

Title: **ROAD CROSSING OVERHEAD  
LINES (INTERMEDIATE POLES  
ON BOTH SIDES OF THE  
ROAD)**

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Transmission Engineering**

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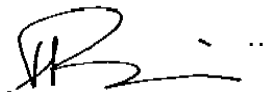
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## Foreword

This Standard has been compiled to ensure compliance with the O.H.S. Act and NRS 082 requirements in ensuring that the network is maintained and the maintenance is carried out in an environment where associated risks and hazards are minimized and / or mitigated.

## Revision history

This revision cancels and replaces revision no 0 of document no. **DWN\_34-318**.

Date	Rev.	Compiled By	Clause	Remarks
Feb 2013	1	D Ntombela	-	Formatted the document and no content changes Document number changed to DMN 34-318
Aug 2006	0	S de Bruin	-	Original issue as <b>34-318</b>

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(INTERMEDIATE POLES ON BOTH SIDES OF THE  
ROAD)**

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Page: **4 of 15**

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## **Introduction**

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

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

## **Keywords**

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

## **Bibliography**

Equipment Manufacturers manual

## **1 Scope**

### **1.1 Purpose**

The purpose of this document is to provide persons building ROAD CROSSING OVERHEAD LINES (INTERMEDIATE POLES ON BOTH SIDES OF THE ROAD) with a step by step description of how to do the task, including the most critical hazards and technical specifications associated with the task.

### **1.2 Applicability**

This Task Manual shall apply throughout Eskom Holdings Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

### **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.

## **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\_34-846: Rev 0, *Operating Regulations for High Voltage systems;*

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

DST\_34-1710: Rev 0, *Provision and Use of Personal Protective Equipment.*

DPC\_34-444: Rev. 0, *Procedure for the application and maintenance of portable earth's;*

DPC\_34-908: Rev. 0, *Procedure for Barricading;*

DPC\_34-380 Rev 0, *Identifying, Analysing, Documenting and Observing Dangerous/Hazardous tasks;*

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*

DST\_34-1454: Rev 0, *Clearing and maintenance of servitude routes; and*

DST\_34-1150: Rev 0, *Lifting machine operators training.*

### **2.2 Informative**

DPC\_34-04: Rev 0, *Procedure For The Preparation And Administration Of Distribution Standards.*

## **3 Definitions and abbreviations**

### **3.1 Definitions**

All definitions in EPC\_34-846 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;

**ABC:** Aerial Bundle Conductor: and

**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 DST\_34-1710.

## **4.3 Task Manual**

### **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, 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, 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
    - 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 Risk Assessment**

**NOTE 1:** Ensure good light/lighting and visibility at the work site.

**NOTE 2:** Job pressure – Ensure a proper risk assessment is performed before any task commences and continuously during task execution in accordance with the risk assessment procedure.

**NOTE 3:** Ensure that the existing hazards/risks are identified and minimised.

**NOTE 4:** Identify workers that may be under the influence of intoxicating substances (drugs / alcohol) or affected by medication.

**NOTE 5:** Ensure that appropriate PPE and safety equipment are identified, inspected and worn/used during execution of the task

- a) On site risk assessment prior to commencement of work and continuous during the task execution

#### **4.3.3 Site Preparation**

**NOTE:** Pole structures shall be tested / inspected for rot, vandalism any damage before ladders are leaned against or are being ascended.

- 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.

#### **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 – using 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 Conductor Stringing**

**NOTE 1: Do not work from an unsafe position**

**NOTE 2: All steps as identified in analysis of work with/on extension/single ladders is applicable**

**NOTE 3: All steps as identified in analysis of operate a vehicle mounted crane is applicable**

**NOTE 4: Strain assembly methods:**

1. Strain clamp make off – Aluminium tape to be applied onto the conductor.
2. Compressed / crimped make off – ensure that enough non – oxide grease is applied generously

**NOTE 5: When connecting or disconnecting a jumper ensure that equipotential earthing is applied.**

**NOTE 6: The three intermediate poles on both sides of the road crossing must be bind in with twin-ties on 10kN counter-lever post insulator.**

**NOTE 7: The traffic must be properly controlled.**

- a) Run out conductors up to road crossing.
- b) Control traffic while running out the conductor at road crossing
- c) Put the conductor on/into the running pulleys.
- d) Sag the conductors to correct tensioning requirements.
- e) Check the tension on the stays and ensure that the poles are in upright position.
- f) Check sagging and ground clearances.
- g) Allow traffic to proceed.
- h) Bind in conductors on the intermediate poles.
- i) Remove conductor running pulleys and lifting gear and lower to ground level.
- j) Remove tools and equipment from site.

#### **4.3.7 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) Remove all redundant material.
- d) Restore site / gates to original state.

## **5 Forms 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 revision.

**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 procedure in this document shall comply to so as to minimize the risk of being electrocuted.

**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 swap 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: Document DPC\_34-444 is required when implementing this document.

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

Comment: (N/A during commenting phase)

**Annex A**  
(continued)

**3 Implementation timeframe**

**3.1 Time period for implementation of requirements.**

Comment: AS per Change Control Committee and Field Services schedule.

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

Comment: The document has just been revised and there are no changes.

**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: NONE.

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

Comment: NONE.

**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: NOT APPLICABLE.

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

Comment: NOT APPLICABLE.

**Annex A**  
(continued)

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

Comment: NOT APPLICABLE.

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

Comment: NOT APPLICABLE.

**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: NO.

**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: YES

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

Comment: Practical / on job training is required.

**6.3 State designations of personnel that will require training.**

Comment: Senior Supervisor, PTOs, STOs and TOs.

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

Comment: YES.

**Annex A**  
(continued)

**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: Safety and Maintenance training.

**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: Training Department and training forums

**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: Comment: No costs other than the training costs will be incurred by the regions and this will depend on the arrangements made for training ie. Training is held regionally or nationally

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.....

Impact assessment completed by:

Name: David Ntombela\_\_\_\_\_

Designation: Consultant\_\_\_\_\_