



Transnet SOC Limited
T/A Transnet Capital Projects

REQUEST FOR QUOTATION

TFR RME RFQ Transformers
 TFR RME RFQ Transformers
 TRANSNET FREIGHT RAIL RME
 PROCUREMENT DEPARTMENT

Registration Number: 1990/000900/06
Vat Number : 4720103177

Attention:

 Telephone Number :
 Fax Number :
 Vendor Number :500000

Quotation Deadline Date : 31.01.2013
Quotation Deadline Time : 16:00

REQUEST for QUOTATION
 Transnet Capital Projects
RFQ Number / Date
 6000145823 / 18.01.2013
Contact Person / Telephone
 Troy Stevens / 021 940 1892
Return to VAX Number/EMAIL
 0218100000 / TCPtendersCapeTown@Transnet.net

Item	Material	Description	RFQ Qty	UoM	Required Del date	Confirm Del date	Unit Price Excl	Total Price Excl
00010		Transformers	1	ea	14.03.2013			

Transformers
 Supply outdoor current transformers on steel structures (Set of 3)
 red phase, white phase, blue phase as per attached specifications
 Per set

Requester and Delivery Address:

Cecil Fourie - Transnet Freight Rail (RME)
 Bellville Square, off Modderdam Road
 Behind the Transnet Park Building
 Bellville South

Tel: 021 940 1865
 Cecil Fourie # 083 852 0773
 Email: cecil.fourie@transnet.net



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Fax: 021 9401938

If you are unable to quote for this enquiry, please submit a NO QUOTE, with a short reason, if possible, for not being able to quote.

Otherwise we look forward to receive your quote by the date and time stated.

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Delivery Address

TFR RME Cape Town
 De Gatt Complex, Behind Propnet Ind Park, Off Modderdam Rd
 Bellville South, Cape Town
 7530

This RFQ is subject to the following conditions:

1. Price/s : The price/s quoted in SA currency and is excluding of V.A.T
2. Delivery : The price/s quoted should include delivery cost to the delivery address stated on the RFQ
3. Returnables : A valid tax clearance certificate and BBBEE certificate from a SANAS accredited verification agency attached to quotation for all quotes above R30 000.
Please note that only the official Transnet RFQ will be accepted and all other correspondence to be attached to the original
4. Safety : To confirm to Transnet Capital Projects Health & Safety plan and specification; HAS-std-0001, copy available on request.
5. Confirmation: To confirm your participation in this tender process please sign and return this document as immediate effect prior to the quotation deadline.
6. Negotiations: The Employer may elect to negotiate the final terms of the contract/order with the preferred tenderer in accordance with Clauses F.2.17 and F.3.13 of the CIDB Standard Conditions of Tender. A copy of which is available upon request.

 Signature

 Date



TRANSNET
freight rail

**TECHNOLOGY MANAGEMENT
SPECIFICATION**

**REQUIREMENTS FOR OUTDOOR POST TYPE CURRENT
TRANSFORMERS FOR TRACTION AND DISTRIBUTION
SUBSTATIONS.**

Author: Chief Engineering Technician
Technology Management
Approved: Senior Engineer
Technology Management
Authorised: Principal Engineer
Technology Management

D.O.Schulz
L.O.Borchard
W.A.Coetzee

[Handwritten signatures]

Date: 21st September 2009

Circulation Restricted To:

Transnet Freight Rail -- Chief Engineer Infrastructure
- Technology Management

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1.0 SCOPE.

- 1.1 This specification covers Transnet Freight Rail's requirements for the design, manufacture, testing and supply of outdoor post type current transformers for use with electrical measuring instruments and electrical protection devices.
- 1.2 The current transformers shall be suitable rated for nominal system phase to phase r.m.s voltages ranging from 22 kV up to 220 kV.

2.0 STANDARDS, PUBLICATIONS AND DRAWINGS

Unless otherwise specified this specification must be read in conjunction with the current edition of the relevant SANS and Transnet Freight Rail's specifications.

The following publications are referred to in this specification:

2.1 SOUTH AFRICAN NATIONAL STANDARDS (SANS)

- SANS 60044-1: Instrument Transformers. Part 1: Current Transformers.
- SANS 121: Hot dip galvanized coatings on fabricated iron and steel articles. – Specifications and test methods.
- SANS 1019: Standard voltages, currents and insulation levels for electricity supply.
- SANS 60529: Degrees of protection provided by enclosures. (IP code)

3.0 TENDERING PROCEDURE

- 3.1 Tenderers shall indicate clause-by-clause compliance with this specification as well as the relevant equipment specifications. This shall take the form of a separate document listing all the specifications clause numbers indicating on individual statement of compliance or non-compliance.
- 3.2 The tenderer shall motivate a statement of non-compliance.
- 3.3 Tenderers shall complete Appendix 2. " Information to be provided by tenderers".
- 3.4 Tenderers shall submit detailed technical literature of the current transformers offered together with drawings showing, general constructional details and principal dimensions.
- 3.5 Any items offered in accordance with other standards will be considered at the sole discretion of Transnet Freight Rail. The tenderer shall supply full details stating where the item differs from these specifications as well as supplying a copy (in English) of the recognised specification(s) with which it complies.
- 3.6 Failure to comply with clauses 3.1, 3.2, 3.3, 3.4 and 3.5 could preclude a tenderer from consideration.

4.0 APPENDICES

- 4.1 The following appendices form an integral part of this specification and shall be read in conjunction with it.
- Appendix 1 - "Schedule of Requirements".
- This appendix details the specific requirements for this application.
- 4.2 Appendix 2 - " Information to be provided by tenderers".
- This appendix calls for specific technical information to be furnished by tenderers.

5.0 SERVICE CONDITIONS**5.1 ATMOSPHERIC CONDITIONS**

The equipment shall be designed and rated for installation and continuous operation under the following conditions:

Altitude:	0 to 1800m above sea level.
Ambient temperature:	-5°C to +45 °C.
Relative humidity:	10% to 90%.
Lightning Conditions:	12 ground flashes per square kilometre per annum.
Pollution:	Heavily salt laden or polluted with smoke from industrial sources.
Wind pressure on equivalent projected area normal to direction of wind:	750Pa.

5.2 ELECTRICAL CONDITIONS

5.2.1 Supply voltage: The incoming AC voltage can vary $\pm 5\%$ of the nominal system r.m.s voltage.

5.2.2 Frequency: Frequency of the supply voltage is 50 ± 2.5 Hz.

5.2.3 The high voltage system shall be treated as effectively earthed unless otherwise specified.

6.0 REQUIREMENTS FOR CURRENT TRANSFORMERS**6.1 GENERAL REQUIREMENTS**

6.1.1 The current transformers shall be designed, manufactured and tested in accordance with the requirements of specification SANS 60044-1.

6.1.2 The current transformers shall be suitable for operation under the nominal phase to phase voltages or phase to neutral voltages specified in Appendix 1.

6.1.3 The current transformers shall be of the oil insulated free-standing post type designed for outdoor use.

6.1.4 The current transformer shall be the bar primary type.

6.1.5 The current transformers shall be provided with measuring and protection cores as specified in Appendix 1.

6.1.6 For certain applications dual measuring cores as specified in Appendix 1 shall be provided for the purpose of ESKOM metering.

6.2 INSULATION LEVELS AND CREEPAGE DISTANCES**6.2.1 CREEPAGE DISTANCES**

6.2.1.1 The standard creepage distance between phase and earth shall be in accordance with table 7 of SANS 60044-1.

6.2.1.2 For coastal areas and very heavy polluted inland areas the standard creepage distance shall be the very heavy polluted level, i.e. 31mm/kV of the highest r.m.s phase to phase voltage U_m for equipment.

6.2.1.3 For inland areas the standard creepage distance shall be the heavy polluted level, i.e. 25mm/kV of the highest r.m.s phase to phase voltage U_m for equipment.

The rated insulation levels of the current transformers shall comply with the requirements specified in Table 1.

6.2.2.1.

Table 1 lists the nominal system voltages present on Transnet Freight Rail and the required insulation levels as specified in accordance with SANS 1019.

Highest phase-to-phase r.m.s voltage for equipment. (U_m)	Nominal system phase-to-phase r.m.s. voltage	Rated lightning impulse withstand voltage peak.	Rated short duration power-frequency withstand r.m.s voltage.
24 kV	22 kV	150kV	50 kV
36 kV	33 kV	200 kV	70 kV
52 kV	44 kV	250 kV	95 kV
72,5 kV	66 kV	350 kV	140 kV
100 kV	88kV	380 kV 450 kV	150 kV 185 kV
145 kV	132 kV	550 kV 650kV	230 kV 275 kV
245 kV	220 kV	550 kV 650kV	360 kV 395 kV
Insulation levels for highest voltage for equipment $U_m < 100$ kV are based on an earth fault factor equal to $\sqrt{3}$ and for $U_m > 100$ kV an earth fault factor equal to 0,8 $\sqrt{3}$. Where more than one insulation level is given per voltage system, the higher level is appropriate for equipment where the earth fault factor is greater than 1,4.			

TABLE 1: Standard Voltages and insulation levels in accordance with SANS 1019:2008 [1]

6.2.2.2

For the 25 kV and 50kV single phase ac traction systems the ac high voltage circuit breakers shall be designed to the following nominal system phase to phase r.m.s voltages and withstand insulation levels:

- For the 25 kV (phase to earth) ac traction systems the ac high voltage circuit breakers current transformer shall be rated for a nominal system phase to phase r.m.s voltage of at least 44 kV and designed to withstand the required insulation level for that nominal system voltage.
- For the 50 kV (phase to earth) ac traction systems the ac high voltage circuit breakers shall be rated for a nominal system phase to phase r.m.s voltage of at least 88 kV and designed to withstand the required insulation level for that nominal system voltage.

6.3 CONSTRUCTIONAL DESIGN

- 6.3.1 The current transformers shall be of the oil insulated post type.
- 6.3.2 The insulating oil shall be certified free from polychlorinated biphenyls.
- 6.3.3 Facilities for oil draining and filling shall be provided.
- 6.3.4 The oil insulated current transformers shall be hermetically sealed.
- 6.3.5 The current transformers shall be fitted with an oil level sight glass, which shall be readable from ground level. The sight glass shall be resistant to ultraviolet radiation.
- 6.3.6 The primary terminals shall be of approved type material i.e. aluminium or electroplated copper and shall be able to carry the rated short circuit current of the current transformer.

BBB0937, Version 4
6.3.7 The orientation of the terminals shall be horizontal and shall be suitable marked P1 and P2 in accordance with SANS 60044-1.

6.3.8 The secondary terminals shall be mounted in a metal terminal box suitable for the termination of the current transformer secondary windings to the outgoing external circuits for the protection relays, metering and indicating instruments.

6.3.9 The secondary winding connections shall be brought out through the tank into the terminal box by means of bushings.

6.3.10 Links shall be provided for shorting out the secondary windings when not in use.

6.3.11 A rail mounted terminal strip shall be provided inside the terminal box for the termination of the current transformer secondary connections to the external circuits. The terminals shall be of the screw clamp type or spring-loaded insertion type.

6.3.12 The secondary winding terminal box shall be provided with a weatherproof cover and bottom entry cable entries. The degree of protection shall be at least IP 54 in accordance with SANS 60529.

6.3.13 An earthing stud of at least 6mm shall be provided inside the terminal box for the earthing of the secondary windings.

6.3.14 The tank or base of each current transformer shall be fitted with an earthing terminal suitable to accommodate a cable lug for a 95mm² copper conductor or copper busbar for the earthing of the current transformer.

6.3.15 Provision shall be made that the current transformers can be bolted to the support structure.

6.3.16 Unless otherwise approved all ferrous parts of the current transformer shall be galvanised in accordance with SANS 121.

6.3.17 Rating plates shall be manufactured of corrosion resistant material and shall be fixed to the main body of the current transformer.

6.3.17.3 The rating plate shall have the following information clearly and indelibly engraved on it:

- Manufactures name or mark.
- Serial number and type designation.
- Rated primary and secondary current.
- Rated frequency.
- Rated output and accuracy class.
- Highest voltage for equipment.
- Rated insulation level.
- Rated short time thermal current and dynamic current.
- Class of insulation.
- The corresponding terminals of each winding.

6.4 CURRENT TRANSFORMER RATINGS

6.4.1 MEASURING CURRENT TRANSFORMERS

6.4.1.1 The transformation ratio(s) shall comply with the requirements of Appendix 1.

6.4.1.2 The secondary current rating shall be 1 Ampere unless otherwise specified in Appendix 1.

6.4.1.3 The minimum rated output burden shall be 10 VA unless otherwise specified in Appendix 1.

6.4.1.4 The accuracy class shall be as follows:

6.4.1.4.1 For metering purposes the class of accuracy shall be 0.5 for current transformers with ratios up to 400/1 and class 0.2 for ratios greater than 400/1.

6.4.1.4.2 For Indication or measuring purposes the accuracy class shall be 0.5.

6.4.2 PROTECTION CURRENT TRANSFORMERS

6.4.2.1 The transformation ratio(s) shall comply with the requirements of Appendix 1.

6.4.2.2 The secondary current rating shall be 1 or 5 Ampere. Refer to Appendix 1.

6.4.2.3 The rated output burden shall comply with the requirements of Appendix 1 but shall not be less than 10 VA.

6.4.2.4 The accuracy limit factor shall be as specified in Appendix 1.

6.4.2.5 The accuracy class shall be as specified in Appendix 1.

6.4.2.6 The protection core shall be provided with a 10 ampere test winding.

CLASS PX CURRENT TRANSFORMERS

6.4.2.7 Class PX protection current transformers shall be provided where specified in Appendix 1.

7.0 TEST CERTIFICATES.

9.1 The manufacture shall make available type test certificates for the equipment (as specified in SANS 60044-1 when required. Routine test certificates shall be supplied with each circuit breaker.

8.0 DRAWINGS

8.1 The drawings shall comply with the requirements of Transnet Freight Rail's specification CEE.0224.

8.2 Drawings showing details of construction and outline dimensions of the currents transformers shall be submitted with the tender documents.

8.3 The drawings shall give the following details:

- Outline dimensions.
- Mounting details
- Main terminal and clamps.
- Main terminal markings.
- Secondary terminal box with covers.
- The arrangement of the secondary terminals and secondary earthing terminal.
- Connection diagram showing the terminal markings and relative polarity and physical arrangement of windings with respect to the primary winding.
- Drawings of the rating and diagram plates.

9.0 GUARANTEE AND DEFECTS.

9.1 The contractor shall guarantee the satisfactory operation of the current transformers supplied and accept liability for maker's defects, which may appear in design, materials and workmanship.

9.2 The guarantee period shall expire after -

A period of 12 months commencing on the date of energising of the current transformers.

9.2 Any specific type of fault occurring three times within the guarantee period and which cannot be proven to be due to other faulty equipment not forming part of this contract, shall automatically be deemed an inherent defect. Such inherent defect shall be fully rectified to the satisfaction of the maintenance manager of the depot and at the cost of the Supplier.

If urgent repairs have to be carried out by Transnet Freight Rail's staff to maintain supply during the guarantee period the supplier shall inspect such repairs to ensure that the guarantee period is not affected and should they be covered by the guarantee, reimburse Transnet Freight Rail the cost of material and labour.

10.0 INSPECTION.

10.1 Transnet Freight Rail reserves the right to carry out inspection and any tests on the equipment at the works of the supplier/ manufacture.

10.2 Arrangements must be made timeously for such inspections to be carried out before delivery of the equipment to the client.

11.0 PACKAGING AND TRANSPORT.

11.1 The tenderer shall ensure that the equipment be packed in such a manner that it will be protected during handling and transport.

11.2 The tenderer shall provide transport for the delivery of the equipment to the site where required.

12.0 BIBLIOGRAPHY

[1] SANS 1019: 2008: Edition 2.5

END

APPENDIX 1

SCHEDULE OF REQUIREMENTS

(To be completed by client)

1.0 SYSTEM DETAIL

- 1.1 Current transformers required for: MULLAEGESVLEI substation/location.
- 1.2 Pollution level: Heavy X Very Heavy _____
- 1.2 Quantity of current transformers required: 3
- 1.2 Nominal phase to phase voltage for 3 phase system: 6.6 kV.
- 1.3 Nominal phase to neutral voltage for single phase systems: N/A kV.
- 1.4 Frequency: 50 Hz

2.0 DETAIL OF CURRENT TRANSFORMER.

MEASURING CURRENT TRANSFORMERS

- 2.1 Measuring current transformer required: Yes / No
- 2.1.1 Purpose: Metering / Measuring
- 2.2 Number of measuring cores required: 3
- 2.3 Transformation ratio: Primary 1.5 Ampere, Secondary 1 Ampere.
- 2.4 Rated primary current: 7.5 Ampere. Rated secondary current: 5 Ampere
- 2.5 Rated burden: 15 VA
- 2.6 Accuracy class: X
- 2.7 Rated short-time current: 10 kA for _____ seconds

PROTECTION

- 2.6 Protection current transformers required: Yes / No
- 2.8 Number of protection cores required: 3
- 2.9 Rated primary current: 7.5 Ampere. Rated secondary current: 5 Ampere.
- 2.10 Rated burden: 15 VA
- 2.11 Accuracy class: 1.0/1.0
- 2.12 Accuracy limit factor: _____
- 2.13 Rated short-time current: 10 kA for 1 seconds

CLASS PX PROTECTION CURRENT TRANSFORMERS

- 2.14 Class PX protection cores required: Yes / No
- 2.15 Number of Class PX protection cores required: _____
- 2.16 Transformation ratio: Primary _____ Ampere, Secondary _____ Ampere.
- 2.17 Rated primary current: _____ Ampere. Rated secondary current: _____ Ampere.

- 2.18 Rated turns ratio: _____
- 2.19 Rated knee point e.m.f. _____
- 2.20 Maximum secondary winding resistance: _____ Ohms at _____ ° C

END

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APPENDIX 2

TECHNICAL DATA SHEET
(To be completed by tenderer)

1.0 DESIGN DETAIL

- 1.1 Manufacturers name: _____
- 1.2 Highest voltage for equipment: _____ kV
- 1.3 Nominal r.m.s voltage: _____ kV
- 1.4 Rated insulation level: _____ kV
- 1.5 Rated frequency: _____ Hz

2.0 DETAIL OF CURRENT TRANSFORMERS.**MEASURING CURRENT TRANSFORMERS**

- 2.1 Transformation ratio: _____
- 2.2 Rated primary current: _____ Ampere. Rated secondary current: _____ Ampere
- 2.3 Accuracy class: _____
- 2.4 Rated Burden: _____ VA
- 2.5 Rated short-time current: _____ kA for _____ seconds

PROTECTION CURRENT TRANSFORMERS

- 2.6 Transformation ratio: _____
- 2.8 Rated primary current: _____ Ampere. Rated secondary current: _____ Ampere
- 2.9 Accuracy class: _____
- 2.10 Accuracy limit factor: _____
- 2.11 Rated Burden: _____ VA
- 2.12 Rated short-time current: _____ kA for _____ seconds

CLASS PX PROTECTION CURRENT TRANSFORMERS

- 2.13 Rated primary current: _____ Ampere. Rated secondary current: _____ Ampere.
- 2.14 Rated turns ratio: _____
- 2.15 Rated knee point e.m.f: _____
- 2.16 Maximum secondary winding resistance: _____ Ohms at _____ ° C
- 2.17 Rated short-time current: _____ kA for _____ seconds

END