

Title: **STRINGING OF CONDUCTORS  
AND CONNECTION OF  
DROPPERS**

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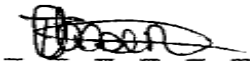
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Date: 16/09/2011

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**Functional Responsibility**

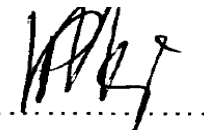


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## Foreword

The purpose of this document is to guide persons to do stringing and droppers in substation yard.

## Revision history

This revision cancels and replaces revision no 0 of document no. **DWN\_34-288**.

Date	Rev.	Clause	Remarks
Nov 2011	1		<b>Compiled By:</b> Tom Claasen Document number changed to DMN 34-288. 5 yearly review – changed format only.
Sept 2007	0		Document approved

## Authorisation

This document has been seen and accepted by:	
Name	Designation
P Moyo	Corporate Manager Divisional Technology
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This task manual shall apply throughout Eskom Holdings Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

## Development team

Major Engineering Works Documentation Standardisation Work Group:

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## Keywords

Stringing of conductors, droppers, Risk assessment

## 1 Scope

### 1.1 Purpose

The purpose of this document is to guide the persons required do stringing of conductors and connection of droppers in sub station yard.

### 1.2 Applicability

This work instruction is applicable to all the Major Engineering works persons doing stringing of conductors and connection of droppers in substation yard for new installation or replacement of old conductors up to 132Kv.

## 2 Normative References

The following documents contain provisions that, through reference in the text, constitute requirements of this work instruction. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this instruction are encouraged to investigate the possibility of applying the most recent editions of the documents listed below. Information on currently valid national and international standards and specifications can be obtained from the Information Centre and Technology Standardization Department at Megawatt Park

ORHVS: *Operating regulations for high voltage systems (ORHVS)*.

DSP\_34-323: *Personal protective equipment specification*.

DPC\_34-227: Rev.0, *Pre-task planning and feedback process*.

EPL\_32-94: Rev.6, *Environmental management policy*.

OSHA Construction Regulations

DPC\_34-333: Rev. 3, *OHS act requirements to be met by principle contractors employed by Eskom distribution*

DPC\_34-228: Rev. 0, *Health and Safety representative's inspection reports and guidelines*

**Note: Each entity to research DT standards applicable to their own function.**

## 3 Definitions and abbreviations

### 3.1 Definitions

**Trained:** means to be trained, assessed and found competent

### 3.2 Abbreviations

**MEW:** Major Engineering Works

**RAS:** Risk Audit System

## **4 Work Instruction**

### **4.1 Risk Assessment**

Risk assessment shall be done on site for each new task and in accordance with DPC\_34-227. Risks identified shall be recorded together with the steps to be taken to minimize such risks.

#### **4.1.1 The risk assessment shall cover risks associated with at least the following:**

- Working in close proximity of live equipment
- Roadside work
- Noise levels and effectiveness of communication
- Work in elevated positions
- Condition of poles, structures, hardware and conductors
- Weight of poles, structures, hardware and conductors to be lifted or displaced
- Rating of equipment (SWL, kV)
- Integrity of line
- Integrity of structures
- Integrity of holes and foundation
- Bystanders
- Weather conditions
- Equipment and tools
- Material or spares
- Work position of workers and specific tasks
- Overall supervision
- Complete declaration and sign

#### **4.1.2 Safety Requirements**

**Note: The workers retain the right to refuse to work on grounds of health and safety**

- Correct height conductors drums for running out of conductor
- Enough person to run out conductors
- Enough people to string and connect conductors.
- Barricade the work site if required
- Ensure isolation and sufficient earthing
- Be aware of obstacles (Fences, Telkom and railway lines, roads etc.)
- No person to be below the drums being loaded /unloaded
- No unauthorised entry is allowed on the site being worked on.
- P.P.E as per pre-task plan

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## 4.2 Stringing and droppers in sub-station yard

### 4.2.1 Pre-Planning

#### 4.2.1.1 Tools and equipment

Torque wrench	Hand tools
Hydraulic cutter / Bolt cutter	Lifting gear
Truck with crane	Ladders
Guide ropes	Shovels
Hand lines	cable jacks
Aerial basket / bucket	Trestles
Compression crimping equipment	Tension stringing gear / dynamometers

#### 4.2.1.2 Preparations

- Ensure erected structure is to specifications
- Provide suitable access and platform for trestles / cable jacks / tension stringing gear
- Provide suitable access for running out of conductors and pilot cables
- Ensure that conductors does not kink when running out
- On long section of line radio commutation must be maintained when running out conductors.
- Ensure appropriate crimper and correct dies on site
- Running blocks to be connected to insulators strings to run conductors through.
- Ensure to work only in barricaded area when working in existing substation
- Provide suitable access for truck and aerial basket

### 4.2.2 Running out and tensioning conductor

- Set up drum stations on level ground in line with the direction of run out.
- Run out conductor
- Tension conductor using approved tensioning method
- Terminate conductors as required by substation design drawing.

### 4.2.3 Dropper

- Measure length of dropper's and crimp.
- Ensure droppers are aligned with each other so that all the slack is similar
- Connect dropper to termination and ensure that phasing is correct and confirmed.

### **4.3 Record keeping**

- A record of all risk analysis and tool box talks
- A record of all quality checks shall be kept in the project file by MEW
- A record of all on job task observation shall be kept in the RAS file by the relevant person
- Material recording system must be kept and updated

*Note: Check up on requirements for recording drum serial numbers*

## **5 Roles and responsibilities**

### **5.1 Responsibilities**

The Designated Person or his delegate shall ensure that persons are trained and equipped to do the stringing and droppers in Sub-stations.

#### **5.1.1 The Principal Construction Official or his delegate shall ensure that:**

**5.1.1.1** Quality inspections are carried out and the quality report is completed

**5.1.1.2** All environmental requirements are met

**5.1.1.3** Applicable drawings and scope of work are on site

**5.1.1.4** Correct lifting equipment (Safe working load) is on site

**5.1.1.5** All outages are arranged beforehand

**5.1.1.6** Test results and calibration certificates are valid

#### **5.1.2 The responsible person on site shall ensure that:**

**5.1.2.1** All safety requirements are met for every specific scope of work

**5.1.2.2** Risk analysis is done

**5.1.2.3** Adequate supervision is carried out on all persons on the work site to ensure their safety

## **6 Process for monitoring**

This document shall be reviewed every three years if necessary. The MEW managers and or the IARC representative (for MEW) may at any time request a revision of this document. This document shall also be revised if major changes to technology, legal requirements or best practices necessitate it.

Minor changes that will affect the outcomes detailed in this document if recorded in the MEW manager's forum decision log will be valid till date of next revision.

## **Annex A - Impact assessment**

(Normative)

**Impact assessment form to be completed for all documents.**

### **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, and optimised costs.**

Comment: This document has been developed to ensure that the method of working in the MEW environment is aligned to the latest safety, health, environmental and quality requirements and technology and that all work is standardised through out Eskom Distribution

**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 enhances the existing statutory or legal compliance requirements.

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

Comment: The existing commercial practices are applicable at the implementation of the document.

**2.4 When will new stock be available?**

Comment: N/A. The prevailing stock arrangements will be applicable at implementation of the document.

**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: N/A. The document deals more with construction methods and not with products.

**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: The staff should have been adequately trained in the execution of the work as this does not constitute a training manual.

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

Comment: The document was developed by the regional MEW subject matter experts (SME's)

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**Annex A**  
(continued)

**3 Implementation timeframe**

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

Comment: N/A The time frame for the implementation of the out puts will be ongoing on both the existing and to all new work.

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

Comments : N/A .The document does not introduce new practices.

**4 Buyers Guide and Power Office**

**4.1 Does the Buyers Guide or Buyers List need updating?**

Comment: N/A All resources envisaged in the document are expected to be as listed previously.

**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**

Comment: N/A .No assessment is required.

**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. No new services or products are required from the Suppliers.

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

Comment: N/A.. No new services or products are required from the Suppliers.

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**Annex A**  
(continued)

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

Comment: N/A. There will be no impact on any product

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

Comment: N/A. There is no impact on any product.

**5.5 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. No products and services from the suppliers are affected

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

Comment: N/A .Existing conditions will apply.

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

Comment: N/A. None

## **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: Awareness of the requirements of the standard are to be discussed as part of pre-task planning during the toolbox talk.

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

Comment: All the designation as indicted in the roles and responsibility section of the document which include PCO, SCO and CO.

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

Comment: The document itself shall be used for personnel awareness.

**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: The document is to be made available at each instance where the activity is to be executed. The document is formulated around the construction activities.

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

Comment: N/A. The services of the Training and Development Section are not required.

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**Annex A**  
(continued)

**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. The existing resources are applicable.

**7.2 Are there stock numbers available for the new equipment?**

Comment: N/A. No new equipment is to be introduced to implement this document.

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

Comment: None.

**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: N/A. No major costs are incurred.

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Impact assessment completed by:

Name: IR Ledingwane

Designation: Senior advisor - MEW