional Responsibility
(Dx)**



Colin Smith

**Manager Design Base
(Maintenance)**

Date: 02/03/2012

Functional Responsibility



Riaz Vajeth

Manager: Line Engineering

Date: 13/12/2012

Authorized by



Prince Moyo

**Power Delivery Engineering
GM**

Date: 12/02/2013

ESKOM COPYRIGHT PROTECTED

Content

	Page
Foreword.....	3
Introduction	4
1 Scope	4
1.1 Purpose	4
1.2 Applicability	4
1.3 Roles and Responsibilities	4
2 Normative / Informative references	5
2.1 Normative References	5
2.2 Informative	5
3 Definitions and abbreviations	5
3.1 Definitions	5
3.2 Abbreviations	6
4 Requirements	6
4.1 Tools and Equipment.....	6
4.2 Personal Protective Equipment	6
4.3 Work Instruction.....	6
5 Form s and Records.....	10
Annex A - Impact assessment.....	11

**ROAD CROSSING OVERHEAD LINES (STRAIN
POLES ON BOTH SIDES)**Unique Identifier: **34-222**Type: **DMN**Revision: **1**Page: **3 of 14****Foreword**

The document was compiled to conform or aligns with NRS 082 in ensuring that equipment in our network are maintained and to ensure that OHSAct requirements are met.

Revision history

This revision cancels and replaces revision no 0 of document no. **DWN_34-222**.

Date	Rev.	Compiled By	Clause	Remarks
Feb 2013	1	F de Bruin / DM Ntombela	-	Reviewed and reformatted the document. Document number changed to DMN 34-222
Sept 2006	0	F de Bruin	-	Original issue as DWN_34-222

Authorisation

This document has been seen and accepted by:	
Name	Designation
P Moyo	Power Delivery Engineering GM
CD Smith	Manager Design Base (Maintenance)
DM Ntombela	Consultant

Development team

This work instruction was prepared by:

NAME	DESIGNATION	DEPT/REGION
DM Ntombela	Consultant	IARC-DTEP
GPN Kruger	O F S	Western Region
SP De Bruin	Senior Supervisor	Central Region
F Van Jaarsveld	O F S	Eastern Region
DFB Lötter	O F S	Western Region
JE van Wyngaard	Senior Supervisor	Southern Region
JJB Uys (Chairperson)	Senior Supervisor	North Western Region
JJN Steenkamp	O F S	Central Region
HJ Martens	Senior Supervisor	Western Region
DM Ntombela	Consultant	IARC-DTEP
PA Pretorius	OFS MEW	Central Region

ESKOM COPYRIGHT PROTECTED

ROAD CROSSING OVERHEAD LINES (STRAIN POLES ON BOTH SIDES)

Unique Identifier: **34-222**
 Type: **DMN**
 Revision: **1**
 Page: **4 of 14**

NAME	DESIGNATION	DEPT/REGION
HCJ Nuttall	Senior Supervisor	North Region
P van der Westhuizen	Senior Supervisor	Southern Region
P Diedericks	SHE Officer	North Western Region
S Delport	SHE Officer	North Region
P Ramosili	Field Services Engineer	North West Region
M Lakhan	O F S	Eastern Region

Introduction

This Task Manual was compiled from the **analysis** that was done on **critical tasks** that are being performed when erecting / installing network equipment to identify **risks and hazards** attached so that they can be **addressed or remedied**.

This document states the procedure for ROAD CROSSING OVERHEAD LINES (STRAIN POLES ON BOTH SIDES) thereby ensuring that work is performed safely risks and hazards are minimised.

Keywords

Pole, Line, Procedure, Document, Manual, Network and Equipment

Bibliography

Not applicable.

1 Scope**1.1 Purpose**

The purpose of this document is to provide persons building "ROAD CROSSING OVERHEAD LINES" (STRAIN POLES ON BOTH SIDES) with a step by step description of how to do the task and highlights associated with the task.

1.2 Applicability

This Task Manual is applicable to persons building ROAD CROSSING OVERHEAD LINES (STRAIN POLES ON BOTH SIDES) in Eskom Holdings (Pty) Limited, it's divisions or Eskom wholly owned subsidiaries.

1.3 Roles and Responsibilities

The designated person or his delegate shall ensure that this procedure is implemented and adhered to. The authorised / responsible person is responsible for the safe execution of all work and activities as set out in this procedure.

ESKOM COPYRIGHT PROTECTED

2 Normative / Informative references

Parties using this document shall apply the most recent edition of the documents listed below:

2.1 Normative References

OHSAct: *Occupation Health and Safety Act 85 of 1993 and Regulations;*

EPC_32-846: Rev 0, *Operating Regulations for High Voltage systems;*

DISASABW3: Rev 2, *Distribution Standard On Fall Arrest Systems;*

SCSPVACL6: Rev 0, *Procedure For Using A Fall Arrest System;*

DPC_34-227: Rev 0, *Pre-task planning and feedback process;*

DST_34-658: Rev 0, *The Use Care Maintenance and Testing of High Voltage Operating Sticks;*

DSP_34-1150: Rev 0, *Lifting machine operators training;*

Specific local operating instruction / procedure; *and*

Manufacturer's manual

2.2 Informative

DST_34-1710: Rev 2, *Provision and Use of Personal Protective Equipment;*

DPC_34-444: Rev. 1, *Procedure for the application and maintenance of portable earth's;*

DPC_34-908: Rev 0, *Procedure for Barricading;*

DST_34-1454: Rev 0, *Clearing and maintenance of servitude routes; and*

DPC_34-04: Rev 0, *Procedure for the Preparation and Administration of Distribution Standards.*

3 Definitions and abbreviations

3.1 Definitions

All definitions in ESKPVAEY6 and OHSAct 85 of 1993 including the following are applicable:

Task Analysis: The systematic examination of all dangerous/hazardous tasks (work) in order to identify and quantify all the potential and existing inherent hazards that employees are exposed to while the tasks are being executed.

Risk Assessment: This process involves the combined functions of hazards identification, risk analysis, risk evaluation, determining the risk control strategy/s and the identification of the risk control measures that will be implemented during the task execution.

Dangerous/hazardous task: A specific element of work, which has produced and/or which possesses the potential to produce major loss or harm to people, assets, processes/production and/or the environment when performed properly.

Directive: A document which sets out a management objective, the appropriate policy if deemed necessary, as well as the functional accountability for activities to achieve that objective and the interface between functions affected by, or responsible for the execution of, such activities.

3.2 Abbreviations

CDP: Career Development Programme;

PTO: Principal Technical Officer;

STO: Senior Technical Officer;

TO: Technical Officer;

CCC: Change Control Committee.

4 Requirements

4.1 Tools and Equipment

- a) Standard tool set;
- b) Aerial Device;
- c) Torque wrench
- d) Loop impedance tester; and
- e) Earth Resistance tester.

4.2 Personal Protective Equipment

All personal protective equipment shall be in accordance with DSP_34-1710.

4.3 Work Instruction

4.3.1 Pre-job Planning

NOTE 1: Do not take short cuts to save time.

NOTE 2: Identify the correct tools, equipment, material, etc, required for the task.

NOTE 3: Lack of knowledge (area, environment, equipment) may cause serious incidents

- a) Confirm details of project contained in Project Package: i.e. way-leaves have been granted, Handing over certificates available, Written permission from Local Authority, Bill of materials,

ROAD CROSSING OVERHEAD LINES (STRAIN POLES ON BOTH SIDES)

Unique Identifier: **34-222**
Type: **DMN**
Revision: **1**
Page: **7 of 14**

Drawings, Survey Sheet, Sag and Tension Chart, Scope of work and Environmental study (documentation) available (EIA)

- b) Assessment on site (where required) to determine whether there are Telkom lines, other pipes (water, gas, oil), a railway line or other power lines crossing the work site, or to determine the scope of work and resources (people, equipment, PPE, etc.) – cause of loss / failure, upgrade/down grade, etc.
- c) Planning work and resources at Unit in accordance with Work Order, Task specific resources include:
- Traffic signs;
 - Red flags;
 - Road cones;
 - Amber rotating lights (Vehicles and on Workmen ahead traffic signs);
 - Reflective vests / bibs;
 - Notifications of proposed work to:
 - Traffic;
 - Telkom if required; and
 - Land owner/s.
 - Determine a strategy to control members of the public
 - Confirm with traffic department if they will control the traffic at the work site
 - If traffic officers will be on site to control the traffic determine and document traffic control measures that will be implemented. Ensure that all parties involved sign the traffic control agreement

4.3.2 On site assessment

NOTE: Identify and remove from site workers that may be under the influence of intoxicating substances (drugs / alcohol) or affected by medication.

- a) Ensure that all members of staff are included when performing risk assessment.
- b) Conduct an on site risk assessment prior to commencement of work and continuously during the task execution by:
- identifying the existing hazards/risks.
 - treating, transferring, tolerating or terminating the identified risks.
 - ensuring that all workers acknowledge identified risks and hazards by signing risk assessment form / worker's register.

4.3.3 Site Preparation

NOTE: Test / Inspect poles for rot/damage or vandalism.

- a) Off load and lay out tools, equipment and material.
- b) Check the stays on the structures on both sides of the road for the correct tension

ESKOM COPYRIGHT PROTECTED

4.3.4 Make worksite safe to work

NOTE 1: When the line is connected to the network, ensure that plant is isolated safety tested and earthed where required in accordance with ORHVS

NOTE 2: When the line is still under construction and/or has not yet been connected to the network, ensure that the authorised person applies working earths on all conductors

NOTE 3: If there are Telkom lines, railway lines or other power lines crossing the work site support structures for the conductors should be erected before any work commences

NOTE 4: Ensure vehicles, equipment and people are in a safe position next to road side.

NOTE 5: Road users ignoring road signs can lead to vehicle accident / incidents

NOTE 6: Ensure road signs are correctly placed

NOTE 7: Ensure Isolating and earthing is according to ORHVS.

- a) Park vehicles as far from the road side as possible
- b) Ensure that all rotating amber lights on the vehicles are switched on.
- c) Ensure that all people are wearing their reflective vests / bibs
- d) Liaise with Traffic Officers on site to confirm traffic control agreement
- e) Place traffic signs:
 - National Roads:
 - Stop/Go signs and persons with red flags placed 60 meters on either side of work site (Person with red flag only required if traffic not controlled by traffic officers).
 - Men at work signs 120 meters on either side of the work site.
 - 60 km/h sign 180 meters on either side of the work site.
 - 80 km/h sign 300 meters on either side of the work site.
 - 100 km/h sign 450 meters on either side of the work site.
 - 120 km/h sign 550 meters on either side of the work site.
 - Workmen ahead sign, fitted with a rotating amber light 560 meters on either side of the work site
- f) Provincial Roads or dual carriage roads:
 - Stop/Go signs and persons with red flags placed 60 meters on either side of work site (Person with red flag only required if traffic not controlled by traffic officers).
 - Men at work signs 120 meters on either side of the work site.
 - 60 km/h sign 180 meters on either side of the work site.
 - 80 km/h sign 300 meters on either side of the work site.
 - 100 km/h sign 450 meters on either side of the work site.
 - Workmen ahead sign, fitted with a rotating amber light 460 meters on either side of the work site

4.3.5 Fitting of hardware and equipment to structures on both sides of the road

NOTE 1: All steps as identified in analysis of work with/on extension/single ladders are applicable.

NOTE 2: All steps as identified in analysis of operate a vehicle mounted crane is applicable.

NOTE 3: Do not work at un-safe speed.

NOTE 4: Use FAS correctly.

NOTE 5: Use correct PPE.

NOTE 6: Ensure that plant is made safe to work on

- a) Position and secure ladder or aerial device.
- b) Place tools and equipment in pouch.
- c) Climb ladder / raise aerial device to working position – use fall arrest system according to requirements
- d) Secure snatch block and rope to lift tools and equipment.
- e) Fit hardware to the structures (Depending on the configuration this may vary):
- f) Non tensioning side: Only insulators
- g) Tensioning side: Insulators, straining clamps, etc
- h) Fit lifting gear and conductor running wheels to the structure on the side to which the conductor will be pulled in. Depending on the configuration and length of the line, more conductor running wheels may be required.

4.3.6 Preparing conductors on one side of the road

NOTE: Do not work from an unsafe position

- a) Measure the length of the conductor required and cut off – Ensure that the length is enough to be able to make jumpers as well.
- b) Make off the conductors on ground level.
- c) Ascend to working position.
- d) Pull up and attach the conductors to the insulators on the non tensioning side.
- e) Descend to ground level.

4.3.7 Pulling the conductors over the road

NOTE 1: Traffic must be properly controlled

NOTE 2: When tensioning remember to fit a dynamometer to the most appropriate conductor.

NOTE 3: When making jumpers ensure that equipotential earthing is applied.

ESKOM COPYRIGHT PROTECTED

ROAD CROSSING OVERHEAD LINES (STRAIN POLES ON BOTH SIDES)

Unique Identifier: **34-222**
Type: **DMN**
Revision: **1**
Page: **10 of 14**

NOTE 4: Strain assembly methods: Strain clamp make off – Aluminium tape to be applied onto the conductor. Pre-form make off – Arcing horns to be installed. Compressed / crimped make off – ensure that enough non – oxide grease is applied generously

- a) Stop traffic from both sides of the work site.
- b) Take the conductor ends to the structure on the other side of the road.
- c) Climb ladder and pull up the conductors and fit through the conductor running wheels.
- d) Pull out the slack on the conductors over the road by hand.
- e) Secure the conductor to the lifting gear with a conductor grip.
- f) Sag conductors to correct tensioning requirements.
- g) Check the tension on the stays and ensure that the poles are in upright position.
- h) Check sagging and ground clearances.
- i) Allow traffic to proceed.
- j) Remove conductor running pulleys and lifting gear and lower to ground level.
- k) Climb down the ladder and remove tools, ladder and relevant equipment from site

4.3.8 Task wrap up.

NOTE 1: Dispose redundant material in accordance with statutory and organisational requirements.

NOTE 2: Gates and fences must be left or returned to original state on completion of work.

- a) Clean work area and remove redundant material
- b) Complete all relevant documentation – works order and risk assessment documentation.
- c) Restore site / gates to original state.

5 Form s and Records

A capacitor bank faults / failure report / feedback shall be completed and forwarded to the Plant Department and Work Management Centre together with the work order via Works co-ordinator.

Annex A - Impact assessment

(Normative)

1 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.

2 Critical points

2.1 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: Statutory requirements and document revisions.

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

Comment: The document is compiled from the task analysis conducted for the task and it stipulates the procedure to follow in carrying out the task, this document was compiled to satisfy the OHSWA requirements.

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

Comment: None

2.4 When will new stock be available?

Comment: Not applicable

2.5 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

2.6 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: This document implementation must be complemented by ORHVS and any regional or local safety publication.

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

Comment: (N/A during commenting phase)

ESKOM COPYRIGHT PROTECTED

Annex A
(continued)

3 Implementation timeframe

3.1 Time period for implementation of requirements.

Comment: As per the regional documents implementation program /process.

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

Comment: Not applicable

4 Buyers Guide and Power Office

4.1 Does the Buyers Guide or Buyers List need updating?

Comment: No

4.2 What Buyer's Guides or items have been created?

Comment: Not applicable

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

Comment: Not applicable

4.4 If the implementation of this document requires assessment by CAP, provide details under 5

4.5 Which Power Office packages have been created, modified or removed?

Comment: None

5 CAP / LAP Pre-Qualification Process related impacts

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

Comment: No

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

Comment: This document has just been reviewed

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

Comment: Not applicable

Annex A

(continued)

5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: This document stipulates maintenance only.

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

Comment: See 5.4

5.6 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: See 5.4

5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: Not applicable

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

Comment: Not applicable

6 Training or communication

6.1 Is training required?

Comment: (If NO then 6.2 – 6.6 will be N/A) Yes and is already taking place.

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

Comment: Awareness training, Practical / on job and / or Module

6.3 State designations of personnel that will require training.

Comment: Supervisor, PTO, STO and TO

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

Comment: Yes

6.5 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: Training as per regional arrangements

ESKOM COPYRIGHT PROTECTED

Annex A

(continued)

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

Comment: Yes

6.7 State communications channels to be used to inform target audience.

Comment: As per regional communication processes

7 Special tools, equipment, software

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

Comment: None

7.2 Are there stock numbers available for the new equipment?

Comment: Not applicable.

7.3 What will be the costs of these special tools, equipment, software?

8 Finances

8.1 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: The document has already been implemented there current status is not going to change.

Impact assessment completed by:

Name: David M Ntombela_____

Designation: Consultant_____