

 Eskom	Task Manual	Technology
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Title : **INSTALLATION OF PREPAID METERS**

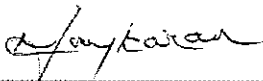
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COE Acceptance

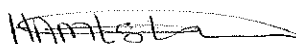


Archie Jaykaran

Power Delivery Maintenance Study
Committee Chairperson

Date: 22 Sept 2017

DBOUS Acceptance



Amelia Mtshali

DBOUS Senior Manager

Date: 28/09/2017

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

This letter is for multiple documents:

PCM Reference: <xxxxxxx>

SCOT Study Committee Number/Name: <Number or name>

Distribution Task Manual –
Part 11: MAINTENANCE

TITLE:
INSTALLATION OF PREPAID METERS

Unique Identifier: **34-135**

Document Type: **DMN**

Revision: **1**

Published date: **FEBRUARY 2010**

Review date: **STABILIZED**





Stabilized: Approved standards¹ that:

- i. Address mature technologies or practices
- ii. Are required for use in connection with existing implementations or for reference purposes
- iii. Contain no identified significant erroneous information
- iv. Are not likely to require revisions.

¹ The term standard covers specifications, standards, technical bulletins, technical instructions, procedures, guidelines and any other document that follow the SCOWT process

Document Classification: **Controlled Disclosure**

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COMPILED BY	APPROVED BY	FUNCTIONAL RESP	AUTHORISED BY
			
DFB LÖTTER Compiler	GPN KRUGER Task Analysis Work group Chairperson	C SMITH for TESCO	MN BAILEY CMDT for MD (Dx)
DATE: 18/01/2010	DATE: 12/01/2010	DATE: 01/02/2010	DATE: 5.2.2010

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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 OHSAAct requirements are met.

Revision history

This revision cancels and replaces revision no 0 of document no. DMN_34-135

Date	Rev. no.	Clause	Remarks
Feb 2010	1	-	Reviewed By: DM Ntombela
		-	Document approved as DMN_34-135
		-	Reformatted the document.
Feb 2006	0	-	Compiled By: DFB Lötter
			One document was original issues as DMN_34-135

Authorisation

This document has been seen and accepted by:

Name	Designation
MN Bailey	Corporate Manager Divisional Technology
C Smith	TESCOD
GPN Kruger	Task Analysis Workgroup Chairperson
DFB Lötter	Compiler

Development team

This task manual was previously prepared by:

GPN Kruger (Chairperson)	OFS	Western Region
DJ Strauss	FSE	Western Region
DFB Lötter	OFS	Western Region
JE van Wyngaard	OFS	Southern Region
JJB Uys	Senior Supervisor	North Western Region
JJN Steenkamp	OFS	Central Region
HJ Martens	Senior Supervisor	Western Region
E Fraser	FSE	North Western Region
DM Ntombela	IARC-DTEP	Central Region
T Barnard	SHE Officer	Eastern Region

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INSTALLATION OF PREPAID METERSUnique Identifier: **34-135**Type: **DMN**Revision: **1**Page: **3 of 15**

PJ van der Westhuizen	Senior Supervisor	Southern Region
SJ van Jaarsveld	OFS	Eastern Region
PA Pretorius	OFS (MEW)	Central Region
HCJ Nuttall	Senior Supervisor	Northern Region
S Spies	OFS (TSG)	Central Region
F de Bruin	Senior Supervisor (TSG)	Central Region
SA Delport	SHE Officer	Northern Region

Introduction

The Task Manual has replaced the Task manuals within the Distribution Division. This has been done to assist the end users of these documents and the following is important to note:

- The contents of a Work Instructions are always linked to the requirements of one or more Job Plans. In many instances only selected paragraphs / sections of the Task Manual will apply to a specific Job Plan.
- Task Manuals also form the main content of the training module for the task and therefore only people who have attended the training and assessed as competent should be assigned the task as described in the Task Manual.

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

This Task Manual document the procedure on a "INSTALLATING PREPAID METERS" so as to ensure that prepaid meters are installed in a safe manner to prevent/avoid damage on equipment or injuries on maintenance staff. The TM has replaced the WI within the Dx Div. This has been done to assist the end users of these documents and the following is important to note.

The contents of a TM are always linked to the requirements of one or more Job Plans. In many instances only selected paragraphs / sections of the TM will apply to a specific Job Plan.

TM's also form the main content of the training module for the task and therefore only people who have attended the training and assessed as competent should be assigned the task as described in the TM.

Keywords

Risk Assessment; Preplanning; Tools; Equipment; Protective; Commissioning; Installation; Base testing; Wiring; Mounting; ED / ECU; Preparations; and Task Wrap Up.

Bibliography

Critical task analysis:

High Voltage Operating; and

Work with/on Extension/Single Ladders.

Training module; and

Relevant Manufacturers manual.

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1 Scope

The purpose of this document is to provide persons INSTALLATING PREPAID METERS with a step by step description of how to do the task, including the most critical hazards and technical specifications associated with the task.

1.1 Applicability

This Task manual is applicable to persons INSTALLATING PREPAID METERS in areas under the jurisdiction of Eskom Holdings (Pty) Limited, it's divisions or Eskom wholly owned subsidiaries.

1.2 Applicability

This document shall apply throughout Eskom Holding Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

2 Normative 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;*

ESKPVAEY6: Rev 0, *Operating Regulations for High Voltage systems;*

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

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

SCSPBAA2 (DST_34-1005): Rev. 0, *Environmental management policy;*

DISASABU8 / DST0051 (DST_34-1462): Rev 1, *Standard For The Selection, Care, Use, Inspection And Maintenance Of Conductive And Non-Conductive Ladders;*

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

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

DPC_34-444: Rev 0, *The Procedure for Use and Maintenance of Portable Earthing Gear;*

DISASABW3 (DST_34-1131): Rev 2, *Distribution Standard On Fall Arrest Systems;*

DISSCABA2 (DPC_34-1507): Rev 2, *Specification for a Fall Arrest System;*

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

EPC_32-418: Rev 0, *Working AT Heights;*

DMN_34-1402; Rev 0, *Fall Arrest System;*

Manufacturers manual

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 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

PTO: Principal Technical Official;

STO: Senior Technical Official;

TO: Technical Official;

CCC: Change Control Committee;

PPE: Personal protective equipment;

ORHVS: Operating Regulations for High Voltage Systems;

SDB: Service Distribution Box;

COC: Certificate of Compliance;

ED: Electricity Dispenser; and

ECU: Energy Control Unit.

4 Roles and Responsibility

4.1 Responsibility

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.

5 Requirements

5.1 Tools and Equipment

- a) Standard tool set
- b) Earth Resistance tester

5.2 Personal Protective Equipment

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

6 Work Execution

6.1 Pre-job Planning

NOTE 1: Ensure that the personnel are trained and competent to perform the task allocated to them and they are familiar to the area or environment: Lack of knowledge (area, environment, equipment) will lead to damage to equipment and injuries to staff.

NOTE 2: Job pressure – During planning it must be ensured that all parts of work are allocated time correctly to avoid unnecessary job pressures.

NOTE 3: Ensure that appropriate PPE and safety equipment are identified and inspected.

NOTE 4: Conduct a pre-use inspection on all equipment and tools before they are used and ensure that they are serviceable and of good standards.

NOTE 5: Ensure that all material and spares used on the installation complies with specifications.

NOTE 6: Do not take shortcuts to save time by not doing a proper pre-task planning.

NOTE 7: Correctly identify tools, equipment, material, etc. to prevent delays, damage and injuries.

NOTE 8: Confirm the validity of all the required authorisations of people that will be involved in the task.

NOTE 9: Ensure that the vehicle is adequately equipped (fire extinguisher, first aid box, labels, tools and equipment, etc).

- 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.
- c) Inform customer of date and time of the installation of ED / ECU and ensure that the COC is available where required.

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6.2 On Site Risk Assessment

NOTE 1: Perform a proper risk assessment before task commencement and continuously during task execution in accordance with the prescribed procedure.

- a) Conduct an On site risk assessment prior to commencement of work and continuous during the task execution as per DPC_34-227.

NOTE 2: Ensure good visibility with additional lights/lighting where necessary.

NOTE 3: Identify and analyse risks and hazards associated with the task, eliminate, minimise, develop measures against – i.e. compile procedures or provide PPE to safeguard maintenance staff.

NOTE 4: Ensure proper communicating ability – language, instructions, signals, etc

6.3 Worksite Preparation

NOTE 1: Commencing with work preparation before line has been handed over or permission has been given.

NOTE 2: Ensure live equipment is isolated and earthed in accordance with ORHVS and correct earthing methods are employed.

- a) If required it should be ensured that live equipment/conductors are isolated, safety tested and earthed in accordance with ORHVS (ESKPVAEY6).
- b) No work preparation should commence before line has been handed over (works permit) in accordance with the ORHVS (ESKPVAEY6) or authorised person supervising the task has given permission for task commencement.

NOTE 3: All steps as identified in analysis of HV Operating are applicable.

NOTE 4: Correct/repair any identified defects or replace substandard/unserviceable/incorrect tools, equipment or material before commencing with task.

6.4 Install ED / ECU

NOTE 1: Use correct tools and equipment for task allocated.

NOTE 2: Ensure that no persons work/stand under person working in elevated position as falling equipment and tools will cause injury to them.

NOTE 3: Ensure that working earth are recorded in the operating instruction and are removed as per regulations and plant is re-energised in accordance with ORHVS i.e. equipotential earthing.

NOTE 4: All steps as identified in analyses of working with and on extension/single ladders, HV Operating and operating a vehicle mounted crane is applicable.

NOTE 6: No work will be carried out in / at customer property without permission from them.

NOTE 7: Ensure mounting position is in accordance with organisational / statutory requirements and customer's requirements.

NOTE 8: Ensure service cable is correctly installed and all defects corrected (no drip loop, substandard mounting brackets, etc).

NOTE 9: Not correcting / repairing any identified defects or replacing substandard / unserviceable / incorrect tools, equipment or material may lead to damages / injuries.

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NOTE 10: Tools, equipment and material at work site can cause a tripping hazard.

- a) Obtain permission to enter the customer's home.
- b) Inform customer that he should always treat his installation as live.
- c) Ensure that the service cable is installed correctly and test for dead.
- d) Locate and mark installation position with the customer's inputs (Even surface, correct height, correct position – not behind door, not above stove/heater, > 1m from water point)

6.5 Mounting of common base

NOTE 1: Ensure that all phases are replaced with fuse elements of the same rating.

NOTE 2: Ensure that electrical connections are properly secured (bolting/crimping) – loose connection leads to hot connection etc and over tightening / crimping leads to weak (physically) connections – breaks off easily.

- a) Prepare common base (Drill mounting holes & cable entry hole).
- b) Mount common base.

NOTE 3: Ensure holes drilled for mounting and cable glands are the correct size.

NOTE 4: Ensure that customers' house / furniture / possessions are treated with respect and not damaged in the execution of the task.

NOTE 5: Base not adequately mounted or not using appropriate method of mounting in accordance with the customer's building material may lead to common base later becoming loose.

NOTE 6: Use power tools and sharp cutting equipment responsibly.

NOTE 7: Be cautious of poor / unhygienic conditions or working in close proximity to people with contagious illnesses due to confined space.

NOTE 8: Construction of house may pose hazard and force awkward working positions.

NOTE 9: Insects / reptiles and animals may pose a hazard.

NOTE 10: Customer interference / communication / requests / demands whilst performing task may cause distraction.

NOTE 11: Frustrated customers may cause more work pressure.

NOTE 12: Ensure workmanship quality is of high or good sub-standard.

NOTE 13: Ensure that all tools and equipment are removed from working position / area when job is completed.

NOTE 14: Ensure that the installation complies with specifications after the repairs or maintenance.

6.6 Wiring of common base

NOTE 1: Ensure that Electrical conductors and connections are not over-tensioned.

NOTE 2: Cable gland shall be correctly mounted and / or adequately secured.

NOTE 3: Ensure cable connections are correct.

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NOTE 4: Ensure that earth bridge is in the correct place.

- a) Prepare cables for mounting.
- b) Connect cable conductors to the correct terminal blocks.
- c) Check that earth bridge connector is in place.
- d) Check that service earth is split from the neutral.
- e) Tighten all electrical connections.

6.7 Base testing

NOTE 1: Ensure that incorrect or defective test instruments are not used.

NOTE 2: Ensure that voltage is within specified parameters.

NOTE 3: Be cautious of possible exposure to live terminals.

NOTE 4: Ensure that the customer's supply cable is correctly connected.

- a) Switch on the supply at Service Distribution Box (SDB).
- b) Test voltage with an approved voltage tester to be within required specifications.
- c) Switch off the supply at Service Distribution Box (SDB) and test for dead (load side).

6.8 Installation of ED / ECU onto common base

NOTE 1: Ensure that the meter is correctly handled.

NOTE 2: Align the connection points before pushing the meter into position.

NOTE 3: Ensure that the meter is adequately pushed in and/or that the securing screws are adequately tightened.

NOTE 4: When installing an ED onto a common base, remove the plastic tab.

NOTE 5: Ensure that poor visibility due to insufficient light/lighting is addressed during the task

NOTE 6: Ensure that the meter is being connected to the correct supply group code, tariff index as well as correct amperage.

- a) Check that meter is correct for the supply group code, tariff index as well as correct amperage.
- b) Align connection points (meter contacts and base terminals) and push the meter into the base.
- c) Tighten securing screws.

6.9 Commissioning of ED / ECU

NOTE 1: Inform the customer that the supply will be switched on for testing purposes.

NOTE 2: Ensure the functionality test of the meter is performed.

NOTE 3: Ensure the polarity, earth leakage and voltage test are performed.

NOTE 4: Ensure that meters are sealed when the tests are completed – it can lead to exposed contacts and tampering of unit.

NOTE 5: Check that meter is on correct Supply group code, tariff index as well as correct amperage.

- a) Inform customer that the supply will be switched on for testing purposes.
- b) Switch on the Supply at Service Distribution Box (SDB).
- c) Ensure that “power on” indication is present on meter.
- d) Perform functionality test.
- e) Perform polarity and earth leakage test on the ECU.
- f) Complete and issue Installation Certificate (COC).
- g) Seal meter in accordance with the requirements of ED.
- h) Obtain a valid Certificate of Compliance (COC) from the customer.
- i) If, due to problems on the customer’s electrical installation, no valid COC is obtained, supply must be disconnected.
- j) Seal meter in accordance with the requirements.

6.10 Task Wrap Up

- a) Remove all personnel, equipment, tools and redundant material from site.
- b) Clean work area and remove redundant material.
- c) Inform customer that the supply has been connected.
- d) Complete and submit required documentation.

NOTE 1: Clean work area at the completion of the job – because leaving off-cuts and material may result in injuries to the public/livestock and damage to the image of Eskom.

6.11 Related/Supporting Documents

6.11.1 Related Documents

- a) Specifications;
- b) Critical task analysis; and
- c) Training module.

6.11.2 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; and
- 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 organizations 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.

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Annex A
(continued)

3 Implementation timeframe

3.1 Time period for implementation of requirements.

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

3.2 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.

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 document is the document supplied to the suppliers not this one.

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 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: 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 / equipment 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.

Annex A

(continued)

- 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.

- 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, Engineering Processes, IARC