

Title: **REPLACEMENT OF A ROTTEN
/ BROKEN POLE WITH A
VEHICLE MOUNTED CRANE**

Unique Identifier: **34-96**

Part **11 - Maintenance**

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Transmission Engineering**

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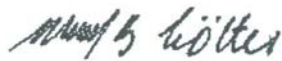
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Foreword

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

Revision history

This revision cancels and replaces revision no 0 of document no. **DMN_34-96**.

Date	Rev.	Compiled By	Clause	Remarks
Feb 2013	1	DFB Lötter	-	Reviewed the document and formatted into the new format. No content changed.
Jan 2006	0	DFB Lötter		Original issue as 34-96

Authorisation

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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 in replacing the rotten / broken pole with a vehicle mounted crane, thereby ensuring that work is performed safely.

Keywords

Equipment, Document, Vehicle, Crane, Pole

1 Scope

1.1 Purpose

The purpose of this task manual document is to ensure that the task of replacing a rotten / broken pole on an intermediate single structure with a vehicle mounted crane is carried out in a safe and orderly manner.

1.2 Applicability

This task manual is applicable to persons replacing a rotten / broken pole on an intermediate single structure with a vehicle mounted crane on electrical network system in Eskom Holdings (Pty) Limited, it's divisions and wholly owned subsidiaries.

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;*

DST_34-1131: Rev 0, *Distribution Standard On Fall Arrest Systems;*

DPC_34-1402: Rev 0, *Procedure For Using A Fall Arrest System;*

DPC_34-227: Rev 1, *Pre-task planning and feedback process;*

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DST_34-1150: Rev 0, *Lifting machine operators training*;

DMN_34-110: Rev 1, *Operating A Vehicle Mounted Crane*;

DMNB_34-111: Rev 1, *Operating A Vehicle Mounted Crane With A Bucket Attached*;

Specific operating local instruction / procedure; and

Manufacturer's manual.

2.2 Informative

DPC_34-04: Rev 0, *Procedure For The Preparation And Administration Of Distribution Standards*;

DST_34-1005: Rev. 0, *Environmental management policy*;

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

DPC_34-444: Rev. 0, *Procedure for the application and maintenance of portable earth's*;

DST_34-1710: Rev 0, *Provision and Use of Personal Protective Equipment*;

DPC_34-380 Rev 0, *Identifying, Analysing, Documenting and Observing Dangerous/Hazardous tasks*;

DISASAAN0: Rev 2, *Standard For The Labelling Of Substations And Networks*;

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

DST_34-658: Rev 0, *The use, care, maintenance and testing of high voltage operating sticks*.

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

PTO: Principal Technical Officer;

STO: Senior Technical Officer;

TO: Technical Officer;

CCC: Change Control Committee;

PPE: Personal protective equipment;

ORHVS: Operating Regulations for High Voltage Systems;

CO: Construction Official;

SCO: Senior Construction Official; and

PCO: Principal Construction Official.

4 Requirements

4.1 Roles and Responsibility

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

4.2 Pre-job Planning

- a) Do an assessment at the site to determine the scope of work and the resources that would be required (people, equipment, PPE, etc.
- b) Plan work and resources required for the task.

NOTE 1: If one lacks knowledge of the area, environment, equipment, etc consult with one's superior when performing the pre-task planning

NOTE 2: Not identifying people, correct tools, equipment, material, etc may cause delays, damage and injuries

NOTE 3: Confirm the validity of all the required authorisations of people that will be involved in the task

NOTE: 4: Ensure that the correct material ie. Poles / structures (correct configuration) are used for replacement.

4.2.1 Spares and Materials

- a) Replacement pole; and
- b) Hardware.

4.2.2 Tools and Equipment

- a) Standard tool set;
- b) Shovel;
- c) Pick;
- d) Guide Ropes;
- e) Soil Compacting / Stamper device;
- f) Plumb bob;
- g) Chain / Nylon web sling;
- h) Pole grip;
- i) Auger / Drilling machine;
- j) Ladders;
- a) Portable earthing gear;
- b) VMC; and
- c) Digging / drilling equipment.

4.2.3 Personal Protective Equipment

All personal protective equipment shall be in accordance with DST_34-1710.

4.2.4 Procedure

4.2.4.1 On-Site Risk Assessment

- a) Conduct an proper on site risk assessment prior to commencement of work and continuous during the task execution

NOTE 1: When doing on site risk assessment and executing the task the following hazards must be addressed:

- Do not take shortcuts to save time
- Ensure that poor visibility due to insufficient light/lighting are addressed during the task execution
- Ensure proper communicating ability – language, instructions, signals, etc
- Correctly identify the critical existing hazards/risks
- Minimise identified critical risks
- Ensure that appropriate PPE and safety equipment are identified, inspected and worn/used during execution of the task
- Tools, equipment and material falling may cause injuries and damage

NOTE 2: If one lacks knowledge of the area, environment, equipment, etc consult with one's superior when performing the pre-task planning.

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4.2.4.2 Plant Isolation

- a) Ensure that the plant is isolated and earthed and handed over (works permit where required) in accordance with EPC_34-846 (ORHVS).

NOTE 1: All risks and hazards as identified in analysis of HV Operating are applicable.

NOTE 2: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution.

NOTE 3: Not ensuring that isolation and earthing is not done in accordance with EPC_34-846 (ORHVS).

4.2.4.3 Digging / Drilling Replacement pole hole

NOTE 1: Ensure that work only commences after an instruction has been given by a responsible person.

NOTE 2: Ensure that when drilling under energized line safe working clearance as EPC_34-846 must be adhered to.

NOTE 3: If power tools are used incorrectly, it can cause injuries to ears, eyes, wrists or lungs (inhalation of dust)

NOTE 4: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution

- a) Secure the existing pole before digging or drilling commences.
- b) Dig / drill the hole for replacement pole and ensure that the depth of hole is correct for the pole length being used.

4.2.4.4 Replacement Pole Preparation

NOTE 1: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution.

NOTE 2: Ensure that no substandard equipment is used (eg support ropes, spikes).

NOTE 3: Ensure that the guide ropes are sufficiently secured.

NOTE 4: Ensure that the material at work site is placed in a manner that it will not become a tripping hazard.

- a) Dress the pole top at ground level according to specifications.
- b) Fit the earth wire in accordance with regional specifications.
- c) Fit the identification label to pole, ensure that the label is in accordance with the latest revision of the labelling standard (DISASAAN0).
- d) Fit the sling to pole above balance point.
- e) Attach the guide ropes to pole base.

4.2.4.5 Replacement pole planting

NOTE 1: All risks and hazards as identified in analysis to operate a vehicle mounted crane (DMN_34-110 / 111) are applicable.

NOTE 2: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution.

NOTE 3: Ensure that plant has been isolated and earthed and handed over (works permit) where required in accordance with EPC_34-846 (ORHVS).

NOTE 4: Ensure that no one is taking up an unsafe position.

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NOTE 5: Pole not planted plumb and in line with other poles may cause strain on pole and insulators.

NOTE 6: Where the crane operator cannot observe the work to be done ensure that he / she is assisted by a crane assistant trained in basic rigging (including hand signal).

- a) Raise pole to vertical position with the crane, supporting base of the pole with the rope.
- b) Position the pole in centre of hole in line with other poles.
- c) Ensure that the pole is plumb in vertical position (use a plumb bob).

NOTE 7: Incorrect back filling, not in accordance with procedure may cause pole to topple

NOTE 8: Not back filling area around pole can cause water to accumulate and can cause pole to rot

- d) Backfill the hole and compact the soil in layers.
- e) Backfill the area around pole to a height of ± 300 mm above ground level and this layer of hipped soil must not compacted.

4.2.4.6 Securing a damaged pole

NOTE 1: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution

NOTE 2: Poor communication and inadequate supervision can result in injuries

NOTE 3: All risks and hazards as identified in analysis of work with/on extension/single ladders is applicable

- a) Secure ladder into working position against new pole or
- b) When using climbing shoes:
 - Remove the anti-climbing device where necessary; and
 - Ensure that FAS is attached to the rope grab before climbing up the pole.

NOTE 4: Tools, equipment and material falling may cause injuries and damage

- c) Place tools and equipment (snatch block and rope) in the pouch.
- d) Use FAS to climb the ladder to working position.
- e) Transfer the sling and the guide ropes from new pole to damaged pole.
- f) Stabilise the damaged pole.

4.2.4.7 Transferring conductors

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

NOTE 2: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution.

NOTE 3: Weight of conductor may cause injuries when handled – strains, pinching.

NOTE 4: If conductors are not bound in accordance with procedure – conductors may become loose and cause damage or injuries.

NOTE 5: Check the condition of conductors prior to commencement of work – if a conductor breaks the conductor may cause injuries/damage or the structure may twist resulting in injuries and damage to equipment.

NOTE 6: Tools, equipment and material falling may cause injuries and damage.

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- a) Disconnect conductors and control the conductor's movement.
- b) Transfer conductors to replacement pole (new).
- c) Bind in conductors.
- d) Lower all tools and equipment to ground level.
- e) Use FAS to descend to ground level.
- f) Remove the ladder from pole.

4.2.4.8 Damaged pole removal

NOTE 1: All risks and hazards as identified in analysis for operating a vehicle mounted cranes are applicable.

NOTE 2: Ensure that poor visibility due to insufficient light/lighting is addressed during the task execution.

NOTE 3: Pole that has been detached from conductors may become unstable.

NOTE 4: Ensure that all persons are standing clear of falling poles (taking up unsafe position).

- a) Take up weight on crane.
- b) Where a stubby was installed remove it from damaged pole.
- c) Attach guide rope to base of the damaged pole.

NOTE 5: Pole not lowered in a controlled manner may result in injuries and damages

- d) Lower pole to ground with vehicle mounted crane (guide with ropes).

NOTE 6: Poles / stumps that are not removed from work site pose a safety risk or hazard

- e) Dig out and remove all stumps from work site.
- f) Backfill the stump hole, compact the soil and level as per procedure.
- g) Rehabilitate work site.

4.2.4.9 Energising plant

- a) Ensure that plant is handed back (work permit) where required and re-energised in accordance with EPC_32-846 (ORHVS).

NOTE 1: All risks and hazards as identified in analysis of HV Operating are applicable

4.2.4.10 Task wrap up

- a) Remove all personnel, equipment and redundant material from site
- b) Complete and submit required documentation

NOTE 1: All risks and hazards as identified in the analysis of physical material handling are applicable

NOTE: 2 Tools and equipment left at work place poses a safety risk or hazard.

NOTE 3: Not disposing redundant material in accordance with statutory and organisational requirements may result in damages/injuries to the environment/public/livestock and damage to the image of Eskom

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4.3 Forms and Records

The completed report shall be returned to the Work Management Centre together with the work order via Work co-ordinator.

The completed reports / forms must be returned to respective departments for record keeping.

- a) Works order
- b) Operating Instruction form / Workers register / Permit
- c) Risk Assessment
- d) In / Out commission sheet / Stores return

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 OHS&A 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)

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

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_____