

**Tender Number:** SIC22002CIDB / HOAC-HO-37671

**Description of Works:** Traction Transformer Refurbishment at Balfour.

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## **Transnet Freight Rail**

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

## **REQUEST FOR PROPOSAL (RFP)**

### **FOR THE: TRACTION TRANSFORMER REFURBISHMENT AT BALFOUR**

<b>RFP NUMBER</b>	<b>: SIC22002CIDB / HOAC-HO-37671</b>
<b>ISSUE DATE</b>	<b>: 03 AUGUST 2022</b>
<b>COMPULSORY BRIEFING</b>	<b>: 10 AUGUST 2022</b>
<b>CLOSING DATE</b>	<b>: 18 AUGUST 2022</b>
<b>CLOSING TIME</b>	<b>: 10h00</b>
<b>TENDER VALIDITY PERIOD</b>	<b>: 12 weeks from closing date</b>

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## T1.1 TENDER NOTICE AND INVITATION TO TENDER

### SECTION 1: NOTICE TO TENDERERS

#### 1. INVITATION TO TENDER

Responses to this Tender [hereinafter referred to as a **Tender**] are requested from persons, companies, close corporations or enterprises [hereinafter referred to as a Tenderer].

<b>DESCRIPTION</b>	Traction Transformer Refurbishment at Balfour.
<b>TENDER DOWNLOADING</b>	<b>This Tender may be downloaded directly from the National Treasury eTender Publication Portal at <a href="http://www.etenders.gov.za">www.etenders.gov.za</a> and the Transnet website at <a href="https://transnetetenders.azurewebsites.net">https://transnetetenders.azurewebsites.net</a> (please use Google Chrome to access Transnet link) <b>FREE OF CHARGE.</b></b>
<b>COMPULSORY TENDER CLARIFICATION MEETING</b>	<p>A Compulsory Tender Clarification Meeting will be conducted at <b>Transnet Freight Rail, LH Marthinusen-Johannesburg 338 Main Reef Rd, Denver, Johannesburg.</b></p> <p>on <b>Wednesday, the 10 August 2022 at 11:00am</b> for a period of ± 2 (two) hours. [Tenderers to provide own transportation and accommodation]. <b>Thabang Tutubala</b> may be contacted on <b>083 268 6852</b> for directions to Site.</p> <p>The Compulsory Tender Clarification Meeting will start punctually and information will not be repeated for the benefit of Tenderers arriving late.</p> <p><b>A Site visit/walk will take place, tenderers are to note:</b></p> <ul style="list-style-type: none"> <li>Tenderers are required to wear safety shoes, goggles, long sleeve shirts, high visibility vests and hard hats.</li> <li>Tenderers without the recommended PPE will not be allowed on the site walk.</li> <li>Tenderers and their employees, visitors, clients and customers entering Transnet Offices, Depots, Workshops and Stores will have to undergo breathalyser testing.</li> <li>All forms of firearms are prohibited on Transnet properties and premises.</li> <li>The relevant persons attending the meeting must ensure that their identity documents, passports or drivers licences are on them for inspection at the access control gates.</li> </ul> <p>Certificate of Attendance in the form set out in the <b>Returnable Schedule T2.2-3</b> hereto must be completed and submitted with your Tender as proof of attendance is required for a <b>compulsory</b> site meeting and/or tender briefing.</p> <p><b>Tenderers are required to bring this Returnable Schedule T2.2-3 to the Compulsory Tender Clarification Meeting to be signed by the Employer's Representative.</b></p> <p><b>Tenderers failing to attend the compulsory tender briefing will be disqualified.</b></p>
<b>CLOSING DATE</b>	<p><b>10:00am on 18 August 2022</b></p> <p>Tenderers must ensure that tenders are uploaded timeously onto the system. <b>If a tender is late, it will not be accepted for consideration.</b></p>

## **2. TENDER SUBMISSION**

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to bids and upload their bid proposals/responses on to the system.

- a) The Transnet e-Tender Submission Portal can be accessed as follows:

Log on to the Transnet eTenders management platform website

(<https://transnetetenders.azurewebsites.net>);

- Click on "ADVERTISED TENDERS" to view advertised tenders;
- Click on "SIGN IN/REGISTER – for bidder to register their information (must fill in all mandatory information);
- Click on "SIGN IN/REGISTER" - to sign in if already registered;
- Toggle (click to switch) the "Log an Intent" button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.**

- b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any confidential details pertaining to the Tender Offers / information received, i.e. pricing, delivery, etc. The names and locations of the Tenderers will be divulged to other Tenderers upon request.
- c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

## **3. CONFIDENTIALITY**

All information related to this RFP is to be treated with strict confidentiality. In this regard Tenderers are required to certify that they have acquainted themselves with the Non-Disclosure Agreement. All information related to a subsequent contract, both during and after completion thereof, will be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Works, which is either directly or indirectly related to Transnet's business, written approval to divulge such information must be obtained from Transnet.



#### **4. DISCLAIMERS**

Tenderers are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this Tender and/or its receipt of a tender offer. In particular, please note that Transnet reserves the right to:

- 4.1. Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer.
- 4.2. Not necessarily accept the lowest priced tender or an alternative Tender;
- 4.3. Go to the open market if the quoted rates (for award of work) are deemed unreasonable;
- 4.4. Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;
- 4.5. Request audited financial statements or other documentation for the purposes of a due diligence exercise;
- 4.6. Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;
- 4.7. Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;
- 4.8. Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);
- 4.9. Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.
- 4.10. Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFP with the possible consequence of being disadvantaged or disqualified as a result thereof.
- 4.11. Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable **[clause 12 on T2.2-22] [Breach of Law]** whether or not they have been found guilty of a serious breach of law during the past five [5] years.
- 4.12. Transnet reserves the right to perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer :
  - *unduly high or unduly low tendered rates or amounts in the tender offer;*
  - *contract data of contract provided by the tenderer; or*
  - *the contents of the tender returnables which are to be included in the contract.*

5. Transnet will not reimburse any Tenderer for any preparatory costs or other work performed in connection with this Tender, whether or not the Tenderer is awarded a contract.

**6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE**

Tenderer are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. The CSD can be accessed at <https://secure.csd.gov.za/>. Tenderer are required to provide the following to Transnet in order to enable it to verify information on the CSD:

Supplier Number..... and

Unique registration reference number.....(**Tender Data**)

**Transnet urges its clients, suppliers and the general public**  
**to report any fraud or corruption to**  
**TIP-OFFS ANONYMOUS: 0800 003 056 OR [Transnet@tip-offs.com](mailto:Transnet@tip-offs.com)**

Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of RFPs exceeding R5million [five million S.A. Rand] in value. Should a Respondent have any material concern regarding an RFP process which meets this threshold, a complaint may be lodged with the Ombudsman for further investigation. The Ombudsman reserves the right to refer the complaint to an external service provider for investigation.

It is incumbent on the Respondent to familiarise himself/herself with the Terms of Reference of the Ombudsman which are available for review at Transnet's website [www.transnet.net](http://www.transnet.net).

An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to [procurement.ombud@transnet.net](mailto:procurement.ombud@transnet.net).

For transactions below the abovementioned threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division/Specialist Unit.

Respondents are to note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a Bidder on its List of Excluded Bidders.



## 8. RFP CLARIFICATION REQUEST FORM

### SIC22002CIDB (HOAC-HO-37671)

RFP deadline for questions / RFP Clarifications: Before **12 pm on 15 August 2022**

TO: Transnet SOC Ltd  
ATTENTION: Governance, Transnet Freight Rail Tender Office  
EMAIL: [Prudence.Nkabinde@transnet.net](mailto:Prudence.Nkabinde@transnet.net)  
Cc: [Kgalalelo.Tlhabanelo@transnet.net](mailto:Kgalalelo.Tlhabanelo@transnet.net)  
DATE: \_\_\_\_\_  
FROM: \_\_\_\_\_

Indicate whether this query is general in nature and applicable to all service categories

Yes ☐ No ☐

1. For all clarification questions prior to the tender closing date and time, direct the communication to the RFP Administrator at [Kgalalelo.Tlhabanelo@transnet.net](mailto:Kgalalelo.Tlhabanelo@transnet.net)
2. For all clarification questions after the tender closing date and time, direct the communication to:

TO: Transnet SOC Ltd  
ATTENTION: Governance, Transnet Freight Rail Tender Office  
EMAIL: [Prudence.Nkabinde@transnet.net](mailto:Prudence.Nkabinde@transnet.net)  
Cc: \_\_\_\_\_  
DATE: \_\_\_\_\_  
FROM: \_\_\_\_\_

### REQUEST FOR RFP CLARIFICATION

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SIGNED at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_  
SIGNATURE OF TENDERER

\_\_\_\_\_  
SIGNATURE OF WITNESS

\_\_\_\_\_  
NAME OF TENDERER

\_\_\_\_\_  
NAME OF WITNESS

## T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts. The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice No 9 of 2008 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010, Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015 and Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

This edition incorporates the amendments made in Board Notice 423 of 2019 in Government Gazette 42622 of 8 August 2019. (see [www.cidb.org.za](http://www.cidb.org.za)).

The Standard Conditions of Tender make several references to Tender data for detail that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data given below is cross-referenced in the left-hand column to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause	Data
C.1.1 The <i>Employer</i> is	<b>Transnet SOC Ltd</b> <b>(Reg No. 1990/000900/30)</b>
C.1.2 The tender documents issued by the <i>Employer</i> comprise:	
<b>Part T: The Tender</b>	
Part T1: Tendering procedures	T1.1 Tender notice and invitation to tender T1.2 Tender data
Part T2: Returnable documents	T2.1 List of returnable documents T2.2 Returnable schedules
<b>Part C: The contract</b>	
Part C1: Agreements and contract data	C1.1 Form of offer and acceptance C1.2 Contract data (Part 1 & 2) C1.3 Form of Securities
Part C2: Pricing data	C2.1 Pricing instructions C2.2 Bill of Quantities
Part C3: Scope of work	C3.1 Works Information
Part C4: Site information	C4.1 Site information


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C.1.4	The Employer's agent is:	Procurement Officer
	Name:	Kgalalelo Tlhabanelo
	Address:	Inyanda House 2, 3rd Floor, 15 Girton Road, Parktown.
	Tel No.	011 584 -0590
	E – mail	<a href="mailto:Kgalalelo.Tlhabanelo@transnet.net">Kgalalelo.Tlhabanelo@transnet.net</a>

C.2.1 Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders:

**1. Stage One - Pre-qualification criteria for preferential procurement in terms of the Preferential Procurement Regulations, 2017:**

- a) A tenderer having a stipulated minimum B-BBEE status level of contributor of **2** or better (1 being better)

***Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.***

**2. Stage One - Eligibility in terms of the Construction Industry Development Board:**

- a) Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, designation of **4EP or higher** class of construction works, are eligible to have their tenders evaluated.
- b) Joint Venture (JV)  
Joint ventures are eligible to submit tenders subject to the following:
- every member of the joint venture is registered with the CIDB;
  - the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; and
  - the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **4EP** or higher class of construction works or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
  - The tenderer shall provide a certified copy of its signed joint venture agreement.

***Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.***



## Transnet Freight Rail

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### 3. Stage Two - Eligibility with regards to attendance at the compulsory clarification meeting:

An authorised representative of the tendering entity or a representative of a tendering entity that intends to form a Joint Venture (JV) must attend the compulsory clarification meeting in terms C2.7

***Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.***

### 4. Stage Four - Local Production and Content in terms of the Preferential Procurement Regulations, 2017:

#### 4.1 Compulsory Local Content Threshold

In terms of section 8(1) of the Preferential Procurement Regulations, 2017, and the Instruction Note issued by National Treasury on the "Invitation and Evaluation of Bids based on a stipulated minimum threshold for local content and production for the Sectors stated below, Transnet is required to set a stipulated minimum threshold be set for this RFQ.

- **Transformers and associated Equipment** [Bushings and Oil] - **100%**
- **Steel Power Pylons** – **100%**
- **Electrical Cables** – **90%**

#### 4.2 Local Content Threshold

Local Content thresholds as stated below will be required for the goods specified in SBD 6.2, to be manufactured by a successful Respondent.

#### 4.3 Local Content Notes

- 4.3.1 The exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) on the date of the advertisement of the tender;
- 4.3.2 Only the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 must be used to calculate local content;
- 4.3.3 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the following formula which must be disclosed in the bid documentation:

$$LC = [1 - x/y] * 100$$

Where

x is the imported content in Rand

y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the SARB at 12:00 on the date of advertisement of the bid.

- 4.3.4 The SABS approved technical specification number SATS 1286:2011 and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)] are accessible to all potential tenderers on the DTI's official website; <http://www.the dti.gov.za/industrial development/ip.jsp> at no cost.

- 4.3.5 The rates of exchange quoted by the tenderer in paragraph 4.1 of Returnable Schedule (the Declaration Certificate for Local Production and Content for Designated Sectors) will be verified for accuracy.
- 4.3.6 Declaration Certificate for Local Production and Content (SBD 6.2) together with the Annex C (Local Content Declaration: Summary Schedule) must be completed, duly signed and submitted at the closing date and time of the bid;
- 4.3.7 Tenderers must familiarise themselves with all the information provided in the Local Content instruction notes with particular reference to paragraph 4 of the instruction notes.
- 4.3.8 Respondents are to ensure that they complete the local content annexures in line with the provisions made in the Guidance Document for the calculation of Local Content. Failure to comply will lead to disqualification.

#### **4.4 Mandatory RFQ Annexures**

The regulatory and mandatory RFQ Annexures, which must be completed by all Respondents in order to declare Local Content, are as follows:

- Annexure B – Declaration Certificate for Local Production and Content [SBD 6.2]
- Annexure C – Local Content Declaration: Summary Schedule
- Annexure B and C must be completed and submitted even if a complete Local Content exemption letter from DTI has been obtained.
- To the extent that an exemption from Local Content has been granted by the DTI, the exemption letter from DTI will be a mandatory returnable document.
- Annexures D and E are Supporting Schedules to Annexure C. They are named as follows:
  - Annexure D – Imported Content Declaration: Supporting Schedule to Annexure C
  - Annexure E – Local Content Declaration: Supporting Schedule to Annexure C
- Annexure F - Guidance Document for the calculation of Local Content

After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. Declaration C should be submitted with the bid documentation at the closing date and time of the bid. Declarations D and E should be kept by Respondents for verification purposes for a period of at least 5 years. The successful Respondent is required to continuously update Declarations C, D and E with the actual values for the duration of the contract. In addition to what is stated above regarding Annexures D and E, please note that these declarations are to be submitted as part of the Essential Returnable Documents.

#### **4.5 Local Content Project Plan [To be utilised where the Local Content threshold must be met in a progressive manner]**

Respondents must indicate how they intend to achieve the compulsory **100%** [Transformers and associated Equipment (Bushings, Clamps and Oil)] and **100%** [Steel Power Pylons] **90%** [Electrical Cables] Local Content minimum threshold within the initial Two [2] month of the contract period by submitting a project plan which schedules the key tasks to be accomplished and related timelines.

*The Local Content Project Plan must project from contract month 1 [award of business] to contract month 2, **100 %** local production and content achieved] and include:*



- (i) *Key tasks to achieve **100%** production and content [i.e. 100% [Transformers and associated Equipment (Bushings, Clamps and Oil)] and 100% [Steel Power Pylons] 90% [Electrical Cables] South African manufacture]*
- (ii) *Completion timelines per task in months [milestones]*
- (iii) *Sufficient breakdown of detail so that no task duration is longer than four weeks*
- (iv) *Critical dependencies*

Transnet will conduct bi-monthly reviews with the Supplier(s) to monitor progress with respect to the completion of projected milestones.

#### **4.6 Challenges meeting the Local Content Threshold**

Should, after the award of a Bid, the Supplier experience challenges in meeting the stipulated minimum threshold for Local Content, Transnet is required to inform the DTI accordingly in order for the DTI to verify the circumstances and provide directives in this regard.

#### **4.7 Exchange Rate Verification**

The rate of exchange quoted by the Respondent in the declaration certificates (Annexure B – Declaration Certificate for Local Production & Content [SBD 6.2] and Annexure C – Local Content Declaration: Summary Schedule) will be verified for accuracy as per the requirement of National Treasury Instruction Notes and Circulars.

#### **4.8 Local Content Obligations**

Respondents are to note that the Local Content commitments made by the successful Respondent(s) will be incorporated as a term of the contract and monitored for compliance. Should the successful Respondent fail to meet its Local obligations, non-compliance penalties shall be applicable as per the contract or Standard Terms and Conditions of Contract. Breach of Local Content obligations also provide Transnet cause to terminate the contract in certain cases where material non-compliance with Local Content requirements are not achieved.

The below mentioned annexures to be fully completed and signed in line with the Guidance Document for the calculation of Local Content. Failure to comply will lead to disqualification.

- **Annexure B** – T2.48 Declaration Certificate for Local Production and Content
- **Annexure C** – Local content Declaration: Summary Schedule

#### **Local content requirements and the exemptions**

Process when requesting exemption letters for exemption requests on designated products and the minimum threshold for local content cannot be met for various reasons; bidders must apply for exemption. After checking with the industry, the DTI will decide whether to grant an exemption or not.

A copy of the exemption letter must be submitted together with the bid document at the closing date and time of the bid

***Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.***



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### 5. Stage Three- Functionality:

Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying score for functionality is **80** points.

The evaluation criteria for measuring functionality and the points for each criteria and, if any, each sub-criterion are as stated in C.3.11.3 below.

***Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.***

C.2.7 The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. **Tenderers must complete and sign the attendance register.** Addenda will be issued to and tenders will only be received from those tendering entities including those entities that intends forming a joint venture appearing on the attendance register.

Tenderers are also **required to bring their RFP document to the briefing session and have their returnable document T2.2-3 certificate of attendance** signed off by the Employer's authorised representative.

C.2.12 No alternative tender offers will be considered.

C.2.13.3 Each tender offer shall be in the **English Language**.

C.2.13.5 The *Employer's* details and identification details that are to be shown on each tender offer are as follows:

Identification details:

The tender documents must be uploaded with:

- Name of Tenderer:
- Contact person and details:
- The Tender Number: SIC22002CIDB (HOAC-HO-37671)
- The Tender Description: Traction Transformer Refurbishment at Balfour.

Documents must be marked for the attention of: ***Employer's Agent:***

C.2.13.9 Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.

C.2.15 The closing time for submission of tender offers is:  
Time: **10:00am** on the **18 August 2022**  
Location: The Transnet e-Tender Submission Portal:  
(<https://transnetetenders.azurewebsites.net> )

### **NO LATE TENDERS WILL BE ACCEPTED**

C.2.16 The tender offer validity period is **12 weeks [17 November 2022]** after the closing date. Tenderers are to note that they may be requested to extend the validity period of their tender, on the same terms and conditions, if Transnet's internal evaluation and governance approval processes has not been finalised within the validity period.

# Transnet Freight Rail

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C.2.23 The tenderer is required to submit with his tender:

1. A valid Tax Clearance Certificate issued by the South African Revenue Services.  
**Tenderers also to provide Transnet with a TCS PIN to verify Tenderers compliance status.**

2. A **valid B-BBEE Certificate** from a Verification Agency accredited by the South African Accreditation System [**SANAS**], or a **sworn affidavit** confirming annual turnover and level of black ownership in case of all EMEs and QSEs with 51% black ownership or more together with the tender;

3. A valid CIDB certificate in the correct designated grading;

4. Proof of registration on the Central Supplier Database;

5. Letter of Good Standing with the Workmen's compensation fund by the tendering entity or separate Letters of Good Standing from all members of a newly constituted JV.

**Note:** Refer to Section T2.1 for List of Returnable Documents

C3.11 The minimum number of evaluation points for functionality is **80**

The procedure for the evaluation of responsive tenders is Functionality and Price:

**Only those tenderers who attain the minimum number of evaluation points for Functionality will be eligible for further evaluation, failure to meet the minimum threshold will result in the tender being disqualified and removed from any further consideration.**

## Functionality Criteria

The functionality criteria and maximum score in respect of each of the criteria are as follows:

Quality Criteria	Sub-Criteria	Sub-Criteria Point Allocation	Maximum number of points
<b>T2.2-5 Programme</b>	<b>The following information is required as a minimum on a programme submitted for evaluation:</b>		<b>30</b>
	Ability to execute the works in terms of the Employer's requirements, indicating the order and timing of the construction activities that will take place in order to provide the works.	15	
	Schedule showing Starting and Completion, as listed in contract data Part One – "Data provided by the Employer" and are logically linked to activities in the schedule and to be driven by activities. All activities to be logically tied using a clearly defined critical path method (CPM).	15	
<b>T2.2-6 Previous Company Experience</b>	<b>Tenderers are required to demonstrate their Company experience in the delivery of Transformer Refurbishment works, and to this end shall supply a sufficiently detailed reference list with contact details of existing customers</b>		<b>20</b>
	Previous experience relating to Transformer Refurbishment	10	
	Sufficient references to substantiate experience indicated (Client name and contact details, project description, duration and contract value)	10	

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**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>T2.2-7:  Method Statement</b>	<b>Tenderers are to submit a project specific Method Statement highlighting the scope of works and outline the proposed approach in respect to the: Transformer Refurbishment. As a minimum the detailed technical method statement should include:</b>		<b>30</b>
	Order and timing of the planning, construction and inspection milestones that will take place in order to provide the Works.	10	
	Indication of how the above will be achieved in terms of the associated policies and procedures, and relevant specification described in the tender	10	
	The method statement covers the Supply, Install, Test and Commission of substation equipment (to enable the Employer to assess the impact to practicality, quality, health, safety, risk and the environment).	10	
<b>T2.2-8: Risk Management Plan</b>	<b>Tenderers should submit a complete and comprehensive Risk Management and Environment Plan that demonstrates the following:</b>		<b>10</b>
	Business continuity plan	7.5	
	Business Continuity Management: The objective is to ensure continuity of the service provision to TFR in case on any interruptions which may arise from the tenderer's site aligned to applicable standards		
	Business Impact Analysis		
	Risk Assessment for the project / Operational Risks: The identified Risks should be based on the scope of works		
<b>T2.2-9: Environmental Management Plan</b>	<b>Provide the comprehensive EMP with the construction, operational and decommissioning phase</b>		<b>2.5</b>
	Key Environmental Impacts and Possible Mitigation Measures		
	Key Roles and Responsibilities		
	Environmental Monitoring, Training and Reporting		
<b>T2.2-10: Health and Safety</b>	<b>Tenderers should submit the following documents as a minimum with their tender:</b>		<b>10</b>
	SHE Plan, Letter of Good standing & Safety, Health & Environmental Policy	2	
	Roles & Responsibilities as per the Occupational health and safety Act 85 of 1993	2	
	List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.	1	
	Overview of the project specific Baseline Risk Assessment (RA), indicating major activities of the project	2	
	Three years synopsis of SHE incidents, descriptions, type and action taken.	1	
	Complete and return the <i>Contractor</i> Safety Questionnaire attached hereto	2	
	<b>TOTAL</b>		



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Functionality shall be scored independently by not less than 3 (three) evaluators and averaged in accordance with the following schedules:

- T2.2-5 Programme
- T2.2-6 Previous Company Experience
- T2.2-7 Method Statement
- T2.2-8 Risk Elements
- T2.2-9 Environmental Management
- T2.2-10 Health and Safety Management

Each evaluation criteria will be assessed in terms of scores of **0, 20, 40, 60, 80 and 100**. The scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for functionality, unless scored collectively. (See CIDB Inform Practice Note #9).

**Note: Any tender not complying with the above-mentioned requirements, will be regarded as non-responsive and will therefore not be considered for further evaluation. This note must be read in conjunction with Clause C.2.1.**

C.3.11. Only tenders that achieve the minimum qualifying score for functionality will be evaluated further in accordance with the 80/20 preference points systems.

80 where the financial value of one or more responsive tenders received have a value equal to or below R50 million, inclusive of all applicable taxes,

Up to 100 minus  $W_1$  tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed. **Should the BBBEE rating not be provided, tenderers with no verification will score zero points for preferencing.**

**Note:** Transnet reserves the right to carry out an independent audit of the tenderers scorecard components at any stage from the date of close of the tenders until completion of the contract.

C.3.13 Tender offers will only be accepted if:

1. The tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;
2. the tenderer does not appear on Transnet's list for restricted tenderers and National Treasury's list of Tender Defaulters;
3. the tenderer has fully and properly completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process and persons in the employ of the state.
4. Transnet reserves the right to award the tender to the tenderer who scores the highest number of points overall, unless there are **objective criteria** which will justify the award of the tender to another tenderer. Objective criteria include but are not limited to the outcome of a due diligence exercise to be conducted. The due diligence exercise may take the following factors into account inter alia;

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the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
- c) has the legal capacity to enter into the contract,
- d) is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
- e) complies with the legal requirements, if any, stated in the tender data and
- f) is able, in the option of the employer to perform the contract free of conflicts of interest.

Submission and verification of the validity of Mandatory Documents / Schedules for Due diligence:

- a) Sample verification (See annexure A)
- b) System test (See annexure B)
- c) Manufacturing process and facilities verification (See annexure C)

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C.3.17 The number of paper copies of the signed contract to be provided by the Employer is 1 (one).

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## **T1.3 CIDB Standard Conditions of Tender**

**STAATSKOERANT, 8 AUGUSTUS 2019**

**DEPARTMENT OF PUBLIC WORKS**

**NOTICE 423 OF 2019**

**STANDARD FOR UNIFORMITY IN ENGINEERING AND CONSTRUCTION**

**WORKS CONTRACTS**

**AUGUST 2019**

### **Annex C**

## **Standard Conditions of Tender**

## **C.1 General**

### **C.1.1 Actions**

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender Process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

*Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.*

*2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.*

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

### **C.1.2 Tender Documents**

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

### **C.1.3 Interpretation**

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are Included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for Tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:

- i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
- ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or



iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;
- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;
- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

#### **C.1.4 Communication and employer's agent**

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

#### **C.1.5 Cancellation and Re-Invitation of Tenders**

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender Invitation for the second time.

#### **C.1.6 Procurement procedures**

##### **C.1.6.1 General**

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

### **C.1.6.2 Competitive negotiation procedure**

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, Specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

### **C.1.6.3 Proposal procedure using the two stage-system**

#### **C.1.6.3.1 Option 1**

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

#### **C.1.6.3.2 Option 2**

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

## **C.2 Tenderer's obligations**

### **C.2.1 Eligibility**

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

### **C.2.2 Cost of tendering**

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

### **C.2.3 Check documents**

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

### **C.2.4 Confidentiality and copyright of documents**

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

### **C.2.5 Reference documents**

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

### **C.2.6 Acknowledge addenda**

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

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**C.2.7 Clarification meeting**

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

**C.2.8 Seek clarification**

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

**C.2.9 Insurance**

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

**C.2.10 Pricing the tender offer**

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes Except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

**C.2.11 Alterations to documents**

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

**C.2.12 Alternative tender offers**

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

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**C.2.13 Submitting a tender offer**

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number Of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer.

Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the Packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal"

and place the remaining returnable documents in an envelope marked "technical proposal".

Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

**C.2.14 Information and data to be completed in all respects**

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

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**C.2.15 Closing time**

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

**C.2.16 Tender offer validity**

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

**C.2.17 Clarification of tender offer after submission**

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

**Note:** Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

**C.2.18 Provide other material**

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

### **C.2.19 Inspections, tests and analysis**

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

### **C.2.20 Submit securities, bonds and policies**

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

### **C.2.21 Check final draft**

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

### **C.2.22 Return of other tender documents**

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

### **C.2.23 Certificates**

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

## **C.3 The employer's undertakings**

### **C.3.1 Respond to requests from the tenderer**

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up To five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the Tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

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**C.3.2 Issue Addenda**

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

**C.3.3 Return late tender offers**

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

**C.3.4 Opening of tender submissions**

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

**C.3.5 Two-envelope system**

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.



### **C.3.6 Non-disclosure**

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

### **C.3.7 Grounds for rejection and disqualification**

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

### **C.3.8 Test for responsiveness**

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified. Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

### **C.3.9 Arithmetical errors, omissions and discrepancies**

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
  - (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
  - (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections Required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

### **C.3.10 Clarification of a tender offer**

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

### **C.3.11 Evaluation of tender offers**

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project. Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

**The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:**

#### **Requirement Qualitative interpretation of goal**

**Fair** The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.

**Equitable** Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.

**Transparent** The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.

**Competitive** The system provides for appropriate levels of competition to ensure cost effective and best value outcomes. **Cost effective** The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

**The activities associated with evaluating tender offers are as follows:**

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

**C.3.11.1 General**

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

**C.3.12 Insurance provided by the employer**

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

**C.3.13 Acceptance of tender offer**

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
- c) has the legal capacity to enter into the contract;
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- e) complies with the legal requirements, if any, stated in the tender data; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

**Transnet Freight Rail**

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

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**C.3.14 Prepare contract documents**

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by

The employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and
- c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

**C.3.15 Complete adjudicator's contract**

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

**C.3.16 Registration of the award**

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

**C.3.17 Provide copies of the contracts**

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

**C.3.18 Provide written reasons for actions taken**

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

## **Annex D**

### **Standard Conditions for the calling for Expressions of Interest**

#### **D.1 General**

##### **D.1.1 Actions**

D.1.1.1 The employer and each respondent submitting an expression of interest shall comply with these conditions for calling for expressions of interest. In their dealings with each other, they shall discharge their duties and obligations as set out in D.2 and D.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anti-competitive practices.

D.1.1.2 The employer and the respondent and all their agents and employees involved in the Submission process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Respondents shall declare any potential conflict of interest in their submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

*Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.*

*2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.*

D.1.1.3 The respondent shall not make a submission without having a firm intention and the capacity to proceed with the next stage of the procurement process.

##### **D.1.2 Supporting documents**

The documents issued by the employer for the purpose of obtaining expressions of interest are listed in the submission data.

##### **D.1.3 Interpretation**

D.1.3.1 The submission data and additional requirements contained in the submission schedules that are included in the returnable documents are deemed to be part of these conditions for the calling for expressions of interest.

D.1.3.2 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

- a) **conflict of interest** means any situation in which:
- i. someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially.
  - ii. an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit.
  - iii. incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and
- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels

#### **D.1.4 Communication and employer's agent**

Each communication between the employer and a respondent shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a respondent. The name and contact details of the employer's agent are stated in the submission data.

#### **D.2 Respondent's obligations**

##### **D.2.1 Eligibility**

Submit an expression of interest only if the respondent complies with the criteria stated in the submission data and the respondent, or any of his/her principals, is not under any restriction to do business with the employer.

##### **D.2.2 Cost of submissions**

Accept that the employer will not compensate the respondent for any costs incurred in the preparation and delivery of a submission.

##### **D.2.3 Check documents**

Check the submission documents on receipt, including pages within them, and notify the employer of any discrepancy or omission.

##### **D.2.4 Acknowledge addenda**

Acknowledge receipt of addenda to the submission documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the submission data, in order to take the addenda into account.

**D.2.5 Clarification meeting** Attend the clarification meeting(s) at which respondents may familiarize themselves with the proposed work, services or supply (and location, etc.) and raise questions. Details of the meeting(s) are stated in the submission data.

### **D.2.6 Seek clarification**

Request clarification of the submission documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the submission data.

### **D.2.7 Making a submission**

D.2.7.1 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

D.2.7.2 Seal the original and each copy of the submission as separate packages marking the Packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the submission data, as well as the respondent's name and contact address.

D.2.7.3 Accept that the employer shall not assume any responsibility for the misplacement or premature opening of the submission if the outer package is not sealed and marked as stated.

### **D.2.8 Information and data to be completed in all respects**

Accept that submissions, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

### **D.2.9 Closing time**

Ensure that the employer receives the submissions at the address specified in the submission data not later than the closing time stated in the submission data. Proof of posting shall not be accepted as proof of delivery. The employer shall not accept submissions submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the submission data. Accept that, if the employer extends the closing time stated in the submission data for any reason, the requirements of these conditions for expressions of interest apply equally to the extended deadline.

### **D.2.10 Clarification of submission**

Provide clarification of a submission in response to a request to do so from the employer during the evaluation of submissions.

## **D.3 Employer's undertakings**

### **D.3.1 Respond to clarification**

Respond to a request for clarification received up to five (5) working days before the submission closing time stated in the submission data and notify all respondents who attended the clarification meetings, if any, of those responses.

### **D.3.2 Issue Addenda**

If necessary, issue addenda that may amend or amplify the submission documents to each respondent during the period from the date of the calling for expressions of interest until seven (7) working days before the closing time for submissions stated in the submission data. If, as a result, a respondent applies for an

**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

extension to the closing time stated in the submission data, the employer may grant such extension and, shall then notify it to all respondents.

**D.3.3 Late submissions**

Unless otherwise stated in the submission data, return submissions received after the closing time stated in the submission data, unopened, (unless it is necessary to open a submission to obtain a forwarding address), to the respondent concerned.

**D.3.4 Opening of submissions**

D.3.4.1 Record the name of each respondent whose submission is opened and acknowledge receipt Of each submission.

D.3.4.2 Make available the names of the respondents that made submissions prior to the closing time for submissions to all interested persons upon request.

**D.3.5 Non-disclosure**

Not disclose to respondents, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of submissions until after the evaluation process is complete.

**D.3.6 Grounds for rejection and disqualification**

Determine whether there has been any effort by a respondent to influence the processing of submissions and instantly disqualify a respondent if it is established that he/she engaged in corrupt or fraudulent practices.

**D.3.7 Test for responsiveness**

Determine, on opening and before detailed evaluation, whether each submission received:

- a) meets the requirements of these conditions for the calling for expressions of interest;
- b) has all the substantive provisions properly and fully completed and signed, and
- c) is responsive to the other requirements of the call for expressions of interest.

**D.3.8 Non-responsive submissions**

Reject all non-responsive submissions.

**D.3.9 Evaluation of responsive submissions**

D.3.9.1 Appoint an evaluation panel of not less than three persons. Evaluate submissions using the evaluation criteria established in the submission data.

D.3.9.2 Notify the respondents of the outcome of the evaluation process within two (2) weeks of the evaluation report being accepted by the employer.

**D.3.10 Provide written reasons for actions taken**

Provide upon request written reasons to respondents for any action that is taken in applying these conditions, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of respondents or might prejudice fair competition between respondents.



## T2.1: List of Returnable Documents

### 2.1.1 These schedules are required for pre-qualification and eligibility purposes:

- T2.2-1 **Stage One as per PPPFA: Pre-qualification Criteria Schedule for preferential procurement in terms of the Preferential Procurement Regulations, 2017(B-BBEE)**  
Pre-qualification criteria for preferential procurement in terms of the Preferential Procurement Regulations, 2017 – A tender having a stipulated minimum B-BBEE status level of contributor of **2** or better (1 being better)
- T2.2-2 **Stage Two as per CIDB: Eligibility Criteria Schedule - CIDB Registration**
- T2.2- 3 **Stage Three as per CIDB: Eligibility Criteria Schedule - Certificate of attendance at Compulsory Tender Clarification Meeting**
- T2.2-4 **Stage Four as per PPPFA: Eligibility Criteria Schedule - Declaration Certificate of Local Production and Content (SBD 6.2) - Declaration Certificate of Local Production and Content (SBD 6.2)**

### 2.1.2 Stage Three as per CIDB: these schedules will be utilised for evaluation purposes:

- T2.2-5 **Evaluation Schedule:** Programme
- T2.2-6 **Evaluation Schedule:** Previous Company Experience
- T2.2-7 **Evaluation Schedule:** Method Statement
- T2.2-8 **Evaluation Schedule:** Risk Elements
- T2.2-9 **Evaluation Schedule:** Environmental Management
- T2.2-10 **Evaluation Schedule:** Health and Safety Management

### 2.1.3 Returnable Schedules:

#### General:

- T2.2-10a Health and Safety Questionnaire
- T2.2-10b Health and Safety Cost Breakdown
- T2.2-10c Letter of Good Standing
- T2.2-11 Availability of equipment and other resources
- T2.2-12 Site Establishment requirements
- T2.2-13 Authority to submit tender
- T2.2-14 Record of Addenda to Tender Documents
- T2.2-15 Storage Capacity

### **Agreement and Commitment by Tenderer:**

- T2.2-16 CIDB SFU ANNEX G Compulsory Enterprise Questionnaire
- T2.2-17 Supplier Code of Conduct
- T2.2-18 Service Provider Integrity Pact
- T2.2-19 Non-Disclosure Agreement
- T2.2-20 Supplier Declaration Form
- T2.2-21 RFP Declaration Form
- T2.2-22 RFP – Breach of Law
- T2.2-23 SBD1 (Tax Compliance Status)
- T2.2-24 Certificate of Acquaintance with Tender Document

### **1.3.2 Bonds/Guarantees/Financial/Insurance:**

- T2.2-25 Insurance provided by the Contractor
- T2.2-26 Three (3) years audited financial statements

## **2.2 C1 - Agreement and Contract Data**

- C1.1 Form of Offer and Acceptance
- C1.2 Contract Data (Parts 1 & 2)

## **2.3 C2 – Pricing Data**

- C2.1 Pricing Instructions
- C2.2 Bill of Quantities

## **2.4 C3 - Scope of Work**

## **2.5 C4 - Site Information**

## **T2.2-1 Eligibility Criteria Schedule: B-BBEE Status Level [Prequalification Schedule]**

In an endeavour to grow and develop Black Owned (BO) companies as well as to ensure that Transnet meets its Shareholder Compact Objectives, Potential Tenderers are required to meet the eligibility criteria of B-BBEE Status Level

**It is a specific tendering condition that tenderers:**

- Have a minimum B-BBEE status level of **2** or better (1 being better)

Tenderers are required to submit the **valid B-BBEE certificates or Sworn Affidavits**

## T2.2-2: CIDB Grading Designation: [Eligibility Criteria Schedule]

### Note to tenderers:

Tenderers are to indicate their CIDB Grading by filling in the table below. **Attach a copy of the CIDB Grading Designation or evidence of being capable of being so registered.**

CRS Number	Status	Grading	Expiry Date

1. Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **4EP** class of construction work, are eligible to have their tenders evaluated.
2. **Joint Venture (JV)**
  1. Every member of the joint venture is a registered contractor in terms of these Regulations and
  2. the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; and [Para. (a) substituted by GN R464 of 2 July 2013 (wef 1 August 2013).]
  3. The category of registration of the joint venture, determined in accordance with subregulation (6) is equal to or higher than the category of registration specified in accordance with subregulation (3) and
  4. the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **4EP or higher** class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
  5. the Contractor shall provide the employer with a certified copy of its signed joint venture agreement;
  6. and in the event that the joint venture is an 'Incorporated Joint Venture' the Memorandum of Incorporation to be provided within 4 (four) weeks of the Contract Date.

## T2.2-3: Certificate of Attendance at Tender Clarification Meeting: [Eligibility Criteria Schedule]

This is to certify that

(Company Name)

Represented  
by:

(Name and  
Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
On (date)		Starting time:

### Particulars of person(s) attending the meeting:

Name

Signature

Capacity

### Attendance of the above company at the meeting was confirmed:

Name

Signature

**For and on Behalf of the  
Employers Agent.**

Date

## T2.2-4: Declaration of Certificate for Local Production and Content for Designated Sectors [Pre-qualification Criteria Schedule]

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

### 1. General Conditions

- 1.1. Preferential Procurement Regulations, 2017 (Regulation 8) makes provision for the promotion of local production and content.
- 1.2. Regulation 8.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. Where necessary, for bids referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.4. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.5. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = [1 - x / y] * 100$$

Where

x is the imported content in Rand

y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as indicated in paragraph 4.1 below.

**The SABS approved technical specification number SATS 1286:2011 is accessible on <http://www.thedti.gov.za/industrial development/ip.jsp> at no cost.**

- 1.6. A bid will be disqualified if Annexure B – Declaration Certificate for Local Production and Content [SBD 6.2] and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation;

## 2. Definitions

- 2.1. **"bid"** includes written price quotations, advertised competitive bids or proposals;
  - 2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);
  - 2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;
  - 2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
  - 2.5. **"duly sign"** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).
  - 2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour or intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
  - 2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
  - 2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and
  - 2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.
3. **The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:**

Description of services, works or goods

Stipulated minimum threshold

- **Transformers and associated Equipment [Bushings and Oil] - 100%**
- **Steel Power Pylons – 100%**
- **Electrical Cables – 90%**

4. Does any portion of the services, works or goods offered have any imported content?

*( Tick applicable box)*

YES		NO	
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- 4.1. If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency at 12:00 on the date of advertisement of the bid.

The relevant rates of exchange information is accessible on [www.reservebank.co.za](http://www.reservebank.co.za)

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

<b>Currency</b>	<b>Rates of exchange</b>
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

- Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.



**LOCAL CONTENT DECLARATION**  
**(REFER TO ANNEX B OF SATS 1286:2011)**

**LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)**

**IN RESPECT OF BID NO. SIC22002CIDB (HOAC-HO-37671)**

**ISSUED BY:** TRANSNET FREIGHT RAIL ON BEHALF OF TRANSNET SOC LTD

NB

- 1 The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.
- 2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on [http://www.thdti.gov.za/industrial\\_development/ip.jsp](http://www.thdti.gov.za/industrial_development/ip.jsp). Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, ..... (full names), do hereby declare, ..... in ..... my ..... capacity as ..... of ..... (name of bidder entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that:
  - (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (c) The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C:

Price of the Designated commodity <b>[Transformers and associated Equipment]</b> Ex VAT	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content <b>100% [Transformers and associated Equipment [Bushings, Clamps and Oil]</b> , as calculated in terms of SATS 1286:2011	

Price of the Designated commodity <b>[Steel Power Pylons]</b> Ex Vat	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content <b>100% [Steel Power Pylons]</b> as calculated in terms of SATS 1286:2011	

Price of the Designated commodity <b>[Electrical Cables]</b> Ex Vat	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content <b>90% [Electrical Cables]</b> , as calculated in terms of SATS 1286:2011	

**If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.**

(d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**WITNESS No. 1** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**WITNESS No. 2** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**NOTE TO TENDERERS: FAILURE TO FULLY COMPLETE, DECLARE, SIGN & DATE THIS SBD6.2 DECLARATION AS WELL AS THE ACCOMPANYING ANNEXURE C "LOCAL CONTENT DECLARATION - SUMMARY SCHEDULE" WILL RESULT IN THE TENDER SUBMISSION BEING NON-RESPONSIVE AND DISQUALIFIED FROM ANY FURTHER EVALUATION.**

## T2.2-5: Programme [Evaluation Schedule]

### Note to tenderers:

#### Programme

**The Tenderer details the programme for evaluation and attaches it to this schedule. In addition, the Tenderer is to provide a hard copy of the Programme**

The Tenderer's attention is drawn to core clause 31 of the NEC3 Engineering and Construction contract regarding the items to be shown on a programme.

The tenderer shall provide the proposed programme but not limited to the following:

- Ability to execute the works in terms of the *Employer's* requirements and within the required timeframe indicating, in a logical sequence, the order and timing of the construction that will take place in order to Provide the Works clearly indicating the capacity & capability to achieve the dates stated in the Contract Data.
- Dates when the *Contractor* will need access to any part of the Site; submission & approval process & timing for Health & Safety Files, Environmental Files and Quality Files. In addition the Programme must clearly demonstrate the procurement process for all long lead items if applicable.
- The *Contractor* indicates how he plans in achieving the following dates and clearly demonstrates them on the schedule - Start Date, Access Date, Planned Completion, & Completion Date. In addition, the Programme clearly demonstrates adequate provisions for Time Risk Allowance (TRA). Time Risk Allowances are not float, are owned by the Tenderer, can be included in the activity duration and illustrated in the schedule in a code field or as an attachment.

The scoring of the Programme will be as follows:

Programme		30
<b>Score 0</b>	The tenderer has submitted no information.	
<b>Score 20</b>	A detrimental response - limited or poor evidence, high probability that the employer's requirements will not be met. <ul style="list-style-type: none"> <li>• Respond to Scope of Works but delivery schedule is &gt;7 months</li> </ul>	
<b>Score 40</b>	Programme not complete or does not represent a clear understanding of the project requirements; <ul style="list-style-type: none"> <li>• Respond to Scope of Works and delivery schedule is <math>\geq 6 \leq 7</math> months</li> </ul>	
<b>Score 60</b>	Programme complete with minor discrepancies; <ul style="list-style-type: none"> <li>• Respond to Scope of Works and delivery schedule is <math>\geq 5 \leq 6</math> months</li> </ul>	
<b>Score 80</b>	Programme complete and represent a clear understanding of the project requirements; <ul style="list-style-type: none"> <li>• Respond to Scope of Works and delivery schedule is <math>\geq 4 \leq 5</math> months</li> </ul>	
<b>Score 100</b>	Programme complete with no discrepancies and represent a clear understanding of the project requirements; <ul style="list-style-type: none"> <li>• Respond to Scope of Works and delivery schedule is &lt;4 months</li> </ul>	

Attachment A: Hard Copy of Programme

## **T2.2-6: Previous Experience [Evaluation Schedule]**

### **Note to tenderers:**

Tenderers are required to demonstrate performance in comparable projects of similar size and nature by supplying the following:

- A list of past / current comparable projects.
  - Construction of similar works as detailed in the Works Information with reference to:
  - Electrical works - Refurbishment of Transformers: Supply, Install, Test and Commission substation equipment
  - Sufficient references to substantiate experience indicated (Client name and contact details, project description, duration and contract value)

### **Index of documentation attached to this schedule**

	<b>DOCUMENT NAME</b>
<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	

The table below will be used as guidelines for scoring / evaluating the method statement submitted by the Tenderer

<b>Work Experience with respect to specific aspects of the project/ completed projects.</b> <ul style="list-style-type: none"> <li>The Tenderer should have done and completed the Refurbishment of Transformers: Supply, Install, Test and Commission substation equipment.</li> <li>Completion certificates, written reference or in execution (company name, contact person, contact no. and value of work) will be required as a proof.</li> </ul>		<b>20</b>
<b>0</b>	The Tenderer failed to address the question / issue. Has not submitted the required information.	
<b>20</b>	<p>The Tenderer's previous experience presented has no relevance to the scope of this project and did not address any of the required categories. Tenderers generally have experience in one (1) project relating to the scope of works.</p> <p>The tenderer has limited or poor evidence of previous experience.</p>	
<b>40</b>	<p>The Tenderer's previous experience presented has some relevance to the project but lacks detail i.e., Description of previous projects, value and references. Tenderers generally have experience in two (2) projects relating to scope of <i>works</i>.</p> <p>The tenderer lacks convincing evidence of knowledge of previous experience, specific to the <i>works</i>.</p>	
<b>60</b>	The Tenderer's previous experience presented demonstrates sufficient knowledge and experience to successfully execute this project scope. Tenderers generally have experience in three (3) projects relating to the scope of works. The tenderer has reasonable and relevant previous experience to the particular requirements of the <i>works</i> .	
<b>80</b>	The Tenderer's previous experience presented demonstrates a real understanding and substantial evidence of the ability meet the stated project requirements. Tenderers generally have experience in four (4) projects relating to the scope of works. The tenderer has extensive previous experience in relation to the <i>works</i> .	
<b>100</b>	The Tenderer's previous experience presented demonstrates real confidence extensive understanding in all of the categories as required. Tenderers generally have experience in five (5) or more projects relating to the scope of works. The tenderer has comprehensive previous experience in projects of a similar nature.	

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the Tenderer, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed

Date

.....

.....

Name

Position

.....

.....

Tenderer

.....

## T2.2-7: Method Statement [Evaluation Schedule]

### Note to tenderers:

Method statement - The tenderers must sufficiently demonstrate the approach/methodology that will be employed to cover the scope of the project.

- A detailed method statement is required describing exactly how each aspect of the work will be executed and the order in which it will be done.

In addition to general methodology for the project, the tenderer must demonstrate the following aspects but not limited to:

- Order and timing of the audits, inspection and design milestones that will take place in order to provide the *Works*.
- Indication of how the above will be achieved in terms of the associated policies and procedures, and relevant specification described in the tender.

The table below will be used as guidelines for scoring / evaluating the method statement submitted by the Tenderer

Method Statement		30
<b>Score 0</b>	The tenderer has submitted no information or inadequate information to determine a score.	
<b>Score 20</b>	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	
<b>Score 40</b>	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	
<b>Score 60</b>	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.	
<b>Score 80</b>	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical characteristics of the project.	
<b>Score 100</b>	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the Tenderer, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed

Date

Name

Position

Tenderer



**Tenderer's Risk Management Plan will be assessed as follows:**

<b>Evaluation of Tender: Risk Management plans</b>	
<b>Company Name:</b> Tender Description: Traction Transformer Refurbishment at Balfour.	
<b>1. Business continuity plan</b> <b>Business Continuity Management: The objective is to ensure continuity of the service provision to TFR in case on any interruptions which may arise from the tenderer's site aligned to applicable standards</b>	
<b>The following criteria to be included:</b> <ul style="list-style-type: none"> <li>- Emergency operating procedures</li> <li>- Business Continuity invocation action</li> <li>- Project recovery resources</li> <li>- Business / Supplier Contact list</li> <li>- Emergency Contact</li> </ul> <b>20%</b>	<u><b>Scoring Criteria</b></u> Business Continuity plan contains Emergency Operating Procedures, Business continuity invocation action, Project recovery resources , Business / Supplier contact list Emergency contacts  <b>(Score 100)</b> Business Continuity plan contains 4 of the 5 required criteria <b>(Score 80)</b> Business Continuity plan contains 3 of the 5 required criteria <b>(Score 60)</b> Business Continuity plan contains 2 of the 5 required criteria <b>(Score 40)</b> Business Continuity plan contains 1 of the 5 required criteria <b>(Score 20)</b> No business continuity plan submitted <b>(Score 0)</b>
<b>2. Business Impact Analysis</b>	
<ul style="list-style-type: none"> <li>- Identification of critical processes within the project</li> <li>- Recovery Time Objective in case of any interruption that may arise</li> <li>- Recovery Strategy: how will the supplier recover</li> <li>- Operational dependencies e.g.: Operational equipments, telephones etc. needed to ensure continuity</li> <li>- Alternative supply of equipment and/ or supply of extra staff</li> <li>- Battle box (It comprises of all necessary documentation, equipments required for continuity)</li> </ul> <b>20%</b>	<u><b>Scoring Criteria</b></u> Business Impact Analysis contains Identification of critical processes within the project, Recovery Time Objective, Recovery Strategy, Operational dependencies, Alternative supply of equipment and/or supply of extra staff, Battle box.  <b>(Score 100)</b> Business Impact Analysis contains 4 of the 5 required criteria <b>(Score 80)</b> Business Impact Analysis contains 3 of the 5 required criteria <b>(Score 60)</b> Business Impact Analysis contains 2 of the 5 required criteria <b>(Score 40)</b> Business Impact Analysis contains 1 of the 5 required criteria <b>(Score 20)</b> No business plan submitted <b>(Score 0)</b>



**3. Risk Assessment for the project / Operational Risks: The identified Risks should be based on the scope of works**

<ul style="list-style-type: none"> <li>- Identification of risks of service interruption during the project</li> <li>- Risk Analysis methodology</li> <li>- Ranking of the Risks</li> <li>- Mitigation of the identified risks</li> <li>- Responsible person</li> </ul> <p><b>60%</b></p>	<p><b><u>Score Criteria</u></b></p> <p>Risk Register contains Identification of risks of service interruption during the project ,Risk Analysis methodology, Ranking of the Risks, Mitigation of the identified risks and Responsible person <b>(Score 100)</b></p> <p>Risk Register contains 4 to 5 required criteria <b>(Score 80)</b></p> <p>Risk Register contains 3 of the 5 required criteria <b>(Score 60)</b></p> <p>Risk Register contains 2 of the 5 required criteria <b>(Score 40)</b></p> <p>Risk Register contains 1 of the 5 required criteria <b>(Score 20)</b></p> <p>No Risk Register submitted \ Risks identified are not relevant to the project <b>(Score 0)</b></p>
<p><b>Assessment criteria:</b></p> <ol style="list-style-type: none"> <li>1. Be fair and objective in your assessment.</li> <li>2. Complete the assessment document in full and use comments row to motivate your marks where necessary.</li> <li>3. The document should be completed in a neat and tidy manner due to the fact that it will become an official document.</li> <li>4. Be transparent and share your observations with the company representative (applicable where site visit was conducted to verify information supplied) and assessment team.</li> <li>5. No copies of the completed assessment document must be provided to the company representative.</li> <li>6. On completion of the assessment the marks obtained and end result of the assessment needs to be discussed with the contractor.</li> <li>7. After the tender award the tenderers representative may be advised of their shortcomings in terms of their SHE submission.</li> </ol>	

Signed

Date

Name

Position

Tenderer

## T2.2-9: Environmental Management Plan [Evaluation Schedule]

The tenderer must provide an environmental management plan describing: -

- Key environmental impacts and aspects associated with the proposed project.
- Possible mitigation measures associated with identified impacts and aspects.
- Key roles and responsibilities for both the Tender's project team and Transnet with regards to the project.
- Monitoring techniques and reporting of both accidents and incidents.
- Details of induction and other forms of training (if any).

The following documents are key -

1.0 Transnet SOC Limited – Integrated Management Systems (IMS) Policy,

1.1 By signing this Tender Schedule, the tenderer confirms that they will comply with the above policy statement and environmental commitments therein.

1.2 Tender to provide a signed declaration of understanding as part of the returnable acknowledging understanding thereof and the budget provision for the implementation of environmental management requirements.

The scoring of the Tenderer's Environmental Management Plan will be as follows:

Key Environmental Impacts and Possible Mitigation Measures (60%)	
(Score 0)	The EMP is <b>not submitted</b> by the bidder.
(Score 20)	Poorly written EMP with <b>zero/no key</b> impacts and mitigation measures specific to the project
(Score 40)	EMP contains <b>1-3</b> key impacts and mitigation measures specific to the project.
(Score 60)	EMP contains <b>4-6</b> key impacts and mitigation measures specific to the project.
(Score 80)	EMP contains <b>7-9</b> key reasonable and relevant impacts and mitigation measures specific to the project.
(Score 100)	EMP contains <b>10 and more</b> key reasonable and relevant impacts and mitigation measures specific to the project, which meet and exceed tender requirements.

Key Roles and Responsibilities (20%)	
(Score 0)	The EMP is <b>not submitted</b> by the bidder.
(Score 20)	Poorly written EMP with <b>zero/no key</b> roles and responsibilities specific to the project.
(Score 40)	EMP <b>contains 1-3 key</b> reasonable and relevant roles and responsibilities specific to the project.
(Score 60)	EMP contains <b>4-6 key</b> reasonable and relevant roles and responsibilities specific to the project.
(Score 80)	EMP contains <b>7-9 key</b> reasonable and relevant key reasonable and relevant roles and responsibilities specific to the project.
(Score 100)	EMP contains <b>10 and more key</b> reasonable and relevant key reasonable and relevant roles and responsibilities specific to the project, which meet and exceed tender expectations.

Environmental Monitoring, Training and Reporting (20%)	
(Score 0)	The EMP is <b>not submitted</b> by the bidder.
(Score 20)	Poorly written EMP with <b>zero/no</b> monitoring techniques, no training and no form of reporting.
(Score 40)	Tenderer did not demonstrate understanding of the project scope and provided irrelevant <b>information</b> on monitoring techniques, training methods and types of reports.
(Score 60)	Tenderer understood the project scope but provided relevant but less detailed information on monitoring techniques, training methods and types of reports.
(Score 80)	Tenderer understood the project scope and identified relevant monitoring techniques, relevant training methods and relevant reports.
(Score 100)	Tenderer understood the project scope and addresses all critical aspects with regards to monitoring, training and reporting which meets and exceeds tender requirements.

By signing this Tender Schedule, the tenderer confirms that they will **comply** with the above requirements and in particular Transnet Freight Rail IMS policy statement and environmental commitments therein.

**Attached submissions to this schedule:**

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.....

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Signed

Date

Name

Position

Tenderer

## T2.2-10: Health and Safety Requirements [Evaluation Schedule]

Submit the following documents as a minimum with your tender:

1. The Tenderers must provide their own project specific health and safety Plan.
2. Health and safety cost breakdown (Bill of Quantities)
3. Safety, Policy signed by the Chief Executive Officer, must include or cover the following five elements –
  - Commitment to Safety, prevention of pollution,
  - Continual improvement,
  - Compliance to legal requirements, appropriate to the nature of contractor's activities,
  - Hold management accountable for development of the safety systems
  - Include objectives and targets.
4. Table or outline the Roles & Responsibilities, such as S16.2 CEO, CR8.1 Construction manager, CR8.2 Assistant Construction manager, CR8.5 Safety officer, CR8.7 Construction Supervisor, CR8.8 Construction assistant supervisor, CR9.1 Risk Assessor, 17.1 SHE Reps, etc. as per the Occupational health and safety Act 85 of 1993
5. List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.
6. Overview of the project specific Baseline Risk Assessment (RA), indicating major activities of the project
7. **Three years** synopsis of SHE incidents, description, type and action taken to prevent re-occurrence.
8. Complete and return with tender documentation the Contractor Safety Questionnaire included as an Annexure B.

### Attached submissions to this schedule:

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## The scoring of the Tenderer's Health and Safety Requirements will be as follows:

MAXIMUM POINTS	2	2	1	2	1	2
10	<b>SHE Plan, Letter of Good standing &amp; Safety, Health &amp; Environmental Policy</b>	<b>Roles &amp; Responsibilities as stipulated from above</b>	<b>List of Job Categories for project as stipulated from above</b>	<b>Overview of the project specific Baseline Risk Assessment (RA), indicating major activities of the project namely:</b>	<b>Three years synopsis of SHE incidents, descriptions, type and action taken</b>	<b>Complete and return the <i>Contractor</i> Safety Questionnaire attached hereto</b>
<b>(Score 0)</b>	The Tenderer has submitted no information or inadequate information to determine a score.					
<b>(Score 40)</b>	<p>SHE plan is project specific, but the information lacks convincing evidence, that stated <i>Employer's</i> requirements will be met.</p> <p>The information provided in the Health and safety bill of quantities is poor and lacks convincing evidence. There's a medium risk that stated <i>Employer's</i> requirements will not be met.</p> <p>2 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirement.</p>	Roles and responsibilities are unlikely to ensure compliance as per the <i>works</i> information and not in line with OHS Act and TFR health and safety specification.	Not all key responsible persons are included in the training matrix. Trainings matrix submitted does not cover all SHE training listed on Health and Safety specification. Training matrix not signed by responsible personnel.	Poor response/answer/solution lacks convincing evidence, medium risk that stated <i>Employer's</i> requirements will not be met.	Poor response/answer/solution lacks convincing evidence, medium risk that stated <i>Employer's</i> requirements will not be met.	Poor response/answer/solution lacks convincing evidence, medium risk that stated <i>Employer's</i> requirements will not be met.

**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>(Score 60)</b>	<p>SHE Plan is project specific. The information is satisfactory to the particular aspect, and evidence given is sufficient that <i>Employer's</i> requirements will be met.</p> <p>The information provided in the health and safety bill of quantities is satisfactory and the evidence is convincing, that stated <i>Employer's</i> requirements will be met. 3 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirements.</p>	Satisfactory response on roles and responsibilities as per <i>Employer's</i> requirements.	Satisfactory response on the list of job categories and trainings as per proposed project organogram structure. Training matrix covers most of the trainings listed on TFR Health and safety specification.	Satisfactory response/answer/solution to the particular aspect of the requirement, evidence given that the stated <i>Employer's</i> requirements will be met.	Satisfactory response/answer/solution to the particular aspect of the requirement, evidence given that the stated <i>Employer's</i> requirements will be met.	Satisfactory response/answer/solution to the particular aspect of the requirement, evidence given that the stated <i>Employer's</i> requirements will be met.
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**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>(Score 80)</b>	<p>SHE plan is project specific. The information is good and demonstrate real understanding &amp; ability to meet stated <i>Employer's</i> requirements.</p> <p>The information provided in the health and safety bill of quantities is good and demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.</p> <p>4 of the five key policy components are recognized and meets the <i>Employer's</i> requirements.</p>	<p>Roles and responsibilities are likely to ensure compliance as per Works Information, OHS Act and TFR health and safety specification.</p>	<p>Most of key persons listed on the training matrix as per proposed project organogram structure. Trainings specified on the matrix are in line with TFR health and safety specification.</p>	<p>Good response/answer/solution which demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.</p>	<p>Good response/answer/solution which demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.</p>	<p>Good response/answer/solution which demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.</p>
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**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>(Score 100)</b>	<p>She plan is project specific. The information is very good and gives real confidence that the tenderer, is most likely to ensure compliance with stated <i>Employer's</i> requirements.</p> <p>The information provided in the Health and safety bill of quantities is very good and gives real confidence that the tender is most likely to ensure compliance with stated <i>Employer's</i> requirements.</p> <p>All 5 key policy components are recognized and meets the <i>Employer's</i> requirements.</p>	Roles and Responsibilities most likely to ensure compliance as per requirements of OHS Act and TFR Health and Safety Management Specification.	Training matrix include Management and all employees /personnel in the project. Training matrix had been signed by responsible personnel.	Very good response/answer/solution gives real confidence that the tenderer is most likely to ensure compliance with stated <i>Employer's</i> requirements.	Very good response/answer/solution gives real confidence that the tenderer is most likely to ensure compliance with stated <i>Employer's</i> requirements.	Very good response/answer/solution gives real confidence that the tenderer is most likely to ensure compliance with stated <i>Employer's</i> requirements.
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## T2.2-10a: Health and Safety Questionnaire

<b>1. SAFE WORK PERFORMANCE</b>													
1A. Injury Experience / Historical Performance - Alberta													
Use the previous three years injury and illness records to complete the following:													
Year													
Number of medical treatment cases													
Number of restricted work day cases													
Number of lost time injury cases													
Number of fatal injuries													
Total recordable frequency													
Lost time injury frequency													
Number of worker manhours													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">1 - Medical Treatment Case</td> <td>Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician</td> </tr> <tr> <td>2 - Restricted Work Day Case</td> <td>Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties</td> </tr> <tr> <td>3 - Lost Time injury Cases</td> <td>Any occupational injury that prevents the worker from performing any work for at least one day</td> </tr> <tr> <td>4 - Total Recordable Frequency</td> <td>Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours</td> </tr> <tr> <td>5- Lost Time Injury Frequency</td> <td>Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours</td> </tr> </table>				1 - Medical Treatment Case	Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician	2 - Restricted Work Day Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties	3 - Lost Time injury Cases	Any occupational injury that prevents the worker from performing any work for at least one day	4 - Total Recordable Frequency	Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours	5- Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours
1 - Medical Treatment Case	Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician												
2 - Restricted Work Day Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties												
3 - Lost Time injury Cases	Any occupational injury that prevents the worker from performing any work for at least one day												
4 - Total Recordable Frequency	Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours												
5- Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours												
1B. Workers' Compensation Experience													
Use the previous three years injury and illness records to complete the following (if applicable):													
Industry Code:		Industry Classification:											
Year													
Industry Rate													
Contractor Rate													
% Discount or Surcharge													
Is your Workers' Compensation account in good standing? (Please provide letter of confirmation)		<input type="checkbox"/> Yes <input type="checkbox"/> No											
<b>2. CITATIONS</b>													
2A.	Has your company been cited, charged or prosecuted under Health, Safety and/or Environmental Legislation in the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:												
2B.	Has your company been cited, charged or prosecuted under the above Legislation in another Country, Region or State? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:												
<b>3. CERTIFICATE OF RECOGNITION</b>													
Does your company have a Certificate of Recognition?													
<input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, what is the Certificate No. _____ Issue Date _____													

**4. SAFETY PROGRAM**

Do you have a written safety program manual?

☐ Yes☐ No

If Yes, provide a copy for review

Do you have a pocket safety booklet for field distribution?

☐ Yes☐ No

If Yes, provide a copy for review

Does your safety program contain the following elements:

	YES	NO		YES	NO
CORPORATE SAFETY POLICY	<input type="checkbox"/>	<input type="checkbox"/>	EQUIPMENT MAINTENANCE	<input type="checkbox"/>	<input type="checkbox"/>
INCIDENT NOTIFICATION POLICY	<input type="checkbox"/>	<input type="checkbox"/>	EMERGENCY RESPONSE	<input type="checkbox"/>	<input type="checkbox"/>
RECORDKEEPING & STATISTICS	<input type="checkbox"/>	<input type="checkbox"/>	HAZARD ASSESSMENT	<input type="checkbox"/>	<input type="checkbox"/>
REFERENCE TO LEGISLATION	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PRACTICES	<input type="checkbox"/>	<input type="checkbox"/>
GENERAL RULES & REGULATIONS	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>
PROGRESSIVE DISCIPLINE POLICY	<input type="checkbox"/>	<input type="checkbox"/>	WORKPLACE INSPECTIONS	<input type="checkbox"/>	<input type="checkbox"/>
RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	INVESTIGATION PROCESS	<input type="checkbox"/>	<input type="checkbox"/>
PPE STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	TRAINING POLICY & PROGRAM	<input type="checkbox"/>	<input type="checkbox"/>
ENVIRONMENTAL STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	COMMUNICATION PROCESSES	<input type="checkbox"/>	<input type="checkbox"/>
MODIFIED WORK PROGRAM	<input type="checkbox"/>	<input type="checkbox"/>			

**5. TRAINING PROGRAM**

5A. Do you have an orientation program for new hire employees?

☐ Yes☐ No

If Yes, include a course outline. Does it include any of the following:

	YES	NO		YES	NO
GENERAL RULES & REGULATIONS	<input type="checkbox"/>	<input type="checkbox"/>	CONFINED SPACE ENTRY	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY REPORTING	<input type="checkbox"/>	<input type="checkbox"/>	TRENCHING & EXCAVATION	<input type="checkbox"/>	<input type="checkbox"/>
INJURY REPORTING	<input type="checkbox"/>	<input type="checkbox"/>	SIGNS & BARRICADES	<input type="checkbox"/>	<input type="checkbox"/>
LEGISLATION	<input type="checkbox"/>	<input type="checkbox"/>	DANGEROUS HOLES & OPENINGS	<input type="checkbox"/>	<input type="checkbox"/>
RIGHT TO REFUSE WORK	<input type="checkbox"/>	<input type="checkbox"/>	RIGGING & CRANES	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT	<input type="checkbox"/>	<input type="checkbox"/>	MOBILE VEHICLES	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	PREVENTATIVE MAINTENANCE	<input type="checkbox"/>	<input type="checkbox"/>
PROJECT SAFETY COMMITTEE	<input type="checkbox"/>	<input type="checkbox"/>	HAND & POWER TOOLS	<input type="checkbox"/>	<input type="checkbox"/>
HOUSEKEEPING	<input type="checkbox"/>	<input type="checkbox"/>	FIRE PREVENTION & PROTECTION	<input type="checkbox"/>	<input type="checkbox"/>
LADDERS & SCAFFOLDS	<input type="checkbox"/>	<input type="checkbox"/>	ELECTRICAL SAFETY	<input type="checkbox"/>	<input type="checkbox"/>
FALL ARREST STANDARDS	<input type="checkbox"/>	<input type="checkbox"/>	COMPRESSED GAS CYLINDERS	<input type="checkbox"/>	<input type="checkbox"/>
AERIAL WORK PLATFORMS	<input type="checkbox"/>	<input type="checkbox"/>	WEATHER EXTREMES	<input type="checkbox"/>	<input type="checkbox"/>

5B. Do you have a program for training newly hired or promoted supervisors? <input type="checkbox"/> Yes <input type="checkbox"/> No					
(If Yes, submit an outline for evaluation. Does it include instruction on the following:					
	Yes	No		Yes	No
EMPLOYER RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	SAFETY COMMUNICATION	<input type="checkbox"/>	<input type="checkbox"/>
EMPLOYEE RESPONSIBILITIES	<input type="checkbox"/>	<input type="checkbox"/>	FIRST AID/MEDICAL PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>
DUE DILIGENCE	<input type="checkbox"/>	<input type="checkbox"/>	NEW WORKER TRAINING	<input type="checkbox"/>	<input type="checkbox"/>
SAFETY LEADERSHIP	<input type="checkbox"/>	<input type="checkbox"/>	ENVIRONMENTAL REQUIREMENTS	<input type="checkbox"/>	<input type="checkbox"/>
WORK REFUSALS	<input type="checkbox"/>	<input type="checkbox"/>	HAZARD ASSESSMENT	<input type="checkbox"/>	<input type="checkbox"/>
INSPECTION PROCESSES	<input type="checkbox"/>	<input type="checkbox"/>	PRE-JOB SAFETY INSTRUCTION	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	DRUG & ALCOHOL POLICY	<input type="checkbox"/>	<input type="checkbox"/>
INCIDENT INVESTIGATION	<input type="checkbox"/>	<input type="checkbox"/>	PROGRESSIVE DISCIPLINARY POLICY	<input type="checkbox"/>	<input type="checkbox"/>
SAFE WORK PROCEDURES	<input type="checkbox"/>	<input type="checkbox"/>	SAFE WORK PRACTICES	<input type="checkbox"/>	<input type="checkbox"/>
SAFETY MEETINGS	<input type="checkbox"/>	<input type="checkbox"/>	NOTIFICATION REQUIREMENTS	<input type="checkbox"/>	<input type="checkbox"/>

### 6. SAFETY ACTIVITIES

Do you conduct safety inspections? Yes No Weekly Monthly Quarterly

☐ ☐ ☐ ☐ ☐

Describe your safety inspection process (include participation, documentation requirements, follow-up, report distribution).

---

Who follows up on inspection action items? \_\_\_\_\_

Do you hold site safety meetings for field employees? If Yes, how often?

Yes No Daily Weekly Biweekly

☐ ☐ ☐ ☐ ☐

Do you hold site meetings where safety is addressed with management and field supervisors?

Yes No Weekly Biweekly Monthly

☐ ☐ ☐ ☐ ☐

Is pre-job safety instruction provided before to each new task? ☐ Yes ☐ No

Is the process documented? ☐ Yes ☐ No

Who leads the discussion? \_\_\_\_\_

Do you have a hazard assessment process? ☐ Yes ☐ No

- Are hazard assessments documented? If yes, how are hazard assessments communicated and implemented on each project? Who is responsible for leading the hazard assessment process?

---



---



---

Does your company have policies and procedures for environmental protection, spill clean-up, reporting, waste disposal, and recycling as part of the Health & Safety Program?

☐ Yes ☐ No

How does your company measure its H&S success?

- Attach separate sheet to explain

**7. SAFETY STEWARDSHIP**

7A Are incident reports and report summaries sent to the following and how often?

	Yes	No	Monthly	Quarterly	Annually
Project/Site Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Director	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Director/Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
/Chief Executive Officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7B How are incident records and summaries kept? How often are they reported internally?

	Yes	No	Monthly	Quarterly	Annually
Incidents totaled for the entire company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incidents totaled by project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Subtotaled by superintendent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Subtotaled by foreman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7C How are the costs of individual incidents kept? How often are they reported internally?

	Yes	No	Monthly	Quarterly	Annually
Costs totaled for the entire company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Costs totaled by project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Subtotaled by superintendent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Subtotaled by foreman/general foreman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7D Does your company track non-injury incidents?

	Yes	No	Monthly	Quarterly	Annually
Near Miss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Property Damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**8 PERSONNEL**

List key health and safety officers planned for this project. Attach resume.

Name	Position/Title	Designation

Supply name, address and phone number of your company's corporate health and safety representative. Does this individual have responsibilities other than health, safety and environment?

Name	Address	Telephone Number

Other responsibilities:

**9 REFERENCES**

List the last three company's your form has worked for that could verify the quality and management commitment to your occupational Health &amp; Safety program

Name and Company	Address	Phone Number

**T2.2-10b: Health and Safety Cost Breakdown**

Tenderer (Company)	Responsible Person	Designation	Date
Project/Tender Title	Project/Tender No.	Project Location / Description	
Traction Transformer Refurbishment at Balfour.	SIC22002CIDB (HOAC-HO-37671)	Balfour	

#	Cost element	Unit Cost (R)	# of Units	Total Cost (R)
1.	Human Resources			
2.	Systems Documentation			
3.	Meetings & Administration			
4.	H&S Training			
5.	PPE & Safety Equipment			
6.	Signage & Barricading			
7.	Workplace Facilities			
8.	Emergency & Rescue Measures			
9.	Hygiene Surveys & Monitoring			
10.	Medical Surveillance			
11.	Safe Transport of Workers			
12.	HazMat Management (e.g. asbestos /silica)			
13.	Substance Abuse Testing (3 kits @R500 pm)			
14.	H&S Reward & Recognition			

<b>Total Health and Safety Estimate (R)</b>	
<b>Total Estimate Value (R)</b>	
<b>H&amp;S Cost as % of Tender value</b>	

## T2.2-10c: Letter/s of Good Standing with the Workmen's Compensation Fund

Attached to this schedule is the Letter/s of Good Standing.

- 1.
- 2.
- 3.
- 4.

Name of Company/Members of Joint Venture:

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

## T2.2-11: Availability of Equipment and Other Resources

The Tenderer to submit a list of all Equipment and other resources that will be used to execute the *works* as described in the Works Information.

Equipment Type and Availability – Description	Hourly Rate	Number of Equipment	Details of Ownership

Tenderers to indicate their Site establishment area requirements:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There is a vertical margin line on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

Signed \_\_\_\_\_ Date \_\_\_\_\_

Name	Position
------	----------

Tenderer



## T2.2-13: Authority to submit a Tender

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for his category of organisation or alternatively attach a certified copy of a company / organisation document which provides the same information for the relevant category as requested here.

A - COMPANY	B - PARTNERSHIP	C - JOINT VENTURE	D - SOLE PROPRIETOR

### A. Certificate for Company

I, \_\_\_\_\_ chairperson of the board of directors \_\_\_\_\_  
 \_\_\_\_\_, hereby confirm that by resolution of the board taken on \_\_\_\_\_  
 \_\_\_\_\_ (date), Mr/Ms \_\_\_\_\_, acting in the capacity of \_\_\_\_\_  
 \_\_\_\_\_, was authorised to sign all documents in connection with this tender  
 offer and any contract resulting from it on behalf of the company.

Signed

Date

Name

Position

Chairman of the Board of Directors

**B. Certificate for Partnership**

We, the undersigned, being the **key partners** in the business trading as \_\_\_\_\_  
\_\_\_\_\_ hereby authorise Mr/Ms \_\_\_\_\_ acting in the capacity of  
\_\_\_\_\_, to sign all documents in connection with the tender offer for  
Contract \_\_\_\_\_ and any contract resulting from it on our behalf.

Name	Address	Signature	Date

**NOTE:** This certificate is to be completed and signed by the full number of Partners necessary to commit the Partnership. Attach additional pages if more space is required.

**C. Certificate for Joint Venture**

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms

\_\_\_\_\_, an authorised signatory of the company \_\_\_\_\_

\_\_\_\_\_, acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract \_\_\_\_\_ and any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Furthermore we attach to this Schedule a copy of the joint venture agreement which incorporates a statement that all partners are liable jointly and severally for the execution of the contract and that the lead partner is authorised to incur liabilities, receive instructions and payments and be responsible for the entire execution of the contract for and on behalf of any and all the partners.

<b>Name of firm</b>	<b>Address</b>	<b>Authorising signature, name (in caps) and capacity</b>

**D. Certificate for Sole Proprietor**

I, \_\_\_\_\_, hereby confirm that I am the sole owner of the business trading  
as \_\_\_\_\_.

Signed

Date

Name

Position

Sole Proprietor

## T2.2-14: Record of Addenda to Tender Documents

This schedule as submitted confirms that the following communications received from the *Employer* before the submission of this tender offer, amending the tender documents, have been taken into account in this specific tender offer:

	Date	Title or Details
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Attach additional pages if more space is required.

## T2.2-15: Storage Capacity

### Note to tenderers:

The Tenderer is required to demonstrate to the Purchaser that he has sufficient current and/or future storage capacity to accommodate Transnet Limited's requirements as detailed in the Pricing Data and Goods Information, (Proof of Ownership or Rental/Lease Agreement of premises)

#### Index of documentation attached to this schedule:

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

## T2.2-16 : Compulsory Enterprise Questionnaire

The following particulars hereunder must be furnished.

In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner/mem must be completed and submitted.

**Section 1: Name of enterprise:** \_\_\_\_\_

**Section 2: VAT registration number, if any:** \_\_\_\_\_

**Section 3: CIDB registration number, if any:** \_\_\_\_\_

**Section 4: CSD number:** \_\_\_\_\_

**Section 5: Particulars of sole proprietors and partners in partnerships**

Name	Identity number	Personal income tax number

\* Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

**Section 6: Particulars of companies and close corporations**

Company registration number \_\_\_\_\_

Close corporation number \_\_\_\_\_

Tax reference number: \_\_\_\_\_

**Section 7: The attached SBD4 must be completed for each tender and be attached as tender requirement.**

**Section 8: The attached SBD 6 must be completed for each tender and be attached as a requirement.**

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise

- i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
- ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention Combating of Corrupt Activities Act of 2004;

- iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
- v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed

Date

Name

Position

Enterprise  
name



**SBD 6.1****PREFERENCE POINTS CLAIM FORM**

This preference form must form part of all bids invited. It contains general information and serves as a claim for preference points for Broad-Based Black Economic Empowerment [**B-BBEE**] Status Level of Contribution.

Transnet will award preference points to companies who provide valid proof of their B-BBEE status using either the latest version of the generic Codes of Good Practice or Sector Specific Codes (if applicable).

**1. GENERAL CONDITIONS**

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 Preference points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contribution.

1.4 The maximum points for this bid are allocated as follows:

	<b>POINTS</b>
<b>PRICE</b>	<b>80</b>
<b>B-BBEE STATUS LEVEL OF CONTRIBUTION</b>	<b>20</b>
<b>Total points for Price and B-BBEE must not exceed</b>	<b>100</b>

1.5 Failure on the part of a bidder to submit proof of B-BBEE status level of contributor together with the bid will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

## 2. DEFINITIONS

- (a) **"all applicable taxes"** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- (b) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (c) **"B-BBEE status level of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (d) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the supply/provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
- (e) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (f) **"EME"** means an Exempted Micro Enterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (g) **"functionality"** means the ability of a bidder to provide goods or services in accordance with specification as set out in the bid documents
- (h) **"Price"** includes all applicable taxes less all unconditional discounts.
- (i) **"Proof of B-BBEE Status Level of Contributor"**
  - i) the B-BBBEE status level certificate issued by an authorised body or person;
  - ii) a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or
  - iii) any other requirement prescribed in terms of the B-BBEE Act.
- (j) **"QSE"** means a Qualifying Small EEnterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (k) **"rand value"** means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties.

### 3. POINTS AWARDED FOR PRICE

#### 3.1 THE 80/20 PREFERENCE POINT SYSTEMS

A maximum of 80 points is allocated for price on the following basis:  
80/20

$$P_s = 80 \left( 1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

$P_s$  = Points scored for comparative price of bid under consideration

$P_t$  = Comparative price of bid under consideration

$P_{\min}$  = Comparative price of lowest acceptable bid

### 4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

4.1 preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

- 4.2 The table below indicates the required proof of B-BBEE status depending on the category of enterprises:

Enterprise	B-BBEE Certificate & Sworn Affidavit
Large	Certificate issued by SANAS accredited verification agency
QSE	Certificate issued by SANAS accredited verification agency Sworn Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned) [Sworn affidavits must substantially comply with the format that can be obtained on the DTI's website at <a href="http://www.dti.gov.za/economic_empowerment/bee_codes.jsp">www.dti.gov.za/economic_empowerment/bee_codes.jsp</a> .]
EME <sup>1</sup>	Sworn Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

- 4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate bid.
- 4.4 Tertiary Institutions and Public Entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 4.5 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 4.6 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.
- 4.7 Bidders are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National Treasury or the DTI. It is the Bidder's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

<sup>1</sup> In terms of the Implementation Guide: Preferential Procurement Regulations, 2017, Version 2, paragraph 11.11 provides that in the Transport Sector, EMEs can provide a letter from accounting officer or get verified and be issued with a B-BBEE certificate by SANAS accredited professional or agency as the Transport Sector Code has not been aligned to the generic Codes. EMEs in the Transport Sector are not allowed to provide a sworn affidavit as the generic codes are not applicable to them.

**5. BID DECLARATION**

- 5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

**6. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 6.1**

- 6.1 B-BBEE Status Level of Contribution: . = .....(maximum of 20 points)

(Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

**7. SUB-CONTRACTING**

- 7.1 Will any portion of the contract be sub-contracted?

(*Tick applicable box*)

YES		NO	
-----	--	----	--

- 7.1.1 If yes, indicate:

- i) What percentage of the contract will be subcontracted.....%
- ii) The name of the sub-contractor.....
- iii) The B-BBEE status level of the sub-contractor.....
- iv) Whether the sub-contractor is an EME or QSE.

(*Tick applicable box*)

YES		NO	
-----	--	----	--

**8. DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional Supplier/Service provider
- ☐ Other Suppliers/Service providers, e.g., transporter, etc.

[ TICK APPLICABLE BOX]

8.7 Total number of years the company/firm has been in business:.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If a bidder submitted false information regarding its B-BBEE status level of contributor,, which will affect or has affected the evaluation of a bid, or where a bidder has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have
  - (a) disqualify the person from the bidding process;
  - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;
- (e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and
- (f) forward the matter for criminal prosecution.

WITNESSES

1. ....

2. ....

.....  
SIGNATURE(S) OF BIDDERS(S)

DATE: .....

ADDRESS .....

.....

**BIDDER'S DISCLOSURE****1. PURPOSE OF THE FORM**

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

**2. Bidder's declaration**

- 2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest<sup>2</sup> in the enterprise, employed by the state? **YES/NO**

- 2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

- a. Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

<sup>2</sup> the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.



2.2.1 If so, furnish particulars:

.....  
.....

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?

**YES/NO**

2.3.1 If so, furnish particulars:

.....  
.....

### **3 DECLARATION**

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium<sup>3</sup> will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

---

<sup>3</sup> Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....  
Signature

.....  
Date

.....  
Position

.....  
Name of bidder

## **T2.2-17: Supplier Code of Conduct**

Transnet SOC Limited aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy. Underpinning our process are several acts and policies that any supplier dealing with Transnet must understand and support. These are:

- The Transnet Procurement Policy – A guide for Tenderers.
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (BBBEE)
- The Prevention and Combating of Corrupt Activities Act (PRECCA); and
- The Construction Industry Development Board Act (CIDB Act).

This code of conduct has been included in this contract to formally appraise Transnet Suppliers of Transnet's expectations regarding behaviour and conduct of its Suppliers.

### ***Prohibition of Bribes, Kickbacks, Unlawful Payments, and Other Corrupt Practices***

Transnet is in the process of transforming itself into a self-sustaining State Owned Enterprise, actively competing in the logistics industry. Our aim is to become a world class, profitable, logistics organisation. As such, our transformation is focused on adopting a performance culture and to adopt behaviours that will enable this transformation.

#### ***1. Transnet SOC Limited will not participate in corrupt practices. Therefore, it expects its suppliers to act in a similar manner.***

- Transnet and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with, and payments to, our suppliers.
- Employees must not accept or request money or anything of value, directly or indirectly, from suppliers.
- Employees may not receive anything that is calculated to:
  - Illegally influence their judgement or conduct or to ensure the desired outcome of a sourcing activity;
  - Win or retain business or to influence any act or decision of any person involved in sourcing decisions; or
  - Gain an improper advantage.

- There may be times when a supplier is confronted with fraudulent or corrupt behaviour of Transnet employees. We expect our Suppliers to use our "Tip-offs Anonymous" Hot line to report these acts. (0800 003 056).

**2. *Transnet SOC Limited is firmly committed to the ideas of free and competitive enterprise.***

- Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust practices.
- Transnet does not engage with non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting).

**3. *Transnet's relationship with suppliers requires us to clearly define requirements, to exchange information and share mutual benefits.***

- Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
  - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
  - Collusion;
  - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
  - Corrupt activities listed above; and
  - Harassment, intimidation or other aggressive actions towards Transnet employees.
- Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted and the supplier is expected to participate in an honest and straight forward manner.
- Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

### ***Conflicts of Interest***

A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of Transnet SOC Limited.

- Doing business with family members.
- Having a financial interest in another company in our industry

Where possible, contracts will be negotiated to include the above in the terms of such contracts. To the extent such terms are not included in contractual obligations and any of the above code is breached, then Transnet reserves its right to review doing business with these suppliers.

I, \_\_\_\_\_ of \_\_\_\_\_  
*(insert name of Director or as per Authority Resolution from Board of Directors)* *(insert name of Company)*

hereby acknowledge having read, understood and agree to the terms and conditions set out in the "Transnet Supplier Code of Conduct."

Signed this on day \_\_\_\_\_ at \_\_\_\_\_

\_\_\_\_\_  
Signature

## T2.2-18: Service Provider Integrity Pact

**Important Note: All potential tenderers must read this document and certify in the RFP Declaration Form that that have acquainted themselves with, and agree with the content. The contract with the successful tenderer will automatically incorporate this Integrity Pact and shall be deemed as part of the final concluded contract.**

### INTEGRITY PACT

Between

#### **TRANSNET SOC LTD**

Registration Number: 1990/000900/30

("Transnet")

and

The Contractor (hereinafter referred to as the "Tenderer/Service Providers/Contractor")

## PREAMBLE

Transnet values full compliance with all relevant laws and regulations, ethical standards and the principles of economical use of resources, fairness and transparency in its relations with its Tenderers / Service Providers/Contractors.

In order to achieve these goals, Transnet and the Tenderer / Service Provider hereby enter into this agreement hereinafter referred to as the "Integrity Pact" which will form part of the Tenderer's / Service Provider's / Contractor's application for registration with Transnet as a vendor.

The general purpose of this Integrity Pact is to agree on avoiding all forms of dishonesty, fraud and corruption by following a system that is fair, transparent and free from any undue influence prior to, during and subsequent to the currency of any procurement and / or reverse logistics event and any further contract to be entered into between the Parties, relating to such event.

All Tenderers / Service Providers / Contractor's will be required to sign and comply with undertakings contained in this Integrity Pact, should they want to be registered as a Transnet vendor.

## CHAPTER 1 OBJECTIVES

**Transnet and the Tenderer / Service Provider / Contractor agree to enter into this Integrity Pact, to avoid all forms of dishonesty, fraud and corruption including practices that are anti-competitive in nature, negotiations made in bad faith and under-pricing by following a system that is fair, transparent and free from any influence / unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:**

- a) Enable Transnet to obtain the desired contract at a reasonable and competitive price in conformity to the defined specifications of the works, goods and services; and**
- b) Enable Tenderers / Service Providers / Contractors to abstain from bribing or participating in any corrupt practice in order to secure the contract.**

## CHAPTER 2 COMMITMENTS OF TRANSNET

Transnet commits to take all measures necessary to prevent dishonesty, fraud and corruption and to observe the following principles:

**Transnet hereby undertakes that no employee of Transnet connected directly or indirectly with the sourcing event and ensuing contract, will demand, take a promise for or accept directly or through intermediaries any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Tenderer, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.**

**Transnet will, during the registration and tendering process treat all Tenderers / Service Providers with equity, transparency and fairness. Transnet will in particular, before and during the registration process, provide to all Tenderers / Service Providers the same information and will not provide to any Tenderers / Service Providers / Contractors confidential / additional information through which the Tenderers / Service Providers / Contractors could obtain an advantage in relation to any tendering process.**

**Transnet further confirms that its employees will not favour any prospective Tenderer in any form that could afford an undue advantage to a particular Tenderer during the tendering stage, and will further treat all Tenderers / Service Providers / Contractors participating in the tendering process.**

**Transnet will exclude from the tender process such employees who have any personal interest in the Tenderers / Service Providers / Contractors participating in the tendering process.**

### **CHAPTER 3 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER**

**The Tenderer / Service Provider / Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer / Service Provider / Contractor commits to the following:**

- a) The Tenderer / Service Provider / Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and**
- b) The Tenderer / Service Provider / Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.**

**The acceptance and giving of gifts may be permitted provided that:**

- a) the gift does not exceed R1 000 (one thousand Rand) in retail value;**
- b) many low retail value gifts do not exceed R 1 000 within a 12 month period;**
- c) hospitality packages do not exceed R5 000 in value or many low value hospitality packages do not cumulatively exceed R5 000;**
- d) a Tenderer / Service Provider does not give a Transnet employee more than 2 (two) gifts within a 12 (twelve) month period, irrespective of value;**
- e) a Tenderer / Service Provider does not accept more than 1 (one) gift in excess of R750 (seven hundred and fifty Rand) from a Transnet employee within a 12 (twelve) month period, irrespective of value;**
- f) a Tenderer / Service Provider may under no circumstances, accept from or give to, a Transnet employee any gift, business courtesy, including an invitation to a business meal and /or drinks, or hospitality package, irrespective of value, during any Tender evaluation process, including a period of 12 (twelve) months after such tender has been awarded, as it may be perceived as undue and improper influence on the evaluation process or reward for the contract that has been awarded; and**



- g) a Tenderer / Service Provider may not offer gifts, goods or services to a Transnet employee at artificially low prices, which are not available to the public at those prices.

The Tenderer / Service Provider / Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.

The Tenderer / Service Provider / Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers / Service Providers / Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.

The Tenderer / Service Provider / Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer /Service Provider will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

A Tenderer / Service Provider / Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.

The Tenderer / Service Provider / Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer / Service Provider or detriment of Transnet or other competitors.

The Tenderer / Service Provider / Contractor shall furnish Transnet with a copy of its code of conduct, which code of conduct shall reject the use of bribes and other dishonest and unethical conduct, as well as compliance programme for the implementation of the code of conduct.

The Tenderer / Service Provider / Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences

## CHAPTER 4 INDEPENDENT TENDERING

**For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:**

- a) has been requested to submit a Tender in response to this Tender invitation;**
- b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and**
- c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.**

**The Tenderer has arrived at his submitted Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive tendering.**

**In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:**

- a) prices;**
- b) geographical area where Goods or Services will be rendered [market allocation];**
- c) methods, factors or formulas used to calculate prices;**
- d) the intention or decision to submit or not to submit, a Tender;**
- e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or**
- f) tendering with the intention of not winning the Tender.**

**In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Goods or Services to which his/her tender relates.**

**The terms of the Tender as submitted have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender opening or of the awarding of the contract.**

**Tenderers are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [NPA] for criminal investigation and/or may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.**

**Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its**

**submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine whether the proposed alternative(s) are acceptable or otherwise, as the case may be.**

## **CHAPTER 5 DISQUALIFICATION FROM TENDERING PROCESS**

**If the Tenderer / Service Provider / Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer / Service Provider into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer / Service Provider from its database, if already registered.**

**If the Tenderer / Service Provider / Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer / Service Provider / Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer / Service Provider / Contractor and the amount of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.**

**If the Tenderer / Service Provider / Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system, or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.**

## CHAPTER 6 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

**All the stipulations around Transnet's blacklisting process as laid down in Transnet's Supply Chain Policy and Procurement Procedures Manual are included herein by way of reference. Below follows a condensed summary of this blacklisting procedure.**

**Blacklisting is a mechanism used to exclude a company/person from future business with Transnet for a specified period. The decision to blacklist is based on one of the grounds for blacklisting. The standard of proof to commence the blacklisting process is whether a "*prima facie*" (i.e. on the face of it) case has been established.**

**Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to blacklisting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.**

**A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.**

**Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:**

- a) **Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;**
- b) **has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;**
- c) **has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;**
- d) **has offered, promised or given a bribe in relation to the obtaining or execution of the contract;**
- e) **has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;**
- f) **has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:**
  - (i) **he made the statement in good faith honestly believing it to be correct; and**
  - (ii) **before making such statement he took all reasonable steps to satisfy himself of its correctness;**
- g) **caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;**

**h) has litigated against Transnet in bad faith.**

**Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.**

**Companies associated with the person/s guilty of misconduct (i.e. entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.**

## **CHAPTER 7 PREVIOUS TRANSGRESSIONS**

**The Tenderer / Service Provider / Contractor hereby declares that no previous transgressions resulting in a serious breach of any law, including but not limited to, corruption, fraud, theft, extortion and contraventions of the Competition Act 89 of 1998, which occurred in the last 5 (five) years with any other public sector undertaking, government department or private sector company that could justify its exclusion from its registration on the Tenderer's / Service Provider's / Contractor's database or any tendering process.**

**If it is found to be that the Tenderer / Service Provider / Contractor made an incorrect statement on this subject, the Tenderer / Service Provider / Contractor can be rejected from the registration process or removed from the Tenderer / Service Provider / Contractor database, if already registered, for such reason (refer to the Breach of Law Form contained in the applicable RFX document.)**

## **CHAPTER 8 SANCTIONS FOR VIOLATIONS**

**Transnet shall also take all or any one of the following actions, wherever required to:**

- a) Immediately exclude the Tenderer / Service Provider / Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation the Tenderer / Service Provider / Contractor. However, the proceedings with the other Tenderer / Service Provider / Contractor may continue;
- b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer / Service Provider / Contractor;
- c) Recover all sums already paid by Transnet;
- d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer / Service Provider / Contractor, in order to recover the payments, already made by Transnet, along with interest;
- e) Cancel all or any other contracts with the Tenderer / Service Provider; and
- f) Exclude the Tenderer / Service Provider / Contractor from entering into any Tender with Transnet in future.

## CHAPTER 9 CONFLICTS OF INTEREST

**A conflict of interest includes, inter alia, a situation in which:**

- a) A Transnet employee has a personal financial interest in a tendering / supplying entity; and
- b) A Transnet employee has private interests or personal considerations or has an affiliation or a relationship which affects, or may affect, or may be perceived to affect his / her judgment in action in the best interest of Transnet, or could affect the employee's motivations for acting in a particular manner, or which could result in, or be perceived as favouritism or nepotism.

**A Transnet employee uses his / her position, or privileges or information obtained while acting in the capacity as an employee for:**

- a) Private gain or advancement; or
- b) The expectation of private gain, or advancement, or any other advantage accruing to the employee must be declared in a prescribed form.

Thus, conflicts of interest of any Tender committee member or any person involved in the sourcing process must be declared in a prescribed form.

**If a Tenderer / Service Provider / Contractor has or becomes aware of a conflict of interest i.e. a family, business and / or social relationship between its owner(s) / member(s) / director(s) / partner(s) / shareholder(s) and a Transnet employee / member of Transnet's Board of Directors in respect of a Tender which will be considered for the Tender process, the Tenderer / Service Provider / Contractor:**

- a) must disclose the interest and its general nature, in the Request for Proposal ("RFX") declaration form; or
- b) must notify Transnet immediately in writing once the circumstances has arisen.

**The Tenderer / Service Provider / Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any committee member or any person involved in the sourcing process, where this is done, Transnet shall be entitled forthwith to rescind the contract and all other contracts with the Tenderer / Service Provider / Contractor.**

## CHAPTER 10 MONITORING

**Transnet will be responsible for appointing an independent Monitor to:**

- a) Conduct random monitoring of compliance to the provisions of this Integrity Pact for contracts entered into between Transnet and the Tenderer / Service Provider / Contractor for less than R100,000.000 (one hundred million Rand) in value;
- b) Monitor compliance to the provisions of this Integrity Pact for contracts entered into between Transnet and the Tenderer / Service Provider / Contractor for greater than R100,000.000 (one hundred million Rand) in value; and
- c) Investigate any allegation of violation of any provisions of this Integrity Pact for contracts entered into between Transnet and the Tenderer / Service Provider / Contractor, irrespective of value.

**The Monitor will be subjected to Transnet's Terms of Conditions of Contract for the Provision of Services to Transnet, as well as to Transnet's Service Provider Code of Conduct.**

## CHAPTER 11 EXAMINATION OF FINANCIAL RECORDS, DOCUMENTATION AND/OR ELECTRONIC DATA

**For the purpose of Monitoring, as stipulated above, the Monitor shall be entitled to:**

- a) Examine the financial records, documentation and or electronic data of Tenderer / Service Provider / Contractor / Transnet. The Tenderer / Service Provider / Transnet shall provide all requested information / documentation / data to the Monitor and shall extend all help possible for the purpose of such examination.

## CHAPTER 12 DISPUTE RESOLUTION

**Transnet recognises that trust and good faith are pivotal to its relationship with its Tenderer / Service Provider / Contractor. When a dispute arises between Transnet and its Tenderer / Service Provider / Contractor, the parties should use their best endeavours to resolve the dispute in an amicable manner, whenever possible. Litigation in bad faith negates the principles of trust and good faith on which commercial relationships are based. Accordingly, following a blacklisting process as mentioned in paragraph Chapter 6 above, Transnet will not do business with a company that litigates against it in bad faith or is involved in any action that reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:**

- a) **Vexatious proceedings:** these are frivolous proceedings which have been instituted without proper grounds;
- b) **Perjury:** where a Tenderer / Service Provider / Contractor make a false statement either in giving evidence or on an affidavit;
- c) **Scurrilous allegations:** where a Tenderer / Service Provider / Contractor makes allegations regarding a senior Transnet employee which are without proper foundation, scandalous, abusive or defamatory; and
- d) **Abuse of court process:** when a Tenderer / Service Provider / Contractor abuses the court process in order to gain a competitive advantage during a Tender process.

## CHAPTER 13 GENERAL

**This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.**

**The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.**

**The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.**

**Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.**

**Should a Tenderer / Service Provider / Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer / Service Provider / Contractor to report this behaviour directly to a senior Transnet official / employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.**

**The Parties hereby declare that each of them has read and understood the clauses of this Integrity Pact and shall a Tenderer by it. To the best of the Parties' knowledge and belief, the information provided in this Integrity Pact is true and correct.**



## T2.2-19: Non-Disclosure Agreement

**Note to tenderers: This Non-Disclosure Agreement is to be completed and signed by an authorised signatory:**

**THIS AGREEMENT** is made effective as of ..... day of ..... 20..... by and between:

**TRANSNET SOC LTD**

(Registration No. 1990/000900/30), a company incorporated and existing under the laws of South Africa, having its principal place of business at Transnet Corporate Centre 138 Eloff Street , Braamfontein , Johannesburg 2000

**and**

.....

(Registration No. ....), a private company incorporated and existing under the laws of South Africa having its principal place of business at

.....

.....

.....

**WHEREAS**

Transnet and the Company wish to exchange Information [as defined below] and it is envisaged that each party may from time to time receive Information relating to the other in respect thereof. In consideration of each party making available to the other such Information, the parties jointly agree that any dealings between them shall be subject to the terms and conditions of this Agreement which themselves will be subject to the parameters of the Tender Document.

## IT IS HEREBY AGREED

### 1. INTERPRETATION

In this Agreement:

- 1.1 **Agents** mean directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;
- 1.2 **Bid** or **Bid Document** (hereinafter Tender) means Transnet's Request for Information [**RFI**] Request for Proposal [**RFP**] or Request for Quotation [**RFQ**], as the case may be;
- 1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:
  - 1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or
  - 1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or
  - 1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;
- 1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and
- 1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities, know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

## 2. CONFIDENTIAL INFORMATION

- 2.1 All Confidential Information given by one party to this Agreement [the **Disclosing Party**] to the other party [the **Receiving Party**] will be treated by the Receiving Party as secret and confidential and will not, without the Disclosing Party's written consent, directly or indirectly communicate or disclose [whether in writing or orally or in any other manner] Confidential Information to any other person other than in accordance with the terms of this Agreement.
- 2.2 The Receiving Party will only use the Confidential Information for the sole purpose of technical and commercial discussions between the parties in relation to the Tender or for the subsequent performance of any contract between the parties in relation to the Tender.
- 2.3 Notwithstanding clause 2.1 above, the Receiving Party may disclose Confidential Information:
- 2.3.1 to those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause 2.2 above, provided that the Receiving Party shall ensure that such Agents are made aware prior to the disclosure of any part of the Confidential Information that the same is confidential and that they owe a duty of confidence to the Disclosing Party. The Receiving Party shall at all times remain liable for any actions of such Agents that would constitute a breach of this Agreement; or
- 2.3.2 to the extent required by law or the rules of any applicable regulatory authority, subject to clause 2.4 below.
- 2.4 In the event that the Receiving Party is required to disclose any Confidential Information in accordance with clause 2.3.2 above, it shall promptly notify the Disclosing Party and cooperate with the Disclosing Party regarding the form, nature, content and purpose of such disclosure or any action which the Disclosing Party may reasonably take to challenge the validity of such requirement.
- 2.5 In the event that any Confidential Information shall be copied, disclosed or used otherwise than as permitted under this Agreement then, upon becoming aware of the same, without prejudice to any rights or remedies of the Disclosing Party, the Receiving Party shall as soon as practicable notify the Disclosing Party of such event and if requested take such steps [including the institution of legal proceedings] as shall be necessary to remedy [if capable of remedy] the default and/or to prevent further unauthorised copying, disclosure or use.
- 2.6 All Confidential Information shall remain the property of the Disclosing Party and its disclosure shall not confer on the Receiving Party any rights, including intellectual property rights over the Confidential Information whatsoever, beyond those contained in this Agreement.

#### **4. RECORDS AND RETURN OF INFORMATION**

- 4.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.
- 4.2 The Receiving Party shall keep a written record, to be supplied to the Disclosing Party upon request, of the Confidential Information provided and any copies made thereof and, so far as is reasonably practicable, of the location of such Confidential Information and any copies thereof.
- 4.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:
  - 4.3.1 return all written Confidential Information [including all copies]; and
  - 4.3.2 expunge or destroy any Confidential Information from any computer, word processor or other device whatsoever into which it was copied, read or programmed by the Company or on its behalf.
- 4.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 4.3.2 above.

#### **5. ANNOUNCEMENTS**

- 5.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Tender without the prior written consent of the other party.
- 5.2 Neither party shall make use of the other party's name or any information acquired through its dealings with the other party for publicity or marketing purposes without the prior written consent of the other party.

#### **6. DURATION**

The obligations of each party and its Agents under this Agreement shall survive the termination of any discussions or negotiations between the parties regarding the Tender and continue thereafter for a period of 5 [five] years.

#### **7. PRINCIPAL**

Each party confirms that it is acting as principal and not as nominee, agent or broker for any other person and that it will be responsible for any costs incurred by it or its advisers in considering or pursuing the Tender and in complying with the terms of this Agreement.

#### **8. ADEQUACY OF DAMAGES**

Nothing contained in this Agreement shall be construed as prohibiting the Disclosing Party from pursuing any other remedies available to it, either at law or in equity, for any such threatened or actual breach of this Agreement, including specific performance, recovery of damages or otherwise.

## **9. PRIVACY AND DATA PROTECTION**

- 9.1 The Receiving Party undertakes to comply with South Africa's general privacy protection in terms Section 14 of the Bill of Rights in connection with this Tender and shall procure that its personnel shall observe the provisions of such Act [as applicable] or any amendments and re-enactments thereof and any regulations made pursuant thereto.
- 9.2 The Receiving Party warrants that it and its Agents have the appropriate technical and organisational measures in place against unauthorised or unlawful processing of data relating to the Tender and against accidental loss or destruction of, or damage to such data held or processed by them.

## **10. GENERAL**

- 10.1 Neither party may assign the benefit of this Agreement, or any interest hereunder, except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.
- 10.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.
- 10.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.
- 10.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.
- 10.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.
- 10.6 This Agreement will be governed by and construed in accordance with South African law and the parties irrevocably submit to the exclusive jurisdiction of the South African courts.

Signed

Date

Name

Position

Tenderer

## T2.2-20: Supplier Declaration Form

Respondents are to furnish the following documentation and complete the Supplier Declaration Form below:

1. **Original or certified** cancelled cheque **OR** letter from the Respondent's bank verifying banking details **[with bank stamp]**
2. **Certified copy** of Identity Document(s) of Shareholders/Directors/Members *[where applicable]*
3. **Certified copy** of Certificate of Incorporation, CM29 / CM9 *[name change]*
4. **Certified copy** of Share Certificates [CK1/CK2 if CC]
5. Original or certified letterhead confirm physical and postal addresses
6. **Original or certified** valid SARS Tax Clearance Certificate [RSA entities only]
7. **Certified copy** of VAT Registration Certificate [RSA entities only]
8. A signed letter from your entity's auditor or accountant confirming most recent annual turnover figures or certified BBBEE certificate
9. **Certified copy** of valid Company Registration Certificate *[if applicable]*

Note: No contract shall be awarded to any South African Respondent whose tax matters have not been declared by SARS to be in order.

Note: No agreement shall be awarded to any Respondent whose tax matters have not been declared by SARS to be in order.

Company Trading Name						
Company Registered Name						
Company Registration Number Or ID Number If A Sole Proprietor						
Form of entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
VAT number (if registered)						
Company Telephone Number						
Company Fax Number						
Company E-Mail Address						
Company Website Address						
Bank Name				Bank Account Number		
Postal Address						Code
Physical Address						Code

**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

Contact Person					
Designation					
Telephone					
Email					
Annual Turnover Range (Last Financial Year)	< R5 Million		R5-35 million		> R35 million
Does Your Company Provide	Products		Services		Both
Area Of Delivery	National		Provincial		Local
Is Your Company A Public Or Private Entity			Public		Private
Does Your Company Have A Tax Directive Or IRP30 Certificate			Yes		No
Main Product Or Service Supplied (E.G.: Stationery/Consulting)					
BEE Ownership Details					
% Black Ownership		% Black women ownership		% Disabled person/s ownership	
Does your company have a BEE certificate	Yes		No		
What is your broad based BEE status (Level 1 to 9 / Unknown)					
How many personnel does the firm employ	Permanent		Part time		
Transnet Contact Person					
Contact number					
Transnet operating division					

Duly Authorised To Sign For And On Behalf Of Firm / Organisation			
Name		Designation	
Signature		Date	

Stamp And Signature Of Commissioner Of Oath			
Name		Date	
Signature		Telephone No.	

## T2.2-21: RFP Declaration Form

NAME OF COMPANY: \_\_\_\_\_

We \_\_\_\_\_ do hereby certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below: *[Respondent to indicate if this section is not applicable]*

FULL NAME OF OWNER/MEMBER/DIRECTOR/  
PARTNER/SHAREHOLDER:

ADDRESS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Indicate nature of relationship with Transnet:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*[Failure to furnish complete and accurate information in this regard may lead to the disqualification of your response and may preclude a Respondent from doing future business with Transnet]*

We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet (other than any existing and appropriate business relationship with Transnet) which could unfairly advantage our company in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman



process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).

7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.
8. We have acquainted ourselves and agree with the content of T2.2-31a "Service Provider Integrity Pact".

For and on behalf of ..... duly authorised thereto
Name:
Signature:
Date:

**IMPORTANT NOTICE TO TENDERERS**

- Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.
- It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website [www.transnet.net](http://www.transnet.net).
- An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to [procurement.ombud@transnet.net](mailto:procurement.ombud@transnet.net)
- For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.
- All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Bidders.

## T2.2-22: REQUEST FOR PROPOSAL – BREACH OF LAW

NAME OF COMPANY: \_\_\_\_\_

I / We \_\_\_\_\_ do hereby certify that ***I/we have/have not been*** found guilty during the preceding 5 (five) years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Tenderer is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences.

*Where found guilty of such a serious breach, please disclose:*

NATURE OF BREACH:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DATE OF BREACH:

\_\_\_\_\_

Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Tenderer from the tendering process, should that person or company have been found guilty of a serious breach of law, tribunal or regulatory obligation.

Signed on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_  
SIGNATURE OF TENDER

**T2.2-23: SBD1 (TAX COMPLIANCE STATUS)****PART A  
INVITATION TO BID**

BID NUMBER:	SIC22002CIDB (HOAC-HO-37671)	ISSUE DATE:	03 August 2022	CLOSING DATE:	18 August 2022	CLOSING TIME:	10h00
DESCRIPTION	Traction Transformer Refurbishment at Balfour.						
<b>BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)</b>							
<p>Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to Respond to bids and upload their bid proposals/responses on to the system.</p> <p><b>RESPONDENTS ARE TO UPLOAD THEIR BID RESPONSE PROPOSALS ONTO THE TRANSNET SYSTEM AGAINST EACH TENDER/RFQ SELECTED.</b></p> <p>The Transnet e-Tender Submission Portal can be accessed as follows:</p> <ul style="list-style-type: none"> <li>▮ Log on to the Transnet eTenders management platform website (<a href="https://www.transnet.net">https://www.transnet.net</a>);</li> <li>▮ Click on "TENDERS";</li> <li>▮ Scroll towards the bottom right hand side of the page;</li> <li>▮ Click on "register on our new eTender Portal";</li> <li>▮ Click on "ADVERTISED TENDERS" to view advertised tenders;</li> <li>▮ Click on "SIGN UP NOW/REGISTER – for bidder to register their information (must fill in all mandatory information);</li> <li>▮ Click on "SIGN IN/REGISTER" - to sign in if already registered;</li> <li>▮ Toggle the "Log an Intent" button to submit a bid;</li> <li>▮ Submit bid documents by uploading them into the system against each tender selected.</li> </ul> <p>Please do always refer back to the tender portal to check if there are any changes on the tender advised before the closing date and time.</p>							
<b>BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO</b>				<b>TECHNICAL ENQUIRIES MAY BE DIRECTED TO:</b>			
CONTACT PERSON	Kgalalelo Tlhabanelo			CONTACT PERSON	Thabang Tutubala		
TELEPHONE NUMBER	011 584 0590			TELEPHONE NUMBER	016 340 7276		
FACSIMILE NUMBER				FACSIMILE NUMBER			
E-MAIL ADDRESS	<a href="mailto:Kgalalelo.Tlhabanelo@transnet.net">Kgalalelo.Tlhabanelo@transnet.net</a>			E-MAIL ADDRESS	<a href="mailto:Thabang.Tutubala@transnet.net">Thabang.Tutubala@transnet.net</a>		
<b>SUPPLIER INFORMATION</b>							
NAME OF BIDDER							
POSTAL ADDRESS							
STREET ADDRESS							
TELEPHONE NUMBER	CODE			NUMBER			
CELLPHONE NUMBER							
FACSIMILE NUMBER	CODE			NUMBER			
E-MAIL ADDRESS							
VAT REGISTRATION NUMBER							

SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE	UNIQUE REGISTRATION REFERENCE NUMBER: MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES &amp; QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]</b>					
<b>1</b> ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		<b>2</b> ARE YOU A FOREIGN BASED SUPPLIER FOR <b>THE GOODS /SERVICES /WORKS OFFERED?</b>		<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER QUESTIONNAIRE BELOW ]
<b>QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS</b>					
<p>IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?  <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>DOES THE ENTITY HAVE A BRANCH IN THE RSA?  <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?  <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?  <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?  <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 1.3 BELOW.</b></p>					

**PART B**  
**TERMS AND CONDITIONS FOR BIDDING**

**1. TAX COMPLIANCE REQUIREMENTS**

- 1.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 1.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
- 1.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
- 1.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 1.5 IN BIDS WHERE UNINCORPORATED CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 1.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

**NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.**

SIGNATURE OF BIDDER: .....

CAPACITY UNDER WHICH THIS BID IS SIGNED: .....

(Proof of authority must be submitted e.g., company resolution)

DATE: \_\_\_\_\_

## T2.2-24: Certificate of Acquaintance with Tender Documents

NAME OF TENDERING ENTITY:

---

1. By signing this certificate I/we acknowledge that I/we have made myself/ourselves thoroughly familiar with, and agree with all the conditions governing this RFP. This includes those terms and conditions of the Contract, the Supplier Integrity Pact, Non-Disclosure Agreement etc. contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.
2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.
3. I/we understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect.
4. For the purposes of this Certificate and the accompanying Tender, I/we understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:
  - a) has been requested to submit a Tender in response to this Tender invitation;
  - b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
  - c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer
5. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.
6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
  - a) prices;
  - b) geographical area where Services will be rendered [market allocation]
  - c) methods, factors or formulas used to calculate prices;
  - d) the intention or decision to submit or not to submit, a Tender;
  - e) the submission of a tender which does not meet the specifications and conditions of the tender;or

- f) Tendering with the intention not winning the tender.
7. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Services to which this tender relates.
8. The terms of the accompanying tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
9. I/We am/are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [NPA] for criminal investigation. In addition, Tenderers that submit suspicious tenders may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_  
SIGNATURE OF TENDERER

## T2.2-25: Insurance provided by the *Contractor*

Clause 84.1 in NEC3 Engineering & Construction Contract (June 2005)(amended June 2006 and April 2013) requires that the *Contractor* provides the insurance stated in the insurance table except any insurance which the *Employer* is to provide as stated in the Contract Data.

Please provide the following details for insurance which the *Contractor* is still to provide. Notwithstanding this information all costs related to insurance are deemed included in the tenderer's rates and prices.

Insurance against (See clause 84.2 of the ECC)	Name of Insurance Company	Cover	Premium
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000			
Insurance in respect of loss of or damage to own property and equipment.			
(Other)			



## T2.2-26: Three (3) years audited financial statements

Attached to this schedule is the last three (3) years audited financial statements of the single tenderer/members of the Joint Venture.

NAME OF COMPANY/IES and INDEX OF ATTACHMENTS:

.....

.....

.....

.....

.....

.....

.....



## Annex C

### Local Content Declaration - Summary Schedule

**Note:** VAT to be excluded from all calculations

(C1)	Tender No.	SIC22002CIDB (HOAC-HO-37671)		
(C2)	Tender description:	Traction Transformer Refurbishment at Balfour.		
(C3)	Designated product(s)	Transformers and associated Equipment [Bushings and Oil]		
(C4)	Tender Authority:			
(C5)	Tendering Entity name:			
(C6)	Tender Exchange Rate:	Pula	EU	GBP
(C7)	Specified local content %	100%		

#### Calculation of local content

#### Tender summary

Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)
2.2	Design, manufacture and install three HV and LV coils complete with new insulation kit.						
3.5	Clean and Supply 3x new HV bushings						
4.2	Oil purification process at 4 passes						
4.3							
6.1							

Commodity Qty	Total Commodity value	Total exempted imported content	Total Imported content
(C16)	(C17)	(C18)	(C19)
1			
3			
1			
1			
1			

(C20) Total tender value

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

Signature of tenderer from Annex B

Date: \_\_\_\_\_



SATS 1286.2011

## Annex C

### Local Content Declaration - Summary Schedule

(C1)	Tender No.	SIC22002CIDB (HOAC-HO-37671)			
(C2)	Tender description:	Traction Transformer Refurbishment at Balfour.			
(C3)	Designated product(s)	Steel Power Pylons			
(C4)	Tender Authority:				
(C5)	Tendering Entity name:				
(C6)	Tender Exchange Rate:	Pula		EU	
(C7)	Specified local content %	100%			

**Note:** VAT to be excluded from all calculations

GBP

#### Calculation of local content

#### Tender summary

Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)
4.4	Fit Top Cover complete with new gaskets and new nuts and bolts						

Commodity Qty	Total Commodity value	Total exempted imported content	Total Imported content
(C16)	(C17)	(C18)	(C19)
1			

(C20) Total tender value

Signature of tenderer from Annex B

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

Date: \_\_\_\_\_



SATS 1286.2011

## Annex C

### Local Content Declaration - Summary Schedule

(C1)	Tender No.	SIC22002CIDB (HOAC-HO-37671)			
(C2)	Tender description:	Traction Transformer Refurbishment at Balfour.			
(C3)	Designated product(s)	Electrical Cables			
(C4)	Tender Authority:				
(C5)	Tendering Entity name:				
(C6)	Tender Exchange Rate:	Pula		EU	
(C7)	Specified local content %	90%			

**Note:** VAT to be excluded from all calculations

GBP

#### Calculation of local content

#### Tender summary

Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)
4.5	Wire up all auxiliary-to-auxiliary terminal box						

Commodity Qty	Total Commodity value	Total exempted imported content	Total Imported content
(C16)	(C17)	(C18)	(C19)
1			

(C20) Total tender value

Signature of tenderer from Annex B

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

Date: \_\_\_\_\_

Annex D

Imported Content Declaration - Supporting Schedule to Annex C

(D1)	Tender No.	SIC20035CIDB		
(D2)	Tender description:	Traction Transformer Refurbishment at Balfour.		
(D3)	Designated Products:	Transformers and associated Equipment [Bushings, Clamps and Oil] [100%]		
		Steel Power Pylons [100%]		
		Electrical Cables [90%]		
(D4)	Tender Authority:			
(D5)	Tendering Entity name:			
(D6)	Tender Exchange Rate:	Pula		EU

Note: VAT to be excluded from all calculations

GBP

A. Exempted imported content

				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Exempted imported value
(D7)	(D8)	(D9)	(D10)	(D11)	(D12)	(D13)	(D14)	(D15)	(D16)	(D17)	(D18)
(D19) Total exempt imported value										R 0	

This total must correspond with Annex C - C 21

B. Imported directly by the Tenderer

				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Unit of measure	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Total imported value
(D20)	(D21)	(D22)	(D23)	(D24)	(D25)	(D26)	(D27)	(D28)	(D29)	(D30)	(D31)
(D32) Total imported value by tenderer										R 0	

**C. Imported by a 3rd party and supplied to the Tenderer**

				Calculation of imported content						Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Quantity imported	Total imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)
(D45) Total imported value by 3rd party											R 0

**D. Other foreign currency payments**

			Calculation of foreign currency payments		Summary of payments	
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	Local value of payments	
(D46)	(D47)	(D48)	(D49)	(D50)	(D51)	
(D52) Total of foreign currency payments declared by tenderer and/or 3rd party						
(D53) Total of imported content & foreign currency payments - (D32), (D45) & (D52) above						R 0

Signature of tenderer from Annex B

\_\_\_\_\_

Date: \_\_\_\_\_

This total must correspond with  
Annex C - C 23

## Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	SIC22002CIDB (HOAC-HO-37671)	Note: VAT to be excluded from all calculations
(E2)	Tender description:	Traction Transformer Refurbishment at Balfour.	
(E3)	Designated products:	Transformers and associated Equipment [Bushings, Clamps and Oil] [100%]	
		Steel Power Pylons [100%]	
		Electrical Cables [90%]	
(E4)	Tender Authority:		
(E5)	Tendering Entity name:		

(E10)	<b>Manpower costs</b>	(Tenderer's manpower cost)		R
(E11)	<b>Factory overheads</b>	(Rental, depreciation & amortisation, utility costs, consumables etc.)		R
(E12)	<b>Administration overheads and mark-up</b>	(Marketing, insurance, financing, interest etc.)		R
	<b>(E13) Total local content</b>			R

**Signature of tenderer from Annex B**

Date: \_\_\_\_\_

## **Guidance Document for the Calculation of Local Content**

### **1. DEFINITIONS**

Unless explicitly provided in this guideline, the definitions given in SATS 1286:2011 apply.

### **2. GENERAL**

#### **2.1. Introduction**

This guideline provides tenderers with a detailed description of how to calculate local content of products (goods, services and works) by components/material/services and enables them to keep an updated record for verification requirements as per the SATS 1286:2011 Annexure A and B.

The guideline consists of two parts, namely:

- a written guideline; and
- three declarations that must be completed:
  - Declaration C: “Local Content Declaration – Summary Schedule” (see Annexure C);
  - Declaration D: “Imported Content Declaration – Supporting Schedule to Annex C” (see Annexure D); and
  - Declaration E: “Local Content Declaration – Supporting Schedule to Annex C” (see Annexure E).

The guidelines and declarations should be used by tenderers when preparing a tender. A tenderer must complete Declarations D and E, and consolidate the information on Declaration C.



Annexure C must be submitted with the tender by the closing date and time as determined by the Tender Authority. The Tender Authority reserves the right to request that Declarations D and E also be submitted.

If the tender is successful, the tenderer must continuously update Declarations C, D and E with actual values for the duration of the contract.

**NOTE:**

Annexure A is a note to the purchaser in SATS 1286:2011; and  
Annexure B is the Local Content Declaration IN SATS 1286:2011.

**2.2. What is local content?**

According to SATS 1286:2011, the local content of a product is the tender price less the value of imported content, expressed as a percentage. It is, therefore, necessary to first compute the imported value of a product to determine the local content of a product.

**2.3. Categories: Imported and Local Content**

The tenderer must differentiate between imported content and local content.

Imported content of a product by components/material/services is separated into two categories, namely:

- products imported directly by the tenderer; and
- products imported by a third party and supplied to the tenderer.

**2.3.1. Imported Content**

Identify the imported content, if any, by value for products by component/material/services. In the case of components/materials/services sourced from a South African manufacturer, agent, supplier or subcontractor (i.e. third party), obtain that information and Declaration D from the third party.

Calculate the imported content of components/materials/services to be used in the manufacture of the total quantity of the products for which the tender is to be submitted.

As stated in clause 3.2.4 of SATS 1286:2011: "If information on the origin of components, parts or materials is not available, it will be deemed to be imported content."

#### 2.3.1.1. Imported directly by the tenderer:

When the tenderer import products directly, the onus is on the tenderer to provide evidence of any components/materials/services that were procured from a non-domestic source. The evidence should be verifiable and pertain to the tender as a whole. Typical evidence will include commercial invoices, bills of entry, etc.

When the tenderer procures imported services such as project management, design, testing, marketing, etc and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

#### 2.3.1.2. Imported by a third party and supplied to the tenderer:

When the tenderer supplies components/material/services that are imported by any third party (for example, a domestic manufacturer, agent, supplier or subcontractor in the supply chain), the onus is on the tenderer to obtain verifiable evidence from the third party.

The tenderer must obtain Declaration D from all third parties for the related tender. The third party must be requested by the tenderer to continuously update Declaration D. Typical evidence of imported content will include commercial invoices, bills of entry etc.

When a third party procures imported services such as project management, design, testing, marketing etc. and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

#### 2.3.1.3. Exempt Imported Content:

Exemptions, if any, are granted by the Department of Trade and Industry (**the dti**). Evidence of the exemptions must be provided and included in Annexure D.

#### **2.3.2. Local Content**

Identify and calculate the local content, by value for products by components/materials/services to be used in the manufacture of the total quantity of the products.

### **3. ANNEXURE C**

#### **3.1. Guidelines for completing Annexure C: Local Content Declaration – Summary Schedule**

*Note: The paragraph numbers correspond to the numbers in Annexure C.*

**C1. Tender Number**

Supply the tender number that is specified on the specific tender documentation.

**C2. Tender description**

Supply the tender description that is specified on the specific tender documentation.

**C3. Designated products**

Supply the details of the products that are designated in terms of this tender (i.e. buses).

**C4. Tender Authority**

Supply the name of the tender authority.

**C5. Tendering Entity name**

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd).

**C6. Tender Exchange Rate**

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**C7. Specified local content %**

Provide the specified minimum local content requirement for the tender (i.e. 80%), as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MDB) 6.2.

**C8. Tender item number**

Provide the tender item number(s) of the products that have a local content requirement as per the tender specification.

**C9. List of items**

Provide a list of the item(s) corresponding with the tender item number.  
This may be a short description or a brand name.

**Calculation of local content**

**C10. Tender price**

Provide the unit tender price of each item excluding VAT.

**C11. Exempted imported content**

Provide the ZAR value of the exempted imported content for each item, if applicable. These value(s) must correspond with the value(s) of column D16 on Annexure D.

**C12. Tender value net of exempted imported content**

Provide the net tender value of the item, if applicable, by deducting the exempted imported content (C11) from the tender price (C10).

**C13. Imported value**

Provide the ZAR value of the items' imported content.

**C14. Local value**

Provide the local value of the item by deducting the Imported value (C13) from the net tender value (C12).

**C15. Local content percentage (per item)**

Provide the local content percentage of the item(s) by dividing the local value (C14) by the net tender value (C12) as per the local content formula in SATS 1286.

**Tender Summary**

**C16. Tender quantity**

Provide the tender quantity for each item number as per the tender specification.

**C17. Total tender value**

Provide the total tender value by multiplying the tender quantity (C16) by the tender price (C10).

**C18. Total exempted imported content**

Provide the total exempted imported content by multiplying the tender quantity (C16) by the exempted imported content (C11). These values must correspond with the values of column D18 on Annexure D.

**C19. Total imported content**

Provide the total imported content of each item by multiplying the tender quantity (C16) by the imported value (C13).

**C20. Total tender value**

Total tender value is the sum of the values in column C17.

**C21. Total exempted imported content**

Total exempted imported content is the sum of the values in column C18. This value must correspond with the value of D19 on Annexure D.

**C22. Total tender value net of exempted imported content**

The total tender value net of exempt imported content is the total tender value (C20) less the total exempted imported content (C21).

**C23. Total imported content**

Total imported content is the sum of the values in column C19. This value must correspond with the value of D53 on Annexure D.

**C24. Total local content**

Total local content is the total tender value net of exempted imported content (C22) less the total imported content (C23). This value must correspond with the value of E13 on Annexure E.

**C25. Average local content percentage of tender**

The average local content percentage of tender is calculated by dividing total local content (C24) by the total tender value net of exempted imported content (C22).

#### **4. ANNEXURE D**

##### **4.1. Guidelines for completing Annexure D: “Imported Content Declaration – Supporting Schedule to Annexure C”**

*Note: The paragraph numbers correspond to the numbers in Annexure D.*

**D1. Tender number**

Supply the tender number that is specified on the specific tender documentation.

**D2. Tender description**

Supply the tender description that is specified on the specific tender documentation.

**D3. Designated products**

Supply the details of the products that are designated in terms of this tender (i.e. buses).

**D4. Tender authority**

Supply the name of the tender authority.

**D5. Tendering entity name**

Provide the tendering entity name (i.e. Unibody Bus Builders (Pty) Ltd).

**D6. Tender exchange rate**

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**Table A. Exempted Imported Content**

**D7. Tender item number**

Provide the tender item number(s) of the product(s) that have imported content.

**D8. Description of imported content**

Provide a list of the exempted imported product(s), if any, as specified in the tender.

**D9. Local supplier**

Provide the name of the local supplier(s) supplying the imported product(s).

**D10. Overseas supplier**

Provide the name(s) of the overseas supplier(s) supplying the exempted imported product(s).

**D11. Imported value as per commercial invoice**

Provide the foreign currency value of the exempted imported product(s) disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

**D12. Tender exchange rate**

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**D13. Local value of imports**

Convert the value of the exempted imported content as per commercial invoice (D11) into the ZAR value by using the tender exchange rate (D12) disclosed in the tender documentation.

**D14. Freight costs to port of entry**

Provide the freight costs to the South African Port of the exempted imported item.

**D15. All locally incurred landing costs and duties**

Provide all landing costs including customs and excise duty for the exempted imported product(s) as stipulated in the SATS 1286:2011.

**D16. Total landed costs excl VAT**

Provide the total landed costs (excluding VAT) for each item imported by adding the corresponding item values in columns D13, D14 and D15. These values must be transferred to column C11 on Annexure C.

**D17. Tender quantity**

Provide the tender quantity of the exempted imported products as per the tender specification.

**D18. Exempted imported value**

Provide the imported value for each of the exempted imported product(s) by multiplying the total landed cost (excl. VAT) (D16) by the



tender quantity (D17). The values in column D18 must correspond with the values of column C18 of Annexure C.

**D19. Total exempted imported value**

The total exempted imported value is the sum of the values in column D18. This total must correspond with the value of C21 on Annexure C.

**Table B. Imported Directly By Tenderer**

**D20. Tender item numbers**

Provide the tender item number(s) of the product(s) that have imported content.

**D21. Description of imported content:**

Provide a list of the product(s) imported directly by tender as specified in the tender documentation.

**D22. Unit of measure**

Provide the unit of measure for the product(s) imported directly by the tenderer.

**D23. Overseas supplier**

Provide the name(s) of the overseas supplier(s) supplying the imported product(s).

**D24. Imported value as per commercial Invoice**

Provide the foreign currency value of the product(s) imported directly by tenderer disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

**D25. Tender rate of exchange**

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**D26. Local value of imports**

Convert the value of the product(s) imported directly by the tenderer as per commercial invoice (D24) into the ZAR value by using the tender exchange rate (D25) disclosed in the tender documentation.

**D27. Freight costs to port of entry**

Provide the freight costs to the South African Port of the product(s) imported directly by the tenderer.

**D28. All locally incurred landing costs and duties**

Provide all landing costs including customs and excise duty for the product(s) imported directly by the tenderer as stipulated in the SATS 1286:2011.

**D29. Total landed costs excl VAT**

Provide the total landed costs (excluding VAT) for each item imported directly by the tenderer by adding the corresponding item values in columns D26, D27 and D28.

**D30. Tender quantity**

Provide the tender quantity of the product(s) imported directly by the tenderer as per the tender specification.

**D31. Total imported value**

Provide the total imported value for each of the product(s) imported directly by the tenderer by multiplying the total landed cost (excl. VAT) (D29) by the tender quantity (D30).

**D32. Total imported value by tenderer**

The total value of imports by the tenderer is the sum of the values in column D31.

**Table C. Imported by Third Party and Supplied to the Tenderer**

**D33. Description of imported content**

Provide a list of the product(s) imported by the third party and supplied to the tenderer as specified in the tender documentation.

**D34. Unit of measure**

Provide the unit of measure for the product(s) imported by the third party and supplied to tenderer as disclosed in the commercial invoice.

**D35. Local supplier**

Provide the name of the local supplier(s) supplying the imported product(s).

**D36. Overseas supplier**

Provide the name(s) of the overseas supplier(s) supplying the imported products.

**D37. Imported value as per commercial invoice**

Provide the foreign currency value of the product(s) imported by the third party and supplied to the tenderer disclosed in the commercial invoice accepted by SARS.

**D38. Tender rate of exchange**

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**D39. Local value of imports**

Convert the value of the product(s) imported by the third party as per commercial invoice (D37) into the ZAR value by using the tender exchange rate (D38) disclosed in the tender documentation.

**D40. Freight costs to port of entry**

Provide the freight costs to the South African Port of the product(s) imported by third party and supplied to the tenderer.

**D41. All locally incurred landing costs and duties**

Provide all landing costs including customs and excise duty for the product(s) imported by third party and supplied to the tenderer as stipulated in the SATS 1286:2011.

**D42. Total landed costs excluding VAT**

Provide the total landed costs (excluding VAT) for each product imported by third party and supplied to the tenderer by adding the corresponding item values in columns D39, D40 and D41.

**D43. Quantity imported**

Provide the quantity of each product(s) imported by third party and supplied to the tenderer for the tender.

**D44. Total imported value**

Provide the total imported value of the product(s) imported by third party and supplied to the tenderer by multiplying the total landed cost (D42) by the quantity imported (D43).

**D45. Total imported value by third party**

The total imported value from the third party is the sum of the values in column D44.

**Table D. Other Foreign Currency Payments**

**D46. Type of payment**

Provide the type of foreign currency payment. (i.e. royalty payment for use of patent, annual licence fee, etc).

**D47. Local supplier making the payment**

Provide the name of the local supplier making the payment.

**D48. Overseas beneficiary**

Provide the name of the overseas beneficiary.

**D49. Foreign currency value paid**

Provide the value of the listed payment(s) in their foreign currency.

**D50. Tender rate of exchange**

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

**D51. Local value of payments**

Provide the local value of each payment by multiplying the foreign currency value paid (D49) by the tender rate of exchange (D50).

**D52. Total of foreign currency payments declared by tenderer and/or third party**

The total of foreign currency payments declared by tenderer and/or a third party is the sum of the values in column D51.

**D53. Total of imported content and foreign currency payment**

The total imported content and foreign currency payment is the sum of the values in column D32, D45 and D52. This value must correspond with the value of C23 on Annexure C.

## **5. ANNEXURE E**

### **5.1. Guidelines to completing Annexure E: “Local Content Declaration-Supporting Schedule to Annexure C”**

*The paragraph numbers correspond to the numbers in Annexure E*

#### **E1. Tender number**

Supply the tender number that is specified on the specific tender documentation.

#### **E2. Tender description**

Supply the tender description that is specified on the specific tender documentation.

#### **E3. Designated products**

Supply the details of the products that are designated in terms of this tender (for example, buses/canned vegetables).

#### **E4. Tender authority**

Supply the name of the tender authority.

#### **E5. Tendering entity name**

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd) Ltd).

#### **Local Goods, Services and Works**

#### **E6. Description of items purchased**

Provide a description of the items purchased locally in the space provided.

#### **E7. Local supplier**

Provide the name of the local supplier that corresponds to the item listed in column E6.

#### **E8. Value**

Provide the total value of the item purchased in column E6.

**E9. Total local products (Goods, Services and Works)**

Total local products (goods, services and works) is the sum of the values in E8.

**E10. Manpower costs:**

Provide the total of all the labour costs accruing only to the tenderer (i.e. not the suppliers to tenderer).

**E11. Factory overheads:**

Provide the total of all the factory overheads including rental, depreciation and amortisation for local and imported capital goods, utility costs and consumables. (Consumables are goods used by individuals and businesses that must be replaced regularly because they wear out or are used up. Consumables can also be defined as the components of an end product that are used up or permanently altered in the process of manufacturing, such as basic chemicals.)

**E12. Administration overheads and mark-up:**

Provide the total of all the administration overheads, including marketing, insurance, financing, interest and mark-up costs.

**E13. Total local content:**

The total local content is the sum of the values of E9, E10, E11 and E12. This total must correspond with C24 of Annexure C.



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA

TO: ACCOUNTING OFFICERS OF ALL NATIONAL DEPARTMENTS AND  
CONSTITUTIONAL INSTITUTIONS

ACCOUNTING OFFICERS OF ALL MUNICIPALITIES AND MUNICIPAL ENTITIES

ACCOUNTING AUTHORITIES OF ALL SCHEDULE 2 AND 3 PUBLIC ENTITIES

HEAD OFFICIALS OF PROVINCIAL TREASURIES

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 12 OF  
2016/2017.**

**INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM  
THRESHOLD OF CONVERSION PROCESSES FOR LOCAL PRODUCTION AND  
CONTENT FOR TRANSFORMERS, SHUNT REACTORS AND ASSOCIATED EQUIPMENT**

**1 PURPOSE**

- 1.1 The purpose of this instruction is to regulate the environment within which accounting officers (AOs) and accounting authorities (AAs) may procure **transformers, shunt reactors and associated equipment** which have been designated for local production and content.

**2 BACKGROUND**

- 2.1 The Preferential Procurement Regulations, 2011 ("the regulations") issued in terms of section 5 of the Preferential Procurement Policy Framework Act, 2000 (Act No 5 of 2000) which came into effect on 7 December 2011, make provision for the Department of Trade and Industry (**the dti**) to designate sectors in line with the national development and industrial policies for local production.
- 2.2 Regulation 9 (1) of the Regulations prescribes that, in the case of designated sectors, wherein the award of bids for local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 2.3 **The dti** has designated and determined the stipulated minimum threshold for **transformers, shunt reactors and associated equipment** for local production and content.

**3 PRODUCT DESIGNATION**

- 3.1 A transformer can be defined as a device that transforms electrical power from one circuit to another. These devices have a critical role at various phases of the electricity delivery process, as the voltage of electricity produced in power stations may not be



suitable for transmission, whereas the voltage that is suitable for transmission may not be suitable for use by consumers. Table 1 categorises transformers in the classes.

**Table 1: Classes of Transformers**

Transformer Class	Power Rating, MVA (Range)	Voltage Rating, kV (Range)
<b>Class 0</b>	0.001 to 1	220V to 22
<b>Class 1</b>	1.25 to 160	11 to 132
<b>Class 2</b>	40 to 315	220 to 275
<b>Class 3A</b>	360 to 500	220 to 275
<b>Class 3B</b>	40 to 1000	320 to 400
<b>Class 4</b>	40 to 2000	>420 to 800

- 3.2 Whereas Shunt reactors are electrical devices which are intended to consume reactive power measured in volt amperes (VAr) produced by an electrical power system which leads to an increase in the system's energy efficiency. Shunt reactors are commonly used for reactive power compensation in long high-voltage transmission lines and cable systems, as well as power distribution systems. Table 2 provides the classes of shunt reactors in Mega Volt Ampere reactive (MVar) and voltage rating.

**Table 2: Classes of Shunt Reactors**

Shunt Reactor	Reactive Power Rating, MVar (Range)	Voltage Rating, kV (Range)
<b>Class 1</b>	<= 80 MVar	11kV to 132 kV
<b>Class 2</b>	>80 MVar	132kV to 275 kV
<b>Class 3</b>	100MVar - 250 MVar	>275kV – 420 kV
<b>Class 4</b>	>100MVar	>420kV – 765 kV

- 3.3 In this instruction, the classes are inclusive of transformers and shunt reactors.
- 3.4 Table 3 provides the stipulated minimum threshold for local content and production for transformers, shunt reactors and associated equipment categorised by classes. To ensure that the minimum local content designated is discharged on manufacturing activities, the components and conversion activities in the manufacture of transformers, shunt reactors and associated equipment are further designated and must also be included in bid invitations.

**Table 3: Minimum Local Content Thresholds on Fully-Built Units**

**Table 3a: Minimum Local Content for Class 0**

Classes of Transformers and Shunt Reactors	Local Content Threshold
	From the Effective Date
Class 0	90%



**Table 3b: Minimum Local Content for Classes 1 and 2**

Classes of Transformers and Shunt Reactors	Local Content Threshold	
	From the Effective Date	01/01/2018
Class 1	70%	80%
Class 2	70%	80%

**Table 3c: Minimum Local Content for Classes 3 to 4**

Classes of Transformers and Shunt Reactors	Local Content Threshold		
	From the Effective Date	01/01/2018	01/01/2020
Class 3	45%	60%	80%
Class 4	10%	20%	20%

- 3.5 To ensure that the above minimum local content on the different classes is achieved on the actual manufacturing activities, it must be discharged against the following components and manufacturing processes:

**Table 4: Components and Manufacturing Process for Class 0**

Components and manufacturing processes	% local content from the Effective Date
Fabrication of the tank <sup>1</sup> and parts	100%
Fabrication of the core <sup>2</sup>	100%
Manufacture <sup>3</sup> of windings and assembly	100%
Manufacture of bushings	100%
Off-circuit tap switch	100%
Oil (i.e. blending, processing and handling)	100%
Accessories Category A: Radiators Fans Kiosks Oil conservator Breather canisters	100%
Accessories Category B: Valves Cables	70% (by the valves instruction) 90% (by the cables instruction)
Assembly and Testing	100%

<sup>1</sup> Fabrication of the tank includes cutting, welding, sand-blasting and painting processes.

<sup>2</sup> Fabrication of the core includes sizing, slitting, cutting, stacking and clamping processes.

<sup>3</sup> Manufacture of windings includes rolling, sizing and insulation.

**Table 5: Components and Manufacturing Process for Class 1**

Components and manufacturing processes	% local content from the Effective Date	% local content from 01/01/2018
Fabrication of the tank and parts	100%	100%
Fabrication of the core	100%	100%
Manufacture of windings and assembly	50%	100% (Conductors localised)
Oil (i.e. blending, processing and handling)	100%	100%
Accessories Category A: Radiators Fans Kiosks Oil conservator Breather canisters	100%	100%
Accessories Category B: Valves Cables	70% (by the valves instruction) 90% (by the cables instruction)	
Assembly and Testing	100%	100%

**Table 6: Components and Manufacturing Process for Class 2**

Components and manufacturing processes	% local content from the Effective Date	% local content from 01/01/2018
Fabrication of the tank and parts	100%	100%
Fabrication of the core	100%	100%
Manufacture of windings and assembly	50%	100% (Conductors localised)
Oil (i.e. blending, processing and handling)	100%	100%
Accessories Category A: Radiators Fans Kiosks Oil conservator Breather canisters	100%	100%
Accessories Category B: Valves Cables	70% (by the valves instruction) 90% (by the cables instruction)	
Assembly and Testing	100%	100%



**Table 7: Components and Manufacturing Process for Class 3**

Components and manufacturing processes	% local content from the Effective Date	% local content from 01/01/2018	% local content from 01/01/2020
Fabrication of the tank and parts	100%	100%	100%
Fabrication of the Core	-	-	100%
Windings processes	-	40% Winding conductors localised	100% Manufacture of windings and assembly inclusive of conductors localised
Oil (i.e. blending, processing and handling)	100%	100%	100%
Accessories Category A: Radiators Fans Kiosks Oil conservator Breather canisters	100%	100%	100%
Accessories Category B: Valves Cables	70% (by the valves instruction) 90% (by the cables instruction)		
Assembly and Testing	100%	100%	100%

**Table 8: Components and Manufacturing Process for Class 4**

Components and manufacturing processes	% local content from the Effective Date	% local content from 01/01/2018	% local content from 01/01/2020
Winding Conductor	-	100%	100%
Oil (i.e. blending, processing and handling)	100%	100%	100%
Accessories Category A: Radiators Fans Kiosks Oil conservator Breather canisters	100%	100%	100%
Accessories Category B: Valves Cables	70% (by the valves instruction) 90% (by the cables instruction)		

3.6 Table 3a, 3b and 3c must be read and applied in conjunction with Tables 4 to 8 to ensure that the local content requirements are discharged against the designated components and manufacturing processes.

**INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD OF CONVERSION PROCESSES FOR LOCAL PRODUCTION AND CONTENT FOR TRANSFORMERS, SHUNT REACTORS AND ASSOCIATED EQUIPMENT.**

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- 3.7 All primary steel related products: flat products (plates and coils) and long products (angles, sections and wire related products) are included in this designation and must be manufactured and sourced locally. This is to support and sustain the existing local steelmaking capacity.
- 3.8 The following primary input materials used in the manufacture of transformers, shunt reactors and associated equipment are deemed as local in this designation:
- steel products (i.e. laminated sheets, grain-oriented electrical core, amorphous core);
  - raw copper rod, sheets and twin enamelled epoxy conductor;
  - paper and boards for insulation;
  - aluminium billets and rod;
  - porcelain insulators (used in shunt reactor cores);
  - ceramics/porcelain; reinforced fibre glass and/or polymers; and
  - un-blended transformer oil.

These inputs should be imported in raw material form for further fabrication and processing in South Africa.

- 3.9 The imported input raw materials indicated in 3.8 used for the assembly and manufacture of transformers, shunt reactors and associated equipment will be deemed to have been sourced locally for the purposes of calculating local content.
- 3.10 The designated local content thresholds (on the components/conversion processes and on the overall) apply to new purchases; refurbishments, replacements and general overhauls.
- 3.11 Bidders must clearly indicate in their bids the quantities to be supplied and the level of local content for each product.
- 3.12 Organs of state may contact **the dti** in instances where the stipulated minimum threshold for local content cannot be met in order for **the dti** to verify and in consultation with the AO/AA provide directives in this regard.
- 3.13 For further information, bidders and procuring state organs may contact the Metals Fabrication, Capital and Rail Transport Equipment Unit within **the dti** at telephone 012 394 1356 or email Thandi Phele at [Tphele@thedti.gov.za](mailto:Tphele@thedti.gov.za)
- 3.14 Bid specifications for the designated products in this instruction may be may be done in collaboration with **the dti**.

**4 INVITATION OF BIDS FOR TRANSFORMERS, SHUNT REACTORS AND ASSOCIATED EQUIPMENT**

- 4.1 Bids in respect of transformers, shunt reactors and associated equipment (broken into classes as shown in tables 3 to 8 above) must contain a specific bidding condition which states that:
- 4.1.1 Only locally manufactured transformers, shunt reactors and associated equipment with a stipulated minimum threshold for local production and content will be considered.



- 4.2 If the quantity; input materials; and/or components of transformers, shunt reactors and associated equipment required cannot be wholly sourced from South African (SA) based manufacturers to achieve the designated local content threshold at any particular time, bidders should request and obtain written exemption from **the dti**. Such exemption applications should be submitted and approvals should be obtained prior to the closure of the bid(s) concerned. **the dti**, in consultation with the procuring organ of state and the local industry, will consider the exemption applications on a case-by-case basis and will consider the following:
- required volumes in the particular bid;
  - available collective SA industry manufacturing capacity at that time;
  - delivery times;
  - availability of input materials and components;
  - technical considerations including operating conditions and technical compliance protocol;
  - quality and reliability;
  - materials of construction;
  - security of supply and emergencies;
  - localisation plans aimed at establishing and/or increasing local manufacturing capacity through ramping-up of capital investments in the initial phases;
  - replacements of components/conversion processes on the existing fleet (i.e. transformers procured prior to the implementation of this instruction notes) in order to honour the warranties and guarantees.
- 4.3 Bidders must clearly indicate in their bids the quantities of transformers, shunt reactors and associated equipment to be supplied and the level of local content for each product.
- 4.4 Organs of state may contact **the dti** in instances where the stipulated minimum threshold for local content cannot be met in order for **the dti** to verify and in consultation with the AO/AA provide directives in this regard.
- 4.5 For further information, bidders and procuring state organs may contact the Metals Fabrication, Capital and Rail Transport unit within **the dti** at telephone 012 394 1356 or email Thandi Phele at TPhele@thedti.gov.za.
- 4.6 AOs/AAs must stipulate in bid invitations that:
- 4.6.1 The exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) on the date of the advertisement of the bid.
- 4.7 Only the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 must be used to calculate local content.
- 4.8 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the following formula which must be disclosed in the bid documentation:

$$LC = \left(1 - \frac{x}{y}\right) * 100$$

Where

$x$  is the imported content in Rand

$y$  is the bid price in Rand excluding value added tax (VAT)

- In the case of turnkey projects  $x$  and  $y$  will only refer to the value of the Transformers, Shunt reactors and associated equipment in the project
- Prices referred to in the determination of  $x$  must be converted to Rand (ZAR) by using the exchange rate published by the SARB on the date of advertisement of the bid.

- 4.9 AOs/AAs must clearly stipulate in the bid documentation that the SABS approved technical specification number SATS 1286:2011 and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)] are accessible to all potential bidders on the dti's official website [http://www.thedti.gov.za/industrial\\_development/ip.jsp](http://www.thedti.gov.za/industrial_development/ip.jsp) at no cost.
- 4.10 For the purpose of paragraphs 4.1, 4.2 and 4.3 above, the attached Declaration Certificates for Local Production and Content (SBD/MBD 6.2) must form part of the bid documentation. The SBD 6.2 is for use by all national and provincial departments, constitutional institutions and public entities listed in schedules 2, 3A, 3B, 3C and 3D to the Public Finance Management Act whilst the MBD 6.2 is for use by all municipalities and municipal entities to which the Municipal Finance Management Act (MFMA) apply.
- 4.11 AOs/AAs must stipulate in the bid documentation that:
- 4.11.1 the Declaration Certificate for Local Production and Content (SBD / MBD 6.2) together with the Annex C (Local Content Declaration: Summary Schedule) must be completed, duly signed and submitted by the bidder at the closing date and time of the bid; and
- 4.11.2 The rates of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate will be verified for accuracy

## **5 EVALUATION OF BIDS FOR TRANSFORMERS, SHUNT REACTORS AND ASSOCIATED EQUIPMENT**

- 5.1. A two stage evaluation process may be followed to evaluate the bids received.

### **5.1.1. First stage: Evaluation in terms of the stipulated minimum threshold for local production and content**

- (a) Bids must be evaluated in terms of the minimum threshold stipulated in the bid documents.
- (b) The declaration made by the bidder in the Declaration Certificate for Local Content (SBD / MBD 6.2) and Annex C (Local Content Declaration: Summary Schedule) must be used for this purpose. If the



- bid is for more than one product, the local content percentages for each product contained in Annex C must be used.
- (c) The amendment of the stipulated minimum threshold for local production and content is not allowed.
  - (d) AOs/AAs must ensure that the **Declaration Certificate for Local Content** (SBD/MBD 6.2) and **Annex C** (Local Content Declaration: Summary Schedule) are submitted as part of the bid documentation.
  - (e) AOs/ AAs must verify the accuracy of the rates of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate for Local Content (SBD / MBD 6.2)

#### **5.1.2. Second stage: Evaluation in terms of the 80/20 or 90/10 preference point systems**

- (a) Only bids that achieve the minimum stipulated threshold for local production and content may be evaluated further. Unless otherwise exempted by the Minister of Finance, the evaluation must be done in accordance with the 80/20 or 90/10 preference point systems prescribed in Preferential Procurement Regulations, 2011.
- (b) AOs/AAs must ensure that bids for products that are designated in this instruction are awarded at prices that are market related taking into account, among others, benchmarking prices, value for money and economies of scale.
- (c) Where appropriate, prices may be negotiated with short listed or preferred bidders. Such negotiations must not prejudice any other bidders.

### **6 BENCHMARK / MARKET RELATED PRICES**

- 6.1. AOs/AAs are required to ensure that reasonable or market related prices are secured for the products being procured taking into account factors such as benchmark prices, value for money and economies of scale.
- 6.2. For this purpose, AOs/AAs may approach **the dti** to assist, where possible, with benchmark prices. **The dti** will be in a position to provide price references for the different products that have been designated for local production and content.

### **7 EVALUATION OF BIDS BASED ON FUNCTIONALITY**

Whenever it is deemed necessary to evaluate bids on the basis of functionality, the prescripts contained in regulation 4 of the Preferential Procurement Regulations, 2011 and paragraphs 6 and 11 of the Implementation Guide must be followed.

### **8 POST AWARD AND REPORTING REQUIREMENTS**

- 8.1 Once bids are awarded, **the dti** must be:
  - 8.1.1. Notified of all the successful bidders and the value of the contracts; and

- 8.1.2. Provided with copies of the contracts, the SBD/MBD 6.2 Certificates together with the annexure C submitted by the successful bidder(s).
- 8.2. The purpose of the requirements of paragraph 7.1 above is for **the dti** to among others, conduct compliance audits with a view to monitor the implementation of the industrial development strategies.
- 8.3. Contractors must not be allowed to sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 8.4. Where, after the award of a bid, contractors experience challenges in meeting the stipulated minimum threshold for local content **the dti** must be informed accordingly in order for **the dti** to verify and in consultation with the AO/AA provide directives in this regard.

## **9 CONTACT INFORMATION**

- 9.1. Any enquiries in respect of Local Production and Content and all documents to be submitted to the dti must be directed as follows:**

The Department of Trade and Industry  
Private Bag X 84  
Pretoria  
0001

For Attention:  
Dr. Tebogo Makube  
Chief Director: Industrial Procurement  
Tel: (012) 394 3927  
Fax: (012) 394 4927  
EMAIL: [TMakube@thedti.gov.za](mailto:TMakube@thedti.gov.za)

## **10 APPLICABILITY**

- 10.1. This instruction applies to all national and provincial departments, constitutional institutions, public entities listed in schedules 2 and 3 to the PFMA and municipalities and municipal entities to which the MFMA apply.

## **11 DISSEMINATION OF INFORMATION CONTAINED IN THIS INSTRUCTION**

- 11.1. Heads of provincial treasuries are requested to bring the contents of this instruction to the attention of accounting officers and supply chain management officials of their respective provincial departments.
- 11.2. Accounting officers of national and provincial departments are requested to bring the contents of this instruction to the attention of accounting authorities and the supply chain management officials of Schedule 3A and 3C public entities reporting to their respective executive authorities.



11.3. Accounting officers of municipalities and municipal entities are requested to bring the contents of this instruction to the attention of the supply chain management officials of their municipalities and municipal entities.

11.4. Accounting authorities of Schedule 2, 3B and 3D public entities are requested to bring the contents of this instruction to the attention of the supply chain management officials of their public entities.

**12. NOTIFICATION TO THE AUDITOR-GENERAL**

12.1. A copy of this instruction will be forwarded to the Auditor-General for notification.

**13. REPEAL OF INSTRUCTION DATED 28 SEPTEMBER 2015**

13.1. The Instruction on invitation and evaluation of bids based on a stipulated minimum threshold of conversion processes for local production and content for transformers, shunt reactors and associated equipment dated 28 September 2015 and effective on 21 October 2015 is hereby repealed.

**14. AUTHORITY FOR THIS INSTRUCTION AND EFFECTIVE DATE**

13.1. The Minister of Finance has approved the issuance of this instruction in terms of regulation 9(2) of the regulations.

13.2. This instruction takes effect on **25 August 2016**.

  
**KENNETH BROWN**  
**CHIEF PROCUREMENT OFFICER**  
**DATE:**

29/7/2016.



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA

**TO: ACCOUNTING OFFICERS OF ALL NATIONAL DEPARTMENTS AND CONSTITUTIONAL INSTITUTIONS**

**ACCOUNTING OFFICERS OF ALL MUNICIPALITIES AND MUNICIPAL ENTITIES**

**ACCOUNTING AUTHORITIES OF ALL SCHEDULE 2 AND 3 PUBLIC ENTITIES**

**HEAD OFFICIALS OF PROVINCIAL TREASURIES**

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 5 OF 2016/2017**

**INSTRUCTION: INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

**1. PURPOSE**

1.1 The purpose of this instruction is to:

- 1.1.1. Introduce amendments to the instruction for **Electrical Cables** dated 8 May 2013 by amending all clauses that contained the deeming of imported primary steel as locally manufactured.
- 1.1.2. Regulate the environment within which accounting officers (AOs) and Accounting Authorities (AAs) may procure the aforementioned products which have been designated as a sector for local production and content.

**2. BACKGROUND**

- 2.1 The Preferential Procurement Regulations, 2011 ("the Regulations"), made in terms of section 5 of the Preferential Procurement Policy Framework Act, 2000 (Act No 5 of 2000), which came into effect on 7 December 2011 make provision for the Department of Trade and Industry (dti) to designate sectors in line with national development and industrial policies for local production.
- 2.2 Regulation 9 (1) of the Regulations prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 5 OF 2016/2017  
INSTRUCTION: INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD  
FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

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- 2.3 To this end, the dti has designated and determined the stipulated minimum threshold for local production and content for power and telecom cable products.

**3. SECTOR DESIGNATION**

- 3.1 The stipulated minimum threshold percentage for local production and content for the different types of electrical cables is 90%.
- 3.2 To ensure that local production and content is discharged on manufacturing activities, the following cables which have been designated must be included in bid invitations:

**Power Cables: cables used for power transmission**

Cable Products	Stipulated minimum threshold
Low Voltage	90%
Low Cost Reticulation	90%
Medium & High Voltage	90%
ACR	90%

**Telecom Cables: cables used for telecommunications**

Cable Products	Stipulated minimum threshold
Optical Fibre Cables	90%
Copper Telecom Cables	90%

- 3.2 Excluded in the designation is mainly copper, aluminium, polyvinyl chloride (PVC), cross-linked polyethylene (XLPE), aramid yarn, and optical fibre used for fabrication of cable products. This is to encourage local manufacturers to seek the best global competitive prices for primary materials hence the competitive imported materials used in the manufacture of cables will be deemed to have been sourced locally for the purposes of calculating local content.
- 3.3 Subject to market changes, National Treasury in consultation with the dti reserves the right to reintroduce deeming of primary steel as locally produced.

**List of Specific Cables designated under this instruction note:**

Category	Type
<b>LOW VOLTAGE</b>	Housewire, Flat Twin and Earth, Surface Cable, Rip Cord, Cab Tyre, Bells Cable, 1,5mm <sup>2</sup> – 16mm <sup>2</sup> , 2-37 cores, Fire Retardant, Low Halogen and



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	<p>Low Smoke Zero Halogen (LSOH)</p> <p><b>Main Cable</b></p> <p>25mm<sup>2</sup> – 100mm<sup>2</sup>, 1-4 cores, Fire Retardant, Low Halogen and Low Smoke Zero Halogen (LSOH), Flexible Cables, Aerial Cables, ACSR, Split Concentric &amp; Aerial Bundled Conductor (ABC)</p>
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Category	Type
<b>MEDIUM VOLTAGE</b>	3,3kV – 22kV, 1-3 cores, Cross linked Polyethylene (XLPE) and Paper Insulated Lead Covered (PILC), Fire Retardant, Low Halogen and Low Smoke Zero Halogen (LSOH)
<b>HIGH VOLTAGE</b>	132kV, Single Core, Corrugated Seamless Aluminium (CSA) Sheathed

**NOTE:** The local Industry manufactures a vast range of engineered telecommunication, Industrial and Instrumentation copper and fibre optic cables, which are not limited to:

Category	Type
<b>COPPER TELECOMMUNICATION CABLES</b>	Standard and high frequency (ADSL) outside plant copper pair telecoms cables (10pair up to 240 pair), Indoor, PABX and high frequency (DSLAM) copper pair telecoms cables up to 200pair, Category 5e and Category 6 copper data cables.
<b>COPPER INDUSTRIAL CABLES</b>	Railway signalling copper cables, Electrical signalling copper cables, Steel wire armoured copper telecoms cables, UVG copper control cables for electrical utilities, Fire Alarm and control copper cables
<b>COPPER INSTRUMENTATION CABLES</b>	Thermocouple extension wire, Tray and direct buried instrumentation and control copper cables compliant to SABS, UL and BS standards accreditation.
<b>FIBRE OPTIC TELECOMMUNICATION CABLES</b>	Outside plant duct fibre optic cables up to 288 Fibre count, Aerial (short span, medium span and long span) self-support fibre optic cables up to 144 fibre count applications up to 144 fibre count
<b>FIBRE OPTIC INDUSTRIAL CABLES</b>	Metaltic armoured instrumentation and control fibre optic cables, Steel wire armoured mineshaft fibre optic cables,

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	Field deployable high durability fibre optic cables, Composite (fibre optic and copper core) cables
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**4. INVITATION OF BIDS FOR ELECTRICAL CABLES**

4.1 Bids in respect of electrical cables must contain a specific bidding condition that only locally produced or locally manufactured cables with a stipulated minimum threshold for local production and content will be considered.

4.2 AOs/AAs must stipulate in bid invitations that:

- (i) the exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid; and
- (ii) only the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 must be used to calculate local content

4.3 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the following formula which must be disclosed in the bid documentation:

$$LC = (1 - x/y) * 100$$

Where

x is the imported content in Rand

y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the SARB at 12:00 on the date of advertisement of the bid.

4.4 AOs/AAs must clearly stipulate in the bid documentation that the SABS approved technical specification number SATS 1286:2011 and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)] are accessible to all potential bidders on the dti's official website <http://www.thedti.gov.za/industrialdevelopment/ip.jsp> at no cost.

4.5 For the purpose of paragraphs 4.1, 4.2 and 4.3 above, the attached Declaration Certificates for Local Production and Content (SBD/MBD 6.2) must form part of the bid documentation. The SBD 6.2 is for use by all National and Provincial Departments, Constitutional Institutions and Public Entities listed in Schedules 2, 3A, 3B, 3C and 3D to the Public Finance Management Act whilst the MBD 6.2 is for use by all Municipalities and Municipal Entities to which the Municipal Finance Management Act (MFMA) apply.

4.6 AOs/AAs must stipulate in the bid documentation that:

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 5 OF 2016/2017**  
**INSTRUCTION: INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD**  
**FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

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(a) the Declaration Certificate for Local Production and Content (SBD / MBD 6.2) together with the Annex C (Local Content Declaration: Summary Schedule) must be completed, duly signed and submitted by the bidder at the closing date and time of the bid; and

(b) the rates of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate will be verified for accuracy.

**4.7 Benchmark / market related prices**

4.7.1 AOs/AAs are required to ensure that reasonable or market related prices are secured for the cables / components being procured taking into account factors such as benchmark prices, value for money and economies of scale.

4.7.2 For this purpose, AOs/AAs may approach the dti to assist, where possible, with benchmark prices for the different classes and components of cables that have been designated for local production and content. The dti will be in a position to provide price references for the different products that have been designated for local production and content.

4.8. Bid specifications for the sub-sectors referred to in paragraph 3 above and the price benchmarking referred to in paragraph 4.7 above must be done in collaboration with the dti. **Contact information in this regard is provided in paragraph 8 below.**

**5. EVALUATION OF BIDS FOR CABLES**

5.1 A two stage evaluation process may be followed to evaluate the bids received.

**5.1.1 First stage: Evaluation in terms of the stipulated minimum threshold for local production and content**

5.1.1.1 Bids must be evaluated in terms of the minimum threshold stipulated in the bid documents.

5.1.1.2 The declaration made by the bidder in the Declaration Certificate for Local Content (SBD / MBD 6.2) and Annex C (Local Content Declaration: Summary Schedule) must be used for this purpose. If the bid is for more than one product, the local content percentages for each product contained in Declaration C must be used.

5.1.1.3 The amendment of the stipulated minimum threshold for local production and content is not allowed.

5.1.1.4 AOs / AAs must ensure that the Declaration Certificate for Local Content (SBD / MBD 6.2) and the Annex C (Local Content Declaration: Summary Schedule) referred to in paragraphs 4.6 (a) and (b) above are submitted as part of the bid documentation.



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FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

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5.1.1.5 The dti has the right, as and when necessary, to request for auditors certificates confirming the authenticity of the declarations made in respect of local content.

5.1.1.6 AOs/ AAs must verify the accuracy of the rates of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate for Local Content (SBD / MBD 6.2).

**5.1.2 Second stage: Evaluation in terms of the 80/20 or 90/10 preference point systems**

5.1.2.1 Only bids that achieve the minimum stipulated threshold for local production and content may be evaluated further. The evaluation must be done in accordance with the 80/20 or 90/10 preference point systems prescribed in Preferential Procurement Regulations, 2011.

5.1.2.2 AOs/AAs must ensure that contracts for cable products are awarded at prices that are market related taking into account, among others, the dti's pre-determined benchmark prices, value for money and economies of scale.

5.1.2.3 Where appropriate, prices may be negotiated with short listed or preferred bidders. Such negotiations must not prejudice any other bidders.

**6. EVALUATION OF BIDS BASED ON FUNCTIONALITY**

6.1 Whenever it is deemed necessary to evaluate bids on the basis of functionality, the prescripts contained in regulation 4 of the Preferential Procurement Regulations, 2011 and paragraphs 6 and 11 of the Implementation Guide must be followed.

**7. POST AWARD AND REPORTING REQUIREMENTS**

7.1. Once bids are awarded, the dti must be:

- (i) notified of all the successful bidders and the value of the contracts; and
- (ii) provided with copies of the contracts, the SBD/MBD 6.2 Certificates together with the Declaration C submitted by the successful bidders.

7.2 The purpose of the requirements of paragraph 7.1 above is for the dti to among others conduct compliance audits with a view to monitor the implementation of the industrial development strategies.

7.3 Contractors must not be allowed to sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

7.4. Where, after the award of a bid, contractors experience challenges in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 5 OF 2016/2017  
INSTRUCTION: INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD  
FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

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**8. CONTACT INFORMATION**

**8.1 Any enquiries in respect of Local Production and Content and all documents to be submitted to the dti must be directed as follows:**

The Department of Trade and Industry  
Private Bag X84  
Pretoria  
0001

For Attention:

Chief Director: Industrial Procurement  
Tel: (012) 394 3927  
Fax: (012) 394 4927

**9. APPLICABILITY**

9.1 This Instruction applies to all National and Provincial Departments, Constitutional Institutions, Public Entities listed in Schedules 2 and 3 to the PFMA and Municipalities and Municipal Entities to which the MFMA apply.

9.2 **This Instruction applies to all bids (written price quotations and advertised competitive bids) in excess of R30 000.00 (all applicable taxes included).** Products may not deliberately be split into parts or items of lesser value merely for the sake of procuring the products otherwise than through the directives contained in this Instruction.

**10. DISSEMINATION OF INFORMATION CONTAINED IN THIS INSTRUCTION**

10.1 Heads of Provincial Treasuries are requested to bring the contents of this Instruction to the attention of Accounting Officers and Supply Chain Management Officials of their respective Provincial Departments.

10.2 Accounting Officers of National and Provincial Departments are requested to bring the contents of this Instruction to the attention of Accounting Authorities and the Supply Chain Management Officials of Schedule 3A and 3C Public Entities reporting to their respective Executive Authorities.

10.3 Accounting Officers of Municipalities and Municipal Entities are requested to bring the contents of this Instruction to the attention of the Supply Chain Management Officials of their Municipalities and Municipal Entities.

10.4 Accounting Authorities of Schedule 2, 3B and 3D Public Entities are requested to bring the contents of this Instruction to the attention of the Supply Chain Management Officials of their Public Entities.



**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 5 OF 2016/2017  
INSTRUCTION: INVITATION AND EVALUATION OF BIDS BASED ON A STIPULATED MINIMUM THRESHOLD  
FOR LOCAL PRODUCTION AND CONTENT FOR ELECTRICAL CABLE PRODUCTS**

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**11. NOTIFICATION TO THE AUDITOR-GENERAL**

11.1 A copy of this Instruction will be forwarded to the Auditor-General for notification.

**12. REPEAL OF INSTRUCTION DATED 8 May 2013**

12.1 This Instruction repeals Instruction on invitation and evaluation of bids based on a stipulated minimum threshold for local production and content for the **Electrical Cables** dated 8 May 2013.

**13. AUTHORITY FOR THIS INSTRUCTION AND EFFECTIVE DATE**

13.1 The Minister of Finance has approved the issuance of this Instruction in terms of regulation 9(2) of the Preferential Procurement Regulations (2011).

13.2 This Instruction takes effect on **27 July 2016**.



**KENNETH BROWN  
CHIEF PROCUREMENT OFFICER**

**DATE:** 30/6/2016



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA

**TO: ACCOUNTING OFFICERS OF ALL NATIONAL DEPARTMENTS AND  
CONSTITUTIONAL INSTITUTIONS**

**ACCOUNTING OFFICERS OF ALL MUNICIPALITIES AND MUNICIPAL  
ENTITIES**

**ACCOUNTING AUTHORITIES OF ALL SCHEDULE 2 AND 3 PUBLIC  
ENTITIES**

**HEAD OFFICIALS OF PROVINCIAL TREASURIES**

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 9 OF  
2016/2017**

**INVITATION AND EVALUATION OF BIDS ON A STIPULATED MINIMUM THRESHOLD  
FOR LOCAL PRODUCTION AND CONTENT FOR:**

- **STEEL POWER PYLONS**
- **MONOPOLE PYLONS**
- **STEEL SUBSTATION STRUCTURES;**
- **POWERLINE HARDWARE**
- **STREET LIGHTING STEEL POLES; AND**
- **STEEL LATTICE TOWERS AND MASTS**

## **1. PURPOSE**

1.1 The purpose of this Instruction is to:

- 1.1.1. Introduce amendments to the Instruction for steel power pylon dated 28 September 2015 by amending all clauses that contained the deeming of imported primary steel as locally manufactured.
- 1.1.1 Regulate the environment within which Accounting Officers (AOs) and Accounting Authorities (AAs) may procure the aforementioned products which have been designated as a sector for local production and content.

## **2. BACKGROUND**

- 2.1. The Preferential Procurement Regulations, 2011 (the regulations) made in terms of section 5 of the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000) which came into effect on 7 December 2011, make provision for Department of Trade and Industry (**the dti**) to designate sectors in line with national development and industrial policies for local production.
- 2.2. Regulation 9(1) of the regulations prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific condition that only locally produced goods,

**NATIONAL TREASURY DESIGNATED SECTORS INSTRUCTION NUMBER 9 OF 2016/2017  
INVITATION AND EVALUATION OF BIDS ON A STIPULATED MINIMUM THRESHOLD FOR LOCAL  
PRODUCTION AND CONTENT FOR: STEEL POWER PYLONS; MONOPOLE PYLONS; STEEL  
SUBSTATION STRUCTURES; POWERLINE HARDWARE; STREET LIGHTING STEEL POLES; AND STEEL  
AND LATTICE TOWERS AND MASTS**

services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

- 2.3. **The dti** has designated and determined the stipulated minimum threshold for the Steel Power and Monopoles Pylons; Steel Substation Structures; Powerline Hardware; Street Lighting Steel Poles and Steel Lattice Towers and Masts for local production and content.

### **3. PRODUCT DESIGNATION**

- 3.1 Power pylons and substation structures are steel fabricated (cut, punched and galvanised) components erected for the transmission, distribution and/or reticulation of electrical power from the power station through to the consumer. At every transition between power generation, power transmission and power distribution there is a need for the erection of a substation which serves as a facility for the stepping up or down of power in preparation for the requirements of the next phase of the power transfer process. Substations are erected using steel structures which are fabricated by way of cutting, punching and galvanising.
- 3.2 Depending on the procuring entity's design requirements, galvanised steel monopole structures can be specified for the transfer of power from the power station through to reticulation to the end user. Galvanised steel monopoles are fabricated following a cutting, bending, welding and galvanising process.
- 3.3 In the construction of power pylons, a variety of auxiliary components are used to fulfil such requirements as providing stability to the power pylon structures, attachment and fastening of components, provision of platforms and foundations etc. They are made in a variety of metals including cast aluminium, galvanised steel and brass. These components are collectively referred to as powerline hardware.
- 3.4 The structures are classified under the harmonisation system as follows:
- H730890: Structures and parts of structures iron/steel (Including Steel Powerlines Hardware)
  - H730820: Towers and Lattice Masts (including Monopole Pylons and Street Lighting Poles)
  - H761090 : Aluminium structures and parts for construction (Including Aluminium Powerlines Hardware)
- 3.5 To ensure that local production and content is discharged on manufacturing activities, the following *steel structures* have been designated and must be included in bid invitations:

<b>Product for designation</b>	<b>Minimum local content</b>
Steel Power Pylons	100%
Monopole Pylons	100%
Steel Substation Structures	100%
Powerline Hardware (listed in Appendix A)	100%
Street Lighting Steel Poles	100%
Steel Lattice Towers and Masts	100%

- 3.6 All primary steel related products: flat products (plates and coils) and long products (rounds, angles, sections and wire related products) and secondary aluminium ingots



are included in this designation and must be manufactured and sourced locally. This is to support and sustain the existing local steelmaking and aluminium secondary smelting capacities respectively.

- 3.7 In this designation, imported input raw materials (aluminium extrusion billets for the manufacture of aluminium components; and zinc ingots used for galvanising powerline, street lighting and substation structure components) are deemed as locally manufactured input materials. These inputs should be imported in raw material form for further fabrication in South Africa.
- 3.8 The imported input raw materials indicated in 3.7 for fabrication of steel power pylons and monopole pylons, steel substation structures, powerline hardware, street lighting steel poles and steel lattice towers and masts will be deemed to have been sourced locally for the purposes of calculating local content.
- 3.9 Organs of State may contact **the dti** in instances where the stipulated minimum threshold for local content cannot be met in order for **the dti** to verify and in consultation with the AO/AA provide directives in this regard.
- 3.10 Subject to market changes, National Treasury in consultation with **the dti** reserves the right to reintroduce deeming of primary steel as locally produced.
- 3.11 For further information, bidders and procuring state organs may contact the Metals Fabrication, Capital and Rail Transport unit within **the dti** at telephone 012 394 4522 or email Muzi Manzi [MManzi@thedti.gov.za](mailto:MManzi@thedti.gov.za).
- 3.12 Bid specifications for the designated products in this instruction may be may be done in collaboration with **the dti**.

#### **4. INVITATION OF BIDS FOR:**

- 4.1 Bids in respect of Steel Power Pylons, Monopole Pylons; Steel Substation Structures; Powerline Hardware; Street Lighting Poles and Lattice Towers and Masts must contain a specific bidding condition which states that:
- 4.1.1 Only locally produced or locally manufactured products with a stipulated threshold for local production and content will be considered;
- 4.1.2 If the quantity; input materials; and/or components of steel power pylons, monopole pylons, steel substation structures, power line hardware, street lighting steel poles, and lattice towers and masts required cannot be wholly sourced from South African (SA) based manufacturers to achieve the designated local content threshold at any particular time, bidders should request and obtain written exemption from the dti. Such exemption applications should be submitted and approvals should be obtained prior to the closure of the bid(s) concerned. The dti, in consultation with the procuring Organ of State and the local industry, will consider the exemption applications on a case-by-case basis and will consider the following:
- Required volumes in the particular bid;
  - Available collective SA industry manufacturing capacity at that time;
  - Delivery times;
  - Availability of input materials and components;
  - Technical considerations including operating conditions; and
  - Materials of construction.
- 4.1.3 Bidders must clearly indicate in their bids the quantities to be supplied and the level of local content for each product.
- 4.2 AOs/AAs must stipulate in bid invitations that:



- 4.2.1 The exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) on the date of advertisement of the bid.
- 4.2.2 Only the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 must be used to calculate local content.
- 4.3 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the following formula which must be disclosed in the bid documentation:

$$LC = \left(1 - \frac{x}{y}\right) * 100$$

Where

$x$  is the imported content in Rand

$y$  is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of  $x$  must be converted to Rand (ZAR) by using the exchange rate published by SARB on the date of advertisement of the bid.

- 4.4 AOs/AAs must clearly stipulate in the bid documentation that the SABS approved technical specification number SATS 1286:2011 and the Guidance on the Calculation of Local Content together with the Local Content Declaration Template [Annex C (Local Content Declaration: Summary Schedule), D(Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)] are accessible to all potential bidders on the dti's official website <http://www.thedti.gov.za/industrialdevelopment/ip.jsp> at no cost.
- 4.5 For the purpose of paragraphs 4.1, 4.2 and 4.3 above, the attached Declaration Certificates for Local Production and Content (SBD/MBD 6.2) must form part of the bid documentation. The SBD 6.2 is for use by all National and Provincial Departments, Constitutional Institutions and Public Entities listed in Schedules 2, 3A, 3B, 3C and 3D to which the Public Finance Management Act apply, whilst the MBD 6.2 is for use by all Municipalities and Municipal Entities to which the Municipal Finance Management Act (MFMA) apply.
- 4.6 AOs/AAs must stipulate in the bid documentation that:
- 4.6.1 The Declaration Certificate for Local Production and Content (SBD/MBD 6.2) together with the **Annex C** (Local Content Declaration: Summary Schedule) must be completed, duly signed and submitted by the bidder at the closing date and time of the bid; and
- 4.6.2 The rate of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate will be verified for accuracy.

## 5. EVALUATION OF BIDS FOR:

- STEEL POWER PYLONS
- MONOPOLE PYLONS;
- SUBSTATION STRUCTURES;
- POWERLINE HARDWARE;
- STREET LIGHTING STEEL POLES; AND
- STEEL LATTICE TOWERS AND MASTS

- 5.1 A two stage evaluation process must be followed to evaluate the bids received.

**5.1.1 First stage: Evaluation in terms of the stipulated minimum threshold for local production and content**

- (a) Bids must be evaluated in terms of the minimum threshold stipulated in the bid documents.
- (b) The declaration made by the bidder in the Declaration Certificate for Local Content (SBD / MBD 6.2) and Annex C (Local Content Declaration: Summary Schedule) must be used for this purpose. If the bid is for more than one product, the local content percentages for each product contained in Annex C must be used.
- (c) The amendment of the stipulated minimum threshold for local production and content is not allowed.
- (d) AOs/AAs must ensure that the **Declaration Certificate for Local Content** (SBD/MBD 6.2) and **Annex C** (Local Content Declaration: Summary Schedule) are submitted as part of the bid documentation.
- (e) AOs/AAs must verify the accuracy of the rates of exchange quoted by the bidder in paragraph 4.1 of the Declaration Certificate for Local Content (SBD/MBD 6.2).

**5.1.2 Second stage: Evaluation in terms of the 80/20 or 90/10 preference point systems**

- (a) Only bids that achieve the minimum stipulated threshold for local production and content must be evaluated further. The evaluation must be done in accordance with the 80/20 or 90/10 preference point systems prescribed in the Preferential Procurement Regulations, 2011.
- (b) AOs/AAs must ensure that bids for products that are designated in this Instruction are awarded at prices that are market related taking into account, among others, benchmarking prices, value for money and economies of scale.
- (c) Where appropriate, prices may be negotiated with short listed or preferred bidders. Such negotiations must not prejudice other bidders.

**5.2 Benchmark/market related prices**

5.2.1 AOs/AAs are required to ensure that reasonable or market related prices are secured for the products being procured taking into account factors such as benchmark prices, value for money and economies of scale.

5.2.2 For this purpose, AOs/AAs may approach **the dti** to assist, where possible, with benchmark prices. **The dti** will be in a position to provide price references for the different products that have been designated for local production and content.

**6. EVALUATION OF BIDS BASED ON FUNCTIONALITY**

Whenever it is deemed necessary to evaluate bids on the basis of functionality, the prescripts contained in Regulation 4 of the PPPFA regulation and paragraph 6 and 11 of the Implementation Guide must be followed.

**7. POST AWARD AND REPORTING REQUIREMENTS**

7.1. Once bids are awarded **the dti** must be:

7.1.1 Notified of all the successful bidders and the value of the contracts; and

7.1.2 Provided with copies of the contracts, the SBD/MBD 6.2 Certificates together with the Annex C submitted by the successful bidder(s).



- 7.2. The purpose of the requirements of paragraph 7.1 above is for **the dti** to, among others, conduct compliance audits with a view to monitor the implementation of industrial development strategies.
- 7.3. Contractors must not be allowed to sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 7.4. Where, after the award of a bid, contractors experience challenges in meeting the stipulated minimum threshold for local content **the dti** must be informed accordingly in order for the department to verify and in consultation with the AO/AA provide directives in this regard.

## **8. CONTACT INFORMATION**

### **8.1 Any enquiries in respect of Local Production and Content and all documents to be submitted to the dti in respect of paragraph 7.1 above must be directed as follows:**

The Department of Trade and Industry  
Private Bag X84  
Pretoria  
0001

For attention:

Dr Tebogo Makube  
Chief Director: Industrial Procurement  
Tel: (012) 394 3927  
Fax: (012) 394 4927  
Email: [TMakube@thedti.gov.za](mailto:TMakube@thedti.gov.za)

## **9. APPLICABILITY**

This Instruction note applies to all National and Provincial Departments, Constitutional Institutions, public Entities listed in Schedule 2 and 3 to the PFMA and Municipalities and Municipal Entities to which MFMA apply.

## **10. DISSEMINATION OF INFORMATION CONTAINED IN THIS INSTRUCTION NOTE**

- 10.1 Heads of Provincial Treasuries are requested to bring the contents of this Instruction note to the attention of Accounting Officers and Supply Chain Management Officials of their respective Provincial Departments.
- 10.2 Accounting Officers of National and Provincial Departments are requested to bring the contents of this Instruction note to the attention of Accounting Authorities and the Supply Chain Management Officials of Schedule 3A and 3C Public Entities reporting to their respective Executive Authorities.
- 10.3 Accounting Officers of Municipalities and Municipal Entities are requested to bring the contents of this Instruction Note to the attention of the Supply Chain Management Officials of their Municipalities and Municipal Entities.
- 10.4 Accounting Authorities of Schedule 2, 3B and 3C Public Entities are requested to bring the contents of this Instruction note to the attention of the Supply Chain Management Officials of their Public Entities.

**11. NOTIFICATION TO THE AUDITOR-GENERAL**

A copy of this Instruction will be forwarded to the Auditor-General for notification.

**12. REPEAL OF INSTRUCTION DATED 28 SEPTEMBER 2015**

This Instruction repeals Instruction on invitation and evaluation of bids based on a stipulated minimum threshold for local production and content for Solar Water Heater Components dated 28 September 2015 and effected on 21 October 2015.

**13. AUTHORITY FOR THIS INSTRUCTION NOTE AND EFFECTIVE DATE**

13.1 The Minister of Finance has approved the issuance of this Instruction in terms of Regulation 9(2) of the Preferential Procurement Regulations.

13.2 The Instruction takes effect on **27 July 2016**.



**KENNETH BROWN**  
**CHIEF PROCUREMENT OFFICER**

DATE: 30/6/2016.



## APPENDIX A: DESIGNATED LINE HARDWARE COMPONENTS

The stipulated minimum threshold for local content is 100% for each of the items below

Designated Components		
Adaptor plates	Guy Grips	Termination bracket
Adjustable extension links	Helical line items	Threaded rods
Adjustable Stay rod,	Hip stay assembly	Tie strap
Adjustable U bolts	H-Pole Cross-arms	Triangle yokes
Adjustor plate	Insulator spindles & hardware	Trimble
A-Frame Cross-arms	Interim cross-arm	Turnbuckles
Anchor links	Joints & compression fittings	Vibration dampers
Ancillary materials - strain	Jumper terminals	X Arm – A Frames
Arcing horns	Light bracket	Yoke Plates
Armour rods	LV ancillary materials	
Ball clevis	Meter box bracket	
Ball hooks	Midspan joints	
Ball oval eyes	Non-Adjustable stay rod	
Ball tongues	PG clamps	
Base assembly	Pigtail	
Big guards	Pistol clamps	
Bird diverters	Pole clamps	
Bolted connectors	Pole top bracket	
Bolted strain clamps	Pole top make-offs	
Bonding clip	Repair sleeves	
Castings line hardware	Rigid spacers	
Composite/ Silicone Insulators	Rock anchor	
Compression strain clamps	Sag Adjustor	
Conductor clamps	Shackles	
Corona rings	S-Hook	
Counterweights	Socket clevis	
Crosby clamps	Socket tongues	
Cross-arm	Soil Anchors	
Curved washer	Spacer dampers	
Dampers	Spacer yokes	
D-Iron	Spindles	
Earth anchor	Stay bracket	
Earthing	Stay plate	
Equipment platform / Transformer platform	Stay steel components	
Equipment platform bracket	Stay Wire / Steel Wire	
Eye bolt	Steel Poles	
Eye nut	Steel rope terminal fittings	
Fasteners - threaded rods	Strain bracket	
Fasteners (Bolts, nuts, washers, threaded rod)	Strain cross-arm	
Fasteners bolt, nuts & washers	Strapping	
Fasteners strain nuts, strain bolts & forgings	Streetlight brackets	
Forging line hardware	Strut bracket	
Fuse Cut-out Brackets	Support cradle	
Fuse Holder brackets	Suspension cross-arm	
Galvanised pre-fabricated steel	Swivel bracket	

## C1.1 Form of Offer & Acceptance

### Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

### **TRACTION TRANSFORMER REFURBISHMENT AT BALFOUR.**

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

The offered total of the Prices exclusive of VAT is	<b>R</b>
Value Added Tax @ 15% is	<b>R</b>
The offered total of the Prices inclusive of VAT is	<b>R</b>
(in words)	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the  
tenderer:**

(Insert name and address of organisation)

Name &  
signature of  
witness

Date

Tenderer's CIDB registration number:

## Acceptance

By signing this part of this Form of Offer and Acceptance, the *Employer* identified below accepts the tenderer's Offer. In consideration thereof, the *Employer* shall pay the *Contractor* the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the *Employer* and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s)

Capacity

**for the  
Employer**

Transnet SOC Ltd

(Insert name and address of organisation)

Name &  
signature of  
witness

Date

## Schedule of Deviations

### Note:

1. To be completed by the Employer prior to award of contract. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	For the Employer
Signature	_____	_____
Name	_____	_____
Capacity	_____	_____
On behalf of	<i>(Insert name and address of organisation)</i>	Transnet SOC Ltd
Name & signature of witness	_____	_____
Date	_____	_____

## C1.2 Contract Data

### Part one - Data provided by the *Employer*

Clause	Statement	Data
1	<p><b>General</b></p> <p>The <i>conditions of contract</i> are the core clauses and the clauses for main Option</p>	<p><b>B: Priced contract with bill of quantities</b></p>
	dispute resolution Option	<b>W1: Dispute resolution procedure</b>
	and secondary Options	
		<b>X2: Changes in the law</b>
		<b>X7: Delay damages</b>
		<b>X16: Retention</b>
		<b>X18: Limitation of liability</b>
		<b>Z: Additional conditions of contract</b>
	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	
10.1	The <i>Employer</i> is:	<b>Transnet SOC Ltd</b> <b>(Registration No. 1990/000900/30)</b>
	Address	Registered address: <b>Transnet Corporate Centre</b> <b>138 Eloff Street</b> <b>Braamfontein</b> <b>Johannesburg</b> <b>2000</b>
	Having elected its Contractual Address for the purposes of this contract as:	<b>Transnet Freight Rail</b> <b>15 Girton Road</b> <b>Parktown, Johannesburg</b> <b>South Africa, 2000</b>

# Transnet Freight Rail

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

10.1	The <i>Project Manager</i> is (name):	<b>Puseletso Pheko</b>
	Address	<b>Transnet Freight Rail Room 14 1 Viljoen Streen Heidelberg</b>
	Tel	<b>016 815 5334</b>
	e-mail	<a href="mailto:puseletso.pheko@transnet.net">puseletso.pheko@transnet.net</a>
10.1	The <i>Supervisor</i> is: (Name)	<b>Thabang Tutubala</b>
	Address	<b>Transnet Freight Rail Room 14 1 Viljoen Streen Heidelberg</b>
	Tel No.	<b>016 340 7276</b>
	e-mail	<a href="mailto:Thabang.Tutubala@transnet.net">Thabang.Tutubala@transnet.net</a>
11.2(13)	The <i>works</i> are	<b>Traction Transformer Refurbishment at Balfour.</b>
11.2(14)	The following matters will be included in the Risk Register	None, identified at Contract Date
11.2(15)	The <i>boundaries of the site</i> are	<b>As stated in Part C4.1." Description of the Site and it surroundings"</b>
11.2(16)	The Site Information is in	<b>Part C4</b>
11.2(19)	The Works Information is in	<b>Part C3</b>
12.2	The <i>law of the contract</i> is the law of	<b>the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.</b>
13.1	The <i>language of this contract</i> is	<b>English</b>
13.3	The <i>period for reply</i> is	<b>2 weeks</b>
<b>2</b>	<b>The <i>Contractor's</i> main responsibilities</b>	<b>No additional data is required for this section of the <i>conditions of contract</i>.</b>
<b>3</b>	<b>Time</b>	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	<b>02 December 2022</b>
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	<b>2 weeks of the Contract Date.</b>
31.2	The <i>starting date</i> is	<b>03 October 2022</b>

# Transnet Freight Rail

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	<b>2 weeks.</b>
<b>4</b>	<b>Testing and Defects</b>	
42.2	The <i>defects date</i> is	<b>52 (fifty-two) weeks after Completion of the whole of the works.</b>
43.2	The <i>defect correction period</i> is	<b>2 weeks</b>
<b>5</b>	<b>Payment</b>	
50.1	The <i>assessment interval</i> is monthly on the	<b>25<sup>th</sup> (twenty fifth) day of each successive month.</b>
51.1	The <i>currency of this contract</i> is the	<b>South African Rand.</b>
51.2	The period within which payments are made is	<b>Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.</b>
51.4	The <i>interest rate</i> is	<b>the prime lending rate of Standard Bank of South Africa.</b>
<b>6</b>	<b>Compensation events</b>	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	<b>the cumulative rainfall (mm)</b>  <b>the number of days with rainfall more than 10 mm</b>  <b>the number of days with minimum air temperature less than 0 degrees Celsius</b>  <b>the number of days with snow lying at 08:00 hours South African Time</b>  <b>and these measurements: N/A</b>
	The place where weather is to be recorded (on the Site) is:	<b>Balfour Substation</b>
	The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:	<b>Balfour</b>
	and which are available from:	<b>South African Weather Service 012 367 6023 or <a href="mailto:info3@weathersa.co.za">info3@weathersa.co.za</a>.</b>



## Transnet Freight Rail

Tender Number: SIC22002CIDB (HOAC-HO-37671)

Description of Works: Traction Transformer Refurbishment at Balfour.

<b>7</b>	<b>Title</b>	<b>No additional data is required for this section of the <i>conditions of contract</i>.</b>
<b>8</b>	<b>Risks and insurance</b>	
80.1	These are additional <i>Employer's</i> risks	None, identified at Contract Date [01 August 2022]
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	
	1 Insurance against:	<b>Loss of or damage to the <i>works</i>, Plant and Materials is as stated in the Insurance policy for Contract Works/ Public Liability.</b>
	Cover / indemnity:	<b>to the extent as stated in the insurance policy for Contract Works / Public Liability</b>
	The deductibles are:	<b>as stated in the insurance policy for Contract Works / Public Liability</b>
	2 Insurance against:	<b>Loss of or damage to property (except the <i>works</i>, Plant and Materials &amp; Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability</b>
	Cover / indemnity	<b>Is to the extent as stated in the insurance policy for Contract Works / Public Liability</b>
	The deductibles are	<b>as stated in the insurance policy for Contract Works / Public Liability</b>
	3 Insurance against:	<b>Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability</b>
	Cover / indemnity	<b>Is to the extent as stated in the insurance policy for Contract Works / Public Liability</b>
	The deductibles are:	<b>As stated in the insurance policy for Contract Works / Public Liability</b>
	4 Insurance against:	<b>Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon</b>
	Cover / indemnity	<b>Cover / indemnity is to the extent provided by the SASRIA coupon</b>




**Transnet Freight Rail**
**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

	The deductibles are	<b>The deductibles are, in respect of each and every theft claim, 0,1% of the contract value subject to a minimum of R2,500 and a maximum of R25,000.</b>
	Note:	<b>The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."</b>
84.1	<p>The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is</p> <p>The <i>Contractor</i> provides these additional Insurances</p>	<p><b>The <i>Contractor</i> must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.</b></p> <ol style="list-style-type: none"> <li><b>1 Where the contract requires that the design of any part of the <i>works</i> shall be provided by the <i>Contractor</i> the <i>Contractor</i> shall satisfy the <i>Employer</i> that professional indemnity insurance cover in connection therewith has been affected</b></li> <li><b>2 Where the contract involves manufacture, and/or fabrication of Plant &amp; Materials, components or other goods to be incorporated into the <i>works</i> at premises other than the site, the <i>Contractor</i> shall satisfy the <i>Employer</i> that such plant &amp; materials, components or other goods for incorporation in the <i>works</i> are adequately insured during manufacture and/or fabrication and transportation to the site.</b></li> <li><b>3 Should the <i>Employer</i> have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the <i>Contractor's</i> policies of insurance as well as those of any sub-contractor</b></li> <li><b>4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000</b></li> </ol>



## Transnet Freight Rail

Tender Number: SIC22002CIDB (HOAC-HO-37671)

Description of Works: Traction Transformer Refurbishment at Balfour.

		<p><b>5 The insurance coverage referred to in 1, 2, 3 and 4 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the <i>Employer</i>. The <i>Contractor</i> shall arrange with the insurer to submit to the <i>Project Manager</i> the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the <i>Contractor</i>.</b></p>
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i> ) caused by activity in connection with this contract for any one event is	<p><b>Whatever the <i>Contractor</i> requires in addition to the amount of insurance taken out by the <i>Employer</i> for the same risk.</b></p>
84.2	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	<p><b>Principal Controlled Insurance policy for Contract.</b></p>
<b>9</b>	<b>Termination</b>	<p><b>There is no additional Contract Data required for this section of the <i>conditions of contract</i>.</b></p>
<b>10</b>	<b>Data for main Option clause</b>	
<b>B</b>	<b>Priced contract with Bill of Quantities</b>	<p><b>No additional data is required for this Option.</b></p>
60.6	The <i>method of measurement</i> is	<p><b>The Bill of Quantities have been measured in accordance with SANS 1200 unless indicated otherwise.</b></p>
<b>11</b>	<b>Data for Option W1</b>	
W1.1	The <i>Adjudicator</i> is	<p><b>Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the Chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>.</b></p>

**Transnet Freight Rail**
**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

W1.2(3)	The <i>Adjudicator nominating body</i> is:	<b>The Chairman of the Association of Arbitrators (Southern Africa)</b>
	If no <i>Adjudicator nominating body</i> is entered, it is:	<b>the Association of Arbitrators (Southern Africa)</b>
W1.4(2)	The <i>tribunal</i> is:	<b>Arbitration</b>
W1.4(5)	The <i>arbitration procedure</i> is	<b>The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)</b>
	The place where arbitration is to be held is	<b>Johannesburg, South Africa</b>
	The person or organisation who will choose an arbitrator	
	- if the Parties cannot agree a choice or	<b>The Chairman of the Association of Arbitrators (Southern Africa)</b>
	- if the arbitration procedure does not state who selects an arbitrator, is	
<b>12</b>	<b>Data for secondary Option clauses</b>	
<b>X2</b>	<b>Changes in the law</b>	<b>No additional data is required for this Option</b>
<b>X7</b>	<b>Delay damages</b>	
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	<b>R1 000.00 per day</b>
<b>X16</b>	<b>Retention</b>	
X16.1	The retention free amount is	<b>Nil</b>
	The retention percentage is	<b>10% on all payments certified.</b>

# Transnet Freight Rail

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	<b>Total of the Prices</b>
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	<b>The deductible of the relevant insurance policy</b>
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to:	<b>The cost of correcting the Defect</b>
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	<b>The Total of the Prices</b>
X18.5	The <i>end of liability date</i> is	<b>5 years after Completion of the whole of the works</b>
<b>Z</b>	<b><i>Additional conditions of contract are:</i></b>	
<b>Z1</b>	<b>Additional clauses relating to Joint Venture</b>	
<b>Z1.1</b>	<p><b>Insert the additional core clause 27.5</b></p> <p><b>27.5. In the instance that the <i>Contractor</i> is a joint venture, the <i>Contractor</i> shall provide the <i>Employer</i> with a certified copy of its signed joint venture agreement, and in the instance that the joint venture is an 'Incorporated Joint Venture,' the Memorandum of Incorporation, within 4 (four) weeks of the Contract Date.</b></p> <p><b>The Joint Venture agreement shall contain but not be limited to the following:</b></p> <ul style="list-style-type: none"> <li><b>A brief description of the Contract and the Deliverables;</b></li> <li><b>The name, physical address, communications addresses and domicilium citandi et executandi of each of the constituents and of the Joint Venture;</b></li> </ul>	



## Transnet Freight Rail

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

- The constituent's interests;
- A schedule of the insurance policies, sureties, indemnities and guarantees which must be taken out by the Joint Venture and by the individual constituents;
- Details of an internal dispute resolution procedure;
- Written confirmation by all of the constituents:
  - i. of their joint and several liabilities to the *Employer* to Provide the Works;
  - ii. identification of the lead partner in the joint venture confirming the authority of the lead partner to bind the joint venture through the *Contractor's* representative;
  - iii. Identification of the roles and responsibilities of the constituents to provide the Works.
- Financial requirements for the Joint Venture:
  - iv. the working capital requirements for the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the constituents from time to time;
  - v. the names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.

### Z1.2

Insert additional core clause 27.6

**27.6.** The *Contractor* shall not alter its composition or legal status of the Joint Venture without the prior approval of the *Employer*.



## Transnet Freight Rail

**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>Z2</b>	<b>Additional obligations in respect of Termination</b>	
<b>Z2.1</b>		<p>The following will be included under core clause 91.1:</p> <p>In the second main bullet, after the word 'partnership' add 'joint venture whether incorporate or otherwise (including any constituent of the joint venture)' and</p> <p>Under the second main bullet, insert the following additional bullets after the last sub-bullet:</p> <ul style="list-style-type: none"> <li>• commenced business rescue proceedings (R22)</li> <li>• repudiated this Contract (R23)</li> </ul>
<b>Z2.2</b>	<b>Termination Table</b>	<p>The following will be included under core clause 90.2 Termination Table as follows:</p> <p>Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"</p>
<b>Z2.3</b>		<p>Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."</p>
<b>Z3</b>	<b>Right Reserved by the <i>Employer</i> to Conduct Vetting through SSA</b>	
<b>Z3.1</b>		<p>The <i>Employer</i> reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any <i>Contractor</i> who has access to National Key Points for the following without limitations:</p> <ol style="list-style-type: none"> <li>1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state.</li> </ol>


**Transnet Freight Rail**
**Tender Number:** SIC22002CIDB (HOAC-HO-37671)

**Description of Works:** Traction Transformer Refurbishment at Balfour.

		<ol style="list-style-type: none"> <li>2. <b>Secret</b> – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state.</li> <li>3. <b>Top Secret</b> – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.</li> </ol>
<b>Z4</b>	<b>Additional Clause Relating to Collusion in the Construction Industry</b>	
<b>Z4.1</b>		The contract award is made without prejudice to any rights the <i>Employer</i> may have to take appropriate action later with regard to any declared tender rigging including blacklisting.
<b>Z5</b>	<b>Protection of Personal Information Act</b>	
<b>Z5.1</b>		The <i>Employer</i> and the <i>Contractor</i> are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.
<b>Z6</b>	<b>Local Production and Content Obligations</b>	
<b>Z6.1</b>		<p>In terms of Local Production and Content (SBD 6.2), Annexure A and Annexure C of the Returnable Schedule T2.2-4. Eligibility Criteria Schedule: Declaration Certificate of Local Production and Content, the <i>Contractor</i> has undertaken to fulfil its obligations of the Local Production and Content for the following designated sectors:</p> <ol style="list-style-type: none"> <li>1. <b>Transformers and associated Equipment</b> [Bushings and Oil] - <b>100%</b></li> <li>2. <b>Steel Power Pylons</b> – <b>100%</b></li> <li>3. <b>Electrical Cables</b> – <b>90%</b></li> </ol>

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<b>Z6.2</b>	<p>The <i>Contractor</i> is required to note that the <i>Employer</i>, the Department of Trade and Industry [DTI] and/or the body appointed by the DTI as the verification authority for local content may conduct compliance audits with regard to the Local Production and Content requirements as prescribed in Regulation 8 of the Preferential Procurement Regulations, 2017 issued in terms of the Preferential Procurement Policy Framework Act no. 5 of 2000.</p>
<b>Z6.3</b>	<p>The <i>Contractor</i> is required to continuously update Declarations C, D and E of the Local Production and Content Declaration commitments with the actual local content values for the duration of the contract.</p> <p>The <i>Contractor</i> shall report to the <i>Employer</i> on a monthly basis during the term of the Contract, the amounts spend on Local Production and Content for the designated sectors for the duration of the contract.</p>
<b>Z6.4</b>	<p>The <i>Contractor</i> must refer to Schedule A attached to the Returnable Schedule T2.2-4. Eligibility Criteria Schedule: Declaration Certificate of Local Production and Content concerning non-compliance penalties applicable to Local Production and Content.</p>
<b>Z6.5</b>	<p>Breach of Local Production and Content commitments provides the <i>Employer</i> cause to terminate the contract.</p>

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## C1.2 Contract Data

### Part two - Data provided by the *Contractor*

The tendering *Contractor* is advised to read both the NEC3 Engineering and Construction Contract - June 2005 (with amendments June 2006 and April 2013) and the relevant parts of its Guidance Notes (ECC3-GN) in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 Guidance Notes.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name):	
	Address	
	Tel No.	
	Fax No.	
11.2(8)	The <i>direct fee percentage</i> is	%
	The <i>subcontracted fee percentage</i> is	%
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are:	
	1 Name:	
	Job:	
	Responsibilities:	
	Qualifications:	
	Experience:	
	2 Name:	
	Job	
	Responsibilities:	
	Qualifications:	
	Experience:	
		<b>CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .</b>

**Transnet Freight Rail**
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B	Priced contract with bill of quantities	
11.2(21)	The <i>bill of quantities</i> is in	
11.2(31)	The tendered total of the Prices is	(in figures)  (in words), excluding VAT
	<b>Data for Schedules of Cost Components</b>	<i>Note "SCC" means Schedule of Cost Components starting on page 60 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC.</i>

B	Priced contract with bill of quantities	Data for the Shorter Schedule of Cost Components		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by			
	The percentage for adjustment for Equipment in the published list is	% (state plus or minus)		
22 in SSCC	The rates of other Equipment are:	<b>Equipment</b>	<b>Size or capacity</b>	<b>Rate</b>
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are	<b>Category of employee</b>		<b>Hourly rate</b>
62 in SSCC	The percentage for design overheads is	%		
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:			

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## C1.3 Forms of Securities

### Pro forma Performance Guarantee

For use with the NEC3 Engineering & Construction Contract - June 2005 (with amendments June 2006 and April 2013)

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Option:

Option X13: Performance bond

The pro forma document for this Guarantee is provided here for convenience but is to be treated as part of the *Works Information*.

The organisation providing the Guarantee does so by copying the pro forma document onto its letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

The Performance Bond needs to be issued by an institution that are reasonably acceptable to the *Employer*.

Transnet may choose to not to accept an Issuer. Should the issuer not being accepted, the performance bond needs to be replaced by an issuer that are acceptable to Transnet. Issuers need to be verified for acceptance by Transnet before a performance bond is issued.

## Pro-forma Performance Bond (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Surety)

Transnet SOC Ltd  
C/o Transnet Freight Rail  
Transnet Corporate Centre  
138 Eloff Street  
Braamfontein  
Johannesburg  
2000

Date:

Dear Sirs,

### Performance Bond for Contract No. [REDACTED]

With reference to the above numbered contract made or to be made between

**Transnet SOC Limited, Registration No. 1990/000900/30** (the *Employer*) and

{Insert registered name and address of the *Contractor*} (the *Contractor*), for

{Insert details of the *works* from the Contract Data} (the *works*).

I/We the undersigned

on behalf of the  
Guarantor

of physical address

and duly authorised thereto do hereby bind ourselves as Guarantor and co-principal debtors in solidum for the due and faithful performance of all the terms and conditions of the Contract by the *Contractor* and for all losses, damages and expenses that may be suffered or incurred by the *Employer* as a result of non-performance of the Contract by the *Contractor*, subject to the following conditions:

1. The terms *Employer*, *Contractor*, *Project Manager*, *works* and Completion Certificate have the meaning as assigned to them by the *conditions of contract* stated in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" and all other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Guarantor. Without derogating from the foregoing compromise, extension of the construction period, indulgence, release or variation of the *Contractor's* obligation shall not affect the validity of this performance bond.

**Transnet Freight Rail**

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**Description of Works:** Traction Transformer Refurbishment at Balfour.

4. This bond will lapse on the earlier of
- the date that the Guarantor receives a notice from the *Project Manager* stating that the Completion Certificate for the whole of the *works* has been issued, that all amounts due from the *Contractor* as certified in terms of the contract have been received by the *Employer* and that the *Contractor* has fulfilled all his obligations under the Contract, or
  - the date that the Surety issues a replacement Performance Bond for such lesser or higher amount as may be required by the *Project Manager*.
5. Always provided that this bond will not lapse in the event the Guarantor is notified by the *Project Manager*, (before the dates above), of the *Employer's* intention to institute claims and the particulars thereof, in which event this bond shall remain in force until all such claims are paid and settled.
6. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Guarantor of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.
7. Our total liability hereunder shall not exceed the sum of:
- (say) \_\_\_\_\_
- R \_\_\_\_\_
8. This Performance Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa, subject to the jurisdiction of the courts of the Republic of South Africa

Signed at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 201\_

Signature(s)

Name(s) (printed)

Position in Guarantor company

Signature of Witness(s)

Name(s) (printed)

## Part 3 : Scope of Work

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C3.1	This cover page	1
	Works Information	27
	Health & Safety Specification TFR-ISM-RN-R&C-FM009	18
	Baseline Risk assessment	23
	Environmental Specifications TFR/EMS (SES) – 001	22
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## C3.1 Works Information

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## Description of the Works

### 1.1 Executive Overview

Balfour Traction Substation is currently offload, the transformer Bucholtz relay tripped year September 2021. The purpose of a Bucholtz relay is to detect any presence of gas realized from an insulation breakdown between windings or other electrical arcing in the transformer. It was then concluded that the transformer had insulation failure. The transformer was taken to the workshop for further investigation. In the workshop the transformer was de tanked for further inspection and there was visible damage on the winding (of all the three phases) and the yoke. The initial mode of failure indicated that the winding was exposed to a severe over current condition which caused in inter-turn fault to occur between turns, this could be a result of insulation integrity as the unit was not energized over a period of time.

### 1.2 Employer's Objectives

- The primary objective is Supply, Install, Test and Commission of Traction Transformer Refurbishment at Balfour under the control of the Depot Engineering Manager-Heidelberg Depot.

#### The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
BBBEE	Broad Based Black Economic Empowerment
CEMP	Construction Environmental Management Plan
COID Act	The Compensation for Occupation Injuries and Deceases Act
CSHEO	<i>Contractor's</i> Safety, Health and Environmental Officer
CM	Construction Manager
DTI	Department of Trade and Industry
DGN	Filename extension for Microstation Drawings
DWG	Filename extension for Autocad Drawings
EDMS	Electronic Document Management System
EO	Environmental Officer
HSR	Health and Safety Representative
PES	Project Environmental Specifications
PHA	Preliminary Hazard Assessment



**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

<b>Abbreviation</b>	<b>Meaning given to the abbreviation</b>
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager
QA	Quality Assurance
QC	Quality Control
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Co-ordinator
SHEO	Safety, Health and Environmental Officer
SIP	Site Induction Programme
SMP	Safety Management Plan
SSRC	Site Safety Review Committee
iPAS DM	Primary software tool used for Document Management

<b>Abbreviation</b>	<b>Description</b>
<b>DB</b>	<b>Drill &amp; Blast</b>
<b>FEL</b>	<b>Front End Loading</b>
<b>km/h</b>	<b>Kilometer per hour</b>
<b>mtpa</b>	<b>million tons per annum</b>
<b>OHTE</b>	<b>Overhead Traction Equipment</b>
<b>ORS</b>	<b>Owner Requirement Specification</b>
<b>SOW</b>	<b>Scope of Works</b>
<b>TBM</b>	<b>Tunnel Boring Machine</b>
<b>TFR</b>	<b>Transnet Freight Rail</b>
<b>TRANSNET</b>	<b>Transnet SOC Limited</b>

## **2. Management and Start Up**

### **2.1 Management Meetings**

The *Contractor* shall attend management meetings at the *Project Manager's* request. The *Contractor* will also be required to attend a safety meeting. The *Contractor* will also attend a kickoff meeting and a close

off meeting. The *Contractor* will be required to present all relevant information including early warnings of compensation events, quality plans, schedules, (including progress) sub*contractor* management, and health, environmental and safety issues at such meetings.

All meetings are to be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register are not to be used for the purpose of confirming actions or instructions under the contract as these are to be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

## **2.2 Documentation Control**

**The *Contractor* shall submit all documentation complying with the *Employer's* standards and requirements. The *Employer* will issue all relevant documentation and drawings, including revisions, to the *Contractor*, but control, maintenance and handling of these documents will be the *Contractor's* sole responsibility and at its expense, and managed with a suitable document control system.**

## **2.3 Safety Risk Management**

### **2.3.1 General**

The *Contractor's* attention is directed to the Health and Safety Specification TFR-ISM-RN-R&C-FM009, and in particular to his Health & Safety Program, which must be submitted with his tender, as well as the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended and Regulations issued in terms thereof or un-repealed regulations issued in terms of the former Act no. 6 of 1983, in their entirety.

Without derogating from the Act or any un-repealed regulations issued in terms of legislation, or without purporting to limit the *Contractor's* responsibilities, the following are brought to the *Contractor's* attention

- (a) For the purpose of the Act the site/s, to be demarcated as agreed to between the *Contractor* and the *Project Manager* before the works start, will be transferred to the control of the *Contractor* for the duration of the contract.
  - (b) The *Contractor* shall appoint a health and safety coordinator to liaise at least fortnightly with the *Project Manager* on matters pertaining to occupational health and safety.
  - (c) The *Contractor* is an 'employer' in his own right as defined in Section 1 of the Act 85 of 1993 and he shall fulfil all his obligations as an employer in terms of the Act.
  - (d) The *Contractor* shall furnish the *Project Manager* with full particulars of any Sub-*Contractor* which he may involve in the contract and the Sub-*Contractor* shall be made aware of all the clauses in this contract pertaining to health and safety.
  - (e) The *Contractor* shall advise the *Project Manager* of any hazardous or potentially hazardous situation, which may arise from, work being performed either by the *Contractor* or Sub-*Contractor*.
  - (f) A letter of good standing in terms of Section 80 (*Employer* to register with the Compensation Commissioner) of the Compensation for Occupational Injuries and Deceases Act 1993 (Act 130 of 1993), must also be furnished.
  - (g) The *Contractor* shall comply with the current Transnet Specification TFR-ISM-RN-R&C-FM009, Safety
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Arrangements and Procedural Compliance with the Occupational Health and Safety Act, Act 85 of 1993 and Regulations, and shall, before commencement with the execution of the Contract, which shall include site establishment and delivery of construction plant, equipment or materials, submit to the *Project Manager*:

- documentary proof of his procedural compliance with the Act, and
  - particulars of the Health and Safety Program to be implemented on the site in accordance with the Transnet Specification TFR-ISM-RN-R&C-FM009.
  - The *Contractor* 's Health and Safety Program will be subject to agreement by the *Project Manager*, who may order supplementary and/or additional safety arrangements and/or different safe working methods to ensure full compliance by the *Contractor* with his obligations as an employer in terms of the Act.
- (h) All clauses in this contract pertaining to health and safety form an integral part of this contract and if not complied with may be construed as breach of contract entitling the *Employer* to the appropriate remedies.

**NB: The *Contractor* and his employees shall have valid safety inductions and medical certificates when accessing or working on site. Copies of which shall be submitted to the *Project Manager*. This will be at a time and location Transnet will arrange.**

### **2.3.2 Hazard identification and risk assessment**

The *Contractor* 's appointed Site Representative and the *Project Manager* shall finalize a site-specific HIRA (Hazard Identification and Risk Assessment) document, on the day of site handover to the *Contractor*. This site-specific HIRA document, based on a continuous HIRA, must cover site-specific hazards and the safe management of these hazards. The HIRA document must be signed by the abovementioned representatives, and be accepted by the *Project Manager*, before any construction work can commence.

### **2.3.3 Substance abuse**

The OHSA (Act 85 of 1993) clearly states in the Safety Regulations no. **2A "INTOXICATION" An employer or user, as the case may be, shall not permit any person who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace"**. Transnet Freight Rail RME enforces this legislation by means of its Substance Abuse Policy, and therefore reserves the right to do substance abuse testing on anyone who enters their premises.

### **2.3.4 Safety meetings**

The *Contractor* shall ensure that a safety representative is appointed and regular safety meetings are held. Written minutes of these safety meetings shall be forwarded to the *Project Manager*. All costs related to the safety aspects required under this contract will be carried by the *Contractor* 's and therefore be covered under the rates tendered.

NB: The tendered amount shall include for all costs to confirm to the Health and Safety requirements.

## **2.4 Environmental Constraints and Management**

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The *Contractor* shall provide a *Contractor's* Environmental Management Plan (CEMP) addressing all the potential impacts of his activities. The *Project Manager* has the right to request additional specific work method statements should in his opinion this be required.

Progressive and systematic finishing and tidying-up will form an essential part of this contract. Under no circumstances shall spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate unnecessarily

No material shall be dumped on the *Employer's* property and no suitable material shall be disposed of if it is required elsewhere for the proper completion of the contract.

All discarded/spoiled/hazardous material shall be disposed of at an accepted registered dumpsite and the *Contractor* shall furnish the *Project Manager* with receipts and official disposal certificates from the dumpsite.

The *Contractor shall* make good all damages to the environment to the satisfaction of the *Project Manager's* Waste Management Objective.

**USE OF CEMENT & CONCRETE:**

Cement and concrete are regarded as hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. The *Contractor* shall therefore ensure that concrete is not mixed directly on the ground and that the visibility remains of concrete, either solid, or from washings, are physically removed immediately and disposed of as waste. Washing the visible remains into the ground will not be acceptable.

**NOISE POLLUTION:**

Equipment used on the site shall be properly muffled and maintained so as to reduce noise generation to the minimum. Working procedures shall be structured so as to avoid the unnecessary generation of noise.

**DUST CONTROL**

Dust has been identified as having a serious environmental impact. The *Contractor* is required to prevent the creation of dust.

The *Contractor* shall ensure that no dust is generated during the mixing process of construction materials used during any stage of the construction process.

The *Contractor* shall, at all times, comply with the statutes that prohibit pollution of any kind. These statutes are enacted in the following legislation:

- National Environmental Management(Act 107 of 1998); and
- The Environmental conservation Act, 73/1989; and
- The National Water Act, 36/1998

The *Contractor shall* appoint a responsible person to ensure that no incident shall occur on site that could cause pollution. Where the *Contractor* was negligent and caused any form of pollution the damage shall be rectified at the *Contractor's* cost.

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## **2.5 Quality Management System**

The onus rests on the *Contractor* to produce work which will conform in quality and accuracy of detail to the requirements of the Specifications and Drawings, and the *Contractor* must, at his own expense, institute a quality control system and provide experienced technical staff together with all transport, instruments and equipment to ensure adequate supervision and positive control of the works at all times.

All materials should conform to the specifications and standards set for the project and shall be inspected in accordance with accepted Quality Control Plans (QCP's). All plant should be checked before work commences.

The *Contractor* shall submit his proposed Quality Control Procedures (QCP) to the *Project Manager* for approval. Site Access will not be permitted until the QCP is to the *Project Managers* satisfaction

**Transnet Freight Rail will have the right to inspect the work at any time during the progress of the contract.**

## **2.6 Programming Constraints**

### **2.6.1 General**

The programme, progress reports, subsequent updates, revisions and supplementary programmes as detailed in this section are an essential part of the iPAS project control system used by the *Employer* for managing the Works and in monitoring the progress of the work under the Contract. The information and data provided by the *Contractor* pursuant to this procedure must therefore be reliable, accurate and timely in presentation.

### **2.6.2 Programme submission**

**As identified in the Contract Data Part 2, a program is to be submitted with the tender. This program shall comply with the requirements as indicated in the Works Information and with specific reference 31.2 of the NEC3 Engineering Construction Contract. The program shall be submitted in both hard and soft copy forms using a computer software package accepted by the *Project Manager*.**

The preferred software package is Microsoft Projects.

### **2.6.3 Progress Reporting**

**To demonstrate the actual progress of the work under the Contract the *Contractor* shall, on a weekly basis, update and submit to the *Project Manager*,**

- a) The revised program, in the form of a three week look-ahead, that shall show two (2) separate bars for each activity as per i) and ii) below so as to enable a comparison of the actual progress with the first program;**
    - (i) The first programme activity bar, and
    - (ii) The revised activity bar identifying the currently forecast start and finish dates of the activity, and the status (% complete of each activity)
  - b) The progress 'S curves' based on the latest Accepted Programme**
  - c) Deviations of the "current" activity schedule from the "baseline" activity schedule together with the 'S curves' will form the basis for assessing progress and performance.**
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## 2.6.4 Progress monitoring and review

**Monitoring and review of the progress of work under the Contract shall consist of an assessment of all activities currently in progress. The following shall be determined:**

- percentage complete;
- forecast completion date;
- S-curves showing actual versus baseline figures;
- deviations from the Accepted Programme; and
- Actions required to remedy any deviations.

**Weekly progress reviews shall be conducted to assist control of the work under the Contract. The *Contractor* shall provide this information upon request from the *Project Manager*; however any identified deviations shall be automatically reported to the *Project Manager*.**

## 2.6.5 Monthly Status Report

**The *Contractor* shall provide a written status report by the 20<sup>th</sup> of each month or such other reporting period as may be required by the *Project Manager* from time-to-time. The report shall summarise progress and problems encountered during that month in respect of all parts of the work under the Contract.**

**As a minimum the report shall include:**

- a) progress against the Accepted Programme;
- b) summary of progress achieved during the period using progress 'S curves';
- c) list of milestones achieved during the period;
- d) status of design, procurement, and off-site works;
- e) status of on-site works;
- f) deviations from the Accepted Programme and in particular, the forecast completion dates of activities which have or should have commenced;
- g) status of approvals;
- h) actual or anticipated problems with corresponding action plans to minimize the impact;
- i) summary of works planned for the following period, and
- j) Cash flow status versus the original forecast.

**The progress report shall form the basis of the monthly progress meeting between the *Project Manager* and the *Contractor*.**

## 2.7 *Contractor's* Management, Supervision and Key People

2.7.1 The *Contractor* shall provide an organogram showing his key people and their lines of authority and communication.

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- 2.7.2 The *Contractor* shall not change the project team as detailed in the organogram submitted by the *Contractor* and accepted by the *Project Manager* without the prior written approval of the *Project Manager*, which approval will not unreasonably be withheld by the *Project Manager*
- 2.7.3 The contract work must conform to current professional engineering practices, standards and specifications and the work must be completed to the satisfaction of the *Project Manager*.
- 2.7.4 The *Contractor* and his sub-*Contractor* s, if any shall have suitably qualified Supervisors in charge of the project. The names and qualifications of the Supervisors together with full details of their experience in this field of work must be furnished. The tenderer must furnish the names and addresses of all proposed sub-*Contractor* s, which is subject to approval.

**2.8 Insurance Provided by the *Employer*****Procedures for making insurance claims can be obtained from the *Project Manager*.****2.9 Contract Change Management****The standard reporting forms that shall be used will be provided to the *Contractor*.****3. Engineering and the *Contractor*'s Design****3.1 Employer's Design****The *Employer*'s design for the works is:**

- **Works Information - attached**
- **Technical specifications - attached**

### **3.2 Parts of the Works which the *Contractor* is to Design**

The *Contractor* is to design the following parts of the works:

- **All temporary works**
- **All other items required for the works**

### **3.3 Procedure for Submission and Acceptance of *Contractor* 's Design**

#### **3.3.1 The *Contractor* shall address the following procedures:**

3.3.2 The *Contractor* submits details of his temporary works and all other items required for the works to the *Project Manager* for review and acceptance.

3.3.3 The *Contractor* shall submit to the *Project Manager* samples of all materials to be used in the *Works* and which are to be supplied by the *Contractor* for the approval of the *Project Manager* prior to their incorporation into the work. If accepted, the samples so submitted will be kept by the *Project Manager* as standards for the duration of the Contract. No materials inferior in quality, workmanship or appearance to the accepted samples shall be used.

3.3.4 All alternative materials not defined herein or SANS proposed by the *Contractor* shall be tested for acceptability by the *Contractor* and the results of the tests made available to the *Project Manager*. All such materials then require the approval of the *Project Manager*. The costs of the tests shall be borne by the *Contractor*.

**3.3.5 The *Project Manager*'s approval is required for any manufacturer's published instructions prior to their use by the *Contractor*.**

**Equipment required to be included in the *works***

#### **3.3.6 Relevant and approved equipment used for Traction Transformer Refurbishment at Balfour.**



## **4. Procurement**

### **4.1 The *Contractor* 's Invoices**

4.1.1 When the *Project Manager* certifies payment (see ECC3 Clause 51.1) following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice submission.

4.1.2 The invoice must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.

4.1.3 The invoice states the following:

- a) Invoice addressed to Transnet SOC Ltd
- b) Transnet Limited VAT No: 4720103177
- c) Invoice number
- d) The *Contractor* 's VAT Number
- e) The Contract number

4.1.4 The invoice contains supporting detail.

4.1.5 The invoice is presented by hand delivery.

4.1.6 Invoices submitted by post: N/A

4.1.7 The invoice and statement are presented as originals. The originals must be in receipt by the *Project Manager* on or before the last working day of the month.

## **4.2 People**

### **4.2.1 BBBEE and preferencing scheme**

Transnet fully endorses and supports the Government's objective of Broad-Based Black Economic Empowerment and it is strongly of the opinion that all South African business enterprises have an equal obligation to redress the imbalances of the past.

**Transnet would therefore prefer to do business with enterprises who share these same values and who are prepared to contribute to meaningful B-BBEE initiatives [including, but not limited to subcontracting and Joint Ventures] as part of their tendered responses. All procurement transactions will be evaluated accordingly:**

B-BBEE Status Level of Contributor	Number of Points [Maximum 20]
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

## **4.3 Subcontracting**

### **Preferred Subcontractors**

The *Contractor* shall not appoint or bring sub-*Contractor* s onto site without the prior approval of the *Project Manager*, and all sub-*Contractor* s will be required to conform to the requirements as set out herein as if they were employees of the *Contractor*.

**The *Contractor* shall not deviate from the accepted sub-*Contractor* 's list without prior approval of the *Project Manager*.**

### **Subcontract documentation, and assessment of subcontract tenders**

**The *Contractor* shall appoint his sub-*Contractor* s under the NEC3 Engineering Contract Sub-Contract unless accepted otherwise by the *Project Manager*.**

#### **4.4 Plant and Materials**

- 4.4.1 All plant used by the *Contractor* on site shall be properly maintained and operated. All vehicles on public roads shall be roadworthy, with the necessary licenses, permits and safety requirements. No transporting of people in the load box of any LDV's without the correct seating and seatbelts or a Kombi may be utilized providing that it has RWC.
- 4.4.2 The *Contractor* replaces any Plant and Materials subject to breakages (whether in the Working Areas or not) or any Plant and Materials not conforming to standards or specifications stated and notifies the *Project Manager* on each occasion where replacement is required.
- 4.4.3 The *Contractor* provides all other Plant and Materials necessary for the works not specifically stated to be provided "free issue" by the *Employer*.
- 4.5 Marking Plant and Materials outside the Working Areas  
The *Contractor* prepares and marks items of Plant and Materials outside the Working Areas with the *Contractor's* Logo.

## **5. Construction**

### **5.1 Temporary works, Site Services & Construction Constraints**

#### **5.1.1 Employer's Site entry and security control, permits, and Site regulations**

The work is to be carried out at Balfour under the control of the Depot Engineering Manager-Heidelberg Depot.

The areas are restricted and the *Contractor* must ensure he complies with the regulations of Transnet in every way. The *Contractor* and any *sub-Contractor s* shall be required to apply for permission to enter the restricted area in writing. A list of workmen shall be given to the *Project Manager* to arrange for the necessary permits. 48 Hours minimum notice is necessary for the processing these permits. This includes changes to staff during the contract period

The *Contractor* shall ensure the safe passage of traffic to and around the working areas at all times. This shall entail the provision of flagmen, protective barriers, lanterns, signs, etc. for protection, direction and control of traffic. No lights are to be fixed anywhere without written approval from the *Project Manager*.

The buildings are occupied and the *Contractor* shall organise the work to cause the least possible inconvenience to any operations at the various Transnet Freight Rail assets.

Access permits shall be made by the *Contractor* to a standard acceptable to the *Project Manager*, be allowed for within the *Contractor s* access control provision and shall include at least the following information:

- Company name and logo.
- Employees name and ID number.
- Date of issue and period of validity.
- Company details
  - ♦ *Telephone number*
  - ♦ *Fax number*
  - ♦ *E-mail address*

#### **5.1.1 Restrictions to Access on Site, hours of work, conduct and records**

The normal working hours are between 07:00 and 16:00 Mondays to Fridays. If it is required to work outside the stated normal working hours the *Contractor* must obtain written permission at least 48 hours before such work needs to be undertaken. Transnet will not unreasonably withhold permission; however, the *Contractor* may have to pay for Transnet's supervisory personnel, should this be required.

**The *Contractor* keeps daily records of his people engaged on the Site and Working Areas (including Subcontractors with access to such daily records available for inspection by the *Project Manager* at all reasonable times.**

### 5.1.2 Health and safety facilities on Site

The provision of security for the *Contractor's* site establishment shall be his own responsibility.

**Both the "Factories, Machinery and Building work Act (Act 22 of 1941) and the "Machinery and Occupational Safety Act (Act 6 of 1983)" shall, wherever they appear in the SANS 1200 standardized specifications, be substituted by the "Occupational Health and Safety Act (Act 85 of 1993)".**

### 5.1.3 Title to Materials from Demolition and Excavation

Before any material arising from the demolitions is removed from site, the material must be offered to Transnet at no cost

### 5.1.4 Cooperating with and Obtaining Acceptance of Others

**The *Contractor* shall not commit or permit any act that may interfere with the performance of the other parties operating in the area and shall carry out work in close liaison with the *Project Manager*.**

### 5.1.5 Publicity and Progress Photographs

The *Contractor shall* obtain the permission and approval of the *Employer* before erecting any notice boards or using the details of the contract in any advertising media.

The *Contractor* does not advertise the contract or the project to any third party, nor communicate directly with the media (in any jurisdiction) whatsoever without the express written notification and consent of the *Project Manager*.

### 5.1.6 *Contractor's* Equipment

**The *Contractor* keeps daily records of his Equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.**

**All equipment, scaffolding, or any other equipment necessary shall be supplied by the *Contractor* to successfully execute the *Works* safely, to completion. All tools, test equipment, i.e. wind-speed indicators, rain meter etc. shall be supplied by the *Contractor*.**

### 5.1.7 Equipment Provided by the *Employer*

**No equipment will be provided by the *Employer*.**

### **5.1.8 Site Services and Facilities**

The *Contractor* shall make his own arrangements for the supply of services such as electricity, potable water, ablutions, fire protection, lighting and all other services required for undertaking the *works*. The *Contractor* shall provide, maintain and finally remove proper portable latrines of sufficient number at his cost. Latrines shall be properly constructed and placed in suitable positions and maintained in a clean and sanitary working condition.

Where any of the above services can be made available by the *Employer*, the cost of meters, connections, reticulation and all other usage costs associated with the provision of services shall be to the *Contractor's* account. The applicable tariffs will be those that the Local Authority charges Transnet and shall be obtained by the *Contractor*.

### **5.1.9 Facilities Provided by the Employer**

A Suitable construction site will be made available free of charge to the *Contractor* for the duration of the contract.

The site shall be clearly sign posted as being a construction site and shall be compliant with the relevant prevailing safety regulations and restrictions that might be in place until the *Contractor* has de-established from site and has been approved by the *Project Manager* or his duly appointed representative.

**The layout of any construction site, if required, shall be submitted to the *Project Manager* for his approval before the *Contractor* starts erecting his camp**

### **5.1.10 Facilities Provided by the Contractor**

The *Contractor* shall make his own arrangements for the accommodation of all labour and comply with the requirements of the respective authorities.

No accommodation for the *Contractor's* and/or sub-*Contractor's* employees will be available on site. No employee, with the exception of security watchmen, may, without written approval from the *Project Manager*, be accommodated on site.

The *Contractor* shall, at his own expense, provide for security and access to his construction sites as he may require. Control of access for construction plant onto public roads shall be in accordance with the requirements of the relevant roads' authority and *Project Manager*.

No liability will be accepted by Transnet for the safekeeping of the *Contractor's* materials. The *Contractor* will not be required to provide any facilities for the use of the *Project Manager*.

### **5.1.11 Existing Premises, Inspection of Adjoining Properties and Checking Work of Others**

**The *Contractor* and the *Project Manager* will inspect the immediate surroundings and record any damage before work is started.**

### **5.1.12 Underground services, other existing services, cable and pipe trenches and covers**

The *Contractor* is required to liaise with the *Project Manager* and establish as accurately as possible, the location of the various existing services such as drains, underground and overhead telephone and electricity lines, ducts,

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poles, water mains, fittings, railway lines, etc. situated within the Works area and record all such information on a suitable "marked-up" drawing for reference at all times before any excavation or other work likely to affect the existing services commences. No services drawings are to be supplied.

**NB: Use specialist equipment to detect and note existing underground services so as to prevent future damage and /or injury to persons.**

All existing services shall at all times be protected and/or barricaded where these maybe affected by the *Works* or where these may endanger the safety of personnel.

Should relocation of existing services be necessary, this will either be carried out by Transnet or the *Contractor* under day works rates were instructed by the *Project Manager* in writing. Should known services be damaged by construction, the cost of repairs will be for the *Contractor's* account.

Where the *Contractor* damages a service due to negligence, he shall bear full cost of repairs to the service. These repairs will be carried out by the relevant authority, or at their discretion, by the *Contractor* to the satisfaction of the relevant authority.

#### 5.1.13 Giving notice of work to be covered up

The *Contractor* shall give 24 hours' notice to the *Project Manager* before covering any work.

#### 5.1.14 Restoring of work site

During the construction of the works, the site shall at all times be kept neat and in a tidy condition. The *Project Manager* may order the *Contractor* to stop all work, until such time as, in his opinion, this condition has been met.

The *Contractor* must clear away all rubble/waste within 14 days of completion of work or part of the works and leave the site and surrounding area in a clean and acceptable state. All rubble to be dumped at an approved dumping site; and proof of dumping must be produced.

## 5.2 Completion, Testing, Commissioning and Correction of Defects

### 5.2.1 The Work to be done by the Completion Date

**On or before the Completion Date the *Contractor* shall have done everything required to provide the *Works*. The *Employer* cannot certify Completion until all the work listed below has been done and is also free of Defects, which would have, in his opinion, prevented the *Employer* from using the *Works* and Others from doing their work.**

### 5.2.2 Access Given by the *Employer* for Correction of Defects

**The *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of part of the *works* which he has taken over if they are needed for correcting a Defect. In this case the *defect correction period* begins when the necessary access and use have been provided.**

## 6. Plant and Materials Standards and Workmanship

### 6.1 Background

- The purpose of this document is to request for the approval of Balfour traction Transformer repairs under the control of the Depot Engineering Manager-Heidelberg Depot.

### 6.2 Standard of Work, Equipment and Materials

**All work shall be carried out in a neat and orderly manner to the satisfaction of Transnet Freight Rail.** Electrical work shall conform to the requirements of SANS 10142-1&2 and those stipulated in this specification.

- 6.2.1 Equipment and materials used shall be of high quality design and manufacture, and shall comply with the relevant National standards incorporated in SANS 10142-1&2.
- 6.2.2 All equipment shall be SABS approved.
- 6.2.3 The *Contractor* must commence Emergency Work within two hours of notification
- 6.2.4 The *Contractor* must commence Day to Day work within twenty-four hours of notification
- 6.2.5 The *Contractor* must at his cost comply with all such laws, Provincial Ordinances, Local Authority Bylaws and all relevant regulations framed there under which are applicable to the work to be undertaken
- 6.2.6 All work must be carried out between the hours of 07H00 and 16H00, Monday to Friday, unless otherwise arranged, in writing

### Standard Specifications

Title - South African National Standards	Date or revision	Tick if publicly available
<ul style="list-style-type: none"><li>• All materials and quality of work shall comply with the latest SANS specifications and standards</li><li>• SANS 1535 Glass-reinforced polyester-coated steel tanks for the underground</li><li>• storage of hydrocarbons and oxygenated solvents and intended for burial horizontally</li><li>• SANS 10089-3 The petroleum industry Part 3: The installation, modification, and</li><li>• decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations</li><li>• SANS 10142-1: The wiring of premises, Part 1: Low-voltage installations.</li><li>• SANS 60034 Electrical rotating machines</li><li>• SANS 60529 Degrees of Protection provided by Enclosures (IP Code)</li><li>• SANS 60947 Low-voltage switchgear and control gear</li></ul>		

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Title - British Standards	Date or revision	Tick if publicly available
<ul style="list-style-type: none"> <li>British Standard (BS) BS 2757 Method for determining the thermal classification of electrical insulation.</li> <li>BS-EN 12285-2 Workshop fabricated steel tanks. Horizontal cylindrical single skin</li> <li>and double skin tanks for the aboveground storage of flammable and non-flammable water polluting liquids International Organization for Standardization (ISO)</li> <li>ISO 3046 Specification for Reciprocating Internal Combustion Engines</li> <li>ISO 9000 Quality assurance</li> <li>ISO 10816 Specification for Mechanical Performance: Vibration</li> </ul>		
Title - Transnet Freight Rail Standards	Date or revision	Tick if publicly available
<ul style="list-style-type: none"> <li>BBB5019_VER_6</li> <li>BBC0198_Ver_2_Requirements For The Supply Electric Cables</li> <li>CEE-0045_ISS_2014</li> <li>Health and Safety Specification TFR-ISM-RN-R&amp;C-FM009</li> <li>Environmental Specifications TFR/EMS (SES) – 001</li> <li>Occupational Health and Safety Act No. 85 of 1993 (Available at depot for referral)</li> </ul>		

**NB:** Any other specifications referenced in the above-mentioned specification will be for information purposes and may be provided on request.

### 6.3 General

- 6.3.1 Prior to on site investigations and works, it will be a requirement that the *Contractor* submit a complete health and safety file, specific to the work to be performed on site, to Transnet Freight Rail's Risk Manager for review and acceptance.
- 6.3.2 Upon approval and acceptance by Transnet Freight Rail of the health and safety file, all on site *Contractor* staff must undergo safety induction training as arranged by TFR. Such induction training will take approximately 1 hour, and *Contractor* is to allow for this in his programme. All *Contractor s'* staff who will be performing work on the site will be required to attend. Any additional persons brought onto site after initial safety induction was conducted, will also first have to undergo the aforesaid safety induction training.
- 6.3.3 All *sub-Contractor s* appointed by the *Contractor*, will also have to submit their own health and safety files for review and acceptance as per procedure detailed in clauses 6.2.1 and 6.2.2 above.
- 6.3.4 Measurements and or quantities do not include off cuts or waste all measurements of material is measured as nett fixed. *Contractor* to add his own % for off cuts and waste.
- 6.3.5 The *Contractor* is responsible to check all the measurements and quantities before ordering any material. The measurement and quantities are only a guide for tender purposes. To be supplied by the *Contractor*: The *Contractor* shall provide all labour, material transport, consumable stores, plant, equipment, tools, services, materials and ingredients of every description required for the carrying out and completion of the WORK as per the attached work list and specification and as may be ordered by the *Project Manager*.

- 6.3.6 AIA: Asbestos Inspection Authority air monitoring shall be implemented at all sites and reports submitted to Transnet.
- 6.3.7 The necessary move of furniture out of the buildings if necessary is included in all the items. All scaffolding and use of ladders up to 4.50m high interior and exterior if and as necessary is part of all the items. All work shall be done according to the attached specifications and shall comply with the National building regulations.

Unless otherwise specified all materials must comply with SANS specifications. Where no applicable SANS Specification exists the materials must be approved by the Transnet Freight Rail *Project Manager*.

## **6.4 Constraints**

### **Constraints on how the *Contractor* Provides the Works:**

- 6.4.1 Water and electricity will be supplied free of charge by Transnet Freight Rail. A continuous supply of water and electricity can however not be guaranteed.
- 6.4.2 The *Contractor* shall at his own cost arrange for connections and extensions (if necessary) to existing supplies and for the removal of these connections and extensions on completion of the contract.
- 6.4.3 The *Contractor must* not turn off any electrical or water supply without obtaining permission from the Service Manager or his Supervisor.
- 6.4.4 The *Contractor* must be in possession of or have access to a cellular phone and a facsimile machine.
- 6.4.5 The *Contractor* will be responsible for his own measurements. Left over material, rubble and all equipment stripped by the *Contractor are* to be removed from site by the *Contractor* as his property.
- 6.4.6 The premises shall be left perfectly clean after completion of the work, before payment will be made.
- 6.4.7 The *Contractor will* supply all equipment and material. Except otherwise specified, the *Contractor* shall provide all labour, tools, consumables stores, plant, equipment, services, materials, materials and ingredients of every description required for the carrying out and completion of the work included in this contract.
- 6.4.8 Proof of prices paid by the *Contractor* for such consumable stores, materials and ingredients shall be made available for Transnet on a monthly basis together with the *Contractor's* invoice.
- 6.4.9 The *Contractor* shall provide sufficient communication facilities including a fax machine in order that he may be reached at any time and place during the duration of the contract. The *Contractor must* be able to respond to any emergency request within twenty-four hours after he is notified thereof.

## **6.5 SCOPE**

### **6.5.1 Scope of Works**

This document details the technical requirements for the repairs of the Balfour traction Transformer.

1. *Contractor* shall remove Radiators and conservator on site.
  2. The *Contractor* shall be responsible for the transportation to site, off-loading, handling, storage and security of all material required for the construction/execution of the works from site to workshop and to the substation.
  3. *Contractor* is responsible for the dismantling of the transformer.
  4. *Contractor* is responsible for cleaning of parts for assessment.
  5. *Contractor* shall conduct electrical and mechanical assessment
  6. *Contractor* shall unstack the top yoke and remove the old coils.
  7. *Contractor* shall design, manufacture, and install the complete HV and LV coils with new Insulation.
  8. The *Contractor* shall Overhaul and clean the tap Changers and replace if necessary.
  9. *Contractor* shall reinsulate clamps to the core.
  10. The *Contractor* shall send the transformer to oven for dry out and conduct routine IR tests.
  11. The *Contractor* shall do pressure test on the radiators to check for any leaks.
  12. The *Contractor* shall clean and recondition all the CT's.
  13. The *Contractor* shall clean and recondition CT Monoblock insulator.
  14. The *Contractor* shall clean and recondition the LV bushings.
  15. The *Contractor* shall supply new HV bushings (G.O.B).
  16. The *Contractor* shall fit active unit into tank and complete all connections.
  17. The *Contractor* shall fill the transformer with virgin oil tested in accordance with SANS 55(~10330).
  18. The *Contractor* shall fit the top cover completed with new gaskets and new nuts and bolts.
  19. Wire all the connections auxiliary to auxiliary terminal box and other cables connecting to the transformer.
  20. The *Contractor* shall perform testing on the transformer:
    - Routine testing
    - Mechanical test
    - SFRA (Sweep frequency response analysis)
  21. The *Contractor* shall deliver the transformer the transformer to Balfour substation and connect it.
  22. *Contractor* shall perform oil sampling with accredited laboratory testing
  23. The *Contractor* shall be responsible for all necessary (as decided by the Transnet Freight Rail Project Manager or Technical Officer) connections between the equipment supplied and other components in the substation including connections to the earth-mat.
-

24. It is required for the *Contractor* to supply calibration Oil plant certificate to Transnet Freight Rail before work commencement.
25. The supplier shall submit a quality
26. *Contractor* shall top up oil and purify in accordance to Transnet Freight Rail recommended oil specification.
27. *Contractor* shall supply Transnet Freight Rail with final oil test result before transformer commissioning.
28. *Contractor* shall perform protection tests and commission the equipment on completion.

### **6.5.2 Requirements**

- Transnet freight rail shall not disclose the successful *Contractor* or any other tendered prices, as this is regarded as confidential information.
- Transnet freight rail reserves the right to inspect the *Contractor*'s facilities prior to awarding the contract in order to ensure that it is suitable for the type of repair required.
- *Contractors* shall submit qualifications/ work history and medical certificates of the staff that will be performing the works.
- Only qualified technical personnel shall supervise the works on the electrical equipment or installations.
- During the duration of the contract the successful *Contractor* will be required to inform the Technical Officer of any staff changes and provide the qualifications/medical certificates of the replacement staff for approval.
- *Contractors* shall indicate clause-by-clause compliance with the specification. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance. This document can be used by *Contractor*s to elaborate on their clause.
- *Contractor*s shall motivate a statement of non-compliance. Where equipment offered does not comply with standards or publications referred to in the specification.
- *Contractor*s shall state which standards apply and submit a copy in English or certified translation.
- *Contractor*s shall submit descriptive literature consisting of detailed technical specifications, general.
- Constructional details and principal dimensions, together with clear illustrations of the equipment offered.
- During the duration of the contract period, the successful *Contractor* will be required to inform the *Project Manager* / Technical Officer of changes to equipment offered and submit detailed information on replacement.
- *Contractor*s shall submit equipment type test certificates as specified with the Tender, these shall be in English or certified translation

## 6.6 Safe working access

### 6.6.1 Safety, Health and Environmental (SHE) File

- 6.6.1.1 The Principal *Contractor* shall prepare a SHE file and submit to TFR Contract Representative for approval prior to commencement of work on site. The file shall include all documentation required as per the OHS Act and applicable regulations.
- 6.6.1.2 The approval time of the file is at least 5 working days
- 6.6.1.3 The Principal *Contractor* shall ensure that a copy of both his SHE File as well as any sub*Contractor*'s SHE File is kept on site and made available to an inspector of the Department of Labour, the TFR Contract Representative/Technical Officer, or sub-*Contractor* upon request.
- 6.6.1.4 The Principal *Contractor* shall hand over a consolidated SHE file to the TFR Contract Representative/Technical Officer upon completion of the Construction Work and shall in addition to documentation mentioned in the OHS Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

### 6.6.2 Safety Induction

- 6.6.2.1 The Principal *Contractor* shall ensure that all his employees and sub*Contractor*'s employees undergo a TFR SHE Induction with regard to the general hazards prevalent on the site, rules and regulations, and other related aspects before commencing work. It is the responsibility of the *Contractor* to inform TFR whenever new employees are appointed after the initial induction was conducted.
- 6.6.2.2 In addition to the TFR SHE induction, it is the responsibility of the Principal *Contractor* to develop and implement a site specific SHE Induction programme, a job specific induction programme and a general employee SHE awareness programme, to develop awareness amongst employees on the generic SHE issues associated with the scope of work and the specific environmental issues in question.
- 6.6.2.3 The Principal *Contractor* shall ensure that all visitors and suppliers to the site undergo and comply with Principal *Contractor*'s site-specific safety induction requirement prior to being allowed access to site. All visitors and suppliers shall sign the attendance register.
- 6.6.2.4 All visitors and suppliers shall wear the necessary personal protective equipment whilst on site and shall remain in the care of the host who understand the scope of work and associated risks.
- 6.6.2.5 The Principal *Contractor* shall maintain comprehensive attendance records of SHE induction training on the SHE file.

### 6.6.3 Occupational Health

- 6.6.3.1 Medical Surveillance Programme
- 6.6.3.2 The Principal *Contractor* shall ensure that all his and sub*Contractor* employees have a valid medical certificate of fitness issued by an Occupational Health Practitioner.
- 6.6.3.3 Medical certificate of fitness must be available and be kept in the SHE file.
- 6.6.3.4 The *Contractor* shall renew medical fitness certificates of personnel that are due to the requirement.
- 6.6.3.5 Employees whose medical fitness certificates have expired will not be permitted to carry out any works on site until re-certified fit and replacement of their certificates is finalised.
- 6.6.3.6 The *Contractor* to submit his methodology that will be adopted to access the site, in order to execute the work safely and the method and plant he will be utilizing to carry out the works.

#### **6.6.4 Site access certificate**

- 6.6.4.1 The Principal *Contractor* shall, before commencing any work, obtain from the TFR Contract Representative/Technical Officer a Site Access Certificate as in Annexure 1 of the Health and Safety Specification executed and signed by him, permitting and limiting access to the designated site or place of work by the Principal *Contractor* and any *subContractors* under his control.
- 6.6.4.2 No Site Access Certificate will be granted to the *Contractor* who fails to comply with TFR minimum SHE requirements, with the SHE File not approved and without the SHE induction been concluded.
- 6.6.4.3 The *Contractor* must assess the security risks and implement appropriate measures. All *Contractors* are to strictly adhere to all security requirements on the premises.
- 6.6.4.4 The Principal *Contractor* in collaboration with the TFR representative will ensure that proper access control is in place and functional at all times onto and out of the site. A form of access control will be issued to *Contractor* employees who have been inducted and submitted copies of ID documents or work permits (where required).
- 6.6.4.5 Access Permits should be carried by a contract employee at all time when on site. Access Permits shall be produced at the point of entry / gate.
- 6.6.4.6 *Contractors* shall ascertain from TFR Contract Representative/Technical Officer the correct route along with their employees may proceed when coming on or going off shift and direct their employees accordingly.

#### **6.6.5 Work Permits**

- 6.6.5.1 Transnet Freight Rail shall have an electrician available for isolation and the erection of barriers to live electrical equipment and issuing of work permits.
- 6.6.5.2 The *Contractor* shall make sure that switching limits are understood by him/her before signing the permit book.
- 6.6.5.3 Where work permit does not cover full working site, *Contractor* shall receive Electrical supervision from Transnet Authorised personnel.
- 6.6.5.4 The *Contractor* shall also ensure to sign portion of the permit book upon handing over of equipment back to Transnet Freight Rail.

#### **6.7 Information to be obtained from Site**

- 6.7.1 The attendance of a site clarification meeting will be compulsory and the prospective *Contractors* shall visit the site of the proposed Works and acquaint themselves with the nature of the Works, the conditions under which the work is to be performed, the means of access, any limitations or other authorities and in general with all matters that influence or affect the contract.
- 6.7.2 *Contractors* shall be deemed to have allowed in their tender for any additional cost to be involved due to the foregoing, as no claims for any extras in connection with the position or nature of the work will be entertained.

#### **6.8 Daily Site Diary and Inspection Book**

- 6.8.1 The *Contractor* shall provide an A4 size triplicate book to be used as a Daily Diary for the duration of the Contract. The Employers Representative shall retain the original copy and the *Contractor* shall retain the first and second copy. The diary shall be completed on a daily basis.
  - 6.8.2 In addition to this the *Contractor* shall provide an A4 size triplicate book to act as Site Instruction Book. The Employers Representative shall retain the original copy and the *Contractor* shall retain the first and second copy. The diary shall be completed on a daily basis. Only the Employers Representative or his Supervisor will have the authority to issue site instructions to the *Contractor*.
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## PART C2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	2 - 6
C2.2	The <i>bill of quantities</i>	7 - 8

## C2.1 Pricing instructions: Option B

### 1. The conditions of contract

#### 1.1. How the contract prices work and assesses it for progress payments

Clause 11 in NEC3 Engineering and Construction Contract, June 2005 and 2013 (ECC) Option B states:

**Identified and defined terms** 11

- 11.2 (21) The Bill of Quantities is the *bill of quantities* as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.
- (22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.
- (28) The Price for Work Done to Date is the total of
- the quantity of the work which the *Contractor* has completed for each item in the Bill of Quantities multiplied by the rate and
- a proportion of each lump sum which is the proportion of the work covered by the item which the *Contractor* has completed.
- Completed work is work without Defects which would either delay or be covered by immediately following work.
- (31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.

This confirms that Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.



## 1.2. Function of the Bill of Quantities

Clause 55.1 in Option B states, "Information in the Bill of Quantities is not Works Information or Site Information". This confirms that instructions to do work or how it is to be done are not included in the Bill, but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does **not** Provide the Works in accordance with the Bill of Quantities. The Bill of Quantities is only a pricing document.

## 1.3. Guidance before pricing and measuring

Employers preparing tenders or contract documents, and tendering contractors are advised to consult the sections dealing with the bill of quantities in the NEC3 Engineering and Construction Contract (June 2005) Guidance Notes before preparing the *bill of quantities* or before entering rates and lump sums into the *bill*.

Historically bill of quantities based contracts in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of contract and methods of measurement. This is particularly apparent in the approach to the Preliminary and General bill. On the other hand, because ECC caters for a number of disciplines in the same contract, including electrical works, a different approach not currently found in local methods of measurement to the Preliminary & General bill items may have been used.

The NEC approach to the P & G bill assumes use will be made of method related charges for Equipment applied to Providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of Equipment that is required throughout the construction phase, time related charges for people working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing work items typically included in other parts of the bill.

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**2. Measurement and payment****2.1. Symbols**

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

Abbreviation	Unit
%	percent
h	hour
ha	hectare
kg	kilogram
kl	kilolitre
km	kilometre
km-pass	kilometre-pass
kPa	kilopascal
kW	kilowatt
l	litre
m	metre
mm	millimetre
m <sup>2</sup>	square metre
m <sup>2</sup> -pass	square metre pass
m <sup>3</sup>	cubic metre
m <sup>3</sup> -km	cubic metre-kilometre
MN	meganewton
MN.m	meganewton-metre
MPa	megapascal
No.	number

**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

Prov sum <sup>1</sup>	provisional sum
PC-sum	prime cost sum
R/only	Rate only
sum	Lump sum
t	ton (1000kg)
W/day	Work day

## 2.2 General assumptions

- 2.2.1 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 2.2.2 The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the *Contractor* in carrying out or providing that item.
- 2.2.3 Clause 63.13 in Option B provides that these rates and Prices may be used as a basis for assessment of compensation events instead of Defined Cost.
- 2.2.4 Where this contract requires detailed drawings, designs or other information to be provided, and no rates or prices are included in the *bill* specifically for such matters, then the *Contractor* is deemed to have allowed for all costs associated with such requirements within the tendered rates and Prices in the Bill of Quantities.
- 2.2.5 An item against which no Price is entered will be treated as covered by other Prices or rates in the *bill of quantities*. If a number of items are grouped together for pricing purposes, this will be treated as a single lump sum.
- 2.2.6 The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of work to be done. The quantities of work assessed and certified for payment by the *Project Manager* at each assessment date will be used for determining payments due and not the quantities given in the Bill of Quantities.
- 2.2.7 The short descriptions of the items of payment given in the *bill of quantities* are only for the purposes of identifying the items. More detail regarding the extent of the work entailed under each item is provided in the Works Information.

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<sup>1</sup> Provisional Sums should not be used unless absolutely unavoidable. Rather include specifications and associated bill items for the most likely scope of work, and then change later using the compensation event procedure if necessary. This is because tenderers cannot programme effectively for unknown scopes of work

## **2.3 Departures from the *method of measurement* [Not Applicable]**

## **2.4 Amplification of or assumptions about measurement items [Not Applicable]**

For the avoidance of doubt the following is provided to assist in the interpretation of descriptions given in the method of measurement. In the event of any ambiguity or inconsistency between the statements in the method of measurement and this section, the interpretation given in this section shall be used.

**C2.2 THE BILL OF QUANTITIES**

Item no.	Description	Unit	QTY	Unit Rate (R)	Total Price (R)
<b>Balfour transformer Complete rewinding</b>					
<b>1</b>	<b>Strip and quote</b>				
1.1	Remove Radiators and conservator on site	sum	1		
1.2	Transport the transformer, radiator, and Conservator from site to workshop then from workshop to s Balfour Substation	sum	1		
1.3	Dismantle the Transformer	sum	1		
1.4	Clean parts for assessment	sum	1		
1.5	Conduct electrical and mechanical assessment	sum	1		
<b>2</b>	<b>Core and Windings</b>				
2.1	Unstack top yoke and remove the coils	sum	1		
2.2	Design, manufacture and install three HV and LV coils complete with new insulation kit.	sum	1		
2.3	Overhaul and clean 3 x tap changers	Ea.	3		
2.4	Reinsulate clamps to core	sum	1		
2.5	Send transformer to oven for dry out and conduct routine IR tests.	sum	1		
<b>3</b>	<b>Overhaul tank</b>				
3.1	Pressure test radiators to check for leaks	sum	1		
3.2	Clean and recondition all the CT's	sum	1		
3.3	Clean and recondition CT monoblock insulator	sum	1		
3.4	Clean and recondition 9 LV bushings	Ea.	9		
3.5	Clean and Supply 3x new HV bushings	Ea.	3		
<b>4</b>	<b>Tanking</b>				
4.1	Fit active unit into tank and complete all connections	sum	1		
4.2	Fill transformer with virgin oil tested in accordance with SANS 555(10330 litres)	sum	1		
4.3	Purify Oil	sum	1		
4.4	Fit Top Cover complete with new gaskets and new nuts and bolts	sum	1		
4.5	Wire up all auxiliary-to-auxiliary terminal box	sum	1		

**Transnet Freight Rail****Tender Number:** SIC22002CIDB (HOAC-HO-37671)**Description of Works:** Traction Transformer Refurbishment at Balfour.

Item no.	Description	Unit	QTY	Unit Rate (R)	Total Price (R)
<b>Balfour transformer Complete rewinding</b>					
<b>5</b>	<b>Testing</b>				
5.1	Routine test transformer in accordance with SANS 780	sum	1		
5.2	Mechanically test transformer	sum	1		
5.3	Deliver transformer to customer	sum	1		
5.4	Final Assemble transformer on site	sum	1		
<b>6</b>	<b>Oil Sample</b>				
6.1	Take off transformer oil sample accredited laboratory testing: PCB Test: Dissolved GAS analysis: Moisture Content: Acidity: Dielectric Strength-kV:Furanic	ea.	1		
6.2	Commissioning	sum	1		
6.3	P's and G's	sum	1		
<b>A</b>	<b>Total Price for Balfour Substation=</b>				
<b>B</b>	<b>Contingency (10% of A) =</b>				
<b>C</b>	<b>SUB TOTAL (A+B) =</b>				
<b>D</b>	<b>VAT (15% of C) =</b>				
<b>E</b>	<b>Gross Total (C+D) =</b>				

## PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

### 1. Description of the Site and its surroundings

#### 1.1. General description

The *Works* entails the Supply, Install, Test and Commission of Traction Transformer shall be performed at Transnet Freight Rail in Balfour, Mpumalanga Province.

#### 1.2. Existing buildings, structures, and plant & machinery on the Site

There are fixed assets that are situated alongside the linear state of the railway infrastructure. These structures are but not limited to; bridges, platforms, culverts and track side components. The *Contractor* shall ensure that all the works being carried out does not deform the existing structures.

#### 1.3. Subsoil information

The project at hand does not interfere with the formation or earthworks. Should there be a need to work on the formation; the employer shall supply the *Contractor* with relevant information.

#### 1.4. Hidden services

There are underground services that were previously erected and the as-built data to locate such services will be utilised. There are situations where the as-built data cannot be traced and in such situations, activities must be carried out with caution. During the execution phases of the project, there is a possibility of disruption of such hidden services. These services include conduits (oil, water and sewage), electrical cables and any other structure that may be present. The *Employer* shall inform the *Contractor* through a baseline risk assessment of any possibilities in anticipation.

#### 1.5. Other reports and publicly available information

The *Employer* shall provide all the standard layouts/drawings for all the turnouts where sleepers are to be replaced. The *Employer* will also provide maps, locations, reports and designs as and when required.

**To Whom It May Concern,**

**CERTIFICATE OF INSURANCE: TRANSNET (SOC) LIMITED – PRINCIPAL CONTROLLED INSURANCE**

In our capacity as Insurance Brokers to the Transnet Group of Companies, we hereby certify that the undermentioned insurances are currently in place:

INSURED: Transnet (SOC) Limited

PERIOD: 1 April 2022 to 31 March 2023 (Both days inclusive)

DIVISION: Transnet Freight Rail, Transnet Engineering, Transnet Properties, Transnet Pipelines, Transnet National Ports Authority and Transnet Port Terminals

THE INSURED'S VAT NO: 4720103177

THE INSURED'S COMPANY REGISTRATION NO: 1990/000900/30

POSTAL ADDRESS (Head Office) P O Box 72501, Parkview, 2122

**CONTRACT WORKS INSURANCE**

Cover Provided : Contract Works - Physical loss or damage to the Property Insured which being materials, plant and other things for incorporation into the permanent works.

Insurer : Mirabilis (Santam Limited)

Policy Number : MZAR35023-CAR

The Contract Site : Any location within the Territorial Limits upon which The Insured Contract is to be executed or carried out as more fully defined in The Insured Contract documents together with so much of the surrounding area as may be required or designated for the performance of The Insured Contract.

Territorial Limits : The Republic of South Africa.

Additional Co-Insureds:

The Contractor: All Contractors undertaking work in connection with The Insured Contract including the Employer to the extent that the Employer undertakes work in connection with The Insured Contract;

Sub-Contractors: All Sub-Contractors employed by the Contractor and all other Sub- Contractors (whether nominated or otherwise) engaged in fulfilment of The Insured Contract; and to the extent required by any contract or agreement;



transporters and persons providing a storage facility, plant owners and/or operators in respect of liability loss or damage arising out of The Insured Contract; project managers, architects, land surveyors, quantity surveyors, engineers and other advisors or consultants or sub-consultants appointed in the performance of the Insured Contract activities arising at the Contract Site provided always that any such person shall not be insured hereunder in respect of liability loss or damage arising out of such person's error or omission in the performance of the professional services for which he was appointed;

**Provincial & Government:** any Local Provincial or Government Department with which the Insured enters into any contract or agreement for the performance of The Insured Contract; all for their respective rights and interests.

**Insured Contracts :** All Contracts (including any undertaking awarded or commenced prior to Inception of the Period of Insurance) involving design, construction, Performance Testing and Commissioning in respect of the Works and shall Include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation, retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **excluding**;

- a) contracts which at award stage have a value in excess of R 1,000,000,000;
- b) contracts with an estimated construction period exceeding 48 months but increasing to 60 months in respect of rail maintenance contracts and Transnet Freight and Rail contracts for logistical support for inline inspections and identification of defects over a 5 year period in respect of Transnet's pipeline assets (excluding Defects Liability/Maintenance period);
- c) contracts involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured;
- d) contracts in or on any aircraft;
- e) Off-shore contracts;
- f) Wet Risk Contracts which at award exceeds R500,000,000;
- g) Dam Contracts
- h) Tunnel contracts which at award exceeds R50,000,000;
- i) Tunnel contracts using tunnel boring machines;
- j) Underground Mining Contracts;
- k) Horizontal Directional Drilling Contracts which at award exceeds R50,000,000;
- l) Horizontal Directional Drilling Contracts where total drilling exceeds 1 km;
- m) Horizontal Directional Drilling Contracts for pipe diameters greater than 76 cm.

### Definitions

1. "Off-shore contracts" means all works and installations in the sea or on the seabed including dredging which are accessible only by ship boat barge or helicopter and do not constitute normal wet works like harbours moles bridges wharves or sewage or cooling water intake or outlet facilities. "OffShore Contracts" shall include oilrigs and oil platforms (but not including oil platforms when connected to the land on completion). The term shall not apply to pre-fabrication works on land associated with an Off-Shore Contract.

- 2 *"Wet Risk Contracts" shall mean any Contract and/or Works where more than thirty-five (35) percentile of its value is in a permanent body of water or is below the high water mark of any tidal body of water. The term shall include contracts for the construction of wharves, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected directly to on-shore facilities and canal developments. Wet Risks shall exclude Off- Shore Contracts;*
- 3 *"Dam Contracts", which term shall include weirs and hydroelectric projects involving the construction of dams or weirs;*
- 4 *"Horizontal Directional Drilling Contracts", means micro-tunnelling work for the construction of tunnels utilising surface based horizontal directional drilling equipment.*
- 5 *Tunnels" means Tunnels (Including declines) involving all of the following;*
  - (a) Works below ground level; and
  - (b) Tunnelling machinery below ground level; and
  - (c) A tunnelling crew operating the machinery below ground level;
  - (d) But shall not include Horizontal Directional Drilling Contracts
- 6 *"Horizontal Directional Drilling Contracts", means micro-tunnelling work for the construction of tunnels utilising surface based horizontal directional drilling equipment.*
- 7 *"Underground Mining Contracts", which shall mean any contract involving underground mining.*

Testing Period: 120 Days not consecutive.

Maintenance Period : 12 Months

Main Policy Extensions :

- Costs & Expenses - Limited to maximum of R50,000,000.
- Expediting Measures – Limited to a maximum of R50,000,000.
- Professional Fees In Reinstatement Of Property Insured - Limited to a maximum of R50,000,000.
- Surrounding Property in care custody or control of the contractor – Limited to a maximum of R55,000,000.
- Fire Brigade & Public Authorities - Limited to a maximum of R10,000,000.
- Public Authority Reinstatement Costs - Limited to a maximum of R20,000,000
- Public Relationship Costs - Limited to a maximum of R1,000,000.
- Records - Limited to a maximum of R2,000,000.
- Removal to Gain Access - Limited to a maximum of R20,000,000
- Road Reserve and Servitude Extensions - Limited to a maximum of R10,000,000

- Search & Locate Costs - Limited to a maximum of R20,000,000.
- Borrowing Of Plant For Commissioning Purposes - Limited to a maximum of R10,000,000
- Escalation during Construction – 30%
- Marine Contribution Clause
- Claim Preparation Costs – Limited to a maximum of R10,000,000

**Main Policy Exclusions :**

- War
- Nuclear Energy Risks
- Terrorism
- Computer Loss General Exception
- DE4 (All types of Works) for defective material workmanship design plan or specification.
- LEG 3 (Mechanical or Electrical Engineering Works only) for defective material workmanship design plan or specification. Limited to maximum of 15% of the total estimated contract value.
- Loss or damage arising during air transit or any ocean voyage or whilst in storage thereafter.
- Occurring during any defects/maintenance period unless cause occurred prior to such defects/maintenance period
- Disappearance or by shortage revealed during routine inventory or periodic stocktaking.
- Consequential loss of whatsoever nature.
- Normal wear and tear, normal atmospheric conditions, rust, erosion, corrosion or oxidation.
- Due to its own explosion breakdown or derangement occurring after the Testing Period which has operated under load conditions.
- Second hand property due to its own electrical or mechanical breakdown or explosion.
- Communicable diseases

**Deductibles:**

In respect of loss or damage:

Major Perils shall mean damage caused by storm, rain, tempest, wind, flood, theft, malicious damage, subsidence, collapse, earthquake, testing or commissioning and the consequences of defective design, specification, materials or workmanship (DE4).

Minor Perils shall mean damage caused by a peril not defined as Major Perils defined above.

Contracts with a contract value :	Major perils	Minor perils
0 to R100,000,000	R25,000	R 15,000
R100,000,001 to R250,000,000	R50,000	R15,000
R250,000,001 to R500,000,000	R100,000	R25,000

R500,000,001 to R1,000,000,000      R150,000      R25,000

Minimum wet risk deductible of R100,000 per occurrence to apply.

LEG 3 Deductible (Only in respect of Mechanical and Electrical contracts);

Contracts with a contract value	Deductible
0 to R500,000,000	R1,000,000 per occurrence
R500,000,001 to R1,000,000,000	R1,500,000 per occurrence

## **PUBLIC LIABILITY**

Cover Provided : Contract Works Public Liability – cover the Insured's legal liability in respect of loss or damage or injury to third parties arising out of work performed in respect of the Insured Contracts.

Insurer : Stalker Hutchinson (Santam Limited)

Policy Number: 6000/132335

Territorial Limits : The Republic of South Africa.

Insured Contracts: All projects (including any undertaking awarded or commenced prior to inception of the period of Insurance) involving design, construction, performance testing and commissioning in respect of the works and shall include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation, retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **Excluding project works;**

- a) which at award stage have a value in excess of R 1,000,000,000.
- b) Contracts with an estimated construction period at award exceeding 48 months but 60 months in respect of contracts awarded prior to 1 April 2020 for rail maintenance contracts For Transnet Freight & Rail and for Transnet Pipeline's logistical support for inline inspections and identification of defects in respect of Transnet's pipeline assets (all excluding Defects Liability/Maintenance period).
- c) Contracts with a Contractual Defects Liability Maintenance Period exceeding 24 months.
- d) involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured.
- e) in or on any aircraft; and
- f) being Off-shore contracts

"Off-shore contracts" means all works and installations in the sea or on the seabed and do not constitute normal Wet Risk Contracts like harbours, moles, bridges, wharves or sewage or cooling water intake or outlet facilities, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected

directly to onshore facilities and canal developments. "Off-Shore contracts" shall include oilrigs and oil platforms.

**Policy Limits:**

Contractors Public Liability	R100,000,000 any one occurrence / unlimited during the Period of Insurance
Contractors Negligent Removal or weakening of Support	R100 000 000 any one occurrence and R100,000,000 per site in the aggregate during the Period of Insurance.
Statutory Legal Defence Costs	*R5 000 000 in the aggregate during the Period of Insurance.
Arrest / Assault / Defamation	*R5 000 000 in the aggregate during the Period of Insurance.
Emergency Medical Expenses	R5 000 000 any one occurrence
Prevention of Access	*R5 000 000 in the aggregate during the Period of Insurance.
Trespass / Nuisance	*R5 000 000 in the aggregate during the Period of Insurance.
Claims Preparation Costs	R5 000 000 any one occurrence

\*Where the limits are noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.

Deductible(s) : R50,000 per occurrence but increased to R5,000,000 in respect of Spread of Fire and/or Hot Works and R250,000 in respect of Sudden and Accidental Pollution and/or Goods on the Hook and R150 000 Removal of Support.

**Main Policy Exclusions :**

The policy does not cover:

- deliberate, conscious and intentional disregard to take reasonable precautions.
- fines, penalties, punitive and exemplary damages.
- Pollution unless caused by a sudden, unintended and unexpected occurrence.
- cost of removing, nullifying or cleaning up the effects of pollution unless caused by a sudden, unintended and unexpected occurrence.
- the hazardous nature of asbestos.
- War And Terrorism Risks.
- Nuclear Risks.
- Actual or alleged unlawful competition, unfair practices, abuse of monopoly power, cartel activities
- Compulsory Insurance
- Loss or damage and any consequence therefrom to any Data. •
- Sanctions Exclusion
- Excluding unfair dismissal
- Data exclusion
- COVID Exclusion

**PROFESSIONAL INDEMNITY**

**Professional Indemnity**

- a) In respect of damages which the Insured shall become legally liable to pay in consequence of neglect, error or omission by or on behalf of the Insured in the conduct or execution of their Professional Activities and Duties as defined.
- b) Prior To Handover/Rectification - against loss arising out of any defect in the works discovered prior to the issue of any practical completion or take-over certificate provided that any such defects are caused by a negligent breach of a Professional Activity or Duty by the Insured in consequence of neglect, error or omission by or on behalf of the Insured.

Insurer : Stalker Hutchinson (Santam Limited)

Policy Number: 6000/132337

Jurisdiction : Worldwide excluding North America

Insured Contracts: All projects (including any undertaking awarded or commenced prior to inception of the period of Insurance) involving design, construction, performance testing and commissioning in respect of the works and shall include capital expenditure, upgrade, modification, maintenance or overhaul, refurbishment, renovation, retrofitting or alterations and additions to existing facilities undertaken by the Insured or other Insured Parties acting on their behalf but **Excluding project works:**

- a) Contracts which at award stage have a value in excess of R 1,000,000,000.
- b) Contracts with an estimated construction period at award exceeding 48 months (excluding Defects Liability/Maintenance period).
- c) Contracts with a Contractual Defects Liability Maintenance Period exceeding 24 months.
- d) involving construction or erection of petrochemical manufacturing plant(s) but this exclusion shall not apply to pipelines and other associated works undertaken by or on behalf of the Insured.
- e) in or on any aircraft.
- f) Being Off-shore contracts

"Off-shore contracts" means all works and installations in the sea or on the seabed and do not constitute normal Wet Risk Contracts like harbours, moles, bridges, wharves or sewage or cooling water intake or outlet facilities, piers, marinas, causeways, breakwaters, jetties, dry docks and offshore pipelines when connected directly to onshore facilities and canal developments. "Off-Shore contracts" shall include oilrigs and oil platforms.

Limit Of Indemnity: Professional Indemnity - \*R100,000,000 in the aggregate during the policy period of insurance.

\*Where the limit is noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.

**Policy Extension  
Limits Of Indemnity:**

Claims Preparation Costs -	*R7,500,000 in the aggregate during the policy period of insurance.
Loss of Documents -	*R2,000,000 in the aggregate during the policy period of insurance.
Statutory Defence Costs -	*R5,000,000 in the aggregate during the policy period of insurance.
Defamation -	*R5,000,000 in the aggregate during the policy period of insurance.
Infringement of Copyright -	*R5,000,000 in the aggregate during the policy period of insurance.

\*Where the limits are noted as in the aggregate during the policy period of insurance, that such aggregated limit is applicable to all Transnet Insured Contracts collectively and in total and does not apply to each contract separately.

**Deductibles:**

R5,000,000 each and every but R10,000 in respect of Claims Preparation Costs, Loss of Documents, Statutory Defence Costs, Defamation and Infringement Of Copyright.

**Policy Special Conditions :**

Condition precedent to liability that the Insured is fully qualified and registered with the relevant Industry Body/Association in terms of legislation as applicable.

Prior to hand over/rectification – the insured must give prior written notice to the Insurers of the intention to take remedial action to rectify such defect and obtain the Insurers' written agreement to such action being taken and the costs and expenses expected to be expended.

**Policy Main Exclusions:**

- Excludes all consequential loss other than cost of re-design, rectification and replacement as a consequence of the defect.
- Excludes Supervision.
- Excludes liability arising out of environmental impairment / pollution
- Excludes the cost of removing, nullifying or cleaning-up the effects of environmental impairment/ pollution.
- Excludes war, invasion, acts of foreign enemies, hostilities or warlike operations (whether war be declared or not), civil war, rebellion, revolution, insurrection, civil commotion assuming the proportions of or amounting to an uprising, military or usurped power, any act of terrorism and nuclear risks.
- Excludes fines, penalties, punitive and exemplary damages, multiplication of compensatory damages and/or any other noncompensating damages of any kind.
- Excludes liability from the hazardous nature of asbestos.
- Excludes medical malpractice.
- Excludes failure to meet contractual requirements relating to efficiency, output or durability.
- Excludes failure to meet completion dates
- Excludes the estimation of probable costs other than cost advice and cost planning services normally provided by a Quantity Surveyor or Project manager.
- Excludes incorrect authorisation of payment.



- Excludes breach of any statutory regulation.
- Excludes liability from the insolvency, liquidation or judicial management of the Insured.
- Excludes the certification of value of work executed by any contractor where the Insured has an equity interest in such contractor;
- Excludes liability due to unlawful competition, unfair practices, abuse of monopoly power, cartel activities or breach of a competitions ac
- Sanctions Exclusion
- Data exclusion
- State Capture exclusion
- COVID exclusion
- Directors & Officers Exclusion

**This certificate of the insurance cover arranged is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies issued by Insurers.**

Dennis Govender

Chief Broking Officer



# MANDATARY AGREEMENT

OCCUPATIONAL HEALTH AND SAFETY ACT 85 of 1993 (AS AMENDED)

## AGREEMENT WITH MANDATORY

In terms of Section 37(1) & (2)

## WRITTEN AGREEMENT ENTERED INTO AND BETWEEN

**Transnet SOC Ltd**

(Hereinafter referred to as the Employer)

**AND**

-----

(Hereinafter referred to as Mandatory (Principal Contractor))

**Compensation Fund Number** :

**Project Name** :

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- PREAMBLE

**WHEREAS** section 37(1) & (2) of the Occupational Health and Safety Act No 85 of 1993 ("the Act") requires that parties have an agreement in writing to ensure compliance by a mandatory in line with the provisions of the Act.

**AND WHEREAS** Transnet SOC Ltd requires the services of the Contractors to execute certain projects within its workshops.

**AND WHEREAS** TRANSNET SOC LTD can be better served by Contractors who have the infrastructure, specialist employees and expertise to execute such projects at the highest level of efficiency on short notice.

**NOW THEREFORE the parties agree as follows;**

## 1. DEFINITIONS

For the purpose of this agreement, unless the context indicates otherwise, the following definitions are set out for the terms indicated:

- 1.1 **"Act"** means the Occupational Health and Safety Act No 85 of 1993;
- 1.2 **"Agreement"** means this Mandatory agreement;
- 1.3 **"Contractor "** means the Mandatory;
- 1.4 **"COID Act"** means the Compensation for Occupational Injuries and Diseases Act No 130 of 1993.
- 1.5 **"Effective Date"** means the date of signature of this Agreement by the last party signing hereto;
- 1.6 **"Employer"** refers to TRANSNET SOC LTD;
- 1.7 **"Mandatory"** means an agent, Contractor or sub-contractor for work, but without derogating from the status in his own right as an employer or user;
- 1.8 **"Parties"** means TRANSNET SOC LTD and the Contractor, and **"Party"** shall mean either one of them, as the context indicates;
- 1.9 **"Principal Contract"** means the appointed contractor whereby such contractor has to provide goods and or services to TRANSNET SOC LTD.
- 1.10 **"Regulations"** means regulations promulgated in terms of the relevant legislation.
- 1.11 **"Section"** means the relevant section of the Occupational Health and Safety Act No 85 of 1993
- 1.12 **"Services"** means the services to be provided by the Contractor to TRANSNET SOC LTD.
- 1.13 **"TRANSNET SOC LTD"** means Transnet Group and all its operating divisions and Specialist units with (Registration No. **1990/000900/06**), a public company incorporated in accordance with the company laws of the Republic of South Africa;

## **2. INTERPRETATION**

- 2.1 Clause headings in this Agreement are included for ease of reference only and do not form part of this Agreement for the purposes of interpretation or for any other purpose. No provision shall be construed against or interpreted to the disadvantage of either Party hereto by reason of such Party having or being deemed to have structured or drafted such provision.
- 2.2 Any term, word or phrase used in this Agreement, other than those defined under the clause heading "Definitions" shall be given its plain English meaning, and those terms, words, acronyms, and phrases used in this Agreement will be interpreted in accordance with the generally accepted meanings accorded thereto.
- 2.3 A reference to the singular incorporates a reference to the plural and vice versa.
- 2.4 A reference to natural persons incorporates a reference to legal persons and vice versa.
- 2.5 A reference to a particular gender incorporates a reference to the other gender.

## **3. REPORTING**

- 3.1 The Mandatary and/or his designated person appointed in terms of Section 16(2) of the Occupational Health and Safety Act 85 of 1993 ("the OHS Act") shall report to the Risk Manager and/or a Project Manager and/or a representative designated by the Employer prior to commencing the work at the premises of the Employer.

## **4. WARRANTY OF COMPLIANCE**

- 4.1 In terms of this Agreement the Mandatary warrants that he agrees to any of the arrangements and procedures as prescribed by the Employer and as provided for in terms of Section 37(2) of the OHS Act for the purposes of compliance with the OHS Act.
- 4.2 The Mandatary further warrants that he and/or his employees undertake to maintain such compliance with the OHS Act. Without derogating from the generality of the above, nor from the provisions of the said Agreement, the Mandatary shall ensure that the clauses as hereunder described are at all times adhered to by himself and his employees.
- 4.3 The Mandatary hereby undertakes to ensure that the health and safety of any other person on the premises is not endangered by the conduct of his activities and that of his employees.

## **5. APPOINTMENTS AND TRAINING**

- 5.1 The Mandatary shall appoint competent persons as per Section 16(2) of the OHS Act. Any such appointed person shall be trained on any occupational health and safety matter and the OHS Act provisions pertinent to the work is to be performed under his responsibility. Copies of any appointments made by the Mandatary shall immediately be provided to the Employer.
- 5.2 The Mandatary shall further ensure that all his employees are trained on the health and safety aspects relating to the work to be done on the premises of the Employer and that they understand the hazards associated with such work being carried out on the premises. Without derogating from the foregoing, the Mandatary shall, in particular, ensure that all his users or operators of any materials, machinery or equipment are properly trained in the use of such materials, machinery or equipment.
- 5.3 Notwithstanding the provisions of the above, the Mandatary shall ensure that he, his appointed responsible persons and his employees are at all times familiar with the provisions of the OHS Act, and that they comply with the provisions of the Act.

## **6. SUPERVISION, DISCIPLINE AND REPORTING**

- 6.1 The Mandatary shall ensure that all work performed on the Employer's a premise is done under strict supervision and that no unsafe or unhealthy work practices are permitted. Discipline regarding health and safety matters shall be strictly enforced against any of his employees regarding non-compliance by such employee with any health and safety matters.

- 6.2 The Mandatary shall further ensure that his employees report to him all unsafe or unhealthy work situations immediately after they become aware of such conditions and that he in turn immediately reports these to the Employer and/or his representative.

## **7. ACCESS TO THE OHS ACT**

- 7.1 The Mandatary shall ensure that he has an updated copy of the OHS Act on site at all times and that this is accessible to his appointed responsible persons and employees, save that the parties may make arrangements for the Mandatary and his appointed responsible persons and employees to have access to the Employer's updated copy/copies of the Act.

## **8. COOPERATION**

- 8.1 The Mandatary and/or his responsible persons and employees shall provide full co-operation and information if and when the Employer or his representative inquires into any occupational health and safety issues concerning the Mandatary. It is hereby recorded that the Employer and his representative shall at all times be entitled to make such inquiry.
- 8.2 Without derogating from the generality of the above, the Mandatary and his responsible persons shall make available to the Employer and his representative, on request, all and/or any checklists and inspection registers required to be kept by him in respect of any of his materials, machinery or equipment.

## **9. WORK PROCEDURES**

- 9.1 The Mandatary shall, after having established the dangers associated with the work performed, develop and implement mitigation measures to minimize or eliminate such dangers for the purpose of ensuring a healthy and safe working environment. The Mandatary shall then ensure that his responsible persons and employees are familiar with such mitigation measures.
- 9.2 The Mandatary shall implement any other safe work practices as prescribed by the Employer and shall ensure that his responsible persons and employees are made conversant with such other safe work practices as prescribed by the Employer and that his responsible persons and employees adhere to such safe work practices.
- 9.3 The Mandatary shall ensure that work for which any permit is required by the Employer is not performed by his employees prior to the Employer obtaining such permit from the Mandatary.

## **10. HEALTH AND SAFETY MEETINGS**

- 10.1 If required in terms of the OHS Act, the Mandatary shall establish his own health and safety committee(s) and ensure that his employees, being the committee members, provide health and safety representatives to attend the Employer's health and safety committee meetings.

## **11. COMPENSATION REGISTRATION**

- 11.1 The Mandatary shall ensure that he has a valid proof of registration with the Compensation Commissioner, as required in terms of **COID Act**, and that all payments owing to the Commissioner are discharged. The Mandatary shall further ensure that the cover remain in force while any such employee is present on the premises.

## **12. MEDICAL EXAMINATIONS**

- 12.1 The Mandatary shall ensure that all his employees undergo routine medical examinations and that they are medically fit for the purposes of the work they are to perform.

**13. INCIDENT REPORTING AND INVESTIGATION**

- 13.1 All incidents referred to in Section 24 of the OHS Act shall be reported by the Mandatary to the Department of Labour and to the Employer. The Employer shall further be provided with copies of any written documentation relating to any incident.
- 13.2 The Employer retains an interest in the reporting of any incident as described above as well as in any formal investigation and/or inquiry conducted in terms of section 32 of the OHS-Act into such incident.

**14. SUBCONTRACTORS**

- 14.1 The Mandatary shall notify the Employer of any subcontractor he may wish to perform work on his behalf on the Employer's premises. It is hereby recorded that all the terms and provisions contained in this clause shall be equally binding upon the subcontractor prior to the subcontractor commencing with the work. Without derogating from the generality of this paragraph:
- 14.1.1 The Mandatary shall ensure that training as discussed under appointments and training, is provided prior to the subcontractor commencing work on the Employer's premises.
- 14.1.2 The Mandatary shall ensure that work performed by the subcontractor is done under his strict supervision, discipline and reporting.
- 14.1.3 The Mandatary shall inform the Employer of any health and safety hazards and/or issue that the subcontractor may have brought to his attention.
- 14.1.4 The Mandatary shall inform the Employer of any difficulty encountered regarding compliance by the subcontractor with any health and safety instruction, procedure and/or legal provision applicable to the work the subcontractor performs on the Employer's premises.

**15. SECURITY AND ACCESS**

- 15.1 The Mandatary and his employees shall enter and leave the premises only through the main gate(s) and/or checkpoint(s) designated by the Employer. The Mandatary shall ensure that employees observe the security rules of the Employer at all times and shall not permit any person who is not directly associated with the work from entering the premises.
- 15.2 The Mandatary and his employees shall not enter any area of the premises that is not directly associated with their work.
- 15.3 The Mandatary shall ensure that all materials, machinery or equipment brought by him onto the premises are recorded at the main gate(s) and/or checkpoint(s). Failure to do this may result in a refusal by the Employer to allow the materials, machinery or equipment to be removed from the Employer's premises.

**16. FIRE PRECAUTIONS AND FACILITIES**

- 16.1 The Mandatary shall ensure that an adequate supply of fire-protection and first-aid facilities are provided for the work to be performed on the Employer's premises, save that the Parties may mutually make arrangements for the provision of such facilities.
- 16.2 The Mandatary shall further ensure that all his employees are familiar with fire precautions at the premises, which includes fire-alarm signals and emergency exits, and that such precautions are adhered to.

**17. ABLUTION FACILITIES**

- 17.1 The Mandatary shall ensure that an adequate supply of ablution facilities are provided for his employees performing work on the Employer's premises, save that the parties may mutually make arrangements for the provision of such facilities.

**18. HYGIENE AND CLEANLINESS**

- 18.1 The Mandatary shall ensure that the work site and surround area is at all times maintained to the reasonably practicable level of hygiene and cleanliness. In this regard, no loose materials shall be left lying about unnecessarily and the work site shall be cleared of waste material regularly and on completion of the work.

**19. NO NUISANCE**

- 19.1 The Mandatary shall ensure that neither he nor his employees undertake any activity that may cause environmental impairment or constitute any form of nuisance to the Employer and/or his surroundings.
- 19.2 The Mandatary shall ensure that no hindrance, hazard, annoyance or inconvenience is inflicted on the Employer, another Mandatary or any tenants. Where such situations are unavoidable, the Mandatary shall give prior notice to the Employer.

**20. INTOXICATION NOT ALLOWED**

- 20.1 No intoxicating substance of any form shall be allowed on site. Any person suspected of being intoxicated shall not be allowed on the site. Any person required to take medication shall notify the relevant responsible person thereof, as well as the potential side effects of the medication.

**21. PERSONAL PROTECTIVE EQUIPMENT**

- 21.1 The Mandatary shall ensure that his responsible persons and employees are provided with adequate personal protective equipment (PPE) for the work they may perform and in accordance with the requirements of General Safety Regulation 2 (1) of the OHS Act. The Mandatary shall further ensure that his responsible persons and employees wear the PPE issued to them at all material times.

**22. PLANT, MACHINERY AND EQUIPMENT**

- 22.1 The Mandatary shall ensure that all the plant, machinery, equipment and/or vehicles he may wish to utilize on the Employer's premises is/are at all times of sound order and fit for the purpose for which it/they is/are attended to, and that it/they complies/comply with the requirements of Section 10 of the OHS Act.
- 22.2 In accordance with the provisions of Section 10(4) of the OHS Act, the Mandatary hereby assumes the liability for taking the necessary steps to ensure that any article or substance that it erects or installs at the premises, or manufactures, sells or supplies to or for the Employer, complies with all the prescribed requirements and will be safe and without risks in terms of health and safety when properly used.

**23. NO USAGE OF THE EMPLOYER'S EQUIPMENT**

- 23.1 The Mandatary hereby acknowledges that his employees are not permitted to use any materials, machinery or equipment of the Employer unless the prior written consent of the Employer has been obtained, in which case the Mandatary shall ensure that only those persons authorized to make use of such materials, machinery or equipment, have access thereto.

**24. TRANSPORT**

- 24.1 The Mandatary shall ensure that all road vehicles used on the premises are in a roadworthy condition and are licensed and insured. The Mandatary shall ensure that all drivers shall have relevant and valid driving licenses and the Mandatary shall ensure that no vehicle/s shall carry passengers unless it is specifically designed to do and that all drivers shall adhere to the speed limits and road signs on the premises at all times.
- 24.2 In the event that any hazardous substances are to be transported on the premises, the Mandatary shall ensure that the requirements of the Hazardous Substances Act 15 of 1973 are complied with fully all times.

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**25. CLARIFICATION**

- 25.1 In the event that the Mandatary requires clarification of any of the terms or provisions of this Agreement, he should take the necessary steps to contact the Risk Manager of the Employer to obtain such clarification.

**26. DURATION OF AGREEMENT**

- 26.1 This Agreement shall remain in force for the duration of the work to be performed by the Mandatary and/or while any of the Mandatary's employees are present on the Employer's premises.

**27. NON-COMPLIANCE WITH THE AGREEMENT**

- 27.1 If the Mandatary fails to comply with any provisions of this Agreement, the Employer shall be entitled to give the mandatory 7 (seven) days written notice to remedy such non-compliance and if the Mandatary fails to comply with such notice, then the Employer shall forthwith be entitled but not obliged, without prejudice to any other rights or remedies which the mandatory may have in law,

271.1 to suspend the main Agreement; or

27.1.2 To claim immediate performance and/or payment of such obligations.

- 27.2 Should mandatory continue to breach the contract on three occasions, then the Employer is authorised to suspend the main contract without complying with the condition stated in the clause above.



## 29. HEADINGS

The headings as contained in this Agreement are for reference purposes only and shall not be construed as having any interpretative value in them or as giving any indication as to the meaning of the contents of the paragraphs contained in this Agreement.

### Thus done and signed

at \_\_\_\_\_ on the \_\_\_\_\_ day of \_\_\_\_\_ 201\_\_

\_\_\_\_\_  
For and on behalf of the Employer

### Witnesses:

1. \_\_\_\_\_

2. \_\_\_\_\_

at \_\_\_\_\_ on the \_\_\_\_\_ day of \_\_\_\_\_ 201\_\_


\_\_\_\_\_  
for and on behalf of the Mandatary

### Witnesses:

3. \_\_\_\_\_

4. \_\_\_\_\_

# TRANSNET FREIGHT RAIL SAFETY HEALTH AND ENVIRONMENTAL (SHE) COMPLIANCE SPECIFICATIONS FOR CONTRACTORS

<b>CONTRACT NAME:</b>	For the repairs of the Balfour traction Transformer	
<b>CONTRACT NUMBER:</b>	SIC22002CIDB / HOAC-HO-37671	
<b>CONTRACT SCOPE:</b>	<p>Contractor shall remove Radiators and conservator on site, be responsible for the transportation to site, offloading, handling, storage and security of all material required for the construction/execution of the works from site to workshop and to the substation. Contractor is responsible for the dismantling of the transformer, cleaning of parts for assessment.</p> <p>Contractor shall conduct electrical and mechanical assessment Contractor shall unstack the top yoke and remove the old coils.</p> <p>The Contractor shall Overhaul and clean the tap Changers and replace if necessary, among others</p>	
<b>CONTRACT LOCATION:</b>	Depot Engineering Manager-Heidelberg Depot: Balfour traction Transformer	
<b>CONTRACT DURATION:</b>	4 months	
<b>CONTRACT MANAGER:</b>	Thabang Tutubala	
<b>TFR TECHNICAL OFFICER:</b>	Puseletso Pheko	
<b>SHE SPECIFICATION APPROVAL</b>		
<b>TITLE:</b>	<b>NAME:</b>	<b>SIGNATURE:</b>
<b>TFR CONTRACT MANAGER / TECHNICAL OFFICER</b>	Thabang Tutubala	 ..... <b>DATE:</b>
<b>RISK / ENVIRONMENTAL SPECIALIST</b>	Mmagauta Tabane	 ..... <b>DATE:</b> 22/07/2022
<b>SAFETY SPECIALIST / MANAGER</b>	Kedibone Moselane	 ..... <b>DATE:</b> 19/7/2022

Contractor Signature.....

Date.....

## 1. Introduction

- 1.1 This Safety, Health and Environmental (SHE) specification is Transnet Freight Rail (TFR) minimum requirements to be met by contractors when performing work for or on behalf of TFR. They set out the requirements to be followed by the Contractor and other contractors so that the health and safety of all person's potentially at risk may receive the same priority as other facets of the contract.
- 1.2 The Contractor shall **develop a SHE plan and prepare a SHE file** based on these requirements, risk assessment as well as all the relevant applicable legislation. The contractor shall remain accountable for the quality and execution of his health and safety programme for his employees and sub-contractor employees. This specification in no way releases the contractors from compliance with the relevant legislation.

## 2 Purpose

- 2.1 The purpose of this specification is to ensure that the Contractor provides and maintains, as far as reasonably practicable a safe working environment for all employees and the public whilst performing work for or on behalf of TFR.
- 2.2 This specification form an integral part of the contract, and the Contractor shall forward this specification to all subcontractors at the bidding stage so that they can in turn prepare health and safety plans relating to their operations

## 3 Scope and Application

- 3.1 This specification is applicable to all contractors, suppliers and all activities and processes carried out for or on behalf of Transnet Freight Rail. The Specification defines the strategies to manage Health and Safety and is a compliance document drawn up in terms of the Occupational Health and Safety Act 85 of 1993 and Electrical Installation Regulations and National Railway Safety Regulator Act (Act no 16 of 2002) requirements as applicable.
- 3.2 This specification shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the TFR Contract Manager/Technical Officer with full particulars of such subcontractors and shall ensure that they comply with the OHS Act and Regulations and Transnet's safety requirements and procedures.
- 3.3 Every effort has been made to ensure that this specification document is accurate and adequate in all respects. Should it however, contain any errors or omissions they may not be considered as grounds for claims under the contract for additional reimbursement or extension of time, or relieve the Contractor from his responsibilities and accountability in respect of the contract to which this specification document pertains. Any such inaccuracies, inconsistencies and/or inadequacies must immediately be brought to the attention of the TFR Contract Manager/Technical Officer or Client Agent.

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## **4 General**

- 4.1 The Contractor and Transnet Freight Rail are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (herein referred as the OHS Act) and applicable Regulations.
- 4.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the OHS Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. The Contractor shall, before commencement with the execution of the contract work, comply with the provisions set out in the OHS Act, and shall implement and maintain a SHE Plan approved by Transnet Freight Rail, on the Site and place of work for the duration of the contract.
- 4.3 The Contractor accepts his obligation to complying with the OHS Act and applicable Regulations notwithstanding the omission of some of the provisions of the OHS Act and the Regulations from this document.
- 4.4 Transnet Freight Rail accepts, in terms of the OHS Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and TFR Contract Manager/Technical Officer or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the works
- 4.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

## **5. Section 37(2) Agreements**

- 5.1 Transnet Freight Rail and the Contractor shall enter into an agreement in terms of section 37(2) of the Occupational Health and Safety Act to the arrangements and procedures between them to ensure compliance by the Contractor with the provisions of the OHS Act.
- 5.2 The agreement shall be completed and signed by the Contractor mandated representative as soon as possible and returned to the relevant TFR Project Manager / TFR Contract Manager for his/her signature on behalf of TFR.
- 5.3 The Contractor shall enter into a Section 37(2) Agreement with their respective sub-contractors. Signed copy of such agreement must be kept on the Contractor's SHE file.

## **6. Definitions**

- 6.1 In this Specification the definitions as listed in the Occupational Health and Safety Act 85 of 1993 and Construction Regulations, 2014 shall apply, unless the context otherwise indicates: -

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6.1.1 **Competent person** means a person who—

- a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and
- b) is familiar with the Act and with the applicable regulations made under the Act;

6.1.2 **Contractor** means an employer (organisation) or a person who performs ANY work and has entered into a legal binding business agreement contract to supply a product or provide services to Transnet. This applies to the Suppliers, Vendors, Consultants, Service Providers or Contractors. NB: A contractor is an employer in his/her own right (includes Principal Contractor and subcontractor);

6.1.3 **Construction work** means any work in connection with the construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to building or any similar structure.

The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or the moving of land, the making of excavation, piling, any similar civil engineering structure or type of work

6.1.4 **Electrical contractor** means a person who undertakes to perform electrical installation work on behalf of any other person, but excludes an employee of such first –mentioned person

6.1.5 **Excavation work** means the making of any man-made cavity, trench, pit, or depression formed by cutting, digging, or scooping

6.1.6 **Fall protection plan** means a documented plan, which includes and provides for-

- a) all risks relating to working from a fall risk position, considering the nature of work undertaken; and

- b) the procedures and methods to be applied in order to eliminate the risk of fall rescue plan and procedures

6.1.7 **Health and safety (SHE) plan** means a site, activity or project specific documented plan in accordance with the client's health and safety specification.

6.1.8 **Responsibility for electrical installation** means the user or lessor of an electrical installation shall be responsible for the safety, safe use and maintenance of the electrical installation he or she uses or leases

Shall be responsible for the safety of the conductors on his or her premises connecting the electrical installation to the point of supply in case where the point of supply is not the point of control.

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- 6.1.9 **Risk assessment** means a programme to determine any risk associated with any hazard at a work site, in order to identify the steps needed to be taken to remove, reduce or control such hazard
- 6.1.10 **Responsibility for electrical installation** means the user or lessor of an electrical installation shall be responsible for the safety, safe use and maintenance of the electrical installation he or she uses or leases  
Shall be responsible for the safety of the conductors on his or her premises connecting the electrical installation to the point of supply in case where the point of supply is not the point of control.
- 6.1.11 **"Safety, Health and Environmental (SHE) File"** means a file or other record in permanent form, containing the information required to be kept on site in accordance with the OHS Act and applicable Regulations.
- 6.1.12 **"TFR"** means Transnet Freight Rail, a division of Transnet SOC Ltd (Registration No. 1990/000900/30), a public company incorporated in accordance with the company laws of the Republic of South Africa
- 6.1.13 **"TFR Contract Manager"** means a TFR employee appointed to liaise with the contractor to ensure that the specifications of the contract are met (with special emphasis on safety, technical specifications, inspection of quality and quantity of work). It includes a Technical Officer, Depot Engineering Manager, Engineering Technician, Maintenance Supervisor's, Security Inspector, Depot Security Manager, Real Estate Manager, Facilities Manager etc
- 6.1.14 **"Risk assessment"** means a programme to determine any risk associated with any hazard at a work site, in order to identify the steps needed to be taken to remove, reduce or control such hazard
- 6.1.15 **"Safety, Health and Environmental (SHE) File"** means a file or other record in permanent form, containing the information required to be kept on site in accordance with the OHS Act and applicable Regulations.

## 7. Notification of Construction Work

- 7.1 The Contractor who intends to carry out any construction work other than work where a Construction Work Permit is required, must at least 7 days before carrying out such work, notify the Provincial Director of the Department of Labour in writing if the construction work:-
- (a) includes excavation work
  - (b) includes working at a height where there is a risk of a person falling.
  - (c) includes the demolition of a structure; or
  - (d) includes the use of explosives to perform construction work,

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- 7.2 The notification to the Provincial Director shall be on a form similar to Annexure 2 of the Construction Regulations, 2014. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, TFR Contract Manager/Technical Officer or employee.

## **8. Letter of Good standing**

- 8.1 The Contractor shall submit proof of registration and Letter of Good Standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Diseases Act, 1993 (Act No. 130 of 1993) for his company and each of his sub-contractors'.
- 8.2 No contractor may do any work for TFR without a valid letter of good standing. The Contractor must ensure that the Letter of Good Standing remains valid for the duration of the contract period.
- 8.3 The letter of good standing must reflect the name of the Contractor and/or Sub-contractor, registration number and, expiry date.

## **9. Management and Supervision**

- 9.1 The Contractor and all subcontractors shall submit a SHE organogram outlining the site SHE management structure including the relevant appointments/competent persons or the intended appointments where such appointments have not been made.
- 9.2 The Contractor shall, in accordance with the OHS Act and applicable Regulations, make all the necessary appointments of competent persons in writing. Copies should also be retained on the SHE file.

## **10. SHE Committee Meetings and SHE Representatives**

- 10.1 Where applicable, The Contractor and subcontractors shall appoint SHE Representative/s in writing after consultation with employees and ensure that they are trained in performing their duties.
- 10.2 SHE Representatives duties shall include inspections of the workplace, taking part in incident investigations, risk assessments, attending SHE Committee meetings etc. Records of monthly inspections of SHE Representatives must be kept on the SHE file.
- 10.3 The number of SHE Representatives appointed shall be in accordance with the requirements of the Occupational health and Safety Act 85 of 1993.
- 10.4 When required by legislation, the Contractor must ensure that a SHE Committee meeting is held monthly and minutes of such meeting shall be recorded and records kept on the SHE file. The Contractor representative and appointed SHE representatives shall attend the monthly SHE Committee meeting.
- 10.5 The TFR Contract Manager/Technical Officer or his deputy shall be allowed to attend meetings of the Contractor's health and safety committee as an observer.

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- 10.6 Subcontractors appointed by the Contractor shall have their own internal monthly SHE Committee meeting.

## **11. SHE Audits and Contractor Monthly Reports**

- 11.1 The TFR Contract Manager/Technical Officer or his deputy shall ensure that the Contractor's SHE Plan is audited at intervals mutually agreed to between them, but at least once every month to ensure that the SHE Plan is implemented and maintained on site.
- 11.2 TFR Safety Officers / Specialists shall at all reasonable times be allowed access to the work sites, the Contractor site offices and tool-sheds to inspect the Contractor's and its subcontractor's tools, equipment, registers and workplace.
- 11.3 Should any non-compliances or contraventions to the TFR safety requirements, legal requirements, this specification or the Contractor's SHE Plan be identified, such non-compliances or contraventions shall be rectified by the contractor at its cost immediately or within a period specified by the TFR Contract Manager/Technical Officer, his deputy, or TFR Safety Officers / Specialists.
- 11.4 Should the Contractor refuse or fail to rectify such non-compliances or contraventions, TFR may take remedial action at the Contractor's cost as it may deem necessary to ensure safety at the TFR sites at all times.
- 11.5 TFR reserves the right to conduct safety audits without prior warning.
- 11.6 The Contractor on all contracts of more than 1 month shall provide a monthly safety performance report as required by TFR.
- 11.7 The Monthly safety performance report shall be compiled in terms of Annexure 1 or in any format that the Contractor has as long as it includes all items listed in Annexure 1.

## **12. Training, Competence and Awareness**

### **12.1 Induction Training**

- 12.1.1 The Contractor shall ensure that all his employees and subcontractors employees undergo a TFR SHE Induction with regard to the general hazards prevalent on the site, rules and regulations, and other related aspects before commencing work. It is the responsibility of the contractor to inform TFR whenever new employees are appointed after the initial induction was conducted.
- 12.1.2 In addition to the TFR SHE induction, it is the responsibility of the Contractor to develop and implement a site specific SHE Induction programme, a job specific induction programme and a general employee SHE awareness programme, to develop awareness amongst employees on the generic SHE issues associated with the scope of work and the specific environmental issues in question.

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- 12.1.3 The Contractor shall ensure that all visitors and suppliers to the site undergo and comply with Contractors' site-specific safety induction requirement prior to being allowed access to site. All visitors and suppliers shall sign the attendance register.
- 12.1.4 All visitors and suppliers shall wear the necessary personal protective equipment whilst on site and shall remain in the care of the host who understand the scope of work and associated risks.
- 12.1.5 The Contractor shall maintain comprehensive attendance records of SHE induction training on the SHE file.

## **12.2 Competency / Training**

- 12.2.1 The Contractor must ensure that all his employees are adequately trained to perform the tasks allocated to them and that there is the requisite amount of supervision at all times to maintain safe work practices and standards.
- 12.2.2 The Contractor shall identify training requirements of employees whose work may have a significant impact on their health and safety or that might create a significant impact upon the environment and ensure that these employees will receive appropriate training. A Training matrix shall be used as a mechanism to manage and control the training of employees.
- 12.2.3 The Contractor shall identify all training needs and incorporate the site-specific training into the SHE plan.
- 12.2.4 Each Contractor shall be required to ensure that before an employee commences work on the contract that the supervisor in control with responsibility for the employee has informed the employee of his scope of authority and any hazards associated with the work performed. This will include man-job specifications, the discussion of any standard task procedures or hazardous operational procedures to be performed by the employee
- 12.2.5 The Contractor is to ensure that the supervisor has satisfied himself that the employee is conversant with all hazards associated with any work to be performed by conducting task observations.
- 12.2.6 The Contractor must ensure that certificate/s of competence where applicable is/are provided in the SHE File.

## **12.3 Awareness Training**

- 12.3.1 Awareness training required shall be identified for all employees on the contract using the SHE Policy, the SHE Plan, the SHE programmes and procedures.
- 12.3.2 The Contractor shall have a daily safety talk. This talk shall include subcontractor employees.
- 12.3.3 The talk must be brief and concise. Subject topics should be applicable to the job at hand, incidents, accidents and up-and-coming work will be discussed along with

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suggestions and comments. These meetings can be used as a training meeting with the central idea of educating employees.

### **13. Health and Safety Plan (SHE Plan)**

13.1 Potential Contractor submitting tenders shall submit with their tender, a Health and Safety Plan setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the OHS Act and Regulations, this SHE specification and particularly in respect of: -

- (a) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the OHS Act.
- (b) the execution of the contract work in such a manner as to ensure in terms of section 9 of the OHS Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety.
- (c) ensuring, as far as is reasonably practical, in terms of section 37 of the OHS Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.

13.2 The Contractor's Health and Safety Plan shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.

13.3 The SHE Plan shall include full particulars in respect of: -

- (a) Safety Management Structure arrangements i.e., Appointments to be done and how.
- (b) SHE Organisation arrangements i.e., SHE Committees, SHE Audits, Findings and Corrective Actions
- (c) Risk Management i.e., Risk Assessment frequencies, methodology
- (d) Education and Training i.e., safety induction, site / job specific training arrangements
- (e) Emergency Planning
- (f) Health and Safety Communication i.e., Toolbox talks, incident recall
- (g) Safe working methods and procedures to be implemented i.e., safe work procedures, task observation

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- (h) Fall Protection Plan i.e., documented plan, training/competency, medical surveillance, rescue plan
- (i) Personal protective Equipment and Clothing
- (j) Contract Security i.e., site access control and security
- (k) SHE Costs
- (l) Occupational Health i.e. Medical Surveillance, First Aid, Welfare Facilities, Substance Abuse testing, Noise, Vibration, Manual Handling etc
- (m) Environmental management
- (n) Incident Management i.e. reporting and investigation
- (o) Operational Control
- (p) Review plan of the SHE Plan and
- (q) COVID-19 Requirements

13.5 The Contractor shall submit a final SHE Plan after awarding of the contract which shall be subject to the TFR Contract Manager/Technical Officer's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the TFR Contract Manager/Technical Officer's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the OHS Act and Regulations.

13.6 The Contractor shall approve the SHE Plan of the subcontractor and further take reasonable steps to ensure that each subcontractor's SHE Plan is implemented and maintained on the site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between them, but at least once every month.

13.7 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's SHE Plan for the site or which poses a threat to the health and safety of persons.

13.8 The Contractor shall ensure that a copy of the SHE Plan is available on site for inspection by an inspector, TFR Contract Manager/Technical Officer, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.

#### **14. Hazards Identification and Potential Hazardous Situations**

14.1 The Contractor shall ensure a risk assessment is carried out by a competent person, appointed in writing, before commencement of any work and reviewed during the

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duration of the contract period. The Risk Assessments shall form part of the Health and Safety Plan to be applied on the site and shall include at least the following:

- (a) The identification of the risks and hazards (including ergonomic risks) that persons may be exposed to.
  - (b) The analysis and evaluation of the hazards identified.
  - (c) A documented plan, including safe work procedures to mitigate, reduce or control the; risks identified; and
  - (d) A monitoring and review plan.
- 14.2 Risk assessments shall be conducted by a competent person and such person shall use a documented method to analyse and evaluate identified risk and hazards.
- 14.3 The Contractor shall consult with the health and safety committee or, if no health and safety committee exist, with a representative group of employees, on the development, monitoring and review of the risk assessment
- 14.4 The risk assessment shall be reviewed when there are changes that affect the design of the structure that may affect the health, safety and environment on site or after an incident.
- 14.5 The Contractor shall ensure that all employees are to be informed, instructed and trained regarding any risks, hazard and related SHE procedures by a competent person as outlined in the risk assessment prior to commencement of work and thereafter at predetermined intervals as outlined in the monitoring plan.
- 14.6 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the risk assessment before any work commences, and thereafter at such intervals as may be determined in the risk assessment.
- 14.7 The risk assessment shall be available on site for review. Where a risk assessment is not readily available or not communicated to contractor employees, the construction activities shall be stopped until such time the contractor complies.
- 14.8 The Contractor and the TFR Contract Manager/Technical Officer shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the contract or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.
- 14.9 The Contractor shall be required to analyse his scope of work and define these critical activities. For each activity, a risk assessment shall be required which defines systems and safe work procedures that will be used in order to complete the activity safely.
- 14.10 Copies of all safe work procedures and proof that employees have been trained on those safe work procedures shall be kept on the SHE file.

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- 14.11 Preliminary risk and hazard identification shall be conducted by the Contractor prior to work commencement on site. Should the Client's Agent, Project Manager, TFR Contract Manager/Technical Officer or his duly nominated alternative identify hazardous activities performed by the Contractor on the site for which the Contractor has not submitted a risk assessment, the Contractor shall be required to do so before continuing with work.

## **15. Safety, Health and Environmental (SHE) File**

- 15.1 The Contractor shall prepare a SHE file and submit to TFR Contract Manager for approval prior to commencement of work on site. The file shall include all documentation required as per the OHS Act and applicable regulations.
- 15.2 The approval time of the SHE file is at least 5 working days
- 15.3 The Contractor shall ensure that a copy of both his or her SHE File as well as any subcontractor's SHE File is kept on site and made available to an inspector of the Department of Labour, the TFR Contract Manager/Technical Officer, or subcontractor upon request.
- 15.4 The Contractor shall hand over a consolidated SHE file to the TFR Contract Manager/Technical Officer upon completion of the Construction Work and shall in addition to documentation mentioned in the OHS Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

## **16. Occupational Health**

### **16.1 Medical Surveillance Programme**

- 16.1.1 The Contractor shall ensure that all his and subcontractor employees have a valid medical certificate of fitness issued by an Occupational Health Practitioner.
- 16.1.2 Medical certificate of fitness must be available and be kept in the SHE file.

### **16.2 Substance Abuse**

- 16.2.1 All Contractors must comply with the Transnet Substance Abuse Policy and Regulation 2A of the General Safety Regulations of the OHS Act.
- 16.2.2 No Contractor may possess, sell, offer to other person, use, store, manufacture, transport, distribute, or transfer drugs or alcohol during work hours, on or off TFR premises.
- 16.2.3 TFR will not tolerate substance abuse or use which put at risk the health and safety of its employees or threatens its services to our stakeholders. It is on this basis that a contractor employee will be considered unfit for work if:
- (a) He/she is subjected to alcohol screening and/or alcohol testing and is found to have alcohol in his/her breathe and/or blood.

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- (b) Refuses to undergo substance screening and/or testing.
- (c) He /she produces a positive confirmatory test for any other substances, measured by sample analysis at a registered pathological laboratory and authorised by a medical practitioner; and/or
- (d) Through observation by security personnel or TFR Contract Manager, it is evident that the contractor's physical, emotional, mental or behavioural state reflects that they are intoxicated or under the influence.

16.2.4 Any transgression of this policy will constitute a breach of the relevant contract and may result in the termination of services/contract.

16.2.5 Any contractor employee using medication that has a narcotic effect must declare before work to his / her supervisor.

### 16.3 Occupational Hygiene

16.3.1 The Contractor shall conduct Health Risk Assessments of all the Occupational Hygiene / Environmental stressors (e.g. noise, dust, illumination, HCS, heat & cold stressors, ergonomics, etc.) present in the area where they operate to determine if there is any possible worker exposure. Records of all these assessments should be documented and kept up to date.

16.3.2 The Contractor shall monitor the extent to which their employees are exposed to the occupational hygiene stressors. These assessments shall be conducted by an Approved Inspection Authority as listed on the Department of Labour database. The findings from these assessments should be kept on the SHE file, communicated to all affected parties and be reported to relevant authorities.

### 16.4 First Aid requirements

16.4.1 All Contractors shall ensure that their employees receive prompt first aid treatment in case of injury or emergency. The Contractor must have the necessary equipment and/or facility on site for treatment of injured persons.

16.4.2 Contractor shall ensure that the first aid box / boxes are available and accessible. More first aid boxes shall be provided if the risks, distance between work teams, or the working environment requires it.

16.4.3 Taking into account the type of injuries that are likely to occur on site, the nature of activities performed and the number of employees on site, the Contractor shall ensure that the first aid box contain suitable first aid equipment which includes at least the minimum contents as listed on Annexure 1 of General Safety Regulation (GSR).

16.4.4 The Contractor must ensure that trained / certificated first-aid personnel are appointed and be available on site at all times. The ratio of first aiders to employees shall be 1:50.

### 16.5 Asbestos Control

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- 16.5.1 The Contractor shall inform the TFR Project Manager or TFR Contract Manager if during construction work asbestos or suspected asbestos containing material is found. Only Asbestos Approved Contractor can work on asbestos containing material.

## **16.6 Noise**

- 16.6.1 The Contractor shall ensure that the requirements of the Noise Induced Hearing Loss Regulations are complied with.
- 16.6.2 Contractor shall ensure that machinery and equipment are operated at noise levels not exceeding an equivalent level of 85-dB (A) during normal working conditions.
- 16.6.3 Where the noise levels at the Operator position or to employees working in the vicinity exceed an equivalent level of 85-dB (A) during normal working conditions, the Contractor shall take appropriate measures to reduce such levels to an equivalent level of 85-dB (A). The use of Personal Protective Equipment (PPE) should be the last resort.
- 16.6.4 All employees exposed to noise must be trained on the effects of exposure, precautionary measures to be taken to prevent exposure and the correct use of PPE.
- 16.6.5 Noise zones must be demarcated as such.

## **16.7 Vibration**

- 16.7.1 Contractors must put measures to reduce the risks associated with hand-arm vibrations, avoid, whenever possible, the need for vibration equipment.
- 16.7.2 Contractor shall develop a good maintenance regime for tools and machinery. This may involve ensuring that tools are regularly sharpened, worn components are replaced or engines are regularly tuned and adjusted.
- 16.7.3 The Contractor must introduce a work pattern that reduces the time exposure to vibrations.
- 16.7.4 The Contractor shall issue employees with gloves and warm clothing. There is a debate as to whether anti-vibration gloves are really effective, but it is agreed that warm clothing helps with blood circulation which reduces the risk of vibration white finger. Care must be taken so that the tool does not cool the hand of the operator.

## **16.8 Manual Handling**

- 16.8.1 Contractor must reduce risk of injury due to manual handling by using mechanical assistance involving the use of mechanical aids to assist the manual handling operation. Mechanical aids such as hand-powered hydraulic hoists, especially adapted trolleys, hoist for lifting patients and roller conveyors can be used.
- 16.8.2 Contractor shall ensure all employees involved in manual handling are trained in good lifting techniques.

## **16.9 Dust**

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16.9.1 The Contractor shall monitor dust caused by their activities, mobile equipment, generators and other equipment during construction. Factors such as wind can often affect the intensity to which the impact is experienced.

16.9.2 Dust suppression measures must be in place to reduce the dust caused by the activities on site.

16.9.3 Appropriate PPE should be provided to exposed employees.

#### **16.10 Weather precautions**

16.10.1 In the event of adverse weather (high winds, flooding, storm surge, lightning etc) or other conditions, the Contractor must institute precautionary measures to protect employees on site.

16.10.2 The Contractor shall take steps to prevent heat stroke, dehydration and exhaustion of employees as a result of exposure to excessive heat on site. Such steps may include employees taking regular breaks, consuming enough water, provision of sun brims for their hard hats and sunscreen to protect them against sun burn.

16.10.3 The Contractor shall take steps to prevent hypothermia or dangerous overcooling of the body as a result of exposure to cold temperatures.

#### **16.11. Welfare Facilities**

16.11.1 The Contractor must ensure that all workplace facilities meet health, safety and welfare needs of all employees, including disabled persons where applicable.

16.11.2 The Contractor must in addition to Facilities Regulations 2004, provide at or within reasonable access of every construction site, the following clean, hygienic and maintained facilities:

- (a) shower facilities, at least one shower facility per 15 persons
- (b) at least one sanitary facility for each sex and for every 30 workers
- (c) changing facilities for each sex; and
- (d) sheltered eating areas

16.11.3 The Contractor must provide reasonable and suitable living accommodation for the workers at construction sites who are far removed from their homes and where adequate transportation between the site and their homes or other suitable living accommodation, is not available

#### **16.12 COVID 19 Requirements**

16.12.1 The contractor shall complete and submit to the TFR Contract Manager a declaration stating that the contractor is permitted to operate in terms of the provisions of the Disaster Management Act 2002 (Act No 57 of 2002) and Regulations, Transnet COVID-19 Guidelines and COVID-19 Occupational Health and Safety Measures in Workplaces, COVID-19 (C19 OHS), 2020 and have prepared a COVID-19 Workplace Readiness Plan

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and shall operate within the regulated permissions and restrictions of applicable lockdown level.

- 16.12.2 The contractor must ensure that all its employees are trained on the health risks and hazards associated with COVID-19 and what precautionary measures they must follow for the protection of their health, including the proper use and maintenance of PPE. They are prepared and informed regarding updated rules, hygiene and behavioural practices, complete a "return to work interview" with their line manager and sign commitment to maintain social distancing.
- 16.12.3 The contractor shall ensure that every employee reporting for duty is screened to ascertain whether they have any observable symptoms associated with COVID-19 and require such employee to immediately inform the contractor if he/she experiences such symptoms
- 16.12.4 Non-essential physical work that requires close contact between workers should be avoided where it is possible to do so.
- 16.12.5 Where it is practicable, every employee must be issued with own tool for use for the duration of the shift. Tools and equipment in stores should be sanitised before issued and on return to the stores.
- 16.12.6 Washing hands facilities must be provided on site, and where it is not available, employees should be provided with hand sanitisers. Employees should be encouraged to regularly wash their hands.
- 16.12.7 Alcohol testing on site should be managed in such a way that no employee is exposed to the virus and contractors must promote personal hygiene. Breathalyzer equipped with disposable mouthpieces shall be used and shall be cleaned and/or disinfected after every use.
- 16.12.8 All non-essential visitors to site are not allowed, only suppliers are allowed. Suppliers must be advised in advance of the COVID-19 site screening tests and required COVID-19 PPE requirements for the site.
- 16.12.9 Where site meetings are held, only absolutely necessary meeting participants should attend. Social distancing should be maintained.
- 16.12.10 The contractor shall when transporting his employees to TFR premises comply with the regulations which outlines that 70% of the vehicle capacity can be utilised or as applicable at the time.
- 16.12.11 The contractor shall inform the TFR Contract Manager when any of its employees working on TFR premises has been diagnosed with COVID-19. The contractor shall investigate the cause and control failure and review its risk assessment to ensure that the necessary controls and PPE requirements are in place.

### **16.13 Work in Confined Space**

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- 16.13.1 The Contractor shall ensure that a confined space is only entered by an employee or any other person only after the air therein has been tested and evaluated by a person who is competent to pronounce on the safety thereof, and who has certified in writing that the confined space is safe and will remain safe while any person is in the confined space, taking into account the nature and duration of the work to be performed therein.
- 16.13.2 The Contractor shall take steps to ensure that any confined space in which there exist or is likely to exist a hazardous gas, vapour, dust or fumes, or which has or likely to have, an oxygen content of less than 20 percent by volume, is entered by an employee or other person only when:
  - (a) the confined space is purged and ventilated to provide a safe atmosphere therein and measures necessary to maintain a safe atmosphere therein have been taken.
  - (b) the confined space is isolated from all pipes, ducts and other communicating openings by means of effective blanking other than the shutting or locking of a valve or a cock, or, if this is not practicable, only when all valves and cocks which are a potential source of danger have been locked and securely fastened by means of chains and padlocks.
- 16.13.3 The Contractor shall ensure that the provisions of General Safety Regulation 5 are complied with regard to work on confined space
- 16.13.4 The Contractor must take into consideration that a tunnel is defined as a confined space in terms of the General Safety Regulations and must ensure compliance to the above when working in tunnels.

## 17 Incidents/Occurrences

- 17.1 All incidents referred to in Regulation 9 of General Administration Regulations of the OHS Act involving the contractor and his subcontractor on TFR premises, shall be reported to the TFR Contract Manager and Department of Labour as prescribed by the OHS Act.
- 17.2 TFR must be forwarded with a copy of a report of any investigation, formal inquiry conducted in terms of Section 31 and 32 of the Act into any incident involving the contractor, his subcontractor, any person or machinery under his control on TFR premises.
- 17.3 TFR Contract Manager must be informed of the above incidents/occurrences before the end of shift when the incident/occurrence occurred.
- 17.4 The Contractor shall make available its employees to attend as witnesses when required so by TFR during an investigation into any incident where TFR believes the said contractor employees were witnesses or may assist in the investigation.
- 17.5 The contractor shall make available to TFR any documents required to assist in their investigation.

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## **18. SHE Cost**

- 18.1 The Contractor shall ensure that it has made adequate provision for the cost of health and safety measures in the tender offer.
- 18.2 The Contractor shall ensure that its subcontractors have made adequate provision for the cost of health and safety measures in the tender offer.

## **19. Personal Protective Equipment (PPE)**

- 19.1 The Contractor shall ensure that all employees are provided with appropriate prescribed Personal Protective Equipment (PPE) free of charge (according to General Safety Regulations (2), suitable for the type of activities that the employees will perform.
- 19.2 Such PPE shall be approved by credible institution such as SABS, EN, or AN.
- 19.3 The Contractor shall manage the issuing of PPE and ensure that PPE is used at all times. Employees shall be trained in the proper use of PPE.

## **20. Emergency Evacuation Plan and Procedure**

- 20.1 The Contractor must establish and implement an emergency evacuation plan to ensure that in the event of fire, explosion structural collapse etc. all staff is able to evacuate the area to a demarcated area for the purpose.
- 20.2 The area so selected must be demarcated and the relevant "Assembly Point" sign displayed where applicable or use TFR nearest assembly point.
- 20.3 An Emergency Evacuation Procedure must be drawn up; all staff members and contractors shall be given awareness training and participate in regular evacuation drills.
- 20.4 The Contractor and its employees shall collaborate and adhere to TFR evacuation drills and requirements.

## **21. Access Control and Security**

- 21.1 The Contractor shall, before commencing any work, obtain from the TFR Contract Manager/Technical Officer a Site Access Certificate signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 21.2 No Site Access Certificate will be granted to the Contractor who fails to comply with TFR minimum SHE requirements, with the SHE File not approved and without the SHE induction been concluded.
- 21.3 The Contractor must assess the security risks and implement appropriate measures. All contractors are to strictly adhere to all security requirements on the premises.

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- 21.4 The Contractor in collaboration with the TFR representative will ensure that proper access control is in place and functional at all times onto and out of the site. A form of access control will be issued to contractor employees who have been inducted and submitted copies of ID documents or work permits (where required).
- 21.5 Access Permits should be carried by a contract employee at all time when on site. Access Permits shall be produced at the point of entry / gate.
- 21.6 Contractors shall ascertain from TFR Contract Manager/Technical Officer the correct route along with their employees may proceed when coming on or going off shift and direct their employees accordingly.

## **22. Management of Subcontractors**

- 22.1 The Contractor is directly responsible for the actions of his contractors/sub-contractors.
- 22.2 The Contractor will also be responsible for initiating any remedial action (recovery plan) that may be necessary to ensure that the contractor complies with all requirements.
- 22.3 The Contractor shall provide any contractor who is making a bid or appointed to perform construction work, with the relevant sections of the documented SHE specification, who would in turn provide a SHE plan for approval.
- 22.4 The Contractor shall carry out inspection/audits on the contractor/subcontractor to ensure that their SHE plan is being implemented and maintained and submit audit report to TFR Representative.
- 22.5 The Contractor shall stop any contractor/subcontractor from executing construction work which poses a threat to the safety and health of persons or the environment.
- 22.6 The Contractor shall ensure that the sub-contractors appointed have the necessary competencies and resources to perform the work safely.
- 22.7 The Contractor will be required to submit 37(2) mandatory agreement between the Contractor and subcontractor to the TFR Contract Manager

## **23. Environmental Management**

- 23.1 The Contractor shall identify, document and comply with all pertinent Environmental laws and associated Regulations, approvals, licenses and permits which are applicable to the Services and activities undertaken.
- 23.2 Before commencement with any of the services to be rendered to TFR, the Contractor shall make available all personnel who will be working on the specified contract to be given environmental induction training. All Contractor employees arriving on the site shall attend such induction.
- 23.3 The Contractor shall adhere to all instructions issued by Contract Manager or his /her delegated person in promotion of environmental management and legal compliance.

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- 23.4 The Contractor shall determine the correct positioning of topsoil stockpiling to avoid massive disturbance and prepare the topsoil for reuse during landscaping.
- 23.5 Concrete shall not be mixed directly on the ground or any other permeable surface. Should concrete batching activities occur, these should be located in the designated area on site with low environmental sensitivity levels.
- 23.6 All excess concrete shall be removed from site on completion of plastering or concrete pouring and disposed of in an environmentally acceptable manner.
- 23.7 The Contractor shall ensure that his or her employees are aware of the procedures to be followed when dealing with spills and leaks, which shall include notifying the relevant authorities and TFR as required in terms of National Environmental Management Act (NEMA), 1998 and National Water Act (NWA), 1998. The Contractor shall ensure that all necessary material and equipment required for use during clean – up/rehabilitation of spills and leaks are available on site at all times. Treatment, remediation and/or rehabilitation of contaminated areas shall be undertaken to the reasonable satisfaction of the TFR Environmental Control Officer or relevant Environmental Specialist.
- 23.8 Contractor shall be solely responsible for the control of dust generated from his or her activities. Excavation, handling and transport of erodable material shall be avoided under aggressive wind conditions or when a visible dust plume is present. If dust damping measures are deemed inadequate, working must cease until the wind speed drops to an acceptable level.
- 23.9 Construction activities generating output levels of 85 db (A) or more shall be confined to the hours 08h00 to 17h00 Mondays to Fridays (close to residential areas).
- 23.10 No on-site burying or dumping of waste material shall occur. Waste must be collected by a licensed waste transporting contractor and disposed of at a licensed disposal site. Disposal certificate must be made available to TFR on request.
- 23.11 Waste bins must be provided in sufficient number and capacity to store solid waste produced on a daily basis. These bins must be kept closed and emptied regularly.
- 23.12 A designated re-fuelling area (s) must be provided. The re-fuelling area must be protected from hydrocarbon spillage to the reasonable satisfaction of the TFR Environmental Control Officer or Relevant Environmental Specialist. As a minimum requirement, re-fuelling and workshop areas shall have a bunded floor surface and storm water collection mechanism. Refuelling shall always be accompanied by the use of drip trays.
- 23.13 The Contractor must notify the Contract Manager immediately of any pollution incident. An incident record system shall be maintained on site for inspection by TFR and relevant authorities.
- 23.14 All vehicles and equipment's shall be kept in good working condition. All leaking equipment's shall be repaired immediately or removed from site. All vehicles and equipment shall be maintained and not emit excessive noise.

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- 23.15 In case of major hydrocarbon spill or leakage as a result of equipment failure, Contract Manager must be made aware of such event and the affected area must be fenced off and be cleaned immediately to the reasonable satisfaction of the TFR Environmental Control Officer to prevent contamination of soil and both surface and groundwater.
- 23.16 The Contractor shall ensure that no spillage occurs when toilets are being cleaned or emptied and that the contents are removed from site by a licensed service provider.
- 23.17 The use of borrow pits for the construction of access roads must comply with the provisions of Minerals and Petroleum Resources Development Act of 2004 as amended and should not be located inside the border of any protected area (e.g. Nature Reserve).
- 23.18 All disturbed areas must be rehabilitated to the reasonable satisfaction of TFR Environmental Control Officer or Relevant Environmental Specialist.
- 23.19 Transportation, handling and storage of all substances classified as hazardous must comply with the provisions of the Hazardous Substances Act, 15 of 1973, relevant Regulations and SANS Codes.
- 23.20 Archaeological remains, artificial features and structures older than 60 years are protected by the Natural Heritage Resources Act, 25 of 1999. Should any archaeological artefact be exposed during construction or any contract work, such work must be stopped immediately. The TFR Environmental Control Officer must be called in for inspection and to recommend the way-forward. Under no circumstances may any artefacts be destroyed or removed from site.
- 23.21 The extraction of water for construction purposes must at all times comply with licensing requirements of Department of Water Affairs, where applicable. Extraction of water from a stream or a river requires approval.
- 23.22 Blasting work that may be required on site shall be carried out entirely within the provisions of the Explosives Act, 26 of 1956 and other relevant engineering and safety standards.
- 23.23 Office and camp sites shall be established, as far as is practicable, outside the flood plain, above the 1:50 flood level mark within the boundaries of the construction area.
- 23.24 No camp or office site shall be located closer than 100 metres from a stream, river, spring, dam or pan.
- 23.25 The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation.
- 23.26 Camps and site offices shall be fenced (where necessary) in consultation with the landowner.
- 23.27 The Project Manager or TFR Contract Manager may, at his or her discretion stop any work, activity or process not in accordance with Environmental laws and associated Regulations, approvals, licenses and permits.

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23.28 The contractor shall preserve wild life in terms of the NEMA.

## **24 Operational Safety**

### **24.1 National Safety Regulator requirements**

- 24.1.1 The Contractor shall ensure that its equipment, machinery and employees when on TFR premises complies fully with all applicable railway safety requirements and/or regulations of the National Safety Regulator Act 16 of 2002 and the relevant SANS Codes of Practice.
- 24.1.2 Permission for the engagement of a subcontractor by the Principal both initially and during a contract shall be subject to a review by TFR of the capability of the proposed subcontractor to comply with railway safety requirements and user specifications.
- 24.1.3 The Contractor and/or his subcontractors must grant TFR access, during the term of the contract, to review any railway safety related activities, including the coordination of such activities across all parts of the organisation.
- 24.1.4 The Contractor shall ensure that where applicable, such work is performed by person who has the necessary competencies as required in terms of any applicable railway safety standard or code of practice.
- 24.1.5 The Contractor shall ensure that all his employees are protected from the risk of being hit by moving trains.
- 24.1.6 The Contractor must ensure that it complies to the requirements of RSR 00-4-1.2016 Edition 1, Part 4-1 Human Factors Management-Fatigue Management standard.

### **24.2 Special Permits**

- 24.2.1 Where special work permits are required before work may be carried out such as for e.g. hot work (welding, cutting etc.), isolation, and occupations, the Contractor shall apply to the TFR Contract Manager/Technical Officer or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such work permits.

### **24.3 Vehicle Safety**

With respect to vehicles, vehicles and mobile plants the Contractor must ensure that:

- 24.3.1 They are of an acceptable design and maintained in a good working order and are used in accordance with their design and the intention for which they were designed
- 24.3.2 Are operated by a person who-has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate such vehicle and mobile plant;
- 24.3.3 Are operated by a person who has a medical certificate of fitness to operate those vehicle and mobile plant, issued by an occupational health practitioner.

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- 24.3.4 Vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried. No employees will be allowed to be transported at the back of LDV's / bakkies unless it is provided with a seat and safety belt and further that the risk assessment has indicated it to be a low risk.
- 24.3.5 Vehicles are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn.
- 24.3.6 Vehicle must be equipped with an acoustic warning device which can be activated by the operator and an automatic acoustic reversing alarm
- 24.3.7 Vehicles must be inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.
- 24.3.8 No person rides or is required or permitted to ride on a construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose.
- 24.3.9 All vehicles or mobile plant when not in use, have buckets, booms or similar appendages, fully lowered or blocked, controls in a neutral position, motors stopped, wheels chocked, brakes set and ignition secured.
- 24.3.10 Whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation
- 24.3.11 Tools, material and equipment are secured and separated by means of a physical barrier in order to prevent movement when transported in the same compartment with employees.
- 24.3.12 Where applicable, also in collaboration with the TFR representative and other appropriate personnel develop a traffic management plan for the site to ensure the safe movement of all construction related mobile plant where applicable
- 24.3.13 This plan is to be reviewed as and when required to ensure its applicability where applicable.
- 24.3.14 Those working or operating on public roads comply with the requirements of the National Road Traffic Act, 1996.

#### **24.4 Housekeeping and general safeguarding on sites**

- 24.4.1 Contractor must ensure that suitable housekeeping is continuously implemented on each work site
- 24.4.2 The Contractor must ensure proper storage of materials and equipment and the removal of scrap, waste and debris at appropriate intervals.
- 24.4.3 The Contractor must ensure that materials required for use, are not placed on the site so as to obstruct means of access to and egress from workplaces and passageways

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24.4.4 The Contractor must ensure that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals.

## **24.5 Hazardous Chemical Substances (HCS)**

24.5.1 The Contractor must ensure that all employees exposed to hazardous chemicals are trained on the potential source of exposure, potential risk to health caused by exposure and measures to be taken by the contractor and employees against any risk of exposure.

24.5.2 HCS risk assessment to be conducted and where it indicates that any employee may be exposed, the contractor shall ensure that monitoring is carried out in terms of regulation 6 and 7 of the Hazardous Chemical Substances Regulations.

24.5.3 Employees exposed to hazardous substances shall be under medical surveillance

24.5.4 Where herbicides are used, the contractor shall comply with all relevant legislative requirements pertaining to the use of herbicides and that work is undertaken under the supervision of a person with a valid certificate in Pest Control.

## **24.6 Stacking and Storage**

24.6.1 The Contractor shall ensure that a competent person is appointed in writing with the duty of supervising all stacking and storage.

24.6.2 Adequate storage areas are provided, demarcated as storage areas and are kept neat and under control.

## **24.7 Fire Precautions and Fire Safety**

24.7.1 The Contractor must ensure that all appropriate measures are taken to avoid the risk of fire. The Contractor shall comply to the fire precautions as stipulated in the Environmental Regulations for Workplaces, 1987 and regulation 29 of the Construction Regulations, 2014

24.7.2 Sufficient and suitable storage is provided for flammable liquids, solids and gases.

24.7.3 Smoking is prohibited and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials

24.7.4 The Contractor shall ensure that the work areas are clear, at all times, of any material, which could fuel a fire and that combustible materials do not accumulate, oily rags, waste and other substances liable to ignite are without delay removed to a safe place.

24.7.5 A thorough inspection is made of the work site at the end of any working period to ensure that no material is left at the work site or any situation left in such a manner that a fire or accident could result (all machines to be turned off at main switches, and cylinders to be closed and hoses deflated).

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- 24.7.6 Suitable and sufficient fire-extinguishing equipment is placed at strategic locations or as may be recommended by the Fire Chief or local authority concerned and that such equipment is maintained in a good working order.
- 24.7.7 The fire equipment is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof
- 24.7.8 Sufficient number of employees are trained in the use of fire extinguishing equipment and familiarise themselves with locations of fire fighting equipment in the work site.
- 24.7.9 There is an effective evacuation plan providing for all persons to be evacuated speedily without panic, accounted for and a siren is installed and sounded in the event of a fire.
- 24.7.10 Where appropriate, suitable visual signs are provided to clearly indicate the escape routes in the case of a fire and the means of escape is kept clear at all times.
- 24.7.11 The Contractor must ensure that fire fighting equipment are not to be used for any purpose other than their intended use.

#### **24.8 Demarcation of the site**

- 24.8.1 The Contractor shall ensure that its activities are conducted within a limited area to facilitate control and to minimize the impact on the existing natural environment and other TFR activities.
- 24.8.2 The Contractor shall demarcate the boundaries of the site in order to restrict activities to the site.
- 24.8.3 The method of demarcation and the location of the demarcated area shall be determined by the Contractor and approved by the TFR Contract Manager prior to any work being undertaken. The Contractor shall ensure that all his plant, labour and materials remain within the boundaries of the site.
- 24.8.4 Failure to do so may result in the Contractor being required to fence off the boundaries of the site at his own expense to the satisfaction of the TFR. The contractor is responsible for the safeguarding of his/her own equipment and material while on site.

#### **24.9 Fall Protection Plan**

- 24.9.1 In the event of the risk and hazard identification, as required in terms of clause 14 of this Specification, revealing risks relating to working from a fall risk position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan.
- 24.9.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of the contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 24.9.3 The fall protection plan shall include: -

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- (a) a risk assessment of all work carried out from a fall risk position.
- (b) the procedures and methods to address all the identified risks per location.
- (c) the evaluation of the employees physical and psychological fitness necessary to work at fall risk positions.
- (d) the training of employees working from fall risk positions.
- (e) rescue plan; and
- (f) the procedure addressing the inspection, testing and maintenance of all fall protection equipment

#### **24.10 SHE Signage (Symbolic Safety Signs) on plant and in buildings**

24.10.1 The Contractor's employees shall comply with all SHE signage posted at various locations of TFR sites.

24.10.2 The Contractor shall after occupation of the construction site ensure that appropriate, SHE signs (Symbolic Safety Signs) are displayed on site

#### **24.11 General Machinery, Tools and Equipment**

24.11.1 The Contractor shall ensure that all machinery, tools and equipment are identified, numbered or tagged, listed on an inventory list.

24.11.2 The Contractor shall ensure that all machinery, tools and equipment are safe to be used and is maintained in a good condition.

24.11.3 The Contractor shall ensure that all machines driven by means of belts, gear wheels, chains and couplings shall be adequately guarded in such a manner that persons cannot gain inadvertent access to the moving parts.

24.11.4 All machinery, tools and equipment to be regularly inspected at least monthly or as required by legislation and risk assessments. Records of such inspections shall be kept on the SHE file.

24.11.5 Where applicable machinery, tools and equipment must have the necessary approved test or calibration documentation.

24.11.6 The Contractor shall ensure that all machinery, tools and equipment are operated by persons who have been trained to operate such machinery, tools or equipment.

#### **24.12 Portable Electrical Tools and Explosive Power Tools**

24.12.1 The Contractor shall ensure that use and storage of all explosive power tools and portable electrical tools comply with all applicable legislation.

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- 24.12.2 The Contractor shall ensure that only trained employees are authorised to use portable electrical tools and explosive power tools
- 24.12.3 The Contractor shall ensure that all portable electrical tools and explosive power tools are kept in a safe working condition.
- 24.12.4 All portable electrical tools and explosive power tools are inspected monthly by a competent person and daily before use by the operator of such tool. Records of such inspections must be kept in the safety file.
- 24.12.5 Users / Operators of electrical power tools and explosive power tools should be issued with suitable protective equipment

### **24.13 Lifting Machine, Lifting Tackle and Suspended Loads**

- 24.13.1 The Contractor shall ensure that lifting machine and tackle comply with Driven Machinery Regulation 18 and all other applicable legislative requirements and standards.
- 24.13.2 The Contractor shall ensure that lifting machine operators shall be competent to operate a lifting machine. They must be in possession of a valid permit. The training should have been done according to the Code of Practice by a provider registered by the Department of Labour.
- 24.13.3 A lock out system should be implemented to ensure that only an operator that is competent can draw lifting machines and forklifts.
- 24.13.4 The Contractor shall ensure that before using any lifting machines or tackle the operator inspect it. Records of such inspections and examinations shall be kept on the safety file.
- 24.13.5 All lifting machines shall be examined and subjected to a performance test by an accredited person/company at intervals not exceeding 12 months.
- 24.13.6 All lifting tackle should be recorded on a register and should be examined by an accredited person/company at intervals not exceeding 3 months.
- 24.13.7 All hooks shall be fitted with a safety latch/catch.
- 24.13.8 All lifting tackle should be conspicuously and clearly marked with identification particulars and the maximum mass load which it is designed for.
- 24.13.9 No person shall be moved or supported by means of a lifting machine unless such a machine is fitted with a cradle approved by an inspector.
- 24.13.10 Rigging of loads to be done in accordance with acceptable safe work practices
- 24.13.11 Contractors and their employees shall keep out from under suspended loads, including excavators, and between a load and a solid object where they might be crushed if the load should swing or fall. They shall not pass or work under the boom or any crane or excavator.

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24.13.12 Contractors and their employees shall ensure that crane loads are not carried over the heads of any workmen.

24.13.13 The Contractor shall ensure proper supervision in terms of guiding the load including the use of guide ropes to prevent loads from swinging and a trained person to direct lifting operations and checking the lifting tackle and attachments daily.

#### **24.14 Hand Tools and Pneumatic Tools**

24.14.1 All hand tools (hammers, chisels, spanners, etc) must be recorded on a register and inspected by a competent person on a monthly basis as well as by users prior to use.

24.14.2 All pneumatic tools should be numbered, recorded and inspected at least monthly as well as by users prior to use. And the revolutions per minutes measured in accordance with the manufacturer specifications

24.14.3 Tools with sharp points in toolboxes must be protected with a cover.

24.14.4 All files and similar tools must be fitted with handles.

24.14.5 The Contractor must have a policy on private and makeshift tools on site.

24.14.6 No pneumatic tool shall be operated by using a compressed gas cylinder. Pneumatic equipment shall only draw supply from mobile air compressors or from compressed air lines installed within the premises.

#### **24.15 Management and control of exposure to Polychlorinated Biphenyls (PCB) contaminated material**

24.15.1 The Contractor shall ensure that all personnel, persons who work with material that contains PCBs and persons who might come into contact with such material are appropriately familiarized with the danger of working with PCBs.

24.15.2 The Contractor shall ensure that provide systems to ensure that personnel who are involved in activities that affect the safe and acceptable use of material that contains PCBs have, at all times, current and suitably authorized documented procedures and standards available, and that such documentation can be retrieved and updated when required.

24.15.3 The Contractor shall ensure adequate ventilation in the working area; portable fans at ground level should be used in enclosed substations.

24.15.4 The Contractor shall ensure full protective clothing shall be worn, which includes:

- a) a one-piece chemical resistant suit,
- b) chemical resistant gloves,
- c) disposable covers for shoes,

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- d) in confined spaces, approved self-contained breathing apparatus, and
- e) a full-face mask with a type "CC" replacement canister can be used for lower-level exposure.

24.15.5 A respiratory protection device with a full-face mask and a cartridge or canister suitable for use with PCBs is required when PCB liquids hotter than 55 °C are handled, where a significant amount of PCB liquid is exposed to the air, or where adequate ventilation is not possible. In a fire situation where PCBs are involved, self-contained breathing apparatus should be used.

24.15.6 The Contractor shall ensure impervious gloves made of butyl rubber, neoprene, nitrile rubber, polyvinyl alcohol, Viton saranex or teflon (NOT ordinary rubber) should be worn when PCB liquids are handled.

24.15.7 The Contractor shall ensure that all PPE shall be disposed of after use and potentially contaminated protective equipment shall be treated as material that contains PCB and shall be disposed of accordingly.

24.15.8 The Contractor shall ensure that respiratory protective equipment is provided and worn when required as per the requirements of clause 5.2 of SANS 290:2016.

24.15.9 The Contractor shall ensure that employees likely to be exposed to PCB contaminated material are trained in first aid measure to be taken in case of exposure.

## **24.16 Ladders**

24.16.1 A contractor shall ensure that all ladders are numbered, inspected before use and weekly inspections are recorded in a register. A contractor shall ensure that a competent person who carries the above inspections is appointed in writing.

## **24.17 Electrical Equipment**

The Contractor must ensure that:

24.17.1 Implementation and compliance with Electrical Installation Regulations, Electrical Machinery Regulations and regulation 24 of the Construction Regulations and OH&S Act.

24.17.2 All electrical installations, machinery and electrical work is performed in compliance with TFR Electrical Safety Instructions.

24.17.3 Connections are not made to any power supply without the prior written approval of the TFR Contract Manager.

24.17.4 All electrical machines and appliances provided by the Contractor for his own use on the Site are in a serviceable condition

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- 24.17.5 Power tools used on the Site are protected by residual current devices approved by TFR Contract Manager and are double insulated.
- 24.17.6 All extension cords, portable tools and electrical plant supplied at a voltage above 32 volts are inspected, tested and tagged by a Licensed Electrician at regular monthly intervals. Details of inspections and tests are kept in Log Books available for inspection by the TFR Contract Manager or any other authorised Officer of TFR.
- 24.17.7 All electrical installations are inspected by the TFR Contract Manager (or his nominee) to ensure that the installation complies with the Statutory Regulations applicable to the site and TFR Electrical Safety Instructions. Any installations deemed unsatisfactory by the TFR Contract Manager should be removed by the Contractor at his expense.
- 24.17.8 Portable lights have adequate stability and are fitted with a mechanical guard to protect the lamp. Temporary festoon lighting is of the 'double insulated' type and is supported at least 2.5m above the floor, if possible. Hand lamps are of the 'all insulated' type.
- 24.17.9 All temporary light fittings are supplied from more than one final sub-circuit, with the supply from a residual current device, extra low voltage source or an isolating transformer.
- 24.17.10 The Contractor must obtain approval from the TFR Contract Manager before any of his employees or Sub-contractors commence work within three (3) metres of conductor rails or high-tension wires, or where there is a possibility of equipment coming close to and/or touching a power source and must provide suitable protective insulating barriers. For the erection of scaffolding, the distance is five (5) metres.
- 24.17.11 Only authorised persons may enter Electrical Contactor Houses, Motor Rooms, Switch Rooms, Control Rooms or Cable Ducts. Should the Contractor require entering such places to carry out work, he must first obtain permission from the TFR Contract Manager and obtain a valid Permit to Work.
- 24.17.12 The Contractor's employees required to enter such electrical spaces "authorised persons", with the names entered in the TFR Authorised Persons Register, after receiving approval from the TFR Electrical Officer, or they are accompanied by an authorised person who must supervise the placement of Danger Tags and Out-of-Service Tags, as well as Electrical Isolation Permit.
- 24.17.13 Electrical equipment supply cabling distribution boards, fixed lighting and portable appliances, extension leads, welding machines, compressors, pumps and hand portable tools are inspected on a monthly basis and also by the user daily before use.
- 24.17.14 Such monthly inspection(s) are to be performed by an appropriately qualified Electrician.
- 24.17.15 Contractors working on, over, under, or adjacent to railway lines and near high voltage equipment shall comply with the TFR E7/1 Specification for Works On, Over, Under or Adjacent to Railway Lines and Near High Voltage Equipment.

Contractor Signature.....

Date.....



- 24.17.16 No person may do electrical installation work as an electrical contractor unless that person has been registered as an electrical contractor in terms of the Electrical Installation Regulations.
- 24.17.17 No person shall authorize, design, install or permit or require the installation of an electrical installation, other than in accordance with a health and safety standard provided that the components within an electrical installation shall comply with the standards and proof of compliance shall be identifiable on the components or certification shall be available from the supplier or manufacturer of the components.
- 24.17.18 Contractor shall provide further that items of an electrical installation not covered by such incorporated safety standard, and the conductors between the point of supply and the point of control, shall be installed in accordance with the by-laws or regulations of the supplier concerned.
- 24.17.19 A registered person shall exercise general control over all electrical installation work being carried out, and no person shall allow such work without such control: Provided that where the voltage exceeds 1kV, the installation shall be designed and supervised by a person deemed competent
- 24.17.20 No supplier shall restrict the application of a health and safety standard when an electrical installation is installed, except where the distribution system of the supplier may be adversely affected by the application thereof.

## **25. Scaffolding**

- 25.1 The Contractor must ensure that all scaffolding operations are carried out under the supervision of a competent person and that all erectors, team leaders and inspectors are competent to carry out their work.
- 25.2 The Contractor must ensure that scaffolding when used and erected, complies with the safety standards as per SANS 10085-1:2004 Please note that Scaffold also need to comply with CR 12 Temporary Works.
- 25.3 All scaffolding equipment to be inspected and proclaimed safe to use or rectified as to be safe to use after any inclement weather. Signage must be posted to indicate the status of the scaffolding.

## **26. Excavations, Floor Openings and Trenches**

The Contractor must ensure that:

- 26.1 All excavation work is carried out under the supervision of a competent person who has been appointed in writing for that purpose.
- 26.2 Evaluation of the stability of the ground, as far as is reasonably practicable, before excavation work begins.

Contractor Signature.....

Date.....



- 26.3 Sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation.
- 26.4 No person is permitted to work in an excavation which has not been adequately shored or braced: Provided that shoring and bracing may not be necessary where the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or such an excavation is in stable material: Provided that permission has been given in writing by the appointed competent person upon evaluation by him or her of the site conditions.
- 26.5 Where any uncertainty pertaining to the stability of the soil still exists the decision from a professional engineer or a professional technologist competent in excavations is decisive and such a decision must be noted in writing and signed by both the competent person and the professional engineer or technologist, as the case may be.
- 26.6 The shoring or bracing used is designed and constructed in a manner that renders it strong enough to support the sides of the excavation in question.
- 26.7 No load, material, plant or equipment is placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
- 26.8 Where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, steps are taken to ensure the stability of such building, structure or road and the safety of persons.
- 26.9 Convenient and safe means of access to be provided to every excavation in which persons are required to work, and such access may not be further than six meters from the point where any worker within the excavation is working.
- 26.10 The location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed and must before the commencement of excavation work that may affect any such service, take the steps that are necessary to render the circumstances safe for all persons involved.
- 26.11 Every excavation, including all bracing and shoring, is inspected by the competent person, daily, prior to the commencement of each shift; after every blasting operation; after an unexpected fall of ground; after damage to supports; and after rain in order to ensure the safety of the excavation and of persons.
- 26.12 The results of such inspections must be recorded in a register kept on site and made available on request to an inspector, the client, the client's agent, any other contractor or any employee.
- 26.13 Every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor.

Contractor Signature.....

Date.....

- 26.14 All precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation.
- 26.15. Where the excavation work involves the use of explosives, appoint a competent person in the use of explosives for excavation, and must ensure that a method statement is developed by that person in accordance with the applicable explosive's legislation.
- 26.16 Warning signs to be positioned next to an excavation within which or where persons are working or carrying out inspections or tests.

## **27. Confidentiality**

- 27.1 The Contractor must, at all times, consider all data or information given to him or that is required in connection with the work of the Company, as confidential and not makes unauthorized use of it.
- 27.2 He/she must ensure that such data or information is not given to any non-employee of the contractor without written consent of the TFR Contract Manager.
- 27.3 The Contractor shall be aware of the confidentiality of the mentioned information and is compelled to treat it accordingly.
- 27.4 The Contractor must provide adequate physical protection for any confidential documents, etc, which were obtained from Transnet in connection with the contract work as well as any copies made thereof. If any documents or sketches are lost, the TFR Contract Manager must be notified immediately.

Contractor Signature.....

Date.....

## ANNEXURE 1

### CONTRACTOR MONTHLY SHE REPORT

<b>For Month/Year</b>		<b>Name of Contractor</b>		
<b>Name of Contract</b>				
<b>Contract Number</b>	<b>Date of Commencement</b>	<b>Date of Completion</b>		
<b>Number of employees</b>	<b>Man-hours worked this Month</b>	<b>Cumulative (Contract duration man-hours)</b>	<b>Man-hours Since last Lost Time Incident (LTI)</b>	<b>DIFR</b>

#### 1. Details of SHE Incidents

<b>Incident</b>	<b>This Month</b>	<b>Cumulative(Contract duration)</b>	<b>Short description of major/ significant incidents and preventative action taken</b>
<b>Number of fatalities</b>			
<b>Number of disabling incidents</b>			
<b>Number of Medical Treatment Cases</b>			
<b>Number of first aid Cases</b>			
<b>Number of near miss incidents</b>			
<b>Motor vehicle incidents</b>			
<b>Number of environmental incidents</b>			
<b>Positive substance abuse incidents</b>			
<b>Substandard Act/ Conditions observed</b>			
<b>Legal violations observed</b>			

Contractor Signature.....

Date.....

## **2. Details of SHE Meetings**

Date	No of participants	Major SHE Concerns	Action taken

## **3. Details of Audits/Inspections**

Date	Area / Facility	Findings/Recommendations	Action taken

## **5. Details of any SHE Promotional activities for the month**

Date	Activity	Remarks

## **6. Safety Communication**

Month	Number of Safety talks held	Remarks

Attach separate sheets for further or other details

.....  
Name of Contractor Representative

.....  
Signature

.....  
Date

Contractor Signature.....

Date.....



A Division of Transnet SOC Limited

# TECHNOLOGY MANAGEMENT

## SPECIFICATION

### REQUIREMENTS FOR TRACTION TRANSFORMERS FOR 3kV DC TRACTION SUBSTATIONS IN ACCORDANCE WITH SANS 60076

Author:	Chief Engineering Technician	B.L Ngobeni
	Technology Management	
Approved:	Senior Engineer	L.O.Borchard
	Technology Management	
Authorised:	Principal Engineer	S.E Sibande
	Technology Management	

A handwritten signature in black ink, appearing to read 'B.L. Ngobeni', positioned above a dotted line.

A handwritten signature in black ink, appearing to read 'L.O. Borchard', positioned above a dotted line.

A handwritten signature in black ink, appearing to read 'S.E. Sibande', positioned above a dotted line.

Date: 07 November 2018

Circulation Restricted To:

Transnet Freight Rail – Chief Engineer Infrastructure  
- Technology Management

"I acknowledge that this application contains personal information as defined in the Protection of Personal Information Act, 2013 (the "Act"). By accessing/using this application, I consent to the processing of my personal information in accordance with the requirements of the Act. I acknowledge that I cannot unreasonably withhold my consent. I acknowledge that the purpose for processing my personal information is in terms of this application."

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## 1.0 SCOPE

- 1.1 This specification covers Transnet freight rail's requirements for the design, manufacture, testing and delivery of traction transformers for 3kV DC traction substations.

## 2.0 BACKGROUND

- 2.1 Transnet's traction substations consist of single and double units and in exceptional cases a three unit rectifier configurations.
- 2.2 Each rectifier unit comprises of a set of high voltage AC disconnects, primary circuit breaker, two current transformers and a traction transformer connected for twelve-pulse rectification with its control and protection circuitry.

## 3.0 STANDARDS AND PUBLICATIONS

The transformers shall comply with all relevant requirements of the latest editions of the following publications unless otherwise specified.

### 3.1 SOUTH AFRICAN NATIONAL STANDARDS

SANS 121:	Hot Dip Galvanized Coatings on Fabricated Iron and Steel articles.
SANS 555:	Unused and reclaimed mineral insulating oils for transformers and switchgear.
SANS 1019:	Standard voltages, currents and insulation levels for electricity supply.
SANS 1091:	National Colour Standards.
SANS 9001:	Quality Management Systems – Requirements.
SANS 10142-1:	The wiring of premises Part 1- Low voltage installations.
SANS 60076-1:	Power Transformers Part 1- General.
SANS 60076-2:	Power Transformers Part 2- Temperature rise for liquid immersed transformers.
SANS 60076-3:	Power Transformers Part 3- Insulation levels, Dielectric tests and External clearances in air.
SANS 60076-5:	Power Transformers Part 5- Ability to withstand short circuit.
SANS 60076-7:	Power Transformers Part 7- Loading Guide for Oil-immersed Power Transformers.
SANS 60137:	Insulated Bushings for Alternating Voltages above 1000V.
SANS 61869-2:	Instrument Transformers Part 2- Current Transformers.

### 3.2 TRANSNET FREIGHT RAIL'S PUBLICATIONS

CEE 0045:	Painting of Steel Components of Electrical Equipment.
CEE 0224:	Drawings, Catalogues, Instruction manuals and Spare lists for electrical equipment supplied under the contract.

## 4.0 TENDERING PROCEDURE

- 4.1 Tenderers shall indicate clause by clause compliance with the specification. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance.
- 4.2 A statement of non-compliance shall be motivated by the tenderer.
- 4.3 Tenderers shall complete Appendix 2. "Information to be provided by tenderers"
- 4.4 Tenderers shall submit descriptive literature consisting of detailed technical specifications, general constructional details and principal dimensions, together with clear illustrations of the equipment offered.
- 4.5 Failure to comply with clauses 4.1, 4.2, 4.3 and 4.4 could preclude a tender from consideration.

## 5.0 APPENDICES

The following appendices form an integral part of this specification and shall be read in conjunction with it.

### 5.1 Appendix 1 - "Schedule of Requirements"

This appendix details the specific requirements for this application.

### 5.2 Appendix 2 - "Information to be provided by tenderers"

This appendix calls for specific technical information to be furnished by tenderers.

## 6.0 SERVICE CONDITIONS

### 6.1 ATMOSPHERIC CONDITIONS

Altitude:	0 to 1800m above sea level.
Ambient temperature:	-10°C to +55 °C.
Relative humidity:	10% to 90%
Lightning Conditions:	20 ground flashes per square kilometre per annum.
Pollution:	Heavily salt laden or polluted with smoke from industrial sources.

### 6.2 ELECTRICAL CONDITIONS

6.2.1	Frequency:	The AC high voltage supply will normally be supplied by Eskom. The frequency will be $50 \pm 2.5$ Hz.	
6.2.2	Supply Voltage:	Under normal conditions the system supply voltage will be maintained at $\pm 5\%$ of the nominal voltage over a 24 hour period. Under crippled supply network conditions the voltage can be expected to drop up to 15%.	
6.2.3	Fault levels:	A three phase short circuit on the supply will be limited to the following levels:	
		Nominal supply voltage	Fault Level
		66kV	20kA
		88kV	25kA
		132kV	40kA

## 7.0 RECTIFIER TRANSFORMERS

### 7.1 GENERAL

- 7.1.1 Unless specified the transformers shall be for outdoor use and of the oil natural air natural (ONAN) cooled type and shall comply with specification SANS 60076-1.
- 7.1.2 All components used in the traction transformer shall be free from polychlorinated biphenyls (PCB free)
- 7.1.3 The design of the transformers shall be such that harmonic disturbances are minimised.
- 7.1.4 The primary winding of the main traction transformer shall be star connected.
- 7.1.5 The configuration of the secondary winding shall be two separated delta windings giving 15° phase shift. The total secondary winding shall consist of six phases and the output voltage of each phase shall be approximately 1220V.
- 7.1.6 The secondary windings shall be designed to be compatible with twelve pulse rectifier units.
- 7.1.7 The responsible Senior Electrical Engineer at Transnet freight rail shall be consulted before any transformer design is finalised.



7.1.8 Provision shall be made for a three phase tertiary winding on the secondary side of the transformer to supply the auxiliary transformers. The winding may be tapped off the secondary winding or be separately wound. The tertiary winding shall have separate bushings for connection to the auxiliary transformer.

7.1.9 The tertiary winding shall be rated to supply a 50kVA auxiliary transformer unless otherwise specified.

## **7.2 TEMPERATURE RISE AND RATING.**

7.2.1 The temperature rise of the transformer windings after thermal equilibrium and a steady temperature has been reached on continuous full load, shall not exceed 65°C.

7.2.2 The maximum temperature rise of the windings subsequent to the application of any of the following rectifier overloads, after the constant continuous rated full load temperature has been attained are as follows:

- 3 x full load for 1 minute the temperature rise of the windings shall not exceed 70°C.
- 3.5 x full load for 10 seconds the temperature rise of the windings shall not exceed 70°C.
- 2 x full load for 30 minutes the temperature rise of the windings shall not exceed 100°C.

7.2.3 The temperature rise of the windings shall be measured by the increase of resistance method. Standard correction for cooling during the measurement of resistance shall be applied.

7.2.4 The rating of the transformer shall be such that when it is operating in conjunction with the rectifier equipment specified and with an auxiliary transformer connected to the tertiary winding the output of the transformer shall be as follows:

- 2 x full load for 30 minutes
- 3 x full load for 1 minute
- 3.5 X full load for 10 seconds.
- 4.25 x full load instantaneous tripping.

These values shall be proved theoretically.

## **7.3 VOLTAGE RATIO AND TAPPINGS**

7.3.1 The transformer shall be designed to operate at the nominal system voltage as specified in the schedule of requirements.

7.3.2 Tappings shall be provided on the primary windings. (5 tap position)

The tap range shall be  $\pm 2,5\%$  and  $\pm 5\%$  of the nominal voltages.

7.3.3 The transformers shall supply full load output at all tappings.

7.3.4 The full load regulation of the transformer shall not be more than 5%.

7.3.5 The tap changing gear shall be externally, manually operated, positively locking, off load type. The arrangement shall be such that excessive backlash will not affect the making of proper contact when the tap changing gear is operated in either direction. Rotary type having high-pressure type contacts is preferred.

7.3.5.1 The tap changing switch shall be lockable with provision for a padlock.

7.3.5.2 The positions of the tap changing switch shall be clearly marked.

## **7.4 BUILT IN CURRENT TRANSFORMERS.**

7.4.1 Where build-in current transformers are required, shall be in accordance with SANS 61869-2.

## **7.5 TRANSFORMER IMPEDANCE**

7.5.1 The transformer impedance shall be as high as possible taking into account the voltage regulation as specified in clause 7.3.4 but shall not be less than 8 %.

## **7.6 MECHANICAL STRENGTH OF TRANSFORMER WINDINGS**

7.6.1 The AC supply system can have a fault capacity specified in clause 6.2.3.

- 7.6.2 The transformer windings shall be able to withstand the electromagnetic and mechanical stresses caused by high fault currents.
- 7.6.3 In the adjudication of tenders particular attention will be given to:
- The mechanical design of the solid bolted clamping arrangement of the windings.
  - The coil stacks in order to withstand short circuit forces.
  - The methods employed to ensure thorough pre-shrinking and pre-stressing of the coils.
- 7.6.4 Tenderers shall describe fully with the aid of detailed drawings of the construction of the windings and clamping arrangements.
- 7.6.5 Tenderers shall quote for transformers having the following design features listed below. No alternative to the requirements laid down in the following sub clauses will be considered unless complete details are submitted giving the advantages and improvements that will result.
- 7.6.5.1 Primary and secondary coil stacks shall be provided with solid bolted clamping arrangements which will distribute the clamping force over the whole end periphery of each coil stack.
- 7.6.5.2 Tenderers shall state the actual force anticipated under the worst fault conditions and the effective force applied by the clamping bolts on each winding.
- 7.6.5.3 Round conductor shall not be used for any windings.
- 7.6.5.4 High voltage windings shall be of the continuous disc type while low voltage windings shall be of the helix winding type.
- 7.6.5.5 Reliance shall not be placed on any resin used on the windings for increasing the mechanical stability of the coils, nor shall such resin have any detrimental effect on the transformer oil.
- 7.6.5.6 If laminated insulating material is subjected to mechanical compression forces, the construction shall be such that these forces are normal to the plane of the laminations.
- 7.6.5.7 All spacers and clacks on packing shall be suitably locked in position. Reliance shall not be placed on the pressure applied to the windings, or an adhesive, to keep the packing pieces in position.
- 7.6.5.8 The end frames shall be well braced and be of substantial construction.
- 7.6.5.9 The internal copper connections between the windings and connections to the leads shall be crimped and bolted.
- 7.6.5.10 Only high tensile steel bolts shall be used for the bolted connections.
- 7.6.5.11 The nuts of the bolted connections shall be torqued to the following recommended values to ensure a good stable electrical contact between the mating surfaces:

Bolt Size	Torque value
M10	35.5NM
M12	61.3NM
M16	147 NM

- 7.6.5.12 Standard machine locknuts or approved locking plates shall be used to lock the nuts of the bolted connections.

## **7.7 INSULATION LEVELS.**

- 7.7.1 Transformer bushings shall comply with SANS 60137.
- 7.7.2 Test voltages and minimum creepage distances for normal and polluted atmospheres shall be in accordance with SANS 60137.

## **7.8 INSULATION OF WINDINGS.**

- 7.8.1 The transformers are required to operate in severe lightning areas. Surge arresters will be connected between the high voltage busbars and the substation earth. The neutral of the primary Star connected windings is not required to be brought out
- 7.8.2 All windings are to be fully insulated. Full and detailed particulars of the insulation and methods employed to reduce the risk of damage by overvoltage caused by system surges and lightning must accompany the tender.

- 7.8.3 The primary and secondary windings shall be insulated to withstand the test pressures referred to in SANS 60076-1. The secondary windings must be insulated for a system highest voltage of 7,2 kV.

## **7.9 TERMINALS AND BUSHINGS**

- 7.9.1 All terminals shall be extended to the top of the transformer tank through suitable outdoor type bushings.
- 7.9.2 The bushings shall conform to the insulation levels as specified in SANS 60137 for the system nominal supply voltage at which the equipment must operate.
- 7.9.3 All bushings, stems and terminals shall be of sufficient size to ensure sufficient mechanical strength of attaching and supporting external connections and shall not be smaller than
- 19 mm diameter for primary and secondary connections
  - 12 mm diameter for auxiliary supply connections.
- 7.9.4 Provision shall be made for an earthing terminal fitted on the outside of the transformer tank for the connection of a 95 mm<sup>2</sup> cable.
- 7.9.5 The height of the wall bushings of the substation is 2,8 meters above ground level. Should the design of the transformer offered be such that the total height of the transformer and secondary bushings is less than 2,7 meters, screens must be provided. Tenderers must include the provision of screens in their offer. Details of the screens shall be submitted to Transnet freight rail for approval.
- 7.9.6 The clearance from the lowest, high voltage connection of the transformer to the finished ground level shall not be less than 3,6m for supply voltages up to 88kV, and not less than 4,1m for supply voltages exceeding 88kV.

## **7.10 TANK AND COOLING RADIATORS**

- 7.10.1 The transformer tank shall be constructed of steel plate not less than 6 mm thick.
- 7.10.2 Transformers shall not be fitted with rollers, but be provided with a substantial base, which will enable it to be supported on steel skid rails, which are embedded in a concrete plinth. The spacing between centers of the skid rails is 1000 mm.
- 7.10.3 Provision shall be made on the transformer base for the attachment of a tackle for this purpose.
- 7.10.4 Four jacking lugs shall be provided for lifting the transformer complete with oil. Tenderers shall submit dimensioned drawings showing details of the tank and base construction.
- 7.10.5 Transformers shall be fitted with detachable radiators with drain and filling plugs.
- 7.10.6 Provision shall be made for radiator shut off valves to allow the removal of the radiators without having to drain the oil from the transformer tank.
- 7.10.7 The design of the cooling radiators shall ensure sufficient circulation of cooling oil.
- 7.10.8 Hot dipped galvanized radiators shall be used for coastal areas or were specified. The radiators shall be galvanized in accordance to the requirements of SANS 121.
- 7.10.9 The transformer cover shall be bolted to the tank. For this purpose a flange will be embedded on to the tank. An "O-ring" gasket will be installed between the cover and the tank to prevent oil leaks.
- 7.10.10 All access covers shall be bolted to the transformer tank and shall be provided with "O-rings" to prevent oil leaks. And they shall have handles and lifting lugs.

## **7.11 FITTINGS ON THE TRANSFORMERS**

The following fittings shall be provided:

- 7.11.1 Conservator tank with a silica gel dehydrating breather, oil level gauge and drain cock.
- 7.11.2 The connecting pipe to the conservator shall extend at least 50 mm into it. All pipe connections shall have flange joints.
- 7.11.3 Where specified in Appendix 1 the conservator shall be provided with a sealed oil preservation bag.
- 7.11.3.1 The bag shall not restrict the normal draining of the conservator or the flow of oil to the transformer.

- 7.11.3.2 The bag shall allow for expansion without any increase in pressure or the causing of a partial vacuum over the specified temperature range.
- 7.11.4 The transformer shall be fitted with a weatherproof dial type thermometer graduated in °C for registering "top oil" temperature. The instrument shall be fitted with a resettable maximum temperature indicator.
- 7.11.5 Adjustable contacts shall be fitted to the thermometer. The contacts shall normally be set to operate at a temperature of 90°C. The trip contacts shall be liberally rated and adequate for closing 110 volt, 6 Ampere DC circuits. If not suitable, auxiliary relays may be provided.
- 7.11.6 A single—float Buchholz relay fitted with contacts for trip and alarm functions.
- 7.11.7 A thermal type overload relay to protect the transformer windings against sustained overloads. This relay shall have a load—temperature characteristic approximately the same as the transformer winding hot spot. Suitable means for compensation for variation of ambient air temperature shall be provided. Full details shall be submitted.
- 7.11.8 The relay shall be provided with trip contacts. The tenderer is to recommend the temperature setting for these contacts, which are normally set at 115 °C. The trip contacts shall be liberally rated and adequate for closing 110 volt, 6 Ampere DC circuits. If not suitable, auxiliary relays shall be provided.
- 7.11.9 A drain cock, two sampling cocks and thermometer pockets on the main tank.
- 7.11.10 A pipe entering the top of the main tank at the conservator end, with a cock easily accessible from ground level, and one cock on the opposite side of the main tank, at its lowest point, for connecting up to an oil filtering system. The cocks shall be screwed 50mm gas or metric equivalent female thread. If desired, the cock at the lowest point of the tank can be combined with the drain cock required in clause 7.11.9 by the addition of a suitable fitting having a 50mm gas or metric equivalent female thread.
- 7.11.11 A suitable pressure relief device fitted on the main tank if it is considered necessary by the manufacturer. The provision of the pressure relief device shall not affect the efficiency of the Bucholz relay in the event of a transformer fault.
- 7.11.12 Tenderers shall ensure that the pockets for the temperature indication are located in areas where the oil is freely circulating, thus avoiding the possibility of incorrect oil temperature measurement. Ambient temperatures can be very high in summer, and the location of the thermometer pockets must take solar radiation into account.
- 7.11.13 Where a marshalling box is fitted to the transformer the degree of protection shall be IP55 and corrosion protected.
- 7.11.14 All terminals in the marshalling box shall be clearly labeled.

## **8.0 CORROSION PROTECTION AND PAINTING**

### **8.1 PREPARATION OF TRANSFORMER TANK**

- 8.1.1 Rust and millscale shall be removed by shot blasting or acid cleaning. Welds which are not ground smooth shall be shot blasted or otherwise descaled and cleaned.

### **8.1 PAINTING**

- 8.1.1 The outer surface of the transformer tank shall be painted Grey to the colour code G12 in accordance with SANS 1091. The conservator shall be painted white. The total paint thickness shall be at least 75 microns. For coastal or heavily polluted conditions it shall be at least 125 microns.
- 8.1.2 Internal surfaces of the conservator above oil level shall be cleaned and painted with one coat of oil resistant rust inhibiting etch primer. The radiators shall be hot dipped galvanized. It is recommended that galvanized radiators used at heavily polluted areas be painted.

## **9.0 TRANSFORMER OIL**

- 9.1 Only unused mineral insulating oil shall be used.
- 9.2 The transformer oil shall meet with the requirements specified in SANS 555.

- 9.3 The oil shall be readily miscible with the oil supplied in conformity with the above mentioned specification by the major oil companies in South Africa, without detriment to the chemical, physical and electrical properties of the oil.

## **10.0 RATING PLATES**

A non—corrosive metal plate shall be fixed to each transformer tank (not cooling tubes), giving the following information:

- Maker's name
- Maker's serial No.
- Transnet freight rail's serial No. (Left blank)
- Rated output in MVA
- Frequency
- Secondary voltage and current
- Primary voltage and current
- Primary voltage tapplings
- Transformer reactance (%)
- Transformer impedance (%)
- Vector diagram
- Diagram of connections
- Quantity of oil in litres
- Conservator fitted with bag.
- Total mass of transformer inclusive of oil in kg
- Transport mass of transformer in kg.
- Year of manufacture.

## **11.0 TESTS AND DATA TO BE SUBMITTED BY SUCCESSFUL TENDERERS**

- 11.1 Manufacturer's type and routine tests as well as impulse voltage withstand including chopped wave type tests shall be carried out on the transformers in accordance with the current edition of SANS 60076-1.
- 11.2 Heat runs shall be carried on the first transformers of a new or different design.
- 11.3 The rating of the transformer shall be such that when it is operating in conjunction with the rectifier equipment specified and with a auxiliary transformer connected to the tertiary winding the output of the transformer shall be as follows:
- 2 x full load for 30 minutes
  - 3 x full load for 1 minute
  - 3.5 X full load for 10 seconds.
  - 4.25 x full load instantaneous tripping.
- These values shall be proved theoretically.
- 11.4 The temperature rise of the transformer windings after thermal equilibrium and a steady temperature has been reached on continuous full load, shall not exceed 65°C.
- 11.5 The maximum temperature rise of the windings subsequent to the application of any of the following rectifier overloads after the constant continuous rated full load temperature has been attained are as follows:
- 3 x full load for 1 minute the temperature rise of the windings shall not exceed 70°C.
  - 3.5 x full load for 10 seconds the temperature rise of the windings shall not exceed 70°C.
  - 2 x full load for 30 minutes the temperature rise of the windings shall not exceed 100°C.

- 11.6 The temperature rise of the windings shall be measured by the increase of resistance method. Standard correction for cooling during the measurement of resistance shall be applied.
- 11.7 Transnet freight rail shall be provided with type test certificates and two copies of test sheets, which record the values of the routine tests, or special tests that are carried out on the transformers.
- 11.8 Transnet freight rail reserves the right to be present/witness all routine including type tests were required.
- 11.9 Type tests including impulse tests must be quoted for separately.
- 11.10 The Senior Electrical Engineer, Technology Management must be notified timeously for routine or impulse test to be witnessed.

## **12.0 DRAWINGS AND MAINTENANCE MANUALS**

- 12.1 Drawings, instruction manuals and spares lists shall be supplied in accordance with Transnet freight rail's specification CEE.0224.
- 12.2 Three copies of each of the following drawings shall be submitted to the responsible project manager for approval within 7 days of the order being placed.
  - 12.2.1 Dimension drawings showing external arrangements of transformer.
  - 12.2.2 External wiring diagrams for the transformer.
  - 12.2.3 Vector diagram and rating plate.

## **13.0 GUARANTEE AND DEFECTS**

- 13.1 The contractor shall guarantee the transformer and accept liability for maker's defects, which may appear in design, materials and workmanship.
- 13.2 The guarantee period for the transformer shall expire after a period of 12 months commencing on the date of commissioning of the equipment.

## **14.0 QUALITY ASSURANCE**

- 14.1 Tenderers must indicate what steps have been taken to implement a Quality Assurance system in terms of the ISO 9000 series of recommendations.

**END**

## SCHEDULE OF REQUIREMENTS (To be completed by client)

### SYSTEM DETAIL

- 1.0 Transformer required for: \_\_\_\_\_ substation/location
- 2.0 Nominal system voltage: \_\_\_\_\_ kV
- 3.0 Frequency: \_\_\_\_\_ Hz

### TRANSFORMER DETAIL

- 1.0 Number of phases: Primary winding: \_\_\_\_\_ Secondary winding: \_\_\_\_\_
- 2.0 Secondary winding configuration: \_\_\_\_\_
- 3.0 Rated power: \_\_\_\_\_ MVA
- 4.0 Impedance %: \_\_\_\_\_
- 5.0 Primary voltage rating: \_\_\_\_\_ kV
- 6.0 Secondary voltage rating: \_\_\_\_\_ kV
- 7.0 Vector group: \_\_\_\_\_

### CURRENT TRANSFORMERS

- 1.0 Built in current transformers required: \_\_\_\_\_ Yes/No.
- 2.0 Current transformer data:

	Protection	Metering
Ratio:	_____	_____
Class:	_____	_____
VA Rating	_____ VA	_____ VA

### OFF CIRCUIT TAPPING SWITCH

- 1.0 No of positions: \_\_\_\_\_ %Steps: \_\_\_\_\_

### TRANSFORMER DIMENSIONS

- 1.0 Dimensions (if critical)
- Length: \_\_\_\_\_ mm. Breadth: \_\_\_\_\_ mm. Height: \_\_\_\_\_ mm

### SPECIAL REQUIREMENTS

- 1.0 Conservator to be fitted with oil preservation bag. \_\_\_\_\_ Yes / No
- 2.0 Radiators galvanised. \_\_\_\_\_ Yes / No
- 3.0 Other special requirements:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**END**

**APPENDIX 2****INFORMATION TO BE PROVIDED BY TENDERERS****GENERAL**

1.0 Manufacturers name \_\_\_\_\_

**TRANSFORMER DETAIL**

1.0 Primary voltage rating: \_\_\_\_\_ kV

2.0 Secondary voltage rating: \_\_\_\_\_ kV

3.0 Rated power: \_\_\_\_\_ MVA

4.0 Impedance %: \_\_\_\_\_

5.0 Off Circuit Tap Switch.

No of positions: \_\_\_\_\_ %Steps: \_\_\_\_\_

6.0 Vector group: \_\_\_\_\_

**TANK AND TANK COVER**

1.0 Free-breathing: Yes/No

2.0 Tank cover bolted to tank: Yes/No

3.0 Radiators galvanised. Yes/No

4.0 Method of Cooling: \_\_\_\_\_

5.0 Overall dimensions: Length \_\_\_\_\_ mm. Breadth \_\_\_\_\_ mm. Height \_\_\_\_\_ mm.

6.0 Winding material: HV \_\_\_\_\_ LV \_\_\_\_\_

7.0 Mass of core and windings: \_\_\_\_\_ kg

8.0 Oil capacity: \_\_\_\_\_ (Litres)

9.0 Mass of transformer complete with oil: \_\_\_\_\_ kg

10.0 Adjustable axial coils provided: Yes/No

11.0 Type of breather and dehydrating agent \_\_\_\_\_

12.0 The following information refers to the transformer when connected on the principal tapping and appropriate reference temperature for the class of insulation used.

13.0 Iron loss (Watts): \_\_\_\_\_

14.0 Copper loss at full load: \_\_\_\_\_ at \_\_\_\_\_ °C

15.0 Total load losses (Watts): \_\_\_\_\_ at \_\_\_\_\_ °C

16.0 Impedance at full load (%Z): \_\_\_\_\_

17.0 Reactance (% X): \_\_\_\_\_;

18.0 Regulation at full load at: 1.0 PF \_\_\_\_\_ Percent, 0.8 PF \_\_\_\_\_ Percent at \_\_\_\_\_ °C

19.0 Efficiency at full load at: 1.0 PF \_\_\_\_\_ Percent, 0.8 PF \_\_\_\_\_ Percent at \_\_\_\_\_ °C

20.0 Temperature rise at rated voltage and power of:

Windings: \_\_\_\_\_ °C

Top oil: \_\_\_\_\_ °C

**END**





A Division of Transnet SOC Limited

## TECHNOLOGY MANAGEMENT

### SPECIFICATION

## REQUIREMENTS FOR THE SUPPLY OF ELECTRIC CABLES

Author:	Chief Engineering Technician Technology Management	B. L. Ngobeni
Approved:	Senior Engineer Technology Management	L.O. Borchard
Authorised:	Principal Engineer Technology Management	S.E. Sibande

  
\_\_\_\_\_  
  
\_\_\_\_\_  
  
\_\_\_\_\_  
Date: 04 February 2019

Circulation Restricted To:

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Transnet and Relevant Third Parties

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## 1.0 SCOPE

This specification covers Transnet Freight Rail's requirements for cables used for:

- Medium voltage reticulation systems, distribution systems, traction substation supplies, and 3 kV DC feeder applications (3,3/3,3 kV to 19/33 kV).
- Cables used for fixed installations (300/500 V to 1900/3300 V).

## 2.0 STANDARDS AND PUBLICATIONS

The following standards or publications (latest version) are referred to herein.

### 2.1 SOUTH AFRICAN NATIONAL STANDARDS

- SANS 97: Electric cables - Impregnated paper insulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables).
- SANS 1339: Electric cables – Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV.
- SANS 1507: Electric cables with extruded solid dielectric insulation for fixed installations 300/500 V to 1900/3300 V,  
Part 1-General,  
Part 3-PVC Distribution cables,  
Part 4-XLPE distribution cables,  
Part 5-Halogen free distribution cables.

### 2.2 TRANSNET FREIGHT RAIL'S PUBLICATION

- BBD5994: Technical Documentation Management Policy.

## 3.0 APPENDIX

The following appendix forms an integral part of this specification.

- 3.1 Appendix 1: Schedule of Requirements: Details of the cable to be supplied.

## 4.0 TENDERING PROCEDURE

- 4.1 Tenderers shall indicate clause-by-clause compliance with the specification. They shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance in English.
- 4.2 The tenderers shall motivate a statement of non-compliance.
- 4.3 The tenderer shall submit technical specifications of the cables offered.
- 4.4 Failure to comply with clauses 4.1, 4.2 and 4.3 could preclude a tender from consideration.

## 5.0 MEDIUM VOLTAGE CABLES

### 5.1 IMPREGNATED PAPER INSULATED.

- 5.1.1 Paper impregnated lead sheathed (PILC) cables used for reticulation systems and traction power supplies and other applications shall be in accordance with SANS 97.
- 5.1.2 The voltage range for the cables shall be between 3,3kV and 33kV.
- 5.1.3 The cables shall be three core with stranded copper conductors.
- 5.1.4 The cables shall be paper insulated, screened type, lead sheathed provided with an extruded PVC bedding.
- 5.1.5 The armouring shall be galvanised steel wire with outer extruded PVC over sheath over the armouring.
- 5.1.6 The cable shall be so manufactured that it is fully protected against the effect of electrolysis.
- 5.1.7 Single core cables used for 3 kV DC application shall withstand a test voltage of 10,5 kV for one minute.

- 5.1.8 Cables shall be suitable for laying directly in soil and concrete trenches.
- 5.1.9 The cables shall withstand exposure to water, corrosive conditions as well as high ultra violet conditions caused by direct sunlight.
- 5.1.10 The cables shall be tested in accordance with SANS 97. Type test certificates shall be submitted with the cables offered.
- 5.1.11 The packing, marking and sealing of cables and cable drums shall be in accordance with SANS 97.
- 5.2 CROSS – LINKED POLYETHYLENE INSULATED (XLPE).**
- 5.2.1 XLPE cables used for reticulation systems, 3kV DC traction feeders and traction power supplies and other applications shall be in accordance with SANS 1339.
- 5.2.2 The voltage range for the cables shall be between 3,8kV and 33kV.
- 5.2.3 Cables shall be single or three core with stranded copper conductors.
- 5.2.4 The cables shall be type A (armoured) for single and three core cables.
- 5.2.5 Single core type A cable shall be copper tape screened, aluminium wire armoured and provided with a PVC outer sheath.
- 5.2.6 Single core cables shall be rated for 3,8/6,6kV.
- 5.2.7 Single core cables used for 3 kV DC application shall withstand a test voltage of 10,5 kV for one minute.
- 5.2.8 Three core type A cable shall be copper tape screened, galvanised steel wire armoured and provided with a PVC outer sheath.
- 5.2.9 The manufacture of the single and three core cables shall be such that the cables are fully protected against the effect electrolysis.
- 5.2.10 The cables shall be suitable for laying directly in soil and concrete trenches.
- 5.2.11 The cables shall withstand exposure to water, corrosive conditions as well as high ultra violet conditions caused by direct sunlight.
- 5.2.12 The cables shall be tested in accordance with SANS 1339. Type test certificates shall be submitted with the cables offered.
- 5.2.13 Where specified flame-retardant and halogen free cables shall be in accordance with SANS 1339.
- 5.2.14 The packing, marking and sealing of cables and cable drums shall be in accordance with SANS 1339.
- 6.0 CABLES FOR FIXED INSTALLATIONS**
- 6.1 Unless otherwise specified single and multi-core, wire armoured, extruded PVC insulated cables shall be used for fixed installations. The cables shall be in accordance with SANS 1507 part 1 and part 3.
- 6.2 The voltage range is between 300/500 V to 1900/3300 V.
- 6.3 Cables shall have stranded annealed copper conductors.
- 6.4 The cables shall be marked according to SANS 1507 part 3. Core identification shall be by means of colour code or numbering of the insulation.
- 6.5 The cable shall be manufactured in a way that it is fully protected against the effect of electrolysis.
- 6.6 Where XLPE or halogen free cables are specified the cables shall be in accordance with SANS 1507 parts 4 and 5.
- 6.7 The cables shall be tested in accordance with SANS 1507 of part 3, part 4 and part 5. Type test certificates shall be submitted with the cables offered.

- 6.8 The packing, marking and sealing of cables and cable drums shall be in accordance with SANS 1507.

## **7.0 QUALITY ASSURANCE**

- 7.1 Transnet Freight Rail reserves the right to carry out inspection and tests on the equipment at the works of the supplier/manufacturer.
- 7.2 Arrangements must be made timeously for such inspections and type/routine tests in accordance with the cable specifications are carried out before delivery of the cables to the site.

## **8.0 INSPECTION AND TESTING**

- 8.1 Transnet Freight Rail reserves the right to carry out inspections and any tests on cables at the factory of the supplier/ manufacture.
- 8.2 Arrangements must be made with Senior Engineer, Technology Management (Electrical) Transnet Freight Rail for inspections to be carried out before delivery of the equipment.

## **9.0 BIBLIOGRAPHY**

- [1] SANS, "SANS 97:2017 Electric cables - Impregnated paper insulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables).," SABS Standards division, Pretoria, South Africa, 2017.
- [2] SANS, "SANS 1339:2017 Electric cables – Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV," SABS standards division, Pretoria, South Africa, 2017.
- [3] SANS, "SANS 1507:2007 Electric cables with extruded solid dielectric insulation for fixed installations 300/500 V to 1900/3300 V,," SABS standards division, Pretoria, South Africa, 2007.
- [4] T. F. R. Transnet, "BBD 5994: Technical Documentation Policy," Transnet, Johannesburg, 2011.

## 10.0 APPENDIX 1

### SCHEDULE OF REQUIREMENTS

(To be completed by the client)

#### 1.0 MEDIUM VOLTAGE CABLES

##### 1.1 PAPER IMPREGNATED LEAD SHEATHED (PILC)

1.1.1 Rated Voltage (V): .....

1.1.2 Number of cores: .....

1.1.3 Length of cables (m): .....

1.1.4 Size of conductors (mm<sup>2</sup>): .....

##### 1.2 CROSS LINKED POLYETHYLENE INSULATED (XLPE)

(XLPE is recommended for 3 kV DC Applications)

1.2.2 Rated Voltage (V): .....

1.2.3 Number of cores: .....

1.2.4 Length of cables (m): .....

1.2.5 Size of conductors (mm<sup>2</sup>): .....

1.2.6 Flame retardant (required/not required): .....

#### 2.1 CABLES FOR FIXED INSTALLATIONS

2.1.1 Type of cable required:

- PVC Distribution cables: (Yes/ No): .....
- XLPE Distribution cables: (Yes/No): .....

2.1.2 Rated Voltage (V): .....

2.1.3 Number of cores: .....

2.1.4 Length of cables (m): .....

2.1.5 Size of conductors (mm<sup>2</sup>): .....

-----END-----



A Division of Transnet SOC Limited

# TECHNOLOGY MANAGEMENT

## SPECIFICATION

### PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Author: Engineer  
Technology Management

A.R. Netsianda

Handwritten signature of A.R. Netsianda in black ink, followed by a dotted line.

Approved: Senior Engineer  
Technology Management

L. O. Borchard

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Authorised: Principal Engineer  
Technology Management

S. E. Sibande

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Date: 28 July 2014

Circulation Restricted To:

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**1.0 SCOPE**

This specification covers Transnet Freight Rail requirements for surface preparation, paint systems and painting of steel components of electrical equipment.

**2.0 REFERENCES AND GLOSSARY**

2.1 The following publications/specifications (latest editions) are referred to herein:

**SOUTH AFRICAN NATIONAL STANDARDS (SANS)**

SANS 10064: The preparation of steel surfaces for coating.

SANS 1091: National colour standards.

SANS 1274: Coatings applied by powder coating process.

2.2 **TRADE NAMES:**

OptiDegreaser

OptiPrimeAqua

Noxyde/OptiRustBusta

2.3 **CLASSIFICATION OF LEVEL OF SURFACE DEGRADATION:**

RE1-0.05% of surface rusted

RE2-0.5% of surface rusted

RE3-1.0% of surface rusted

RE4-3.0% of surface rusted

RE5-8.0% of surface rusted

**3.0 METHOD OF TENDERING**

3.1 Tenderers shall indicate clause-by-clause compliance with this specification. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance. This document can be used by tenderers to elaborate on their response to a clause.

3.2 A statement of non-compliance shall be motivated by the tenderer.

3.3 Failure to comply with clauses 3.1 and 3.2 could preclude a tender from consideration.

**4.0 SERVICE CONDITIONS****4.1 ENVIRONMENTAL CONDITIONS**

The equipment shall be designed and rated for installation and continuous operation under the following conditions:

Altitude: 0 - 1800 m above sea level

Relative humidity: 10% to 90%

Ambient temperature: -10° C to +55° C

Lightning conditions: 20 ground flashes/km<sup>2</sup> per annum

Pollution: Heavily salt laden with industrial pollutants including diesel-electric locomotive emissions

**5.0 SURFACE PREPARATION****5.1 NON-GALVANISED STEELWORK****5.1.1 NEW STEELWORK**

SURFACE PREPARATION (Read: NOTES and SPECIAL INSTRUCTIONS)	PRODUCT REQUIREMENTS AND APPLICATION
---	--------------------------------------

	(see variations for specific environmental conditions)
<ul style="list-style-type: none"> <li>➤ Sandblast to a standard of Sa2 to remove mill scale and/or flash rust</li> <li>➤ Remove dust with <u>clean</u> compressed air (check air for oil contamination)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply a stripe coat to edges, bolts, crevices, nuts and rivets.</li> <li>➤ Apply 300µm wet coat of Noxyde/OptiRustBusta to the entire structure with contrasting colour.</li> <li>➤ Apply a final 300µm wet coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup></li> </ul>

## 5.1.2 PREVIOUSLY COATED STEELWORK

### 5.1.2.1 COATING START FAILING TO A LEVEL RE 2

<ul style="list-style-type: none"> <li>➤ test for adhesion (refer to supplier)</li> <li>➤ degrease thoroughly with OptiDegreaser</li> <li>➤ hydro blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply a stripe to edges, bolts, nuts, rivets and fill crevices.</li> <li>➤ Apply one coat of Noxyde/OptiRustBusta to entire substrate in a contrasting colour.</li> </ul>
---	--

### 5.1.2.2 COATING FAILURE AND RUSTING TO A LEVEL OF RE 4

<ul style="list-style-type: none"> <li>➤ Remove all visible traces of rust by mechanical means ST2 (chip/grind/sand) OR shotblasting/spotblasting</li> <li>➤ degrease thoroughly with OptiDegreaser</li> <li>➤ hydro blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply 300µm wet coat of Noxyde/OptiRustBusta to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices.</li> <li>➤ Apply one coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup> to entire substrate using a contrasting colour.</li> </ul>
--	---

### 5.1.2.3 BITUMEN COATED

<ul style="list-style-type: none"> <li>➤ Remove all visible rust and loosely adhering bitumen coating by means of chipping and scrapping (ST2)</li> <li>➤ degrease thoroughly with OptiDegreaser</li> <li>➤ hydro blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply 300µm wet coat of Noxyde/OptiRustBusta to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices.</li> <li>➤ Apply one coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup> to entire substrate using a contrasting colour.</li> </ul>
---	---

## 5.1.2.4 BADLY RUSTED STEEL WITH PITTING AND CRUST FORMATION TO RE5

<ul style="list-style-type: none"> <li>➤ Degrease thoroughly with OptiDegreaser</li> <li>➤ hydro blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle</li> <li>➤ shotblast/sandblast complete substrate giving particular attention to bolts nuts rivets and crevices Sa2</li> <li>➤ De-dust</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply a first 300µm wet of Noxyde/OptiRustBusta to entire substrate to the contrasting colour.</li> <li>➤ Apply a stripe coat to edges, bolts, nuts, rivets and fill crevices using a contrasting colour.</li> <li>➤ Apply a final coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup>.</li> </ul>
---	--

## 5.2 GALVANISED STEELWORK

## 5.2.1 NEW AND WEATHERED GALVANISING WITH A SMOOTH GLOSSY FINISH

<ul style="list-style-type: none"> <li>➤ Degrease thoroughly with OptiDegreaser</li> <li>➤ rinse down with copious quantities of potable water</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply one thin coat of OptiPrime/Aqua (100 micron wet/35 micron dry)</li> <li>➤ Apply a stripe coat of Noxyde/OptiRustBusta to edges, bolts, nuts, rivets and fill crevices.</li> <li>➤ Apply two coats of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup> per coat to the complete substrate using contrasting colors.</li> </ul>
---	--

## 5.2.2 WEATHERED GALVANISING

## 5.2.2.1 White rust (Zinc oxide)

<ul style="list-style-type: none"> <li>➤ Degrease thoroughly with OptiDegreaser – ensure that all traces of “white rust” are removed</li> <li>➤ rinse down with copious quantities of potable water</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply one 300µm wet coat of Noxyde/OptiRustBusta</li> <li>➤ Apply a stripe coat of Noxyde/OptiRustBusta to edges, bolts, nuts, rivets and fill crevices.</li> <li>➤ Apply a final coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup> per coat to the complete substrate using contrasting color.</li> </ul>
--	--

## 5.2.2.2 Combination of red rust (Iron oxide) and white rust (Zinc oxide)

<ul style="list-style-type: none"> <li>➤ Remove all traces of red rust</li> <li>➤ Degrease thoroughly with OptiDegreaser – ensure that all traces of “white rust” are removed</li> <li>➤ rinse down with copious quantities of potable water</li> </ul>	<ul style="list-style-type: none"> <li>➤ Apply 300µm wet coat of Noxyde/OptiRustBusta to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices.</li> <li>➤ Apply a final coat of Noxyde/OptiRustBusta at a consumption rate of minimum 400g/m<sup>2</sup> per coat to the complete substrate using contrasting color.</li> </ul>
---	---

## NOTES AND SPECIAL INSTRUCTIONS:

<p>1 Sand or Grit-blasting:</p> <ul style="list-style-type: none"> <li>a) Always use clean, non-recycled grit</li> <li>b) Always use fine or extra fine grit</li> <li>c) Always use oil free air</li> <li>d) Always use a moisture trap</li> <li>e) Dedust</li> </ul>	<p>2 Degreasing:</p> <ul style="list-style-type: none"> <li>a) Use only OptiDegreaser</li> <li>b) Dilute according to instructions – see data sheet</li> <li>c) Always follow up with hydro-blasting to remove all chemical residues</li> </ul>	<p>3 Hydro-blasting:</p> <ul style="list-style-type: none"> <li>a) Always use clean portable water</li> <li>b) Use a rotating nozzle and ensure a pressure of minimum 250 bar at the nozzle</li> <li>c) Remove ALL traces of dirt and any form of salt contamination and residues of the degreasing agent</li> <li>d) Concentrate in crevices and other similar “collection” areas</li> </ul>
---	---	---

## 6.0 PRODUCT APPLICATION

### 6.1 METHOD OF APPLICATION

OptiPrimeAqua	Noxyde/OptiRustBusta
<p>Temperature-Min 5 °C Relative humidity-Max 80% R.H.</p> <ul style="list-style-type: none"> <li>➤ Apply by brush, lacquer roller or airless spray using a no.11 nozzle</li> <li>➤ Apply one thin coat only – 100 micron wet=35 micron dry (DFT)</li> <li>➤ Small parts can be dipped – dilute with 10% water for dipping</li> </ul>	<p>Temperature-Min 5 °C Relative humidity-Max 80% R.H.</p> <ul style="list-style-type: none"> <li>➤ Apply by brush, roller or airless spray</li> <li>➤ For airless spray applications refer to “data sheet of Noxyde/OptiRustBusta”</li> </ul>

### 6.2 DRYING TIME AND OVERCOAT PERIODS

<ul style="list-style-type: none"> <li>➤ Do not overcoat within 12 hours</li> <li>➤ Wash down with clean portable water (100 bar) before over coating to remove dust or any other form of intermediate contamination</li> </ul>	<ul style="list-style-type: none"> <li>➤ Drying time is dependent on ambient conditions and can vary from a few minutes (in dry windy conditions) to a few hours (in humid shaded conditions)</li> <li>➤ Over coat as soon as possible to avoid contamination of previous coat</li> <li>➤ Wash down with clean portable water (100-150 bar) before over coating if danger of contamination exists or it left more than 4 hours before over coating</li> </ul>
---	---

### 6.3 CURING TIME

n/a	➤ 7 – 14 days to “full cure”. During this period the product is prone to mechanical damage – the longer time it is allowed to cure, the tougher it becomes
-----	--

### 6.4 DRY FILM THICKNESS (DFT) READINGS

35 micron	<ul style="list-style-type: none"> <li>➤ Severe coastal &amp; marine environment (in the spray zone) – TWO stripe coats &amp; overall minimum DFT of 400 micron</li> <li>➤ Normal coastal environment (15 km from coastal line) - a single stripe of coat &amp; overall minimum DFT of 400 micron</li> <li>➤ Non-coastal high rainfall areas, in the immediate vicinities of rivers, dams, lakes, etc., and in industrial areas with high levels of chemical pollution – a single stripe of coat &amp; overall minimum DFT of 400 micron</li> <li>➤ Dry non aggressive environments - a single stripe of coat &amp; overall minimum DFT of 250 micron</li> </ul> <p>NOTE: DFT readings can only be taken after 72 hours</p>
-----------	---

- 6.5 Notwithstanding the above requirements, all surfaces shall be cleaned according to the appropriate method described in SANS 10064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.
- 6.6 Blast cleaning of components shall be in accordance with clause 4.5 of SANS 10064 to a degree of cleanliness of at least Sa2 for inland exposure components and Sa2 1/2 for coastal exposure components. See table 1 of SANS 10064 for the appropriate profile.
- 6.7 Sheet metal components that cannot be blast cleaned shall be cleaned by pickling according to clause 4 of SANS 10064.
- 6.8 Components that will be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SANS 10064 to a medium weight classification of table 2 of that specification.
- 6.9 Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SANS 10064.

## 7.0 PAINT SYSTEM

A choice of two systems is available to suit the contractors' equipment.

### 7.1 Water based paint system

1<sup>st</sup> coat: OptiPrimeAqua

Wet film thickness: 100 micrometers. Dry film thickness: 35 micrometers.

2<sup>nd</sup> coat: Noxyde/OptiRustBusta

Dry film thickness: 165 micrometers @ 400g/m<sup>2</sup>.

3<sup>rd</sup> coat: Noxyde/OptiRustBusta

---

Dry film thickness: 165 micrometers @ 400g/m<sup>2</sup>.

7.1.1 Paint application

- 7.1.1.1 The primer and paint is normally applied by brush at supply viscosity (no reducer required)
- 7.1.1.2 The practical spreading rate of the primer and paint is the function of the ambient temperature, wind velocity and application technique, but will generally fall in the range of 400g/m<sup>2</sup> in low to mild corrosive areas, and 500g/m<sup>2</sup> in severely corrosive areas.
- 7.1.1.3 Once the applied coat of primer/paint is touch dry, the next coat of paint may be applied.
- 7.1.1.4 If painted steelwork is to be bolted onto structures, it is imperative that the paint has been allowed to hard dry before the steelwork is bolted onto structures. This is to prevent the soft paint being damaged when tightening the bolts securing the steelwork to the structures.

7.2 Powder coating system

The powder-coating process shall be in accordance with SABS 1274 type 4: Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coatings.

**8.0 COATINGS AND WORKMANSHIP**

- 8.1 All specified coatings shall be applied according to relevant specification and the manufacturer's instructions shall be followed.
- 8.2 coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.
- 8.3 When examined visually, the finished product shall have a uniform appearance and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

**9.0 SUBSTITUTION**

- 9.1 This specification replaces specification CEE.045 of 2002/1.
- 9.2 All clauses have been revised to suit latest requirements.

**END**

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**SANS 60076-3:2019**

Edition 3.1

**IEC 60076-3:2018**

Edition 3.1

# **SOUTH AFRICAN NATIONAL STANDARD**

## **Power transformers**

### **Part 3: Insulation levels, dielectric tests and external clearances in air**

This national standard is the identical implementation of IEC 60076-3:2018, and is adopted with the permission of the International Electrotechnical Commission.

#### **WARNING**

**This standard references other documents normatively.**

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## **SANS 60076-3:2019**

Edition 3.1

## **IEC 60076-3:2018**

Edition 3.1

### **Table of changes**

<b>Change No.</b>	<b>Date</b>	<b>Scope</b>
IEC amdt. 1	2018	Amended to update the clause on dielectric tests, an annex on information on transformer insulation and dielectric tests to be supplied with an enquiry and with an order, and the annex on basis for dielectric tests, insulation levels and clearances.

### **National foreword**

This South African standard was prepared by National Committee SABS/TC 067/SC 05, *Electricity distribution systems and components – Electricity distribution*, in accordance with procedures of the South African Bureau of Standards, in compliance with annex 3 of the WTO/TBT agreement.

In the case of distribution transformers, national deviations from this SANS document (if required) will be given in SANS 780.

This document was approved for publication in June 2019.

This document supersedes SANS 60076-3:2014 (edition 3).

**Compliance with this document cannot confer immunity from legal obligations.**



IEC 60076-3

Edition 3.1 2018-03

# CONSOLIDATED VERSION

# VERSION CONSOLIDÉE



## Power transformers –

## Part 3: Insulation levels, dielectric tests and external clearances in air

## Transformateurs de puissance –

## Partie 3: Niveaux d'isolement, essais diélectriques et distances d'isolement dans l'air

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### POWER TRANSFORMERS –

#### Part 3: Insulation levels, dielectric tests and external clearances in air

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**This Consolidated version of IEC 60076-3 bears the edition number 3.1. It consists of the third edition (2013-07) [documents 14/745/FDIS and 14/749/RVD] and its amendment 1 (2018-03) [documents 14/947/FDIS and 14/952/RVD]. The technical content is identical to the base edition and its amendment.**

**This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.**

IEC 60076-3:2013+AMD1:2018 CSV  
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– 5 –

International Standard IEC 60076-3 has been prepared by IEC technical committee 14: Power transformers.

This third edition of IEC 60076-3 constitutes a technical revision. The main changes from the previous edition are as follows:

- Three categories of transformer are clearly identified together with the relevant test requirements, these are summarised in Table 1.
- Switching impulse levels are defined for all  $U_m > 72,5\text{kV}$ .
- The procedure for Induced voltage tests with PD has been revised to ensure adequate phase to phase test voltages.
- The AC withstand test has been redefined (LTAC instead of ACSD).
- Induced voltage tests are now based on  $U_r$  rather than  $U_m$ .
- New requirements for impulse waveshape (k factor) have been introduced.
- Tables of test levels have been merged and aligned with IEC 60071-1:2010.
- Additional test levels have been introduced for  $U_m > 800\text{kV}$ .
- A new Annex E has been introduced, which sets out the principles used in assigning the tests, test levels and clearances in air.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60076 series, under the general title *Power transformers*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

This part of IEC 60076 specifies the insulation requirements and the corresponding insulation tests with reference to specific windings and their terminals. It also recommends external clearances in air (Clause 16).

The insulation levels and dielectric tests which are specified in this standard apply to the internal insulation only. Whilst it is reasonable that the rated withstand voltage values which are specified for the internal insulation of the transformer should also be taken as a reference for its external insulation, this may not be true in all cases. A failure of the non-self-restoring internal insulation is catastrophic and normally leads to the transformer being out of service for a long period, while an external flashover may involve only a short interruption of service without causing lasting damage. Therefore, it may be that, for increased safety, higher test voltages are specified by the purchaser for the internal insulation of the transformer than for the external insulation of other components in the system. When such a distinction is made, the external clearances should be adjusted to fully cover the internal insulation test requirements.

Annex E sets out some of the principles used in assigning the tests, test levels and clearances in air to the transformer according to the highest voltage for equipment  $U_m$ .



## POWER TRANSFORMERS –

### Part 3: Insulation levels, dielectric tests and external clearances in air

#### 1 Scope

This International Standard applies to power transformers as defined by and in the scope of IEC 60076-1. It gives details of the applicable dielectric tests and minimum dielectric test levels. Recommended minimum external clearances in air between live parts and between live parts and earth are given for use when these clearances are not specified by the purchaser.

For categories of power transformers and reactors which have their own IEC standards, this standard is applicable only to the extent in which it is specifically called up by cross reference in the other standards.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-421, *International Electrotechnical Vocabulary (IEV) – Chapter 421: Power transformers and reactors*

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60060-2, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60071-1, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60076-1, *Power transformers – Part 1: General*

IEC 60137, *Insulated bushings for alternating voltages above 1 000 V*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

#### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60076-1, IEC 60050-421 and the following apply.

##### 3.1

##### highest voltage for equipment applicable to a transformer winding

$U_m$

highest r.m.s. phase-to-phase voltage in a three-phase system for which a transformer winding is designed in respect of its insulation

### 3.2

#### **rated voltage of a winding**

$U_r$

voltage assigned to be applied, or developed at no-load, between the terminals of an untapped winding, or a tapped winding connected on the principal tapping, for a three-phase winding it is the voltage between line terminals

Note 1 to entry: The rated voltages of all windings appear simultaneously at no-load when the voltage applied to one of them has its rated value.

Note 2 to entry: For single-phase transformers intended to be connected in star to form a three-phase bank or to be connected between the line and the neutral of a three phase system, the rated voltage is indicated as the phase-to-phase voltage, divided by  $\sqrt{3}$ , for example  $400/\sqrt{3}$  kV.

Note 3 to entry: For single phase transformers intended to be connected between phases of a network, the rated voltage is indicated as the phase-to-phase voltage.

Note 4 to entry: For the series winding of a three-phase series transformer, which is designed as an open winding, the rated voltage is indicated as if the windings were connected in star.

[SOURCE: IEC 60076-1:2011, 3.4.3]

### 3.3

#### **rated insulation level**

set of rated withstand voltages which characterise the dielectric strength of the insulation

### 3.4

#### **rated withstand voltage**

value of the assigned test voltage applied in one of the standard dielectric tests that proves that the insulation complies with the assigned test voltage

### 3.5

#### **uniform insulation of a transformer winding**

insulation of a transformer winding that has all its ends connected to terminals with the same rated insulation level

### 3.6

#### **non-uniform insulation of a transformer winding**

insulation of a transformer winding when it has a neutral terminal end for direct or indirect connection to earth, and is designed with a lower insulation level than that assigned to the line terminal

Note 1 to entry: Non-uniform insulation may also be termed graded insulation.

## 4 General

The insulation requirements for power transformers and the corresponding insulation tests are given with reference to specific windings and their terminals.

For liquid-immersed or gas-filled transformers, the requirements apply to the internal insulation only. Any additional requirements or tests regarding external insulation which are deemed necessary shall be subject to agreement between manufacturer and purchaser. If the purchaser does not specify any particular requirements for external clearances then the provisions of Clause 16 shall apply. If the purchaser intends to make the connections to the transformer in a way which may reduce the clearances provided by the transformer alone, this should be indicated in the enquiry.

Bushings shall be subject to separate type and routine tests according to IEC 60137 (including appropriate bushing test levels for the particular transformer test level), which verify their phase-to-earth insulation, external as well as internal.

When a transformer is specified for operation at an altitude higher than 1 000 m, clearances shall be designed accordingly. It may then be necessary to select bushings designed for higher insulation levels than otherwise required for operation at lower altitudes, see Clause 16 of this standard and IEC 60137.

The manufacturer may shield the bushing terminals if necessary during the dielectric tests but any shielding of the earthed parts closest to the terminals shall form part of the transformer structure in-service except for shielding required only during partial discharge measurement.

Bushings and tap-changers are specified, designed and tested in accordance with the relevant IEC standards. The dielectric tests on the complete transformer constitute a check on the correct application and installation of these components. In the case of tap-changers which according to IEC 60214-1 are not subjected to dielectric routine tests at the tap-changer manufacturer's works then the tests performed according to this standard also serve as the only dielectric tests routinely performed on this component.

The temperature of the insulation system shall not be less than 10 °C during the tests, but temperatures higher than those given in IEC 60076-1 may be used.

The transformer shall be completely assembled as in service in respect of all elements that might influence the dielectric strength of the transformer. It is normally assumed that the insulating liquid or gas is not circulated during the tests and coolers do not need to be assembled. Any equipment designed to collect or detect free gas produced by faults in the insulation shall be installed and monitored during the tests. If free gas is detected during any test, the nature and cause of the gas shall be investigated and any further actions shall be agreed between purchaser and manufacturer.

NOTE 1 External overvoltage protection devices such as surge arresters do not need to be assembled and bushing spark gaps can be removed or their spacing increased to avoid operation during the tests.

NOTE 2 It is common practice for larger transformers for oil samples to be taken for dissolved gas analysis before and after dielectric tests.

Liquid immersed transformers shall be tested with the same type (mineral, ester, silicone, etc.) and specification (with respect to the properties that might affect the test performance) of liquid that it will contain in service.

NOTE 3 Some purchasers can require that the insulating liquid be circulated on OD cooled transformers during an IVPD test to detect the possibility of static electrification, but this is a very specific requirement and is not covered by this standard.

Transformers for cable box connection or direct connection to metal-enclosed SF<sub>6</sub> installations should be designed so that temporary connections can be made for dielectric tests, using temporary bushings, if necessary. By agreement between manufacturer and purchaser, the service liquid to SF<sub>6</sub> bushings may be replaced by appropriate liquid to air bushings for test, in this case the design of the end of the bushing inside the transformer including the positions of the live parts and the clearances of the substitute bushings inside the transformer shall be the same (within the normal variation of dimensions of the bushing associated with manufacturing tolerances) as those of the in-service bushings.

When the manufacturer intends to use non-linear elements (for example surge arresters or spark gaps), built into the transformer or tap-changer or externally fitted, for the limitation of overvoltage transients, this shall be brought to the purchaser's attention by the manufacturer at the tender and order stage and shall be indicated on the transformer rating plate circuit diagram.

If any terminals of the transformer are to be left open when the transformer is energised in service then consideration needs to be given to the possibility of a transferred voltage occurring on the open terminals, see Annex B. During the lightning impulse tests all non-tested line and neutral terminals are normally connected to earth, see Clause 13.

## 5 Highest voltage for equipment and rated insulation level

A value of highest voltage for equipment  $U_m$  (see Clause 3) is assigned to both the line and neutral end of each winding, see IEC 60076-1.

The rules for dielectric testing depend on the value of  $U_m$ . When rules about tests for different windings in a transformer are in conflict, the rule for the winding with the highest  $U_m$  value shall apply for the whole transformer.

Series windings (for example found in autotransformers and phase shifting transformers) where the rated voltage of the winding is less than the rated voltage of the system, shall be assigned a value of  $U_m$  corresponding to the rated voltage of the highest voltage system to which the winding is connected.

Standardized values of  $U_m$  are listed in Table 2. Unless otherwise specified, the value to be used for a transformer winding is the one equal to, or nearest above, the value of the rated voltage of the winding.

NOTE 1 Single-phase transformers intended for connection in star to form a three-phase bank are designated by phase-to-phase rated voltage divided by  $\sqrt{3}$ , for example  $400/\sqrt{3}$  kV. The phase-to-phase value determines the choice of  $U_m$  in this case, consequently,  $U_m = 420$  kV (see also IEC 60076-1). The same principle applies to single-phase transformers intended for use in a single phase system in that the maximum phase to earth voltage is multiplied by  $\sqrt{3}$  to obtain the equivalent  $U_m$  in order to define the test voltages.

NOTE 2 For transformer windings intended to be used for example in railway supply applications where two opposite phase to earth voltages are supplied,  $U_m$  relates to the phase to phase voltage unless otherwise specified.

NOTE 3 It might happen that certain tapping voltages are chosen slightly higher than a standardized value of  $U_m$ , but the system to which the winding will be connected has a system highest voltage which stays within the standard value. The insulation requirements are to be coordinated with actual conditions, and therefore this standard value can be accepted as  $U_m$  for the transformer, and not the nearest higher value.

NOTE 4 In certain applications with very special conditions the specification of other combinations of withstand voltages can be justified. In such cases, general guidance should be obtained from IEC 60071-1.

NOTE 5 In certain applications, delta-connected windings are earthed through one of the external terminals. In those applications, a higher withstand voltage with respect to the highest voltage for equipment  $U_m$  can be required for this winding and would need to be agreed between manufacturer and purchaser.

The highest voltage for equipment  $U_m$  and the rated insulation level (the set of assigned rated withstand voltages) determine the dielectric characteristics of a transformer. These characteristics are verified by a set of dielectric tests, see Clause 7.

The value of  $U_m$  and the rated insulation level which are assigned to each winding of a transformer are part of the information to be supplied with an enquiry and with an order. If there is a winding with non-uniform insulation, the assigned  $U_m$  and the rated insulation level of the neutral terminal may also be specified by the purchaser, see 7.4.

The rated insulation level shall be characterised as follows:

$U_m$  / SI / LI / LIC / AC with the associated values (see examples below) for the line terminals of each winding

If the winding does not have an assigned SI or LIC withstand level then the abbreviation is omitted from the rating so for terminals without an assigned switching impulse withstand level or chopped wave lightning impulse withstand level and for neutral terminals the abbreviation would be:

$U_m$  / LI / AC together with the associated values

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If the neutral terminal of a winding has the same rated insulation level as the line terminal then the rated insulation level of the neutral does not need to be shown separately.

The abbreviations here and in the examples below have the following meaning:

- SI is the rated switching impulse withstand voltage level for the line terminals of the winding with the highest  $U_m$ ;
- LI is the rated lightning impulse withstand voltage level for the terminal of each individual winding;
- LIC is the rated lightning impulse withstand voltage level for the line terminals of each individual winding if a chopped wave lightning impulse test was performed;
- AC is the highest rated AC withstand voltage level to earth designed for the terminals of each winding.

NOTE 6 The AC is the value for which the transformer is designed, this is generally the highest AC voltage required to be achieved on test.

- HV high voltage;
- LV low voltage;
- MV medium voltage (intermediate voltage IEC 60076-1);
- N neutral.

The rated withstand voltages for all windings shall appear on the rating plate.

The principles of the standard abbreviated notation are shown in some examples below.

#### EXAMPLE 1

Transformer with a nominal rated voltage of 66 / 11 kV  $U_m$  (HV) = 72,5 kV and  $U_m$  (LV) = 12 kV, both uniformly insulated, Y connected, the rating plate would read:

HV  $U_m$  72,5 / LI 325 / AC 140 kV  
LV  $U_m$  12 / LI 75 / AC 28 kV

#### EXAMPLE 2

$U_m$  (HV) line = 245 kV, Y connected (220 kV rated voltage);

$U_m$  (HV) neutral = 52 kV;

$U_m$  (MV) line = 72,5 kV, uniform insulation, Y connected (LIC not specified);

$U_m$  (LV) line = 24 kV, D connected LIC not required.

The rating plate would read:

HV  $U_m$  245 / SI 750 / LI 950 / LIC 1045 / AC 395 kV  
HVN  $U_m$  52 / LI 250 / AC 95 kV  
MV  $U_m$  72,5 / LI 325 / AC 140 kV  
LV  $U_m$  24 / LI 125 / AC 50 kV

## 6 Transformers with re-connectable windings

Unless otherwise specified, windings which are specified to be capable of being connected in more than one configuration for service shall be tested in each configuration.

## 7 Dielectric tests

### 7.1 Overview

The dielectric capability of the transformer insulation is verified by dielectric tests. The following is a general explanation of the different tests.

- **Full wave lightning impulse test for the line terminals (LI)**, see 13.2

The test is intended to verify the capability of the transformer to withstand fast rise time transients in service typically associated with lightning strikes. The test verifies the withstand strength of the transformer under test, when the impulse is applied to its line terminals. The test contains high frequency voltage components and produces non-uniform stresses in the winding under test different to those for an alternating voltage test.

- **Chopped wave lightning impulse test for the line terminals (LIC)**, see 13.3

As well as covering the intention of the LI test, this test is intended to verify the capability of the transformer to withstand some high frequency phenomena that may occur in service. For this test the lightning impulse test includes both full wave impulses and impulses chopped on the tail to produce a very high rate of change of voltage. The chopped wave test voltage impulse has a higher peak value and contains higher frequency components than the full wave impulse.

- **Lightning impulse test for the neutral terminal (LIN)**, see 13.4

The test is intended to verify the impulse withstand voltage of the neutral terminal and its connected winding(s) to earth and other windings, and along the winding(s) under test.

- **Switching impulse test for the line terminal (SI)**, see Clause 14

The test is intended to verify the capability of the transformer to withstand slow rise time transient voltages typically associated with switching operations in service. The test verifies the switching impulse withstand strength of the line terminals and the connected winding(s) to earth and other windings. The test also verifies the withstand strength between phases and along the winding(s) under test. This is a single-phase test. The voltage is inductively distributed through all windings of the transformer, line terminals are open circuit for the test and the line terminals of the tested phase experience a voltage during the test approximately determined by the transformer turns ratio.

The voltage distribution in the tested phase is similar to that experienced during an induced voltage withstand test.

- **Applied voltage test (AV)**, see Clause 10

The test is intended to verify the alternating voltage withstand strength of the line and neutral terminals and their connected windings to earth and other windings. The voltage is applied to all the terminals of a winding, including the neutral, simultaneously so there is no turn-to-turn voltage.

- **Line terminal AC withstand voltage test (LTAC)**, see Clause 12

The test is intended to verify the alternating voltage (AC) withstand strength of each line terminal to earth. During the test, voltage appears at one or more of the line terminals. The test allows the line terminals of a transformer with non-uniform insulation to be tested at the applied voltage test level applicable to the line terminals.

- **Induced voltage withstand test (IVW)**, see 11.2

The test is intended to verify the alternating voltage withstand strength of each line terminal and its connected winding(s) to earth and other windings, along the winding(s) under test and the withstand strength between phases. The test is performed with the transformer connected as for service. During the test, symmetrical voltages appear at all the line terminals and between turns, with no voltage at the neutral. The test is performed with a three phase voltage on three phase transformers.

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– **Induced voltage test with PD measurement (IVPD)**, see 11.3

This test is intended to verify that the transformer will be free of harmful partial discharges under normal operating conditions. The test voltage is applied in the same way as the voltage that the transformer will experience in service. During the test, symmetrical voltages appear at all the line terminals and between turns, with no voltage at the neutral. The test is performed with a three phase voltage on three phase transformers.

– **Auxiliary wiring insulation test (AuxW)**, see Clause 9

This test verifies the insulation of the auxiliary wiring of the transformer that is not connected to the windings.

– **Lightning impulses applied to two or more terminals simultaneously (LIMT)**, see 13.1.4.3

This test verifies that the transformer can withstand the internal voltage rises that may occur if two or more terminals are subjected to a lightning impulse simultaneously. The test is only applicable to some special types of transformer with either a series winding that may be shorted in service (for example some phase shifting transformers with an on-load bypass) or where impulses on two or more terminals may occur simultaneously in service.

NOTE This test is also referred to as a 'double-ended lightning impulse test'.

## **7.2 Test requirements**

### **7.2.1 General**

The requirements for dielectric tests, both the required tests and the test voltage levels, depend on the highest voltage for equipment  $U_m$  for the highest voltage winding of the particular transformer. The required tests are summarised in Table 1 and specific requirements are given in 7.3.

NOTE Lightning impulses applied to two or more line terminals simultaneously is a special test for only a few special types of transformer irrespective of  $U_m$  and is not included in the table for clarity.

Any additional tests above the requirements of this standard and the test voltage levels shall be specified by the purchaser at the time of enquiry and order since they may affect the transformer design (see Annex C).

Reference shall be made to IEC 60060-1 for details of the tests. Where tolerances on test parameters and values are not specifically given in this standard then the values given in IEC 60060-1 shall be used.



**Table 1 – Requirements and tests for different categories of transformers based on the  $U_m$  of the highest voltage winding**

	$U_m \leq 72,5 \text{ kV}$	$72,5 \text{ kV} < U_m \leq 170 \text{ kV}$		$U_m > 170 \text{ kV}$
Insulation	Uniform	Uniform	Non-uniform	Uniform and non-uniform
Full wave lightning impulse test for the line terminals (LI)	Type	Routine	Routine	Not applicable (included in LIC)
Chopped wave lightning impulse test for the line terminals (LIC)	Special	Special	Special	Routine
Lightning impulse test for the neutral terminals (LIN)	Special	Special	Special	Special
Switching impulse test for the line terminal (SI)	Not applicable	Special	Special	Routine
Applied voltage test (AV)	Routine	Routine	Routine	Routine
Induced voltage withstand test (IVW)	Routine	Routine	Routine	Not applicable
Induced voltage test with PD measurement (IVPD)	Special <sup>a</sup>	Routine <sup>a</sup>	Routine <sup>a</sup>	Routine
Line terminal AC withstand voltage test (LTAC)	Not applicable	Special	Routine <sup>b</sup>	Special
Auxiliary wiring insulation test (AuxW)	Routine	Routine	Routine	Routine
<sup>a</sup> The requirements of the IVW test can be incorporated in the IVPD test so that only one test is required.				
<sup>b</sup> The LTAC test for this category of transformers can be replaced by a switching impulse test by agreement between manufacturer and purchaser.				

### 7.2.2 Test voltage levels

Levels of standard test voltages, identified by the highest voltage for equipment  $U_m$  of a winding are given in Table 2. The choice between the different levels of test voltages in these tables depends on the severity of overvoltage conditions to be expected in the system and on the importance of the particular installation. Guidance may be obtained from IEC 60071-1.

All test voltages are phase to earth.

The lowest values given in Table 2 for a particular value of  $U_m$  represent the minimum test voltage levels and shall be used if nothing else is specified. In general the values given in each row in Table 2 are co-ordinated. If only a lightning impulse voltage level is specified then the other values on the same row shall be used. The purchaser may specify any value higher than the minimum for the particular  $U_m$  for each test, preferably standard values for coordination, but not necessarily the values from a single row in Table 2. If higher levels are specified this shall be stated in the enquiry and order.

If, under special circumstances, the minimum levels given in Table 2 are considered too high by the purchaser then the values in Table 3 may be used. The values in Table 3 may only be used if special precautions have been taken to avoid overvoltage conditions beyond the capability of the transformer and either extensive studies have been completed or the values used represent proven existing practice applicable to the installation.

NOTE Certain installation conditions, particularly where energisation of the transformer is from the remote end of a cable or a long overhead line, can lead to severe exposure to overvoltages which might be frequent and repetitive. In such cases, higher test voltages, lightning impulse, switching impulse and other tests on individual units could be agreed between manufacturer and purchaser. For example a winding with a  $U_m < 1,1 \text{ kV}$  might be tested at the values appropriate to a winding with a  $U_m$  of 3,6 kV. The specific voltage-time characteristic of the overvoltage is an important consideration when deciding the type and level of the test required to assure satisfactory operation.



In particular, failures have been reported at  $U_m = 36$  kV and below where the transformer is energised/de-energised by a vacuum type circuit breaker from the remote end of a cable because a resonant condition might exist causing re-ignitions and repetitive transients. In certain cases increasing the insulation level might not be sufficient and other methods such as the installation of a snubber circuit could be considered. Further information is contained in IEEE C57.142:2010 and CIGRE report 12-14.

**Table 2 – Test voltage levels (1 of 2)**

Highest Voltage for equipment winding $U_m$ kV	Full Wave Lightning Impulse (LI) kV	Chopped Wave Lightning Impulse (LIC) kV	Switching impulse (SI) kV	Applied voltage or line terminal AC withstand (AV) (LTAC) kV
<1,1	–	–	–	3
3,6	20	22	–	10
	40	44	–	10
7,2	60	66	–	20
	75 <sup>a</sup>	83 <sup>a</sup>	–	20
12	75	83	–	28
	95	105	–	28
	110 <sup>a</sup>	121 <sup>a</sup>	–	34 <sup>a</sup>
17,5	95	105	–	38
	125 <sup>a</sup>	138 <sup>a</sup>	–	38
24	125	138	–	50
	145	160	–	50
	150 <sup>a</sup>	165 <sup>a</sup>	–	50
36	170	187	–	70
	200 <sup>a</sup>	220 <sup>a</sup>	–	70
52	250	275	–	95
72,5	325	358	–	140
	350 <sup>a</sup>	385 <sup>a</sup>	–	140
100	450	495	375 <sup>a</sup>	185
123	550	605	460 <sup>a</sup>	230
145	550	605	460 <sup>a</sup>	230
	650	715	540 <sup>a</sup>	275
170	650	715	540 <sup>a</sup>	275
	750	825	620 <sup>a</sup>	325
245	850	935	700 <sup>a</sup>	360
	950	1 045	750 <sup>a</sup>	395
	1 050	1 155	850 <sup>a</sup>	460
300	950	1 045	750	395
	1 050	1 155	850	460
362	1 050	1 155	850	460
	1 175	1 290	950	510
420	1 175	1 290	950	510
	1 300	1 430	1 050	570
	1 425	1 570	1 175 <sup>a</sup>	630

**Table 2 (2 of 2)**

Highest Voltage for equipment winding $U_m$ kV	Full Wave Lightning Impulse (LI) kV	Chopped Wave Lightning Impulse (LIC) kV	Switching impulse (SI) kV	Applied voltage or line terminal AC withstand (AV) (LTAC) kV
550	1 300	1 430	1 050	570
	1 425	1 570	1 175	630
	1 550	1 705	1 300 <sup>a</sup>	680
	1 675 <sup>a</sup>	1 845 <sup>a</sup>	1 390 <sup>a</sup>	–
800	1 800	1 980	1 425	–
	1 950	2 145	1 550	–
	2 050 <sup>a</sup>	2 255 <sup>a</sup>	1 700 <sup>a</sup>	–
	2 100	2 310	1 675 <sup>a</sup>	–
1 100	1 950	2 145	1 425	–
	2 250	2 475	1 800	–
1 200	2 250	2 475	1 800	–
<sup>a</sup> These values are not given in IEC 60071-1:2011 for the particular value of $U_m$ but are included either because they represent common practice in some parts of the world or for some switching impulse levels, because they represent a co-ordinated value for a particular value of lightning impulse level.				

**Table 3 – Test voltage levels used in special cases**

Highest Voltage for equipment winding $U_m$ kV	Full Wave Lightning Impulse (LI) kV	Chopped Wave Lightning Impulse (LIC) kV	Switching impulse (SI) kV	Applied voltage or line terminal AC withstand (AV) (LTAC) kV
7,2	40	44	-	20
12	60	66	-	28
17,5	75	83	-	38
24	95	105	-	50
36	145	160	-	70
60 <sup>a</sup>	280 <sup>a</sup>	308 <sup>a</sup>	230 <sup>a</sup>	115 <sup>a</sup>
123 <sup>b</sup>	450 <sup>b</sup>	495 <sup>b</sup>	375 <sup>a</sup>	185 <sup>b</sup>
170 <sup>b</sup>	550 <sup>b</sup>	605 <sup>b</sup>	460 <sup>a</sup>	230 <sup>b</sup>
245	650 <sup>b</sup>	715 <sup>b</sup>	550 <sup>a</sup>	275 <sup>b</sup>
	750 <sup>b</sup>	825 <sup>b</sup>	620 <sup>a</sup>	325 <sup>b</sup>
300	850	935	750	395
362	950	1 045	850	395
420	1 050	1 155	850	460
550	1 175	1 290	950	510
<sup>a</sup> These values are not given in IEC 60071-1:2011 for the particular value of $U_m$ but are included because they represent existing practice in some parts of the world.				
<sup>b</sup> these values require special consideration, refer to IEC 60071-1:2011				

### 7.2.3 Test sequence

The tests shall be performed in the sequence given below:

- a) lightning impulse tests (LI, LIC, LIN, LIMT);
- b) switching impulse (SI);
- c) applied voltage test (AV);
- d) line terminal AC withstand test (LTAC);
- e) induced voltage withstand test (IVW);
- f) induced voltage test with partial discharge measurement (IVPD).

NOTE This is a comprehensive list, not all these tests will be applicable to a particular transformer.

By agreement between the manufacturer and purchaser, the switching impulse test may be performed before the lightning impulse test.

If an IVPD test is to be performed then by agreement between the manufacturer and purchaser, the test sequence may be varied except that the IVPD test shall be the last dielectric test.

## 7.3 Test requirements for specific transformers

### 7.3.1 Tests for transformers with $U_m \leq 72,5$ kV

#### 7.3.1.1 Routine tests

- a) Applied voltage test (AV)

An applied voltage test shall be performed according to the method given in Clause 10 on each separate winding of the transformer. Test voltages are given in Table 2.

NOTE Transformers with  $U_m \leq 72,5$  kV are expected to have uniform winding insulation to satisfy this test.

- b) Induced voltage withstand test (IVW)

An induced voltage withstand test shall be performed according to the method given in 11.2 with a (phase to earth) test voltage of  $(2 \times U_r) / \sqrt{3}$ . If agreed by the purchaser this test may be substituted by an IVPD test with an enhancement voltage of  $(2 \times U_r) / \sqrt{3}$  see 7.3.1.3 a).

#### 7.3.1.2 Type tests

Full wave lightning impulse test (LI)

A full wave lightning impulse test shall be carried out on the line terminals using the method given in 13.1 and 13.2. Test voltages are given in Table 2.

#### 7.3.1.3 Special tests

- a) Induced voltage test with partial discharge measurement (IVPD)

If specified by the purchaser, a test shall be carried out according to the method given in 11.3, with an enhancement (phase to earth) voltage level of  $(1,8 \times U_r) / \sqrt{3}$  and a PD measurement voltage of  $(1,58 \times U_r) / \sqrt{3}$ . Alternative higher voltage levels may be used if specified by the purchaser. In particular an enhancement voltage of  $(\sqrt{3} \times U_m) / \sqrt{3}$  and a PD measurement voltage of  $(1,5 \times U_m) / \sqrt{3}$  may be used if higher.

If an enhancement voltage level of  $(2 \times U_r) / \sqrt{3}$  is used this test can substitute for the routine induced voltage withstand test.

A shorter duration at the PD measurement voltage may be agreed between manufacturer and purchaser, a duration of 5 min is recommended.

- b) Chopped wave lightning impulse test (LIC)

If specified by the purchaser the full wave lightning impulse test shall be substituted by a chopped wave lightning impulse test according to the method given in 13.1 and 13.3.

The extension of the lightning impulse test to include impulses chopped on the tail as a special test is recommended in cases where the transformer is directly connected to GIS by means of liquid to SF6 bushings or when the transformer is protected by rod gaps.

c) Lightning impulse test on the neutral terminal (LIN)

If specified by the purchaser a full wave lightning impulse test shall be carried out on the neutral terminal according to the method given in 13.1 and 13.4. This normally applies if the neutral is not directly connected to earth in service.

d) Lightning impulses applied to multiple line terminals simultaneously (LIMT)

If specified by the purchaser an additional lightning impulse test on two or more terminals connected together shall be performed according to the method given in 13.1 with the test connections given in 13.1.4.3. If not otherwise specified the type of test is LI.

### 7.3.2 Tests on transformers with $72,5 \text{ kV} < U_m \leq 170 \text{ kV}$

#### 7.3.2.1 Routine tests

a) Full wave lightning impulse test (LI)

A full wave lightning impulse test shall be carried out on the line terminals using the method given in Clause 13. Test voltages are given in Table 2.

b) Applied voltage test (AV)

An applied voltage test in accordance with the method given in Clause 10 shall be performed on each separate winding of the transformer. Test voltages are given in Table 2 for transformers with uniform insulation. For transformers with non-uniform insulation the test shall be carried out at the test voltage for the neutral terminal see 7.4.2.

c) Induced voltage withstand test (IVW)

An induced voltage withstand test shall be performed according to the method given in 11.2 with a (phase to earth) test voltage of  $(2 \times U_r) / \sqrt{3}$ . If agreed by the purchaser this test may be substituted by an IVPD test with an enhancement voltage  $(2 \times U_r) / \sqrt{3}$ , see e) below.

d) Line terminal AC withstand voltage test for non-uniformly insulated transformers (LTAC)

For windings with non-uniform insulation this test shall be performed at the test level given for the applied voltage test applicable to the line terminal in Table 2 using the method given in Clause 12. This test may be omitted if a switching impulse test is performed by agreement between manufacturer and purchaser.

e) Induced voltage test with partial discharge measurement (IVPD)

A test shall be carried out according to the method given in 11.3, with an enhancement (phase to earth) voltage level of  $(1,8 \times U_r) / \sqrt{3}$  and a PD measurement voltage of  $(1,58 \times U_r) / \sqrt{3}$ . Alternative higher voltage levels may be used if specified by the purchaser. In particular an enhancement voltage of  $(\sqrt{3} \times U_m) / \sqrt{3}$  and a PD measurement voltage of  $(1,5 \times U_m) / \sqrt{3}$  may be used if higher.

If an enhancement voltage level of  $(2 \times U_r) / \sqrt{3}$  is used this test can substitute for the routine induced voltage withstand test.

#### 7.3.2.2 Special tests

a) Switching impulse test (SI)

If specified by the purchaser a switching impulse test using the method given in Clause 14 shall be performed on the line terminals. The test voltage is given in Table 2. If this test is carried out, then the Line Terminal AC Withstand Test (LTAC) may be omitted by agreement.

b) Chopped wave lightning impulse test (LIC)

If specified by the purchaser the full wave lightning impulse test shall be substituted by a chopped wave lightning impulse test according to the method given in 13.1 and 13.3.

The extension of the lightning impulse test to include impulses chopped on the tail as a special test is recommended in cases where the transformer is directly connected to GIS by means of liquid to SF6 bushings or when the transformer is protected by rod gaps.

c) Line terminal AC withstand voltage test (LTAC)

If specified by the purchaser for windings with uniform insulation, this test shall be performed at the test level given for the applied voltage test applicable to the line terminal in Table 2 using the method given in Clause 12.

d) Lightning impulse test on the neutral terminal (LIN)

If specified by the purchaser a full wave lightning impulse test shall be carried out on the neutral terminal. This normally applies if the neutral is not directly connected to earth in service.

e) Lightning impulses applied to multiple line terminals simultaneously (LIMT)

If specified by the purchaser an additional lightning impulse test on two or more terminals connected together shall be performed according to the method given in 13.1 with the test connections given in 13.1.4.3. If not otherwise specified the type of test is LI.

### 7.3.3 Tests on Transformers with $U_m > 170$ kV

#### 7.3.3.1 Routine tests

a) Chopped wave lightning impulse test (LIC)

A chopped wave lightning impulse test shall be carried out on all line terminals with a  $U_m > 170$  kV using the method given in Clause 13. A lightning impulse test (LI) shall be carried out on all line terminals with  $U_m \leq 170$  kV using the method given in Clause 13. Test voltages are given in Table 2. If required by the purchaser in the contract, LIC tests shall additionally be carried out on line terminals with  $U_m \leq 170$  kV.

b) Switching impulse test (SI)

A switching impulse test using the method given in Clause 14 shall be performed on the line terminals. The test voltage is given in Table 2.

c) Applied voltage test (AV)

An applied voltage test shall be performed in accordance with the method given in Clause 10 on each separate winding of the transformer. Test voltages are given in Table 2 for transformers with uniform insulation. For transformers with non-uniform insulation the test shall be carried out at the test voltage for the neutral terminal see 7.4.2.

d) Induced voltage test with partial discharge measurement (IVPD)

A test shall be carried out using the method given in 11.3, with an enhancement (phase to earth) voltage level of  $(1,8 \times U_r)/\sqrt{3}$  and a one hour PD measurement voltage of  $(1,58 \times U_r)/\sqrt{3}$ . Alternative higher voltage levels may be used if specified by the purchaser. In particular an enhancement voltage of  $(\sqrt{3} \times U_m)/\sqrt{3}$  and a one hour PD measurement voltage of  $(1,5 \times U_m)/\sqrt{3}$  may be used if higher.

NOTE For three phase transformers, the voltage between the phases at the IVPD-enhancement level can be higher than the phase to earth AC withstand voltages given in Table 2 – Test voltage levels.

#### 7.3.3.2 Special tests

a) Lightning impulse test on the neutral terminal (LIN)

If specified by the purchaser a full wave lightning impulse test shall be carried out on the neutral terminal. This normally applies if the neutral is not directly connected to earth in service.

b) Line terminal AC withstand voltage test for non-uniformly insulated windings (LTAC)

If specified by the purchaser this test shall be performed at the test level given for the applied voltage test applicable to the line terminal in Table 2 using the method given in Clause 12.

c) Lightning impulses applied to multiple line terminals simultaneously (LIMT)

If specified by the purchaser an additional lightning impulse test on two or more terminals connected together shall be performed according to the method given in 13.1 with the test connections given in 13.1.4.3. If not otherwise specified the type of test is LIC.

## 7.4 Assigning $U_m$ and test voltages to the neutral terminal of a winding

### 7.4.1 Transformers with $U_m \leq 72,5$ kV

The neutral shall be tested at the applied voltage test level for the line terminals. If a lightning impulse test on the neutral terminal is specified then the test level shall be given in the enquiry and order.

NOTE Transformers with  $U_m \leq 72,5$  kV need to be designed with uniform winding insulation to satisfy the test requirements.

### 7.4.2 Transformers with $U_m > 72,5$ kV

#### 7.4.2.1 Directly earthed neutral terminal

If the neutral terminal is to be permanently connected to earth in service, either directly or through a current transformer, but without any intentionally added impedance in the connection then the applied voltage test voltage shall be at least 38 kV ( $U_m \geq 17,5$  kV). Higher test levels may be specified.

No impulse test on the neutral terminal is recommended but it may be specified.

#### 7.4.2.2 Neutral terminal not directly earthed

The  $U_m$  and test voltages for the neutral terminal shall be given by the purchaser at the time of enquiry and order. The  $U_m$  of the neutral depends on whether the neutral terminal is intended to be left open or earthed via an impedance (see Annex D). The value of  $U_m$  and the test voltages shall preferably be selected from Table 2.  $U_m$  shall in no case be less than 17,5 kV.

If a lightning impulse test on the neutral terminal is specified, then the test level shall be given in the enquiry and order, and the rated impulse withstand voltage of the neutral terminal shall be verified by the test described in 13.4. A chopped wave lightning impulse test on the neutral is not applicable.

## 8 Dielectric tests on transformers that have been in service

Any transformer that is to be regarded as complying with this standard in the same way as a new transformer (for example following a warranty repair or complete rewind and refurbishment intended to restore the transformer to the 'as new' condition) shall be subject to all the routine tests required by this standard for the transformer at 100 % of the required test voltage level after the repair or refurbishment is complete.

Any transformer that is repaired to restore its functionality (for example after a breakdown following many years in service) but is still to be regarded as compliant with this standard shall be subject to the tests described in this standard necessary to verify the repair at a test voltage of between 80 % and 100 % of the original test voltage level. As a general guide any new part of a repaired transformer should be tested at 100 %, but 80 % of the original test voltage level may be regarded as an adequate test voltage level for verifying that used parts or components are suitable for continued use. Where both old and new parts are tested at the same time then an agreement on the test voltage level shall be reached. The IVPD test shall be performed at

100 % of the original test voltage level. The partial discharge criteria may need to be modified depending on the circumstances of the test and this shall be subject to agreement.

## 9 Insulation of auxiliary wiring (AuxW)

The wiring for auxiliary power, and control circuitry shall be subjected to a 1 min AC separate source test of 2 kV to earth. The test is passed if no voltage collapse or other sign of breakdown occurs. The test shall be carried out at the manufacturer's works, unless the transformer is to be installed on-site by the manufacturer in which case the test may be performed on-site instead of in the factory. Wiring disconnected or removed for transport which has been subject to a 2 kV test at the factory shall be tested at site following erection using either a repeat of the 2 kV AC test or a 1 kV DC insulation resistance measurement with a minimum measured resistance of 1 MΩ.

The wiring for current transformer secondary windings shall be tested at 2,5 kV AC to earth for 1 min. The test shall be carried out at the manufacturer's works. If the current transformer knee-point voltage exceeds 2 kV AC the test shall be performed at 4 kV AC. The test is passed if no voltage collapse or other sign of breakdown occurs.

Motors and other apparatus for auxiliary equipment shall fulfil insulation requirements according to the relevant IEC standard (which are generally lower than the value specified for the wiring alone, and which may sometimes make it necessary to disconnect them in order to test the circuits). All solid state and microprocessor based devices shall be excluded from the test circuit. All three phase undervoltage relays and withdrawable type devices shall be removed from the test circuit.

NOTE It is normal practice for all the auxiliary wiring to be checked on-site at 1 kV DC for 1 min before energisation.

## 10 Applied voltage test (AV)

The test shall be carried out on each separate winding of the transformer in turn.

The full test voltage shall be applied for 60 s between all accessible terminals of the winding under test connected together and all accessible terminals of the remaining windings, core, frame and tank or casing of the transformer, connected to earth.

The test shall be made with an approximately sinusoidal single-phase alternating voltage at not less than 80 % of the rated frequency. The peak value of voltage shall be measured. The peak value divided by  $\sqrt{2}$  shall be equal to the test value.

NOTE Approximately sinusoidal can be taken to mean that the peak value divided by  $\sqrt{2}$  does not differ from the r.m.s value of the waveform by more than about 5 % (see IEC 60060-1), but wider deviations may be accepted.

The test shall commence at a voltage not greater than one-third of the specified test value, and the voltage shall be increased to the test value as rapidly as is consistent with measurement. At the end of the test, the voltage shall be reduced rapidly to less than one-third of the test value before switching off.

The test is successful if no collapse of the test voltage occurs.

For windings with non-uniform insulation, the test is carried out with the test voltage specified for the neutral terminal.

In transformers where windings having different  $U_m$  values are connected together within the transformer (usually auto-transformers), the test voltages shall be determined by the insulation of the common neutral and its assigned  $U_m$ .



## 11 Induced voltage tests (IVW and IVPD)

### 11.1 General

The test shall be carried out with any accessible neutral terminals and any other terminals that are normally at earth potential in service earthed. For three phase transformers a symmetrical three phase test voltage shall be used. Any line terminals not connected to the test supply shall be left open.

NOTE 1 When voltage is induced in a winding with no neutral connection, the voltages with respect to earth at each terminal of this winding will depend on the capacitances to earth and other windings. Any flashover from one of the line terminals to earth during the test can result in voltages exceeding the applied voltage test level appearing at the other terminals of the winding. Suitable precautions can be required to take account of this possibility.

During the test, the test voltage appropriate to a winding without voltage variation shall appear at the terminals of that winding so that the voltages between turns and between phases will have the same ratio between test voltage and rated voltage. The voltage shall either be measured on the highest voltage terminals, or if this is not practical the voltage shall be measured at the terminals of the transformer connected to the supply.

For transformers with tapplings, the test shall be carried out with the transformer on principal tap unless otherwise specified or agreed by the purchaser.

If the purchaser requires a specific test voltage for lower voltage windings higher than the voltage determined in this clause then this shall be clearly stated in the enquiry and tender and an agreement reached on the method of test and the test voltages that will appear on the higher voltage windings which may consequently exceed the specified test voltages.

The test shall be performed with the transformer excited exactly as it will be for service. The voltage may be induced from any winding or from a special winding or taps provided for test purposes.

An alternating voltage shall be applied to the terminals of one winding of the transformer. The form of the voltage shall be as nearly as possible sinusoidal and its frequency shall be sufficiently above the rated frequency to avoid excessive magnetizing current during the test.

The peak value, as defined in IEC 60060-1 divided by  $\sqrt{2}$  and the r.m.s. value of the induced test voltage shall be measured and the lower of the peak value divided by  $\sqrt{2}$  and the r.m.s. value shall be taken as the test value.

### 11.2 Induced voltage withstand test (IVW)

The test time at full test voltage shall be 60 s for any test frequency up to and including twice the rated frequency, unless otherwise specified. When the test frequency exceeds twice the rated frequency, the test time in seconds of the test shall be:

$$120 \times \frac{\text{rated frequency}}{\text{test frequency}}, \text{ but not less than 15 s}$$

The test shall commence at a voltage not greater than one-third of the specified test value, and the voltage shall be increased to the test value as rapidly as is consistent with measurement. At the end of the test, the voltage shall be reduced rapidly to less than one-third of the test value before switching off.

The test is successful if no collapse of the test voltage occurs.



### 11.3 Induced voltage test with partial discharge measurement (IVPD)

#### 11.3.1 General

When a particular type of bushing is specified by the purchaser that is expected to have a partial discharge level that will prevent accurate partial discharge measurements of the transformer on test it is permitted to exchange the bushings for a partial discharge free type during the testing of the transformer.

#### 11.3.2 Test duration and frequency

The test time at the enhancement voltage shall be 60 s in case  $U_m \leq 800$  kV and 300 s in case  $U_m > 800$  kV for any test frequency up to and including twice the rated frequency, unless otherwise specified. When the test frequency exceeds twice the rated frequency, the test time in seconds of the test shall be:

$$120 \times \frac{\text{rated frequency}}{\text{test frequency}}, \text{ but not less than 15 s for } U_m \leq 800 \text{ kV}$$

or

$$600 \times \frac{\text{rated frequency}}{\text{test frequency}}, \text{ but not less than 75 s for } U_m > 800 \text{ kV}$$

The duration of the test, except for the enhancement level, shall be independent of the test frequency

#### 11.3.3 Test sequence

The test sequence shall be as follows:

- a) The voltage shall be switched on at a voltage not higher than  $(0,4 \times U_r)/\sqrt{3}$ .
- b) The voltage shall be raised to  $(0,4 \times U_r)/\sqrt{3}$  and a background PD measurement shall be made and recorded.
- c) The voltage shall be raised to  $(1,2 \times U_r)/\sqrt{3}$  and held there for a minimum duration of 1 min and only long enough to make a stable PD measurement.
- d) The PD level shall be measured and recorded.
- e) The voltage shall be raised to the one hour PD measurement voltage and held there for a minimum duration of 5 min and only long enough to make a stable PD measurement.
- f) The PD level shall be measured and recorded.
- g) The voltage shall be raised to the enhancement voltage and held there for the test time in 11.3.2.
- h) Immediately after the test time, the voltage shall be reduced without interruption to the one hour PD measurement voltage.
- i) The PD level shall be measured and recorded.
- j) The voltage shall be held at the one hour PD measurement voltage for a duration of at least one hour following the PD measurement.
- k) The PD level shall be measured and recorded every 5 min during the one hour period.
- l) After the last PD measurement in the one hour period the voltage shall be reduced to  $(1,2 \times U_r)/\sqrt{3}$  and held there for a minimum duration of 1 min and only long enough to make a stable PD measurement.

- m) The PD level shall be measured and recorded.
- n) The voltage shall be reduced to  $(0,4 \times U_r)/\sqrt{3}$  and the background PD level shall be measured and recorded.
- o) The voltage shall be reduced to a value below  $(0,4 \times U_r)/\sqrt{3}$ .
- p) The voltage shall be switched off.

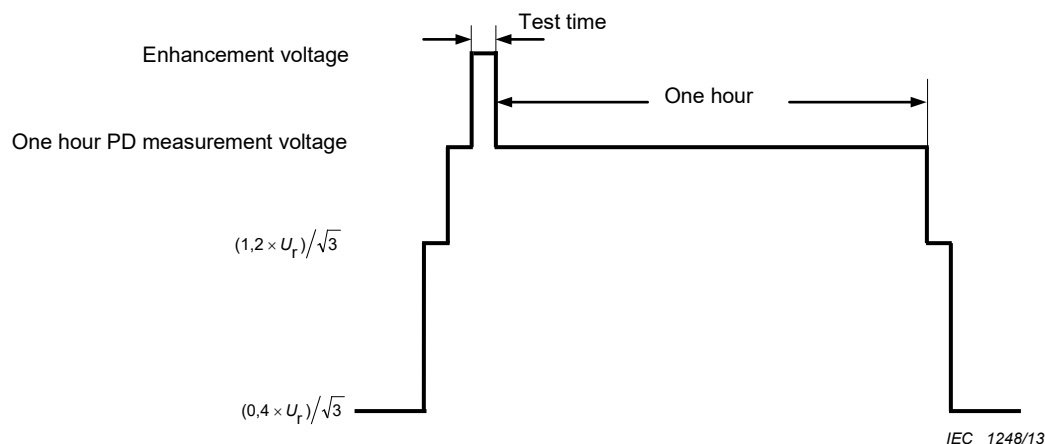
The partial discharge level shall be continuously observed on at least one measuring channel for the entire duration of the test.

During the test sequence the inception and extinction voltages of any significant PD activity should be noted to aid the evaluation of the test result if the test criteria are not met.

NOTE It can also be helpful to record the PD pattern (phase angle, apparent charge and number) of any significant PD activity to aid evaluation.

Enhancement voltage level and one hour PD measurement voltage are given in 7.3.1.3, 7.3.2.1 and 7.3.3.1 depending on the  $U_m$  of the transformer.

The main features of the test sequence are illustrated in Figure 1.



NOTE Enhancement voltage level and one hour PD measurement voltage are given in 7.3.1.3, 7.3.2.1 and 7.3.3.1

**Figure 1 – Time sequence for the application of test voltage for induced voltage test with partial discharge measurement (IVPD)**

#### 11.3.4 Partial discharge (PD) measurement

Partial discharges shall be measured by a method according to IEC 60270.

Each PD measurement channel including the associated bushing or coupling capacitor shall be calibrated in terms of apparent charge (pC) according to the method given in IEC 60270.

The PD measurement shall be given in pC and shall refer to the highest steady-state repetitive impulses indicated by the measuring instrument.

Occasional bursts of high partial discharge level may be disregarded.

For each required PD measurement step in the test sequence, PD measurements shall be made and recorded on all the line terminals equipped with bushings with a  $U_m \geq 72,5$  kV, during the test, however if there are more than six such terminals then only six measurements need to be made (one on each of the highest voltage terminals) unless otherwise specified.

NOTE Bushings with  $U_m \geq 72,5$  kV are equipped with test taps according to IEC 60137 which can be used for the measurement, if this test is specified as a special test for transformers with a  $U_m < 72,5$  kV then the method of measurement will have to be agreed between the manufacturer and purchaser.

### 11.3.5 Test acceptance criteria

The test can only be considered valid if the measured background PD level does not exceed 50 pC at both the beginning and the end of the test. For tests on shunt reactors a background PD level of up to 100pC may be accepted.

NOTE The higher background level for shunt reactors is because filtering of the test supply might not be possible where high current and high voltage is required.

The test is successful if all the following criteria are fulfilled:

- a) no collapse of the test voltage occurs;
- b) none of the PD levels recorded during the one hour period exceed 250 pC;
- c) the PD levels measured during the one hour period do not exhibit any rising trend and no sudden sustained increase in the levels occur during the last 20 min of the test;
- d) the measured PD levels during the one hour period do not increase by more than 50 pC;
- e) the PD level measured at a voltage level of  $(1,2 \times U_T)/\sqrt{3}$  after the one hour period does not exceed 100 pC.

If the criteria c) or d) are not met, the one hour period may be extended and these criteria will be considered to have been met if they are fulfilled for a continuous period of one hour.

As long as no breakdown occurs, and unless very high partial discharges are sustained for a long time, the test is regarded as non-destructive. A failure to meet the partial discharge acceptance criteria shall therefore not warrant immediate rejection, but lead to consultation between purchaser and manufacturer about further investigations. Suggestions for such procedures are given in Annex A.

## 12 Line terminal AC withstand test (LTAC)

The test shall be arranged so that the test voltage appears between the tested terminal and earth. Each phase terminal of the tested winding shall be tested in turn. The test time, frequency and voltage application shall be as given for the induced voltage withstand test see 11.2.

For transformers with taps and a non-uniformly insulated lower voltage winding, the tap position for test shall be selected so that when the required test voltage appears on the highest voltage winding terminals, the voltage appearing on the lower voltage winding terminals shall be as close as possible to the required test value. For transformers with a uniformly insulated lower voltage winding subject to an applied voltage test, the tap position may be chosen by the manufacturer.

The test is successful if no collapse of the test voltage occurs.

NOTE This test is intended only as a withstand test for each line terminal of a non-uniformly insulated transformer to earth, it is not intended to test the phase to phase or turn to turn insulation so the test arrangement can be made in any convenient way, for example with voltage at the neutral to reduce the turn to turn voltage and the test will normally be carried out as three single phase tests. Under normal circumstances the switching impulse test fully covers the intent of this test. If required by the purchaser partial discharge measurements can be made during this test.

## 13 Lightning impulse tests (LI, LIC, LIN, LIMT)

### 13.1 Requirements for all lightning impulse tests

#### 13.1.1 General

General definitions of terms related to impulse tests and requirements for test circuits are given in IEC 60060-1. General definitions of terms related to performance tests and routine checks on approved measuring devices are given in IEC 60060-2. Further information is given in IEC 60076-4.

For liquid-immersed transformers, the test voltage is normally of negative polarity, because this reduces the risk of erratic external flashovers in the test circuit. One, more or all of the impulses may be specified by the purchaser to be of positive polarity. If positive impulses are required by the purchaser this shall be stated in the enquiry and order. If a mixture of impulse polarities are used then additional reference impulses will be required and the test sequence shall be agreed between the manufacturer and purchaser.

Before an impulse of opposite polarity is applied, sufficient time should be allowed for any residual charge to dissipate.

#### 13.1.2 Tap positions

If the tapping range is  $\pm 5\%$  or less and the rated power of the transformer is  $\leq 2\,500$  kVA then, the lightning impulse tests shall be made with the transformer connected on the principal tapping.

If the tapping range is larger than  $\pm 5\%$  or the rated power of the transformer is  $> 2\,500$  kVA then, unless otherwise agreed, the two extreme tapplings and the principal tapping shall be used, one tapping for each of the three individual phases of a three-phase transformer or the three single-phase transformers designed to form a three-phase bank.

Alternatively if specified by the purchaser and in special cases such as one single phase transformer, or multiple tap-changers, or when the tapping-range is not symmetrical, the tap-position which gives the highest internal voltages (determined either by calculation or by performing low voltage impulse measurements) shall be used. If different tap-positions give highest internal voltages in different parts of the insulation then by agreement those different tap positions may be tested, one on each phase of a three phase transformer.

NOTE Particular attention is drawn to the difference between the raise and lower positions at the change-over tap position(s) of a reversing type tapping winding or of a coarse-fine type tapping winding as these give different internal voltages.

In the case of a coarse-fine type tapping winding, if the tap-changer diverter is provided with a non-linear element or arcing gap, which might operate if the transformer is tested on a particular tap-position, then an alternative tap-position may be chosen. Guidance is given in IEC 60076-4.

#### 13.1.3 Records of tests

The applied test voltage shall be recorded using a measurement system according to IEC 60060-2. The records obtained shall clearly show the applied voltage impulse shape (front time, time-to-half value and amplitude).

The recorded curve and the extreme value of the recorded curve (as defined in IEC 60060-1) shall be presented in the test record.

The value of the test voltage (after the application of any filtering or correction for overshoot,  $U_t$  see IEC 60060-1) shall be reported in the test record.

At least one more measurement channel shall be used. In most cases an oscillogram of the current flowing to earth from the tested winding (neutral current) or the capacitive probe current, i.e. the current transferred to the non-tested and shorted winding, will represent the best sensitivity for fault indication. The current flowing from tank to earth, or the transferred voltage in a non-tested winding, are examples of alternative suitable measuring quantities. The detection method chosen shall be agreed between manufacturer and purchaser.

Further recommendations about failure detection, suitable time-base durations, etc. are given in IEC 60076-4.

### **13.1.4 Test connections**

#### **13.1.4.1 Test connections during tests on line terminals**

The impulse test sequence is applied to each of the line terminals of the tested winding in succession. The other line terminals of the transformer shall be earthed directly or, if needed to achieve the required waveshape, through an impedance. The impedance shall not exceed the surge impedance of the connected line (if a value is supplied by the purchaser) or 400  $\Omega$  whichever is lower. In all circumstances, the voltage appearing during the impulse test at the other line terminals shall not be more than 75 % of their rated lightning impulse withstand voltage for star-connected windings, or 50 % for delta-connected windings. The lowest value of impedance at each terminal needed to achieve the required waveshape shall be used.

If the winding has a neutral terminal, the neutral shall be earthed directly or through a low impedance such as a current measuring shunt. The tank shall be earthed. If the required waveshape cannot be obtained without the use of a resistor between neutral and earth, then an additional complete impulse test sequence shall be applied. In this case the first impulse test sequence tests the winding at the full voltage without the resistor but the required waveshape may not be achieved and the second sequence with the resistor achieves the waveshape. Chopped waves, if required, would not be repeated in the second sequence.

When a transformer is fitted with internal non-linear elements such as surge arresters which will limit the voltage on internal parts during the impulse test then the provisions of 13.2.3 apply. Any such internal non-linear elements which are present in the service condition shall be present during the tests. External non-linear elements and other external voltage control elements such as capacitors shall be disconnected for test.

The impulse circuit and measuring connections shall remain unchanged during reference and full voltage tests.

Exceptions from this main procedure are given in 13.3.2 and 13.3.3.

NOTE If an impulse test is required by the purchaser on an LV winding with  $U_m \leq 1,1$  kV then this is normally applied to all the LV terminals (including the LV neutral) connected together with the higher voltage terminals earthed.

#### **13.1.4.2 Test connections for lightning impulse on the neutral**

Lightning impulses are applied directly to the neutral with all other terminals earthed.

When a transformer is fitted with internal non-linear elements such as surge arresters which will limit the voltage on internal parts during the impulse test then the provisions of 13.2.3 apply. Any such internal non-linear elements which are present in the service condition shall be present during the tests. External non-linear elements shall be disconnected for test.

For transformers having a tapped winding near the neutral end of the winding, the tapping connection with the maximum turns ratio shall be chosen for the impulse test, if not otherwise agreed between purchaser and manufacturer.

The impulse circuit and measuring connections shall remain unchanged during reference and full voltage tests.

#### 13.1.4.3 Test connections for lightning impulses applied to multiple line terminals simultaneously (LIMT)

The purchaser shall specify the terminals which are to be connected together for this test.

Lightning impulses shall be applied simultaneously to the specified line terminals connected together with the other terminals earthed. The test levels and details of the test arrangement shall be agreed. The test shall be carried out on each phase in turn.

NOTE The voltages appearing within the winding during this test can significantly exceed the terminal voltages during this test.

### 13.2 Full wave lightning impulse test (LI)

#### 13.2.1 Wave shape, determination of test voltage value and tolerances

The test impulse shall be a full standard lightning impulse:  $1,2 \pm 30 \% / 50 \mu\text{s} \pm 20 \%$ .

The test voltage value shall be the test voltage value as defined in IEC 60060-1 (after the test voltage function is applied). If the maximum relative overshoot magnitude is 5 % or less, the test voltage value may be taken as the extreme value as defined in IEC 60060-1.

The tolerance on the test voltage value is  $\pm 3 \%$ .

It is important that the manufacturer assesses the adequacy of the test equipment to achieve a waveshape within the tolerances for the particular combination of transformer and test equipment at the bid stage and has a reasonable expectation of meeting the requirements. In circumstances where the manufacturer believes that it is not reasonably possible to meet the waveshape because of the transformer characteristics and the variations to the waveshape allowed in the following paragraphs will need to be applied then this shall be clearly stated in the tender. The value of the effective energy of the impulse generator shall be made available to the purchaser on request.

NOTE 1 The minimum impulse generator energy required to meet the tail time (50  $\mu\text{s}$ ) during an impulse test on a transformer can be estimated by using the following equation (this equation is only a guide and might underestimate the energy required. Information from previous experience of testing similar transformers can be used if available):

$$E_{\min} = \frac{100 \times 2\pi \times f \times (t_2)^2}{z \times U^2} \times \left( \frac{U_{LI}}{\eta} \right)^2 \times S_r$$

where

- $E_{\min}$  is the minimum energy required from the impulse generator in joules;
- $f$  is the rated frequency of the transformer in hertz;
- $t_2$  is the tail time in seconds;  $t_2$  equal  $50 \times 10^{-6}$  s;
- $z$  is the short circuit impedance in % seen from the impulse terminal see IEC 60076-1;
- $U$  is the winding rated voltage in volts, phase-to-phase;
- $U_{LI}$  is the full wave lightning impulse test voltage of the tested winding in volts;
- $\eta$  is the impulse generator efficiency per unit;  $\eta = 1,0$ ;
- $S_r$  is the three-phase power rating in volt-amperes for which the impedance 'z' is defined.

If the standard impulse shape cannot reasonably be obtained because of low winding inductance or high capacitance to earth and the resulting impulse shape is oscillatory so that the relative overshoot magnitude exceeds 5 % then for windings that will receive a chopped wave lightning impulse test, the front time may be increased to reduce the overshoot. In all cases with  $U_m \leq 800$  kV the front time shall not exceed 2,5  $\mu\text{s}$ . If the relative overshoot magnitude exceeds 5 % at the full wave voltage level, then a test voltage function shall be

applied in accordance with IEC 60060-1 to determine the test voltage value. It is permissible to apply the requirements of IEC 60060-1 Annex B to the evaluation of the parameters of the lightning impulse irrespective of the overshoot value.

NOTE 2 This clause gives two methods of dealing with an overshoot of more than 5 %. The front time can be increased, but if  $1,2 \mu\text{s} + 30 \%$  is exceeded then chopped waves are required to provide a high frequency test. Alternatively or in addition, the peak voltage of the impulse (maximum value of the recorded curve) is increased if the overshoot exceeds 5 % and the frequency of oscillation is higher than about 100 kHz by the application of the test voltage function in accordance with IEC 60060-1.

For transformers with a  $U_m > 800 \text{ kV}$  there may be cases where a front time of less than  $2,5 \mu\text{s}$  cannot be reasonably achieved because of a very high capacitance to earth. In these cases a longer front time may be accepted by agreement between purchaser and manufacturer.

If the minimum tail time is not achieved then by agreement between manufacturer and purchaser a shorter tail time may be accepted but the test voltage shall be increased by 1 % for each  $2 \mu\text{s}$  by which the tail time is less than  $40 \mu\text{s}$ . The minimum allowable tail time is  $20 \mu\text{s}$ . In the case of the low voltage winding of generator step-up transformers where the connection is arranged so that a direct lightning impulse cannot occur in service then this requirement may be varied by agreement.

Further guidance may be obtained from IEC 60076-4.

### 13.2.2 Tests on transformers without non-linear elements

#### 13.2.2.1 Test sequence

The test sequence shall consist of:

- a) one reference impulse of a voltage between 50 % and 70 % of the full test voltage
- b) three subsequent impulses at full voltage.

If, during any of these applications, an external flashover in the circuit or across a bushing spark gap occurs, or if the recording fails on any of the specified measuring channels, that application shall be disregarded and a further application made.

NOTE Additional impulses at amplitudes not higher than the reference impulse voltage level can be used, these do not need to be shown in the test report.

#### 13.2.2.2 Test acceptance criteria

The test is successful if there are no significant differences between voltage and current transients recorded from the reference impulse and those recorded at the full test voltage.

NOTE The detailed interpretation of the test records and the discrimination between marginal differences and differences indicating failure requires a great deal of skill and experience. Further information is given in IEC 60076-4.

If there is a voltage collapse or deviation and it is agreed between the manufacturer and purchaser that the test is not immediately failed, the test sequence shall be completed and then the full test sequence repeated using the original reference impulse. If any further voltage collapse or deviation is observed then the test is failed.

Additional observations during the test (abnormal sounds, etc.) may be used to confirm the interpretation of the records, but they do not constitute evidence in themselves.



### 13.2.3 Tests on transformers with non-linear elements

#### 13.2.3.1 Test sequence

If non-linear elements or surge arresters are built into the transformer for the limitation of transferred overvoltage transients, they may operate during the test procedure and this may cause differences between impulse records made at different voltages. There will be a threshold voltage at which the differences caused by the non-linear elements start to appear and the test sequence shall include at least one record below this threshold.

The test sequence shall consist of:

- a) one reference impulse at between 50 % and 60 % of the full test voltage;
- b) one reference impulse at between 60 % and 75 % of the full test voltage;
- c) one reference impulse at between 75 % and 90 % of the full test voltage;
- d) three consecutive 100 % full wave impulses;
- e) a comparison impulse at as nearly as possible the same voltage as c) above;
- f) a comparison impulse at as nearly as possible the same voltage as b) above;
- g) a comparison impulse at as nearly as possible the same voltage as a) above.

The reference impulse voltages shall be at least 10 % (of the 100 % level) different from each other.

If none of the 100 % full wave records differ from the lowest voltage record of the reference impulse records, then impulses e), f) and g) above may be omitted.

NOTE Additional impulses at amplitudes not higher than the reference impulse voltage level can be used, these do not need to be shown in the test report.

If, during any of these applications, an external flashover in the circuit or across a bushing spark gap should occur, or if the recording should fail on any of the specified measuring channels, that application shall be disregarded and a further application made.

#### 13.2.3.2 Test criteria

The test is successful if there are no significant differences between voltage and current transients recorded from the lowest voltage reference impulse and those recorded at the full test voltage.

If this is not the case then the records of current and voltage from the following impulses shall be compared:

- a) and g)
- b) and f)
- c) and e)
- all the 100 % level impulse records.

The test is successful if there is no significant difference between the compared records (beyond that which can reasonably be explained by small differences in the test voltage) and any changes between successive records are progressive and smooth, consistent with the proper operation of the non-linear element.

NOTE Further information is given in IEC 60076-4.

If there is a voltage collapse or deviation and it is agreed between the manufacturer and purchaser that the test is not immediately failed, the test sequence shall be completed and then the full test sequence repeated using the original reference impulse. If any further voltage collapse or deviation is observed then the test is failed.



Additional observations during the test (abnormal sounds, etc.) may be used to confirm the interpretation of the records, but they do not constitute evidence in themselves.

### 13.3 Chopped wave lightning impulse test (LIC)

#### 13.3.1 Wave shape

The wave shape of the full wave impulses shall be as given in 13.2.1. The chopped wave lightning impulse shall have a time to chopping between 3  $\mu\text{s}$  and 6  $\mu\text{s}$ . The time to first voltage zero after the instant of chopping shall be as short as possible. The test shall be made without the deliberate addition of impedance in the chopping circuit, but if the overswing observed during a reduced voltage application is more than 30 % then the minimum impedance required to bring the overswing below 30 % may be added to the chopping circuit.

A time to chopping of between 2  $\mu\text{s}$  and 3  $\mu\text{s}$  can be accepted by agreement provided that the peak value of the lightning impulse wave is achieved before the chop.

NOTE Transformers are normally designed to withstand an overswing to the opposite polarity of 30 % of the amplitude of the chopped wave lightning impulse. If the transformer is to be tested by a third party the overswing is to be limited to this value.

Usually, the same settings of the impulse generator and measuring equipment are used, and only the chopping gap equipment is added.

Different time bases may be used to record the chopped wave lightning impulses.

It is recommended to use a triggered-type chopping gap with adjustable timing, although a plain rod-rod gap is allowed.

The peak value of the chopped wave lightning impulse shall be as given in Table 2.

#### 13.3.2 Tests on transformers without non-linear elements

##### 13.3.2.1 Test sequence

The test is combined with the full impulse test in a single sequence. Unless otherwise specified the order of the different impulse applications shall be:

- one full wave reference impulse at between 50 % and 70 % of the full wave lightning impulse test voltage;
- one full wave impulse at the full wave lightning impulse test voltage;
- two chopped impulses at the chopped wave lightning impulse test voltage;
- two full wave impulses at the full wave lightning impulse test voltage.

The same types of measuring channels and oscillographic records are specified as for the full-wave impulse test.

NOTE Additional impulses (full or chopped) at amplitudes not higher than the reference impulse voltage level can be used, these do not need to be shown in the test report

If, during any of these applications, an external flashover in the circuit or across a bushing spark gap should occur, or if the recording should fail on any of the specified measuring channels, that application shall be disregarded and a further application made.

As far as possible the same time to chop shall be used for all chopped wave lightning impulses in the sequence.

### 13.3.2.2 Test criteria

The test is successful if there are no significant differences between voltage and current transients recorded from the reference reduced level full impulse and those recorded at the full test voltage including the chopped impulses up to the time of chop. In the case of the chopped impulses differences after the chopping time may be due to minor variations in the performance and timing of the chopping gap.

NOTE The detailed interpretation of the test records and the discrimination between marginal differences and differences indicating failure requires a great deal of skill and experience. Further information is given in IEC 60076-4.

If there is a voltage collapse or deviation and it is agreed between the manufacturer and purchaser that the test is not immediately failed the test sequence shall be completed and then the full test sequence repeated using the original reference impulse. If any further voltage collapse or deviation is observed then the test is failed.

Additional observations during the test (abnormal sounds, etc.) may be used to confirm the interpretation of the records, but they do not constitute evidence in themselves.

### 13.3.3 Tests on transformers with non-linear elements

#### 13.3.3.1 Test sequence

The test is combined with the full impulse test in a single sequence.

If non-linear elements or surge diverters are built into the transformer for the limitation of transferred overvoltage transients, they may operate during the test procedure and this may cause differences between impulse records made at different voltages. There will be a threshold voltage at which the differences caused by the non-linear elements start to appear and the test sequence shall include at least one record below this threshold.

The test sequence shall consist of:

- a) one full wave reference impulse at between 50 % and 60 % of the full wave lightning impulse test voltage;
- b) one full wave reference impulse at between 60 % and 75 % of the full wave lightning impulse test voltage;
- c) one full wave reference impulse at between 75 % and 90 % of the full wave lightning impulse test voltage;
- d) one full wave impulse at the full wave lightning impulse test voltage;
- e) two chopped impulses at the chopped wave lightning impulse test voltage;
- f) two full wave impulses at the full wave lightning impulse test voltage;
- g) a comparison impulse at as nearly as possible the same voltage as c) above;
- h) a comparison impulse at as nearly as possible the same voltage as b) above;
- i) a comparison impulse at as nearly as possible the same voltage as a) above.

The reference impulse voltages shall be at least 10 % (of the 100 % level) different from each other.

If none of the 100 % full wave records differ from the lowest voltage of the reference impulse record then impulses g), h) and i) above may be omitted.

The time interval between the application of the last chopped wave and the first full wave after the chop waves shall be as short as practicable.

NOTE Additional impulses (full or chopped) at amplitudes not higher than 75 % of the full level can be used, these do not need to be shown in the test report.

If, during any of these applications, an external flashover in the circuit or across a bushing spark gap should occur, or if the recording should fail on any of the specified measuring channels, that application shall be disregarded and a further application made.

The same types of measuring channels and oscillographic records are specified as for the full-wave impulse test.

As far as possible the same time to chop shall be used for all chopped impulses in the sequence.

### 13.3.3.2 Test criteria

The test is successful if there are no significant differences between voltage and current transients recorded from the lowest voltage reference impulse and those recorded at the full test voltage including the chopped wave impulses up to the time of chop. In the case of the chopped impulses differences after the chopping time may be due to minor variations in the performance and timing of the chopping gap.

If this is not the case then the records of current and voltage from the following impulses shall be compared:

- a) and i);
- b) and h);
- c) and g);
- all the 100 % level impulse records;
- both the chopped wave records up to the time of chop.

The test is successful if there is no significant difference between the compared records (beyond that which can reasonably be explained by small differences in the test voltage) and any changes between successive records should be progressive and smooth, consistent with the proper operation of the non-linear element.

NOTE 1 Further information is given in IEC 60076-4.

If there is a voltage collapse or deviation and it is agreed between the manufacturer and purchaser that the test is not immediately failed, the test sequence shall be completed and then the full test sequence repeated using the original reference impulse. If any further voltage collapse or deviation is observed then the test is failed.

Additional observations during the test (abnormal sounds, etc.) may be used to confirm the interpretation of the records, but they do not constitute evidence in themselves.

NOTE 2 The information given in IEC 60076-4 with reference to waveshape evaluation is based on the visual observation of oscillographic records. Under certain circumstances it might be appropriate to evaluate the waveshape parameters of non-standard waveshapes and perform the interpretation of deviations manually rather than relying completely on software tools.

## 13.4 Lightning impulse test on a neutral terminal (LIN)

### 13.4.1 General

Full wave lightning impulses at the impulse voltage level specified for the neutral are applied directly to the neutral with all other terminals earthed.

### 13.4.2 Waveshape

The wave shape of the full wave impulses shall be as given in 13.2.1 except that the duration of the front may be up to a maximum of 13  $\mu$ s.

### 13.4.3 Test sequence

The test sequence shall be as given in 13.2.2.1 for transformers without a non-linear element and 13.2.3.1 for transformers with a non-linear element.

### 13.4.4 Test criteria

The test criteria shall be as given in 13.2.2.2 for transformers without a non-linear element and 13.2.3.2 for transformers with a non-linear element.

## 14 Switching impulse test (SI)

### 14.1 General

During switching impulse tests, the voltages developed across different windings are approximately proportional to the ratio of numbers of turns.

The switching impulse test voltage shall be as specified for the winding with the highest  $U_m$  value. If the ratio between the windings is variable by tapplings, the tapplings shall be used to bring the test voltage for the winding with lower  $U_m$  as close as possible to the corresponding test value given in Table 2. The windings with lower  $U_m$  values may not receive their full test voltage; this shall be accepted. If lower voltage windings do not have a switching impulse level given in Table 2 then the manufacturer may choose the tap position for test unless otherwise specified by the purchaser.

In a three-phase transformer, the voltage developed between line terminals during the test shall be approximately 1,5 times the voltage between line and neutral terminals.

### 14.2 Test connections

The impulses are applied either directly from the impulse voltage source to a line terminal of the highest voltage winding, or to a lower voltage winding so that the test voltage is inductively transferred to the highest voltage winding. The specified test voltage shall appear between the line terminal of the highest voltage winding and earth. The voltage shall be measured at the line terminal of the highest voltage winding.

A three-phase transformer shall be tested phase by phase.

Star connected windings with the neutral brought out shall be earthed at the neutral terminal either directly or through a low impedance such as a current measuring shunt. A voltage of opposite polarity and about half amplitude appears on the two remaining line terminals which may be connected together but not connected to earth. To limit the voltage of opposite polarity to approximately 50 % of the applied level, it is permissible to connect high resistance damping resistors (5 k $\Omega$  to 20 k $\Omega$ ) to earth at the non-tested phase terminals.

For delta connected windings the terminal corresponding to the end of the phase under test shall be earthed either directly or through a small measuring impedance, the other terminals shall be open circuit. Tests on a three-phase transformer shall be arranged so that a different terminal of the delta is earthed for each phase test. Delta connected windings with more than three terminals brought out shall have the delta closed for the test.

For a single phase transformer with one or more windings which will have both ends connected to a line in service and with a switching impulse test specified, then the switching impulse test shall be applied to both ends of the winding.

For a star connected winding with a neutral connection not brought out and not connected to earth internally, it is not always possible to achieve the appropriate test voltages by earthing

one or more line terminals, in this case the test connection shall be agreed between manufacturer and purchaser.

Bushing spark gaps may be removed or their spacing increased to prevent sparkover during the test.

### 14.3 Waveshape

The test voltage is normally of negative polarity to reduce the risk of erratic external flashover in the test circuit.

The voltage impulse shall have a time to peak ( $T_p$  as defined in IEC 60060-1) of at least 100  $\mu\text{s}$ , a time above 90 % ( $T_d$  as defined in IEC 60060-1) of the specified amplitude of at least 200  $\mu\text{s}$ , and a time to zero ( $T_z$  as defined in IEC 60060-1) of a minimum of 1 000  $\mu\text{s}$ .

NOTE 1 The impulse wave shape is purposely different from the standard waveshape of 250 / 2 500  $\mu\text{s}$  recommended in IEC 60060-1, since IEC 60060-1 is intended for equipment without a saturable magnetic circuit. The time to peak is chosen to be long enough to give an essentially linear voltage distribution along the winding.

The time to zero can be increased by inducing a remnant flux into the core of opposite direction to that induced during the test before each full-voltage test impulse. This is normally accomplished by applying impulses of similar shape but opposite polarity at a voltage not exceeding 70 % of the full test level, but other methods may be used. A time to zero of less than 1 000  $\mu\text{s}$  is permissible if as far as practicable full reverse saturation of the core is achieved.

NOTE 2 During the test considerable flux is developed in the magnetic circuit. The impulse voltage can be sustained up to the instant when the core reaches saturation and the magnetizing impedance of the transformer becomes drastically reduced.

For test objects without a magnetic core or with a gapped core design, it is permissible to have a time to zero of less than 1 000  $\mu\text{s}$ . See IEC 60076-4.

### 14.4 Test sequence

The test sequence shall consist of one reference impulse of a voltage between 50 % and 70 % of the full test voltage and three impulses at full voltage. Sufficient reverse polarity applications shall be made before each full impulse to ensure the magnetization of the core is similar before each full wave impulse in order to make the time to first zero as uniform as possible.

NOTE If the core does not saturate during the full voltage applications then reverse polarity applications might not be required.

Oscillographic records shall be made of the impulse wave-shape on the line terminal under test and the current between the tested winding and earth. If during any of these applications an external flashover in the circuit or across a bushing spark gap should occur, or if the recording should fail on any of the specified measuring channels, that application shall be disregarded and a further application made.

### 14.5 Test criteria

The test is successful if there is no sudden collapse of voltage or discontinuity in the voltage or current indicated on the oscillographic records.

Additional observations during the test (abnormal sounds, etc.) may be used to confirm the oscillographic records, but they do not constitute evidence in themselves.

NOTE Successive oscillograms might differ because of the influence of magnetic saturation on impulse duration.

## 15 Action following test failure

If the transformer fails any of the dielectric tests then the complete sequence of dielectric tests shall be repeated at the full level following repair. However, under circumstances where it is clear that some parts of the transformer that have been fully tested are not involved in the failure or repair, then at the discretion of the purchaser these parts may not need to be tested again. Particular account needs to be taken of the possibility of contamination or internal transients having damaged other parts of the transformer.

If a transformer fails to meet its test requirements and the fault is in a bushing, provided that the purchaser is satisfied that the transformer is not in any way affected by the failure, it is permissible to replace this bushing and continue the test on the transformer to completion without delay.

If a test failure occurs as the result of a flashover external to the transformer, then the particular test may be repeated and if successful the test sequence may be completed and no repeat of previously successful tests is required.

## 16 External clearances in air

### 16.1 General

This part of the standard is applicable when clearances in air are not specified by the purchaser. Where such clearances are specified, the manufacturer may use higher values if required for test.

Clearance in air is understood as the shortest distance between any metallic part of the bushing terminal and any part of the transformer, taking a line which does not pass through the bushing insulator.

This standard is not applicable to the clearance between parts of the bushing itself and the length of the bushing may need to be greater than the given clearances to pass the required tests on the bushing.

This standard does not consider the risk from intrusion of birds and other animals.

The line to earth clearance figures given in this standard are based on those given in IEC 60071-1 for a rod to structure electrode configuration for < 850 kV lightning impulse level and the conductor to structure clearance for higher lightning impulse levels. The highest clearance determined by switching impulse or lightning impulse is used. The phase-to-phase clearances are based on those given in IEC 60071-1 for a conductor-to-conductor electrode structure based on the switching impulse level with a phase-to-phase divided by phase-to-earth value of 1,5. It is therefore assumed that at  $\geq 850$  kV lightning impulse level the bushing ends and any connections normally have rounded electrode shapes.

It is assumed that conductor clamps with their associated shield electrodes are suitably shaped so that they do not reduce the flashover voltage. It is also assumed that the arrangement of incoming conductors does not reduce the effective clearances provided by the transformer itself. The design shall provide for suitable conductors to be connected to the bushing terminals leading away from the transformer without infringing the clearances given in this document.

If the purchaser intends to make the connection in a particular way which is likely to reduce the effective clearances, this shall be stated in the enquiry.

In general, the provision of adequate clearances in air becomes technically difficult mainly at high system voltages, particularly for relatively small units, or when the installation space is restricted. The principle followed in this standard is to provide minimum, non-critical clearances

which are satisfactory without further discussion or proof under various system conditions and in different climates. Other clearances based on past or current practice shall be subject to agreement between purchaser and manufacturer.

The recommended clearances are referred to the rated withstand voltages of the internal insulation of the transformer, unless otherwise specified in the enquiry and order. When the clearances of the transformer are equal to or larger than the values specified in this standard and the bushings have properly selected ratings according to IEC 60137, then the external insulation of the transformer shall be regarded as satisfactory without further testing.

NOTE 1 The impulse withstand strength of the external insulation is polarity dependant, in contrast to what is assumed for the internal insulation. The tests prescribed for the internal insulation of the transformer do not automatically verify that the external insulation is satisfactory. The recommended clearances are dimensioned for the more onerous polarity (positive).

NOTE 2 It is recognised that in some countries, clearances can be different if based on LI and AC withstand voltages only.

NOTE 3 If a clearance smaller than that according to the paragraph above is to be used, a type test either using the general methods given in Clauses 10 to 14 of this standard using the test voltages applicable to the transformer, or the tests given in another standard (for example IEC 62271-1) applicable to the connected substation equipment might be required on an arrangement simulating the actual clearance.

If the transformer is specified for operation at an altitude higher than 1 000 m, the clearance requirements shall be increased by 1 % for every 100 m by which the altitude exceeds 1 000 m.

Requirements are given for the following clearances:

- clearance phase-to-earth and phase-to-neutral;
- clearance phase-to-phase between phases of the same winding;
- clearance between a line terminal of the high voltage winding and a line terminal of a lower voltage winding (see 16.2).

It follows from the above that the recommended values are in effect minimum values. The design clearances shall be stated on the outline drawing. These are nominal values subject to normal manufacturing tolerances and they have to be selected so that the actual clearances will be at least equal to the specified values.

These statements shall be taken as proof that the transformer complies with the recommendations of this standard, or with the modified values which may have been agreed for the particular contract.

## 16.2 Clearance requirements

The clearance requirements are given in Table 4 for each value of lightning and switching impulse voltage for each value of  $U_m$ .

The phase-to-phase clearance applies only between line terminals of the same winding, the phase to earth clearance applies to all other distances including to the line terminals of other windings and neutral terminals.



**Table 4 – Minimum clearances in air (1 of 2)**

Highest Voltage for equipment $U_m$ kV	Full Wave Lightning Impulse (LI) kV	Switching impulse (SI) kV	Minimum air clearance	
			Line to earth mm	Phase to phase mm
<1,1	-	-		
3,6	20	-	60	60
	40	-	60	60
7,2	60	-	90	90
	75 <sup>a</sup>	-	120	120
12	75	-	120	120
	95	-	160	160
	110 <sup>a</sup>	-	200 <sup>a</sup>	200 <sup>a</sup>
17,5	95	-	160	160
	125 <sup>a</sup>	-	220	220
24	125	-	220	220
	145	-	270	270
	150 <sup>a</sup>	-	280 <sup>a</sup>	280 <sup>a</sup>
36	170	-	320	320
	200 <sup>a</sup>	-	380	380
52	250	-	480	480
72,5	325	-	630	630
	350 <sup>a</sup>	-	630	630
100	450	375 <sup>a</sup>	900	900
123	550	460 <sup>a</sup>	1 100	1 100
145	550	460 <sup>a</sup>	1 100	1 100
	650	540 <sup>a</sup>	1 300	1 500 <sup>a</sup>
170	650	540 <sup>a</sup>	1 300	1 500 <sup>a</sup>
	750	620 <sup>a</sup>	1 500	1 700 <sup>a</sup>
245	850	700 <sup>a</sup>	1 600	2 100 <sup>a</sup>
	950	750 <sup>a</sup>	1 700	2 300
	1 050	850 <sup>a</sup>	1 900	2 600
300	950	750	1 700	2 300
	1 050	850	1 900	2 600
362	1 050	850	1 900	2 600
	1 175	950	2 200	3 100
420	1 175	950	2 200	3 100
	1 300	1 050	2 600	3 600
	1 425	1 175 <sup>a</sup>	3 100	4 200
550	1 300	1 050	2 600	3 600
	1 425	1 175	3 100	4 200
	1 550	1 300 <sup>a</sup>	3 600	5 000 <sup>a</sup>
	1 675 <sup>a</sup>	1 390 <sup>a</sup>	4 000 <sup>a</sup>	5 600 <sup>a</sup>



**Table 4 (2 of 2)**

Highest Voltage for equipment $U_m$ kV	Full Wave Lightning Impulse (LI) kV	Switching impulse (SI) kV	Minimum air clearance	
			Line to earth mm	Phase to phase mm
800	1 800	1 425	4 200	5 800 <sup>a</sup>
	1 950	1 550	4 900	6 700 <sup>a</sup>
	2 050 <sup>a</sup>	1 700 <sup>a</sup>	5 800 <sup>a</sup>	7 900 <sup>a</sup>
	2 100	1 675 <sup>a</sup>	5 600	7 700 <sup>a</sup>
1 100	1 950	1 425	b	b
	2 250	1 800	6 300	c
1 200	2 250	1 800	6 300	c
<sup>a</sup> These values are not given in IEC 60071-1:2011 for the particular value of $U_m$ but are included either because they represent common practice in some parts of the world or for some switching impulse levels, and clearances because they represent a co-ordinated value for a particular value of lightning impulse level. <sup>b</sup> No clearance values are given for this value of rated insulation level because it is not applicable to air insulation according to IEC 60071-1. <sup>c</sup> No value of phase-phase clearance is given as transformers with this value of rated insulation level are usually single phase.				

## **Annex A** **(informative)**

### **Application guide for partial discharge measurements on transformers**

#### **A.1 General**

This annex is particularly applicable to the partial discharge measurements made during induced voltage test with partial discharge measurement (IVPD) according to 11.3 but it may be applied to any other partial discharge measurements made.

A partial discharge (PD) is an electric discharge that only partially bridges electrically stressed insulation. In a transformer, such a partial discharge causes a transient change of the voltage to earth at every externally available winding terminal.

Measuring impedances are connected effectively between the earthed tank and the terminals, usually through a bushing tap or through a separate coupling capacitor, as detailed in A.2.

The actual charge transferred at the site of a partial discharge cannot be measured directly, instead the apparent charge  $q$  as defined in IEC 60270 is measured at the terminal as determined by a suitable calibration, see A.2.

A particular partial discharge gives rise to different values of apparent charge at different terminals of the transformer. The comparison of simultaneously collected indications at different terminals may give information about the location of the partial discharge source within the transformer, see A.5.

The acceptance test procedure specified in 11.3 calls for measurements of apparent charge at the winding line terminals.

#### **A.2 Connection of measuring and calibration circuits – Calibration procedure**

The measuring technique and equipment is described in IEC 60270.

The principle of the measurement is to determine the voltage change at the terminal caused by the injection of a calibrated amount of charge. The voltage change is measured using a series coupling capacitance (usually a condenser type bushing) and a measuring impedance. The normal arrangement for transformer tests is to have the measuring impedance directly connected to the bushing test tap.

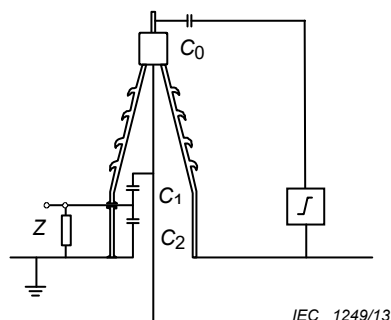
The measuring equipment may be connected to the measuring impedance by a matched coaxial cable. The impedance of the cable and the matched input impedance of the measuring instrument may form part of the measuring impedance. Some systems use a fiber optic cable between the measuring impedance and the recording equipment. Normally the measuring impedance, the cable and the measuring instrument are supplied together so that the overall performance of the measuring system is optimised.

During the measurement of partial discharge between a line terminal of a winding and the earthed tank, the normal arrangement is to install the measuring impedance  $Z_m$  between the condenser bushing test tap and the earthed flange of the bushing, see Figure A.1. If a test tap is not provided, it is also possible to insulate the bushing flange from the tank and use it as the measuring terminal. The capacitances between the central conductor and the measuring terminal, and between the measuring terminal and earth, act as a capacitive voltage divider for the partial discharge signal. The calibration is therefore made between the top terminal of the

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bushing and earth. As much of the de-energised test circuit as possible should be connected to the terminal during calibration to take account of additional capacitance and any filter circuits.



**Figure A.1 – Calibration circuit for partial discharge measurement using the test tap of condenser type bushing**

If PD measurements need to be made at a terminal where a bushing test tap or insulated flange is not available then a separate high-voltage coupling capacitor is used. A partial discharge free capacitor is required and its capacitance value  $C$  should be suitably large in comparison with the calibration generator capacitance  $C_0$  (see IEC 60270 for specific requirements). The measuring impedance (with a protective gap) is connected between the low voltage terminal of the capacitor and earth, see Figure A.2.

The calibration of the complete measuring system is made by the injection of a known charge into the transformer terminal. According to IEC 60270, a calibration generator consists of a step voltage pulse generator with short rise time and a small series capacitor of known capacitance  $C_0$ .  $C_0$  should be small in comparison to  $C_1$  (see IEC 60270 for specific requirements regarding rise time and the choice of  $C_0$ ). When this generator is connected between the transformer terminal and earth the injected charge from the pulse generator will be:

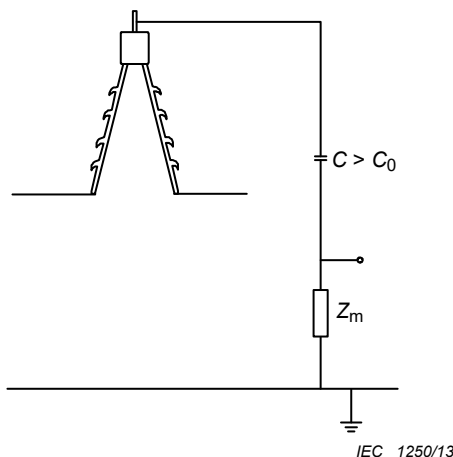
$$q_0 = U_0 \times C_0$$

where

- $q_0$  is the calibration apparent charge
- $U_0$  is the voltage step chosen to give the required  $q_0$
- $C_0$  is the value of the series capacitance

The calibration level  $q_0$  should be representative of the specified discharge level limit (usually between 50 % and 200 %). Additional measurements using the calibrator at different values of  $q_0$  may be useful to check the operation of the measuring instrument.

It is convenient if the calibration generator has a repetition frequency synchronised to the power frequency so that the resulting pulse can be viewed on an instrument also synchronised to the power frequency.



**Figure A.2 – Circuit for partial discharge measurement using a high-voltage coupling capacitor**

To avoid errors the leads between the terminal and the calibrator and between the calibrator and earth (at the bushing flange) should be kept as short as practicable. The calibration pulse generator should preferably be battery-operated and have small physical dimensions for convenient use at the transformer terminals.

This method of calibration provides for measurement of apparent charge at the terminal, which is the basis of this standard, but it does not give the real value of a partial discharge occurring away from the terminal because the transmission path between the discharge and the terminal is not included in the calibration.

### A.3 Instruments, frequency range

The characteristics of the measuring instruments should be as specified in IEC 60270.

A graphical display of any detected partial discharge is generally useful, particularly because it offers a possibility of discriminating between true partial discharge in the transformer and certain forms of external disturbances. This is based on rate of repetition, point on the wave, polarity differences, etc.

The level of partial discharge should be observed continuously or at frequent intervals throughout the test period. Continuous recording of the signal is not obligatory.

Measuring systems for partial discharges are classified as narrow-band or wideband systems. A narrow-band system operates with a bandwidth of about 10 kHz or less at a certain tuning frequency (for example, radio noise meters). A wideband system utilises a relatively large ratio between lower and upper limits of the frequency band, for example 50 kHz to 800 kHz.

By the use of a narrow-band system, interference from local broadcasting stations may be avoided by suitably adjusting the mid-band frequency, but a check has to be made to show that winding resonances near the measuring frequency do not greatly affect the measurement. The narrow-band instrument should be operated at a frequency no higher than 500 kHz, and preferably less than 300 kHz. There are two reasons for this. First, the transmission of the discharge pulse entails a high attenuation of the higher frequency components, and second, when applying a calibration pulse to the line terminal, the pulse is likely to excite local oscillations at and near the terminal, and this will complicate the calibration when mid-band frequencies greater than 500 kHz are used.

A wideband measuring system is less critical as to attenuation and response to different pulse shapes, but is more receptive to disturbances in test locations without electromagnetic

shielding. Band-stop or other types of filters may be used to reduce the interference from external influences such as radio transmitters.

The choice of measuring bandwidth does not affect the partial discharge pulse pattern and the statistical behaviour of the discharge which can be used to identify the discharge source.

In summary a wide-band measuring system is the first preference because of the greater chance of detecting a partial discharge, the bandwidth should not be less than 100 kHz. A narrow band system may be required in certain circumstances to eliminate interference. Care should however be taken over the choice of measuring centre frequency to ensure a reasonable sensitivity to PD in the transformer.

#### **A.4 Procedure after an unsuccessful test**

In 11.3.5 PD level acceptance criteria are given. If there has been no voltage collapse, but the test has been unsuccessful because of a PD level above the acceptance criteria then the test shall initially be regarded as non-destructive and the test object should not be rejected immediately upon such a result, but further investigations should be undertaken to identify and locate the partial discharge source.

A further important consideration is whether phase correlated partial discharges are sustained below the operating voltage level, when triggered at the test level, because such partial discharges are most likely to be detrimental to the transformer in service.

The testing environment should first be investigated to find any obvious sign of irrelevant sources of partial discharges. This should be followed by consultations between the manufacturer and purchaser to agree on further supplementary tests or other action to show either the presence of serious partial discharge, or that the transformer is satisfactory for service operation.

Below are some suggestions which may be useful during the above courses of action.

- Investigation as to whether the indications are truly correlated to the test sequence or just represent coincident, irrelevant sources. This is often facilitated by oscillographic monitoring or recording of the pattern of the partial discharges, external disturbances may for example be identified by their being asynchronous with the test voltage.
- Investigation as to whether the partial discharge may be transmitted from the supply source. Low-pass filters on the supply leads to the transformer under test can help in such cases.
- Investigation to determine whether the partial discharge source is within the transformer or outside (spitting from objects at floating potential in the hall, from live parts in air, or from sharp edges on earthed parts of the transformer). As the test concerns the internal insulation, provisional electrostatic shielding on the outside is permitted and recommended.
- Investigation of the probable location of the source(s) in terms of the electrical circuit diagram of the transformer, for example single phase and applied voltage tests may be useful. There are several known and published methods to locate discharges. One is based on correlation of readings and calibrations at different pairs of terminals (in addition to the obligatory readings between line terminals and earth). It is also possible to identify individual pulse shapes during the test with corresponding calibration waveforms, if records from wideband circuits are used. A particular case is the identification of partial discharge in the dielectric of the capacitance graded bushings.
- Investigation by acoustic or ultrasonic detection of the location of the source(s) within the tank.
- Investigation of the location and nature of the source using ultra high frequency electromagnetic sensors introduced into the tank.

- Determination of the probable physical nature of the source by conclusions drawn from variation with test voltage level, hysteresis effect, pulse pattern along the test voltage wave, development of the partial discharge with time, etc.
- Partial discharge in the insulation system may be caused by insufficient drying or insufficient liquid impregnation, generally this will be apparent from the pattern of the partial discharge. Re-processing of the transformer, or a period of rest, and subsequent repetition of the test may therefore be tried in this case.
- Even a limited exposure to a relatively high partial discharge may lead to local cracking of oil or liquid and temporarily reduced extinction and re-inception voltages, but the original conditions may be self-restored in a matter of hours.
- Relatively limited variation of the partial discharge level with voltage increase, a partial discharge pattern typical of a floating particle in the electrical field and an absence of an increase of level with time, may be accepted as evidence that the transformer is suitable for service. In this case it may be agreed to repeat the test, possibly with extended duration, and possibly with an increased voltage level, as this may reduce the discharge level over time.
- Traces of partial discharges visible after untanking are usually not found unless the transformer has been exposed for a considerable duration of time to levels which are very high in comparison with the acceptance limit. Such a procedure may be the last resort if other means of improving the behaviour of the transformer or identifying the source have failed.

## **Annex B** **(informative)**

### **Overvoltage transferred from the high-voltage winding to a low-voltage winding**

#### **B.1 General**

The problem of transferred overvoltage is treated from a system point of view in IEC 60071-2. The information given below concerns only problems associated with the transformer itself under particular conditions of service. The transferred overvoltages to be considered are either transient surges or overvoltages.

**NOTE** It is the responsibility of the purchaser to define the loading of a low-voltage winding. If no information can be given, the manufacturer can provide information about the expected transferred voltages when the low-voltage terminals are open-circuited, and about the values of resistors or capacitors which are needed to keep the voltages within acceptable limits.

#### **B.2 Transfer of surge voltage**

##### **B.2.1 General**

A study of particular transformer installation with regard to transferred surge overvoltages is, in general, justified only for large generator transformers, which have a large voltage ratio, and for large high-voltage system transformers with a low-voltage tertiary winding.

As single phase auto transformers are tested separately, the transferred voltages appearing on the tertiary terminals when the transformers are connected as a three-phase bank needs to be considered

In order to ensure that the transferred voltages do not exceed the specified level, or to confirm that surge arresters are not required, transferred surge measurements can be made using a low voltage recurrent surge generator. Alternatively these measurements can be made at a reduced voltage during impulse tests.

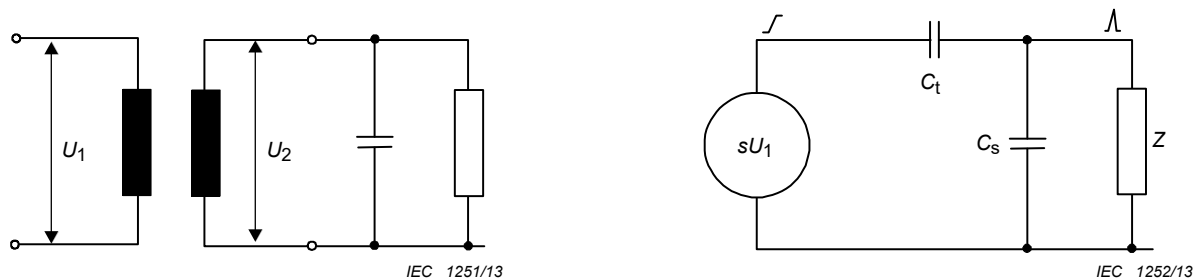
It is convenient to distinguish between two mechanisms of surge transfer, namely capacitive transfer and inductive transfer.

##### **B.2.2 Capacitive transfer**

The capacitive transfer of overvoltage to a low-voltage winding may in the first approximation be described as a capacitive voltage division. The simplest equivalent circuit as seen from the low-voltage winding consists of an electromotive force (e.m.f.) source in series with a transfer capacitance  $C_t$ , see Figure B.1.

The equivalent e.m.f. is a fraction  $s$  of the incoming surge on the high-voltage side.  $C_t$  is of the order of  $10^{-9}$  F;  $s$  and  $C_t$  are not well-defined quantities but dependent on the shape of the surge front. They can be determined together by oscillographic measurements. Pre-calculation is uncertain.

A loading of the secondary terminals with switchgear, short cables or added capacitors (a few nF), which act as lumped capacitance  $C_s$  directly on the terminals (even during the first microsecond), will reduce the transferred overvoltage peak. Longer cables or busbars are represented by their characteristic impedance. The resulting shape of secondary overvoltage will normally have the character of a short (microsecond) peak, corresponding to the front of the incoming surge.



**Figure B.1 – Equivalent circuit for capacitive transfer of overvoltage**

### B.2.3 Inductive transfer

The inductive transfer of surge voltage depends on the flow of surge current in the high-voltage winding.

If no external loading is applied to the secondary winding, the voltage transient usually has a superimposed damped oscillation with a frequency determined by leakage inductance and winding capacitances.

A reduction of the inductively transferred overvoltage component can be effected either by resistive damping through a surge diverter or by modification of the oscillation with capacitive loading. If capacitors are used, the capacitance value has usually to be of the order of tenths of microfarads. (They will therefore automatically eliminate the capacitively transferred component as long as the circuit inductance is low.)

The transformer parameters which are involved in inductive surge transfer are better defined and less dependent on rate of rise (or frequency) than those involved in capacitive transfer. For further information, see the literature on the subject.

## B.3 Power-frequency transferred overvoltage

If a low-voltage winding which is physically adjacent to the high-voltage winding is left without connection to earth or with only a high-impedance connection to earth while the high-voltage winding is energised, there is a risk of power frequency overvoltage by capacitance division.

The risk is obvious for a single-phase winding, but it can also exist for a three-phase winding if the primary winding voltage becomes asymmetric, as occurs during earth faults. In particular circumstances, resonance conditions may arise.

Tertiary windings and stabilizing windings in large transformers are also subjected to the same risk. It is the responsibility of the purchaser to prevent a tertiary winding from being accidentally left with too high an impedance to earth. A stabilizing winding should normally be arranged for permanent connection to earth (tank) either externally or internally.

The overvoltage is determined by capacitances between windings and between windings and earth. These can be measured at low frequency from the terminal of the transformer in different combinations, and they can also be calculated with sufficient accuracy.



## Annex C (informative)

### Information on transformer insulation and dielectric tests to be supplied with an enquiry and with an order

#### C.1 General

For each winding of the transformer the following information should be supplied with the enquiry and order according to the  $U_m$  of the winding.

NOTE Although SI and IVW can be specified for a lower voltage winding on a transformer the values might not be achieved during the test depending on the ratio of the transformer.

It is recommended that test connections and procedures should be discussed at the time of placing the order or at the design review stage, particularly with regard to the connection for induced withstand voltage tests on complicated transformers with non-uniformly insulated high-voltage windings and the method to be used for impulse tests on high-power low-voltage windings and neutral terminals (see 13.1.4). The application of non-linear protection devices, built into the transformer is to be indicated by the manufacturer at the enquiry and at the order stage, and should be shown in the connection diagram on the rating plate.

#### C.2 For transformers and windings with $U_m \leq 72,5$ kV

In all cases:

- value of  $U_m$ ;
- value of  $U_r$ ;
- applied voltage test level (AV);
- full wave lightning impulse test level (LI).

In special cases:

- whether partial discharge measurements are required and whether this is to be done with the induced voltage test or separately, and whether it is to be done on only one unit (type test unit) or all units. The length of time at the PD measurement voltage should be given if this is less than one hour;
- whether a lightning impulse test is required on any or all units to be supplied under the order rather than just on the first unit of the design;
- whether chopped wave lightning impulse tests are required and whether it is to be done on only the first or on all units;
- whether a lightning impulse test on the neutral terminal is required and whether it is to be done on only the first or on all units;
- whether a lightning impulse applied to multiple line terminals simultaneously is required and whether it is to be done on only the first or on all units;
- clearances in air if different from the clearances given in Clause 16.

The values of  $U_m$ , LI and AV should preferably be chosen from a single line of Table 2 as they will then be a co-ordinated set, however it is permissible to choose values from different lines within the same  $U_m$  or from a higher  $U_m$  to match existing system insulation co-ordination. The LIC value, if specified, should be taken from the same line in Table 2 as the LI value. Any mix of values coming from different lines may result in over design in respect of some parameters.

### C.3 For transformers and windings with $72,5 \text{ kV} < U_m \leq 170 \text{ kV}$

In all cases:

- value of  $U_m$ ;
- value of  $U_r$ ;
- applied voltage test level;
- full wave lightning impulse test level.

Additionally for transformers with non-uniform insulation:

- line terminal AC test level or the switching impulse test level if specified as an alternative;

In special cases:

- whether alternative higher voltage levels are to be used for the induced voltage test with partial discharge measurement and whether it can be combined with the IVW test;
- whether chopped wave lightning impulse tests are required and whether it is to be done on only the first or on all units;
- whether a lightning impulse test on the neutral terminal is required and whether it is to be done on only the first or on all units;
- whether the required test voltage for the induced test voltage differs from twice rated voltage;
- whether a switching impulse test is required and whether it is to be done on only the first or on all units and whether the SI test replaces the LTAC test;
- whether a lightning impulse applied to multiple line terminals simultaneously is required and whether it is to be done on only the first or on all units;
- whether a line terminal AC withstand voltage test is required for transformers with non-uniformly insulated windings and if so the test voltage required;
- clearances in air if different from the clearances given in Clause 16.

The values of  $U_m$ , LI, AV, and if specified LTAC and SI should preferably be chosen from a single line of Table 2 as they will then be a co-ordinated set, however it is permissible to choose values from different lines within the same  $U_m$  or from a higher  $U_m$  to match existing system insulation co-ordination. The LIC value, if specified, should be taken from the same line in Table 2 as the LI value. Any mix of values coming from different lines may result in over design in respect of some parameters.

### C.4 For transformers and windings $U_m > 170 \text{ kV}$

In all cases:

- value of  $U_m$ ;
- value of  $U_r$ ;
- lightning impulse test level;
- switching impulse test level;
- applied voltage test level.

In special cases:

- whether alternative higher voltage levels are to be used for the induced voltage test with partial discharge measurement;
- whether a lightning impulse test on the neutral terminal is required and whether it is to be done on only the first or on all units;

- whether a lightning impulse applied to multiple line terminals simultaneously is required and whether it is to be done on only the first or on all units;
- whether a line terminal AC withstand voltage test is required for transformers with non-uniformly insulated windings and if so the test voltage required;
- clearances in air if different from the clearances given in Clause 16.

The values of  $U_m$ , LI, SI, AV and if specified, LTAC should preferably be chosen from a single line of Table 2 as they will then be a co-ordinated set, however it is permissible to choose values from different lines within the same  $U_m$  or from a higher  $U_m$  to match existing system insulation co-ordination. The LIC value should be taken from the same line in Table 2 as the LI value. Any mix of values coming from different lines may result in over design in respect of some parameters.

## Annex D (informative)

### Neutral insulation voltage level calculation

#### D.1 General

The recommendations in this annex allow the determination of the minimum withstand voltage for the neutral terminal of a transformer with non-uniform insulation which is not directly earthed. To control fault levels or for other reasons the neutral terminal may be connected to earth through a considerable impedance (for example an arc-suppression reactor, earthing reactor or resistor).

The determination of the withstand voltage of the neutral terminals of a transformer designed for use with a separate neutral end voltage regulating transformer is not covered by this annex.

When the neutral terminal is not directly earthed, an overvoltage protective device shall be installed between the neutral terminal and earth in order to limit transient voltages. It is the responsibility of the purchaser to select the overvoltage protective device, to determine its impulse protection level, and to specify the corresponding impulse withstand voltage for the neutral terminal of the transformer.

NOTE For non-uniform insulation the manufacturer might design the winding with a higher than specified neutral insulation level because of the line terminal withstand test (special test).

The AC withstand voltage shall be higher than the maximum overvoltage arising under system fault conditions. There should be a margin between the impulse level of the neutral terminal and the operating voltage of the protective device, both of these voltages shall be above the maximum voltage arising under system fault conditions. The formulae below give guidance for the calculation of the maximum voltages which can occur at a neutral terminal earthed through an impedance.

#### D.2 Neutral fault current calculation

The maximum neutral fault current  $I_{\text{fault}}$  for a two winding three phase transformer (single phase earth fault on a star connected winding) can be calculated according to the following formula:

$$I_{\text{fault}} = \frac{3 \times E}{(Z_{1t} + Z_{1s} + Z_{2t} + Z_{2s} + Z_{0t} + Z_{0s}) + 3 \times Z_N + 3 \times Z_{\text{fault}}}$$

where

$E$	is the phase to earth voltage taken as $U_m/\sqrt{3}$ in V
$Z_{1s}$	is the positive sequence impedance of the network in $\Omega$
$Z_{2s}$	is the negative sequence impedance of network in $\Omega$
$Z_{0s}$	is the zero sequence impedance of the network in $\Omega$
$Z_{1t}$	is the positive sequence impedance of the transformer in $\Omega$
$Z_{2t}$	is the negative sequence impedance of the transformer in $\Omega$
$Z_{0t}$	is the zero sequence impedance of the transformer in $\Omega$ (including any tertiary or stabilizing winding)
$Z_N$	is the impedance between the neutral and earth in $\Omega$

$Z_{\text{fault}}$  is the fault impedance in  $\Omega$  (taken as zero)

NOTE As a guide, in accordance with common practice to calculate the worst case, the following values might be used:

$$\begin{aligned} E &= U_m / \sqrt{3} \\ Z_{1s} &= 0 \\ Z_{2s} &= 0 \\ Z_{0s} &= 0 \\ Z_{\text{fault}} &= 0 \end{aligned}$$

### D.3 Minimum insulation level

#### D.3.1 Applied voltage minimum insulation level

The minimum AV level for the neutral should be chosen from Table 2 of this standard to be greater than  $U_{\text{ACneutral}}$  Where:

$$U_{\text{ACneutral}} = I_{\text{fault}} \times Z_N$$

#### D.3.2 Minimum impulse level

The impulse level should be chosen to provide a margin above the operating level of the protective device, which should be chosen so that it does not operate under system short-circuit fault conditions. The highest asymmetrical peak voltage under these conditions is given by

$$U_{\text{neutral max}} = U_{\text{ACneutral}} \times K_v \times \sqrt{2}$$

where

$K_v$  is the voltage asymmetry factor.

In the case of a purely resistive  $Z_N$ ,  $K_v$  is the same as the current asymmetry factor  $k$  as defined in IEC 60076-5, but for an inductive  $Z_N$ ,  $K_v$  will be lower because of the DC component of current. The factor  $K_v$  can be taken as 2 in the worst case of a very high transformer  $X/R$  and a small resistive  $Z_N$  but will be  $< 2$  in practical cases. In the case of a purely inductive  $Z_N$ ,  $K_v$  can be taken as 1,05 as this represents the worst case with a transformer  $X/R$  of about 7. It is recommended that  $U_{\text{neutral max}}$  is calculated using a system model.

### D.4 Example

A transformer connected Ynd11 with a rated HV voltage of 155 kV (i.e.  $U_m$  is 170 kV) and a rated power of 100 MVA with a 12 % positive sequence impedance on a 100 MVA base and a zero sequence impedance of 10,8 %, and with the HV neutral earthed through a 39  $\Omega$  reactor will experience the following fault current in the HV neutral for an HV line to earth fault considering an infinite short circuit power of the network:

$$I_{\text{fault}} = \frac{3 \times E}{(Z_{1t} + Z_{1s} + Z_{2t} + Z_{2s} + Z_{0t} + Z_{0s}) + 3 \times Z_N + 3 \times Z_{\text{fault}}}$$

$$I_{\text{fault}} = \frac{3 \times 170\,000 / \sqrt{3}}{(28,83 + 0 + 28,83 + 0 + 25,95 + 0) + 3 \times 39 + 0} \text{ A}$$

$$I_{\text{fault}} = 1\,468 \text{ A}$$

which gives a voltage of:

$$U_{ACneutral} = I_{fault} \times Z_N$$

$$U_{ACneutral} = 1\,468 \times 39\,V$$

$$U_{ACneutral} = 57\,243\,V$$

therefore the minimum AV level from Table 2 is 70 kV

Assuming  $K_v = 1,05$  for a reactive neutral impedance, the highest voltage on the neutral under system fault conditions is:

$$U_{neutral\,max} = 57\,243 \times 1,05 \times \sqrt{2}\,V$$

$$U_{neutral\,max} = 85,0\,kV$$

Since the protective device should not operate at a peak level of 85 kV its highest continuous AC level should not be less than  $85/\sqrt{2}\,kV = 60,1\,kV$ . A suitable surge arrester for this voltage (10 second withstand) has a 10 kA protective level of 140 kV and allowing a margin on this gives an LI level of 170 kV for the neutral.

A lightning impulse level of 170 kV corresponds to a  $U_m$  of 36 kV and this would be specified for the neutral.

## **Annex E** **(informative)**

### **Basis for dielectric tests, insulation levels and clearances**

#### **E.1 General**

It is the intention of this standard that the line to earth, neutral to earth, phase to phase and turn to turn insulation of the transformer shall be properly tested.

Depending on the voltage level and on the type of transformer different tests have been selected to achieve this, and appropriately coordinated test voltage levels are given in Table 2.

This annex summarises the rules, which prevailed during the revision of this standard. In general the revision has been aimed at simplifying the required testing and clarifying the requirements without increasing or reducing the overall level of testing, which is considered to have given good performance in service over many years.

#### **E.2 Tests**

##### **E.2.1 Tests for transformers with $U_m \leq 72,5$ kV**

These transformers include distribution transformers, which are often produced in large quantities of a particular design. The testing of such transformers should remain quick and affordable.

As all transformers and windings with a  $U_m$  of 72,5 kV and below are produced with uniform insulation, the line to earth and neutral to earth insulation are both verified during the applied voltage test (AV).

The induced test withstand (IVW), therefore, only needs to check the turn to turn insulation, and as in the previous edition a test at twice the normal operating voltage have been considered as offering a sufficient margin.

The design of the phase to phase and phase to earth insulation is also proven with the lightning impulse (LI) test but in order to limit the testing equipment necessary for this category of transformer the lightning impulse test has been retained as a type rather than a routine test.

The chopped wave lightning impulse test (LIC) is not regarded as necessary in general. This test is defined as a special test available at the request of the purchaser for use only when there are particularly onerous service conditions.

The induced test with partial discharge measurement (IVPD) has been considered also as too costly and too long for general application on these transformers, and furthermore its goals are covered by the IVW and AV tests. This test is defined as a special test available if required possibly with a reduced duration at the request of the purchaser for use when there are special service conditions.

##### **E.2.2 Tests for transformers with a $72,5$ kV $< U_m \leq 170$ kV**

Transformers in this middle range are generally built to order but because of the higher powers transmitted, requirements for higher quality checks are included. As both uniform and non-uniform insulation can be specified the list of tests has been prepared to accommodate both possibilities.

The neutral to earth insulation and for uniformly insulated transformers the line to earth insulation is proven with the applied voltage test (AV). For non-uniform insulation as the test level is limited by the neutral insulation it is insufficient to prove the line to earth insulation. For this reason a line terminal AC (LTAC) test is routine for non-uniformly insulated transformers, but this can be replaced by agreement with a switching impulse (SI) test so that this class of transformer can be tested in a similar manner to larger units.

The phase-to-phase and phase to earth insulation is also tested with the routine lightning impulse (LI) test. The chopped wave lightning impulse test is a special test for these voltage levels to be specified only when required by the purchaser for particular service conditions.

To test the turn-to-turn insulation and phase-to-phase insulation, an induced voltage withstand test (IVW) at twice rated voltage and an induced voltage test with partial discharge measurement (IVPD) are specified as routine tests. In order to shorten the test time and not to reproduce twice the same type of dielectric stress in the transformer, the opportunity to combine these tests is given as the enhancement of the IVPD test gives similar stresses to the IVW and both are made in a configuration similar to the service conditions.

### **E.2.3 Tests for transformers with $U_m > 170$ kV**

This category of transformer covers the largest transmission and generation transformers. The limited number of units as well as the necessary quality checks for these large and important units leads to the following tests:

To check the insulation to earth an applied voltage test is required as a routine test.

The IVPD test checks the quality of the turn to turn and line to earth and phase to phase insulation connected in the service condition. The switching impulse test (SI) proves the phase to phase and line to earth withstand. It is considered therefore that a separate induced voltage withstand test is not necessary but the enhancement voltage of the IVPD test can be increased if desired for example to twice rated voltage.

Lightning impulse tests including chopped waves are included as a routine test for these transformers as it is considered important to prove the ability of the transformer to withstand impulses including those containing higher frequency components.

For the purchaser who wishes to further test the line to earth insulation with an AC test, the single phase line terminal AC test (LTAC) can be specified as a special test. This test is derived from the previous induced voltage withstand test.

## **E.3 Test voltages**

The test voltages contained in Table 2 have been established based on IEC 60071-1. All values below the acceptable limits given in this insulation coordination standard have been excluded from Table 2, but Table 3 has been introduced with lower values which may be used to co-ordinate with existing practice. Table 2 continues to give a range of possible test voltage values for each  $U_m$  to allow the specification of a transformer to match a particular system requirement, whilst providing a minimum standard.

The general rule, which prevailed when establishing the values given in Table 2 is based on the behaviour of insulation containing cellulose-based solid insulation and mineral oil. The studies made on this type of insulation have shown that the switching impulse withstand (SI) is usually between 0,8 and 0,85 times the lightning impulse withstand. IEEE C57.12.00-2010 gives figures based on a ratio of 0,83.

In Table 2 the values were rounded up whenever this did not introduce an excessive bias to the general rule.



The induced voltage withstand (IVW) of the line to earth is usually around 50 % of the switching impulse voltage i.e. about 40 % to 43 % of the lightning impulse withstand voltage (LI). The values in Table 2 have been set using this general principle and the standardized figures for the IVW present in the IEC 60071-1. Except for  $U_m$  below 36 kV where the practices in use are somewhat different, the general rule is followed with only limited discrepancies to reflect existing practice.

The  $(1,58 \times U_r) / \sqrt{3}$  value for the PD measurement level is  $1,5 \times U_r$  plus 5 % and is the level used in IEEE C57.12.00-2010  $(1,8 \times U_r) / \sqrt{3}$  is  $1,7 \times U_r$  plus 5 % to account for the changed basis from  $U_m$  to  $U_r$  and to harmonise with IEEE C57.12.00-2010.

#### E.4 Clearances

The values given in the line to earth column of Table 4 are the highest of those given in IEC 60071-1:2011 for the relevant lightning impulse or switching impulse level. Rod to structure values have been used for lightning impulse levels < 850 kV and conductor to structure values above 750 kV. Where figures are not given in IEC 60071-1 they have been obtained by linear interpolation rounded to the nearest 10 mm or 100 mm.

The values given in the phase-phase clearance column of Table 4 have been obtained by re-basing the conductor to conductor values given in IEC 60071-1:2011 to a phase to phase divided by phase to earth value of 1,5 which is relevant to transformers with a delta winding. Where exact figures are not available from IEC 60071-1 a third order polynomial regression was used to interpolate between the figures re-based to a phase to phase divided by phase to earth value of 1,5. An example of the re-basing would be the clearance of 7 200 mm at 1 425 kV and 1,7 is taken to be equivalent to 1 615 kV and 1,5.

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