

Distribution Task Manual –  
Part 24: MEW

**Title:**  
INSTALLATION OF TUBULAR BUSBAR

Unique Identifier: **34-296**

Document Type: **DMN**

Revision: **1**

Published date: **DECEMBER 2010**

Review date: **STABILIZED**

---

**Stabilized:** Approved standards<sup>1</sup> that:


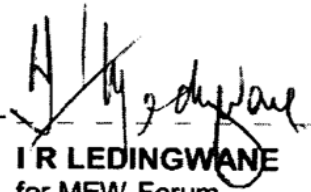
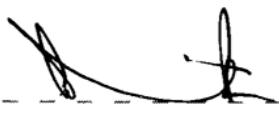

- i. Address mature technologies or practices
- ii. Are required for use in connection with existing implementations or for reference purposes
- iii. Contain no identified significant erroneous information
- iv. Are not likely to require revisions.

---

<sup>1</sup> 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**

Title: <b>Distribution Task Manual – Part 24:</b>	Unique Identifier: <b>34-296</b>
<b>INSTALLATION OF TUBULAR BUSBAR</b>	Document Type: <b>DMN</b>
	Revision: <b>1</b>
	Published date: <b>DECEMBER 2010</b>
	Total pages: <b>10</b>
	Review date: <b>DECEMBER 2015</b>

COMPILED BY	APPROVED BY	FUNCTIONAL RESP	AUTHORISED BY
			
<b>B KOTZE</b> PCO - MEW	<b>I R LEDINGWANE</b> for MEW-Forum	<b>C SMITH</b> for TESCO	<b>MN BAILEY</b> CMDT for MD (Dx)
DATE: 04/11/2010	DATE: 04/11/2010	DATE: 26/11/2010	DATE: 8.12.2010

## Content

	Page
Foreword.....	2
1 Scope .....	3
1.1 Purpose .....	3
1.2 Applicability .....	3
2 Normative References.....	3
3 Definitions and abbreviations .....	3
3.1 Definitions .....	3
3.2 Abbreviations .....	4
4 Task Manual .....	4
4.1 Risk Assessment .....	4
4.2 Installation of Tubular busbar .....	5
4.3 Record keeping.....	5
5 Roles and responsibilities.....	6
5.1 Responsibilities.....	6
Annex A - Impact assessment.....	7

**INSTALLATION OF TUBULAR BUSBAR**Unique Identifier: **34-296**Type: **DMN**Revision: **1**Page: **2 of 10****Foreword**

This documents has been developed to meet the Safety, Health, Environment and Quality requirements in construction of the lines and substations

**Revision history**

This revision cancels and replaces revision no 0 of document no. **DWN\_34-296**.

Date	Rev.	Clause	Remarks
Dec 2010	1	-	<b>Compiled By:</b> B Kotze
		Compiled by	J Nezar as the compiler is replaced by B Kotze Document number changed to DMN 34-296
		Development team-	Included and removed names under development team
		Clause no 2	Change the document reference numbers under normative references
		Clause no 4	Changed work instruction to task manual
		Clause no.	Draft watermark added.
Sept 2007	0		Document approved

**Authorisation**

This document has been seen and accepted by:	
Name	Designation
MN Bailey	Corporate Manager Divisional Technology
C D Smith	Engineering Processes Manager
I Ledingwane	MEW-Forum

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:

Bertie Kotze	William Sehako	Vuy Lutshaba
Ishmael Ledingwane	Tom Claasen	Johan Myburgh
Josiah Tshabangu	Neil Williams	Philemon Mzobe
Piet Pretorius	Tommy Meyer	Kholeka Dyakala
Ashley Tsineng		

**ESKOM COPYRIGHT PROTECTED**

## Keywords

Guide, Installation, tubular, busbar

## 1 Scope

### 1.1 Purpose

The purpose of this document is to guide the persons required to install Tubular Busbar correctly.

### 1.2 Applicability

This work instruction is applicable to all the Major Engineering Works persons doing installation of Tubular Busbars.

## 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: Definitions and abbreviations

OSHA Construction Regulations

PC 32-846: Rev. 0, *Operating regulations for high voltage systems (ORHVS)*.

DSP 34-323: Rev.1, *Personal protective equipment specification*.

DPC 34-227 Rev.1, *Pre-task planning and feedback process*.

ETE 34-1005: Rev.0, *Environmental management policy*.

DISASABW3: Rev. 2, *Standard for Fall Arrest Systems*

DST 34-1195: Rev. 5, *Quality control process for the checking of distribution substation construction before handing over for commercial operation*.

## 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

**DHO:** Design Hand Over document

## **4 Task Manual.**

### **4.1 Risk Assessment**

Risk assessment shall be done on site for each new task and in accordance with DPC 34 -227 Rev 1 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
- Work in accordance with ORHVS requirements
- 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 workers register and sign

#### **4.1.2 Safety Requirements**

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

- PPE as per Matrix
- Update documentation to align with RAS requirements to accommodate changes at the site.

**ESKOM COPYRIGHT PROTECTED**

**INSTALLATION OF TUBULAR BUSBAR**Unique Identifier: **34-296**Type: **DMN**Revision: **1**Page: **5 of 10**

- 
- Sufficient personal for sizing and preparation
  - Proper inspection of Tubular bars prior to installation according to general arrangement
  - Ensure that only material slings are used when lifting equipment that has porcelain or any other type of insulating material that can be damaged by the steel chains.
  - No person is allowed below the equipment being installed

**4.2 Installation of Tubular busbar****4.2.1 Pre-Planning****4.2.1.1 Tools and equipment**

Hand Tools	Contact Crease	Torque Wrench
Tape Measure	Cut off Grinder	Half round file
Safety goggles		

**4.2.1.2 Preparations**

- Determine that the correct type and size of Tubular Bus Bars to be installed as per scope of work are available

**4.2.2 Installation of Tubular Busbar**

- Measure Tubular Busbar to specification according to general arrangement (Sub station Plan or DHO) and mark
- Place Tubular Bus Bar in Cut-off Grinder and cut at specified markings
- Use half round file to clean off bars after cutting
- Fit clamps for support insulators to Tubular Bars before lifting Bars ( Note: Clamps must be loose for adjustment and to apply contact grease )
- Apply ropes on both ends of the Bar and lift into position
- Put clamps in place on insulators. (Note: Check clamps for contact crease)
- Secure bolts with spanner and Torque to specified Torque
- Insert conductor into Tubular Bas Bar for vibration damper
- Fit end caps

**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 RAS by the relevant person
- All documents pertaining to service contracts must be kept according to site file index.

**INSTALLATION OF TUBULAR BUSBAR**

Unique Identifier: **34-296**  
Type: **DMN**  
Revision: **1**  
Page: **6 of 10**

---

## **5 Roles and responsibilities**

### **5.1 Responsibilities**

- 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 RAS by the relevant person
- All documents pertaining to service contracts must be kept according to site file index.

## **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)

**ESKOM COPYRIGHT PROTECTED**



**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.

**ESKOM COPYRIGHT PROTECTED**

**INSTALLATION OF TUBULAR BUSBAR**

Unique Identifier: **34-296**  
Type: **DMN**  
Revision: **1**  
Page: **9 of 10**

---

**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.

**ESKOM COPYRIGHT PROTECTED**

**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.

.....  
.....  
.....

Impact assessment completed by:

Name: B.Kotze

Designation: PCO - MEW