 Eskom	Task Manual	Technology
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Title : **TITLE: DRILL HOLES UNDERNEATH OR IN CLOSE PROXIMITY OF HIGH VOLTAGE APPARATUS WITH A DRILLING RIG**

Unique Identifier: **240-134697232**

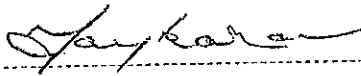
Alternative Reference Number: **34-1766**

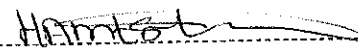
Area of Applicability: **Engineering**

Next Review Date: **STABILISED**

COE Acceptance

DBOUS Acceptance





Archie Jaykaran
Power Delivery Maintenance Study
Committee Chairperson

Amelia Mtshali
DBOUS Senior Manager

Date: **01/03/18**

Date: **07/03/2018**

This document is **STABILISED**. The technical content in this document is not expected to change because the document covers: *(Tick applicable motivation)*

1	A specific plant, project or solution	
2	A mature and stable technical area/technology	X
3	Established and accepted practices.	X




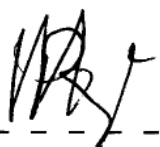
Document already Stabilized with old document number

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SCOT Study Committee Number/Name: **Asset Management**

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DATE: 06/03/2011	DATE: 07/04/2011	DATE: 07/04/2011	DATE: 7/4/11

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DRILL HOLES UNDERNEATH OR IN CLOSE PROXIMITY OF HIGH VOLTAGE APPARATUS WITH A DRILLING RIGUnique Identifier: **34-1766**Type: **DMN**Revision: **3**Page: **2 of 15****Foreword**

The document was compiled to conform or aligns with NRS 082, NRS 090 and NRS 090-1-1 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. 2 of document no. **DMN_34-1766**.

Date	Rev.	Compiled/ Revised By	Clause	Remarks
April 2011	3	D Ntombela	-	Reformatted the document
			1.3	“ Roles and Responsibility ” section moved to section “ 4 Requirements ”
			4.1.1	Relocated “ The requester is responsible for the following ” to Roles and Responsibility section
			4.2.2 c)	Remove 06TI-013 reference from the document as it is superseded by DST_34-445
			5	Removed “ Testing ” section
Oct 2007	2	D Ntombela	2	▪ Normative references updated;
			3	▪ Definitions and abbreviation updated;
			-	▪ Re-numbered all the titles and added more information;
			-	▪ Included Revision History information; and
			-	▪ Included impact assessment form.
April 2007	1	CTA WG	-	Replace Revision 0 / To also facilitate drilling of holes under live conditions safely.
Jun 2006	0	JD van Zyl	-	Original issues as DMN_34-1766

Authorisation

This document has been seen and accepted by:	
Name	Designation
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C Smith	Engineering Processes Manager
C Smith	Maintenance Management Steering Committee Chairperson

Development team

The work instruction was previously prepared by:

JD Van Zyl

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DRILL HOLES UNDERNEATH OR IN CLOSE PROXIMITY OF HIGH VOLTAGE APPARATUS WITH A DRILLING RIG

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This Task Manual was revised by:

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Introduction

This Task Manual is compiled to formalize the task steps where “DRILLING HOLES UNDERNEATH OR IN CLOSE PROXIMITY OF HIGH VOLTAGE APPARATUS WITH A DRILLING RIG are to be carried out in Eskom Distribution Division.

The document includes the latest updates in information, format, safety precautions from the task analysis developed or carried out to identify risks and hazards associated with the tasks so that the associated risks and hazards are addressed or remedied. This is done to prevent/avoid loss of supply, damage on equipment or injuries to all staff.

Keywords

Work, Site, Drill, Rig, Hole, Apparatus, Task, Manual, Contractor, Document and Manual

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Bibliography

- a) Training module; and
- b) Relevant Manufacturers manual.

1 Scope

1.1 Purpose

The purpose of this Task Manual is to standardise maintenance instructions on “Drill holes underneath or in close proximity of high/medium/low voltage apparatus with a Drilling rig”.

1.2 Applicability

This document shall apply throughout Eskom Holdings Limited, its divisions, subsidiaries, contractors employed by Eskom and entities wherein it has a controlling interest.

2 Normative/Informative References

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

2.1 Normative

NOTE 1: When issuing an enquiry based on this specification, it should be stated in the enquiry that the editions of the normative references that are current at the *date of issue* of the enquiry shall apply, unless otherwise agreed with Eskom. However in special cases, the responsible engineer may rule that the editions of one or more normative references applicable at the effective date of the Eskom specification shall apply.

Occupational Health and Safety Act and Regulations (OHSAct);

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

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

DST_34-445: Rev 0, *Standard For The Use Of Equipotential Earth Footplates*;

DST_34-1954: Rev 0, *Supervision of people in electrically hazardous locations*;

DST_34-908: Rev. 0, *Procedure for Barricading*;

DPC_34-227: Rev. 0, *Pre-Task Planning and feedback process*;

D-DT-0332: Rev 7 *MV/LV Reticulation pole planting depth details*; and

Manufacturers manual.

2.2 Informative

DST_34-1710: Rev. 0, *Provision and use of Personal protective equipment;*

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

ESP_32-191: Rev 0 *Specification for high voltage operating sticks;*

DPC_34-380: Rev 0 *Identifying, Analysing, Documenting and observing dangerous/hazardous tasks;*

DPC_34-925: Rev 0 *Procedure for refusal to work on the grounds of health, safety and environmental concerns;*

DSP_34-487: Rev 0 *Specification for portable earthing gear;*

DST_34-408: Rev 0 *Distribution driver and operator assessment and training;*

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

Manufacturers manual

3 Definitions and abbreviations

3.1 Definitions

All definitions in EPC_34-846 and OHSAct 85 of 1993 including the following are applicable.

Drilling rig driver: means a person driving the mobile Drilling rig and in possession of a valid drivers licence and Eskom K53 permit.

Drilling rig operator: a person who is selected, trained, assessed and authorised in terms of legislation to operate special machines.

Requester: means the person in charge of the work for which the holes are needed. He is the person that puts a drilling request through to Fleet (e.g. Project co-ordinator, Clerk of works, Outage leader, etc.)

Authorised person: means a person, whether an employee or another person, who has been authorised in terms of these regulations

NOTE: Only persons who have satisfied the designated person on terms of the Occupational Health and Safety Act (Act 85 of 1993) (General Machinery Regulation 2(1)) that their knowledge is adequate to perform specific duties on specified plant and that their knowledge of these regulations is sufficient may be authorised.

3.2 Abbreviations

CCC: Change Control Committee;

CDP: Career Development Programme;

GMR: General Machinery Regulation;

HV: High voltage;

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LV: Low voltage;

MV: Medium voltage;

ORHVS: Operating regulations for high voltage systems;

PPE: Personal Protective Equipment;

PTO: Principal Technical Officer;

STO: Senior Technical Officer;

SWP: Safe Work Procedure;

TSC: Technical Service Centre;

TO: Technical Officer;

PCO: Principal Construction Official;

SCO: Senior Construction Official;

MEW: Major Engineering Work and

CO: Construction Official.

4 Requirements

4.1 Roles and Responsibilities

4.1.1 Plant Managers shall be responsible for

- a) Ensuring that equipment job plans are available and issued for specific maintenance.
- b) Ensuring that the maintenance feedback information that is available in the maintenance management system is analysed.

4.1.2 Each Field Services / MEW Manager shall be responsible for

- a) Ensuring that staff carrying out maintenance tasks is trained, competent and authorized to perform maintenance on the specific equipment;
- b) Ensuring that instructions are implemented and adhered to and equipment is maintained in accordance to relevant Task Manuals.
- c) Ensuring that the maintenance feedback information / data is captured and recorded into the system for future maintenance planning.

4.1.3 The requester is responsible for the following

- a) Ensures all relevant disciplines/teams are involved in the pre-task planning phase (e.g. Technical Service Centre (TSO and/or Authorised person), Drill Rig Operator, Etc.).
- b) Ensures that pre-planning discussion is done in writing as per annexure A.

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c) During the pre-planning phase take the following into consideration;

- Identifies if drilling is to take place underneath live or dead apparatus.
- Identifying all risks associated with the task and inform/discuss with all relevant persons (obtain relevant team inputs in this regard).
- Identifies all underground services (e.g. Water, Electricity, and Sewerage) and obtain permission to drill from the respective authorities.
- Telephone lines above or near the line peg where the hole(s) must be drilled.
- That all relevant persons are aware of the 'right to refuse' procedure (DPC_34-925).
- In possession of the relevant/necessary reference documentation (e.g. job plan (copy), applicable Task Manual, etc.)

4.1.4 The Drilling rig Driver/Operator is responsible for the following

- In possession of a valid driver's license and Eskom permit (if Eskom employee) to drive the Drilling rig vehicle.
- Is competent by having been trained, assessed and authorised to operate the Drilling rig (Valid authorisation).
- Keep onlookers a safe distance away from drill and compressor rigs when in operation.
- The Drilling rig has its maximum extended height permanently and clearly marked on it.
- That the Drilling rig is in good working order.
- That the Drilling rig/vehicle is roadworthy.
- Correct tools and in good working condition.
- Equipotential earth footplates (and earth spikes) conform to specification and used as set out in DSP_34-487 and DST_34-445.
- Correct spares for the job (if applicable).
- All relevant PPE for the job.
- All emergency equipment on site (e.g. First aid box, Fire extinguisher, etc.)
- In possession of the relevant/necessary reference documentation (e.g. Task Manual, etc.)
- Ensures that unattended holes are covered by means of approved type covers/barricading.

4.1.5 The Authorised person is responsible for the following:

- In possession of a valid authorisation (e.g. to perform operating, take handover, issue permit or supervision, etc.)
- Knowledgeable with regard to safe work clearances and how to measure.
- Correct level of supervision throughout (refer to DST_34-1954).
- Conduct an on-site risk assessment and toolbox talk, see DPC_34-227.
- If drilling is to take place underneath DEAD apparatus the following applies in terms of EPC_34-846:
 - Isolation and earthing to the relevant apparatus.
 - Hand over and permission to apply/remove working earths
 - Issue permit (if applicable)

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- If safety clearance won't be breached working earths need not be applied but the work shall be done under the supervision of the authorised person.
- Work shall be supervised by an authorised person throughout.
- If drilling is to take place underneath or in close proximity LIVE apparatus the following applies in terms of the EPC_34-846;
 - The relevant apparatus to be taken off auto reclose (optional).
 - Safe work clearances may not be breached.
 - Work shall be supervised by an authorised person throughout (refer to DST_34-1954).

4.2 Pre-planning

Do an assessment to determine the resources that would be required (people, PPE, equipment, drawings, etc.) as per DPC_34-227.

Refer to driving (DMN_34-2210), DGL_34-256 and EPC_32-93 when planning to drive to site.

All personal protective equipment shall be in accordance with DST_34-1710 and PPE identified from Risk assessment (DPC_34-227) performed.

4.2.1 Tools and Equipment

- a) Drill Rig operator requirements:
 - Crow bar (Also known as Tommy bar or Wrecking bar)
 - Shovel
 - Pick
 - Spirit level ("Waterpas")
- b) Authorised person requirements:
 - Telescopic operating stick
 - Non-conductive tape measure
 - Cable height meter – e.g. Suparule (Optional)
- c) Requester
 - Covers/Barricading equipment for unattended holes

4.2.2 Personal Protective Equipment

All personal protective equipment shall be in accordance with DST_34-1710 and those identified by risk assessment (DPC_34-227).

- a) Head protection – Hard Hats
- b) Eye/face protection – Impact resistant eye glasses/face shields
- c) Hearing protection – Ear plugs and/or ear muffs

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-
- d) Shirt/Pants – Cotton
 - e) Foot protection – Safety boots/shoes and socks (cotton)
 - f) Hand protection – Leather gloves
 - g) Respirator for dust, gas or fumes.

4.2.3 Safety and preparation

- a) Isolate and earth panel in accordance with EPC_34-846.
- b) Erect barricading in accordance with DPC_34-908 and OHSAct (construction regulation).
- c) Ensure all tools, equipment and materials are placed inside the barricaded area where they will not hinder or obstruct any worker.
- d) Environmental hazards shall be removed in accordance with DST_34-1005

4.3 Procedures

Risk assessment and critical task analysis shall be done in accordance to DPC_34-227 and approved safe work procedures.

4.3.1 On Site Risk Assessment and toolbox talk

The authorised person shall adhere to the following requirements;

- a) Prior to the commencement of any work conduct a risk assessment to ensure that the risks and hazards identified during the pre-task planning phase are either still applicable or whether they must be re-evaluated because of changed circumstances or conditions.
- b) Allocate the precise work to be carried out, by whom and exactly where.
- c) Visually inspect the work site in order to identify other possible risk areas and hazards.
- d) Identify and agree upon risk control measures that are to be implemented to minimize potential risks and hazards.
- e) Complete the risk assessment form as set out in annexure B.

NOTES:

- 1 **Consider the height of the Drilling rig tower when either fully or partially raised in conjunction with the height of the nearest/lowest parts of the LV / MV / HV apparatus. This is to prevent the apparatus from getting damaged when raising/lowering the tower (Drilling rigs should have its maximum extended height permanently and clearly marked on it).**
- 2 **It is not always possible that the surface/terrain is level therefore be mindful of rocks, stones, ditches, walls, slopes, holes, etc. when positioning the Drilling rig.**
- 3 **Also be mindful of the clearances when the jacks are used when levelling the Drilling rig.**

4.3.2 Worksite Preparation

- a) Measures the clearances in order to ensure that safe work clearances (as per EPC_32-846) won't be breached or apparatus won't be damaged when raising/lowering the tower.
- b) If possible level the parking surface/area for the Drilling rig.
- c) Position the equipotential earth footplates as set out in DST_34-445.
- d) Inspect the footplate(s) and earths as follows:

NOTE 1: Irrespective of the fact that the apparatus is isolated and earthed, footplates shall be used at all times. (Due to the fact that lines can be made alive by various reasons such as unauthorised operating, live line crossing the isolated line broke and fell onto the dead line, etc.)

NOTE 2: All equipment being on the same work site shall be connected to the common earth electrode.

- Footplate(s) is bonded to the vehicle chassis
- The earth spike lead is bonded to the base of the drilling rig
- The spike is correctly driven into the ground
- Where Equipotential earthing is used on de-energised lines it all needs to be connected to the cluster bar which will be bonded to the earth electrode.

4.3.3 Work Execution

- a) Ensure appropriate PPE and safety equipment are worn/used during execution of the task.
- b) Ensure proper communication (language, instructions, signals, labelling, etc.)
- c) Operate the Drilling rig as per suppliers manual.
- d) Drill operator must ensure that the holes are drilled to the correct specification.
- e) Always stand with both feet on the footplate when using / touching the controls or any parts of drilling rig while it is in close proximity of live high voltage apparatus (refer to EPC_32-846).
- f) When in position the footplates or earth spike may not be handled until the tower is fully lowered again.

NOTE 1: Be mindful of the fact that when stepping of the footplate implies that the operator may not touch any part of the Drilling rig/vehicle. He/she may not even climb onto or off the vehicle. This applies to all other persons also at the work site (e.g. team members, team leader, member of public, etc.).

NOTE 2: A Drilling rig with the controls situated in such a position that the operator sits on the vehicle operating the controls the following shall apply:

- While raising/lowering the tower or drilling the operator may not climb off the rig and others may not climb on or touch the rig.
- Footplates not needed but at least an earth tail with earth spike shall be used as indicated in DST_34-445.

4.3.4 Task Wrap Up

- a) Ensure that the workplace is left clean and tidy on completion of work.
- b) Cover / barricade unattended holes in an approved manner to prevent humans/animals from falling into them (refer to OHSAct-Construction regulation).
- c) Complete and submit required documentation.

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4.3.5 Task Wrap Up

- a) Ensure that the workplace is left clean and tidy on completion of work.
- b) Cover/barricade unattended holes in an approved manner to prevent humans/animals from falling into them. This is the responsibility of the requester.
- c) Complete and submit required documentation.

5 Forms and Records Documents

The attached report and the following forms shall form the record of work done.

- a) Work orders (if applicable)
- b) Written Pre-planning form
- c) Workers register / Permit (if applicable)
- d) Risk Assessment form

The completed report must be returned to the Work Co-ordinator together with the work order and a copy to the Technical Services Center.

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, optimized costs.

Comment: Statutory requirements and or 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: No impact on statutory or legal compliance and mainly document revisions

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

Comment: N/A - No new equipment or item need to be acquired for implementation of this document.

2.4 When will new stock be available?

Comment: N/A –see 2.3 above.

2.5 Has the interchange ability of the product or item been verified - i.e. when it fails is a straight swap possible with a competitor's product?

Comment: N/A – It is a maintenance document and also see 2.3 above.

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: Consult / Refer to equipment maintenance documents when implementing the document.

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

Comment: None.

Annex A

(Continued)

3 Implementation timeframe

2.1 Time period for implementation of requirements.

Comment: N/A – No technical changes were made to this document.

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

Comment: None.

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 – The configuration hasn't changed.

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

Comment: N/A – The revision requires no new equipment / assessment.

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: N/A – The document doesn't specify but stipulated the maintenance procedures on the existing equipment.

Annex A

(Continued)

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

Comment: N/A – The specification is supplied to the suppliers not this document.

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

Comment: Yes – This is the revision of document that is presently being implemented and requires no change to the supplier's qualification period.

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

Comment: N/A – see 5.4 above.

5.6 If Yes to 4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: N/A – see 5.4 above.

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

Comment: N/A – No new material is required.

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

Comment: N/A – No new material is required.

6 Training or communication

6.1 State the level of training or communication required to implement this document. (E.g. none, communiqués, awareness training, practical / on job, module, etc.)

Comment: Practical / On job and training module.

6.2 State designations of personnel that will require training.

Comment: TSO, PTO & STO.

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

Comment: Yes – DT- Training is revising earthing related training manual which will address the changes in this document.

6.4 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.

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Annex A

(Continued)

6.5 Was Training & Development Section consulted w.r.t training requirements?

Comment: Yes.

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: N/A – No new equipment is required.

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

Comment: N/A – No new equipment is required.

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:

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

Impact assessment completed by:

Name: David M. Ntombela

Designation: Consultant