RFQ / TENDER

Tender No: EFQ-20878

Vendor No: 11001386

BOARD LIST
BOARD LIST
TRANSNET FREIGHT RAIL
PROCUREMENT DEPARTMENT
2000

Purchaser : Nobahle Mjoli
Telephone : 011 584 0606
Fax Number:

Please quote reference:
K62/6000619393

Deliver to:
PARK STATION, UNDERGROUND LEVEL
RISSIK STREET, JOHANNESBURG.
2000 Johannesburg

Closing Date :25.02.2016
Validity Date :30.06.2016
RFQ No :6000619393

SUPPLY BASE RADIO WITH ACCESSORIES & TRAINING AT JOHANNESBURG.

THE RFQ DOCUMENTS ARE OBTAINABLE FROM THE OFFICE OF TRANSNET FREIGHT RAIL, TENDER ADVISE CENTRE, GROUND FLOOR, INYANDA HOUSE 1, WELLINGTON ROAD, PARKTOWN, DURING OFFICE HOURS 08:00 TO 15:00 AND RFQ DOCUMENT IS FOR FREE. RFQ CLOSING DATE: 25 FEBRUARY 2016.

QUOTATIONS MAYBE FAXED TO : (011) 774-9129/(011) 774-9186.

FOR ANY TECHNICAL ENQUIRIES WITH REGARD TO THIS RFQ YOU CAN CONTACT :MR THAMI NDAMASE 083 450 8465.

1.1 QUOTATION/S MUST BE SUBMITTED PUNCTUALLY AT 10:00 ON OR BEFORE CLOSING DATE AND LATE QUOTATIONS WILL NOT BE CONSIDERED.

1.2 IF POSTED:

21 WELLINGTON ROAD
INYANDA HOUSE 1
PARKTOWN
2193

1.3 ,IF DELIVERED BY HAND:

TRANSNET FREIGHT RAIL-SUPPLY CHAIN SERVICES
21 WELLINGTON ROAD
INYANDA HOUSE 1
PARKTOWN

DATE: ..... SIGNATURE OF TENDERER(S): ....

CONTACT PERSON: ..... TEL No: .....

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2. CONDITIONS:

2.2 ANY PURCHASE ORDER PLACED AS A RESULT OF YOUR QUOTATION WILL BE SUBJECT TO THE STANDARD TERMS AND CONDITIONS OF CONTRACT, FORM US7, (LATEST), GENERAL TENDER CONDITIONS, FORM CSS5 (LATEST) AND CONDITIONS MENTIONED HEREIN.

2.3 TENDERERS MAY OFFER AN EARLIER VALIDITY DATE, BUT THEIR QUOTATION MAY, IN THAT EVENT, BE DISREGARDED FOR THIS REASON.

2.4 TENDERERS ARE REQUIRED TO OFFER ONLY FIRM PRICES. PRICES SUBJECT TO REVIEW IN TERMS OF CLAUSE 32 OF FORM US7 WILL ONLY BE CONSIDERED SHOULD THE DELIVERY PERIOD REQUIRED EXCEED 6 MONTHS.

2.5 BEST DELIVERY TIME MUST BE OFFERED.

2.6 DISCOUNT (TRADE DISCOUNT) CASH DISCOUNT (CONDITIONAL DISCOUNT) VALUE VALUE ADDED TAX (VAT) MUST BE SHOWN SEPARATELY.

2.7 TRANSNET RESERVES THE RIGHT TO NEGOTIATE PRICES AND COMMERCIAL ASPECTS AFTER THE CLOSING DATE OF THE QUOTATION.

DATE: ..... SIGNATURE OF TENDERER(S): ....

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2.8 DIRECT DELIVERY INTIMATES DELIVERY BEING EFFECTED INTO THE WAREHOUSE OR THE ACTUAL POINT OF SUPPLY AND SHOULD THEREFORE INCLUDE ANY TRANSPORTATION MODE DEEMED NECESSARY IN EXECUTING THIS METHOD OF DELIVERY BASIS IN ORDER TO MEET THE REQUIRED DELIVERY DATE.

3. EVALUATION CRITERIA:- SUBSTANTIVE RESPONSIVENESS (MANDATORY)
3.1. COMPLIANCE TO SPECIFICATION (CLAUSE BY CLAUSE DECLARATION).
3.2. COMPETITIVE PRICING AND BBBEE.
TAX CLEARANCE CERTIFICATES:
The Regulations in terms of the Public Finance Management Act, 1999: Framework for Supply Chain Management as published in Government Gazette No. 25767 dated 5 December 2003, Clause 9 (1) (d), stipulates that the accounting officer or accounting authority of an institution to which these regulations apply must reject any bid from a supplier who fails to provide written proof from the South African Revenue that the supplier either has no outstanding tax obligations or has made arrangements to meet outstanding tax obligations.
Tenderers will be disqualified if a valid tax clearance certificate or written proof from the South African Revenue Service that supplier has made arrangements to meet outstanding tax obligations is not submitted with the tender.

COMPANY DETAILS:
NAME OF COMPANY: _____
CONTACT PERSON: _____
TEL. NO. _____ **FAX NO:** _____
REG. NO. _____

BROAD BASED BLACK ECONOMIC EMPOWERMENT (BBBEE)

Transnet fully endorses and supports the Government's Broad-based Black Economic Empowerment Programme 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 will therefore prefer to do business with local business enterprises who share these same values. Transnet will endeavour to do business with local business enterprises that possess a BBBEE "recognition level" of at least a level 5. Transnet urges Tenderers (large enterprises and QSE's - see below) to have themselves accredited by any one of the various Accreditation Agencies available, who do their BBBEE ratings in accordance with the latest Codes (i.e. those promulgated on 9 February 2007) and whose names appear on the present ABVA (Association of BEE Verification Agencies) - "List of Full Members" as displayed on the ABVA website (www.abva.co.za).
Although no agencies have, as yet, been accredited by SANAS (SA National Accreditation System), Transnet will, in the interim, accept rating certificates of tenderers who have been verified by any of the listed agencies.

Enterprises will be rated by such agency based on the following:
1. Large Enterprises (i.e. annual turnover >R35million:
" Rating level based on all seven elements of the BBBEE scorecard.

2. Qualifying Small Enterprises - (QSE) (i.e. annual turnover >R5million but <R35million:
" Rating based on any four elements of the BBBEE scorecard.
NB:
3. Emerging Micro Enterprises - (EME) (i.e. annual turnover <R5m) are exempted from being rated/verified:
" Automatic rating of Level 4 BBBEE irrespective of race of ownership, i.e. 100% BBBEE recognition
" Black ownership >50% or Black Women ownership >30% automatically qualifies as Level 3 BBBEE, i.e. 110% BBBEE recognition
" EME's should provide certified documentary proof of annual turnover (i.e. audited financials) plus proof of Black ownership if Black ownership >50% or Black Women ownership >30% from the EME's Auditor/Accounting Officer.

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4. In addition to the above, Tenderers who wish to enter into a Joint Venture or subcontract portions of the contract to BBBEE companies, must state in their tenders the percentage of the total contract value that will be allocated to such BBBEE companies, should they be successful in being awarded any business. A rating certificate in respect of such BBBEE JV-partners and / or sub-contractor/s, as well as a breakdown of the distribution of the aforementioned percentage must also be furnished

In view of the high emphasis which Transnet places on Broad-based Black Economic Empowerment, Transnet will allow certain preference points for BBBEE in the evaluation of all responses. Depending upon the value of the ensuing business award (i.e. below or in excess of R2m), the 80/20 or 90/10 point preference systems will be utilized where BBBEE will count out of 20 or 10 respectively in the evaluation process.

EACH RESPONDENT IS REQUIRED TO FURNISH PROOF OF THE ABOVE TO TRANSNET. FAILURE TO DO SO WILL RESULT IN A SCORE OF ZERO BEING ALLOCATED FOR BBBEE.

Turnover: Kindly indicate your company's annual turnover for the past year R_____

" If annual turnover <R5m, please attach certified confirmation from your Auditor/Accounting Officer
" If annual turnover >R5m please attach original or certified copy of accreditation certificate and detailed scorecard by an ABVA accreditation agency (registered as a "Full Member")

PAYMENT TERMS

The following payment terms will apply as from 1 October 2008.
" **All suppliers will be paid 30 days from receipt of month end statement, i.e. payment term F055.**

CONDITIONS:
This quotation is subject to the provisions of the Standard Terms and Conditions of Contract, Form US7, (Latest) and the General Tender Conditions, Form CSS5 (Latest) and any other standard or special conditions mentioned and/or embodied in the quotation request.

SCHEDULE OF REQUIREMENTS
PRICES TENDERED ARE TO BE "DIRECT" AND EXCLUDE VAT.

IN THIS REGARD THE TENDERER'S ATTENTION IS DIRECTED TO PARAGRAPH 16 OF FORM CSS5 (LATEST).

DATE: ..... SIGNATURE OF TENDERER(S): ....

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TRANSNET INSISTS ON HONESTY AND INTEGRITY BEYOND REPROACH AT ALL TIMES AND WILL NOT TOLERATE ANY FORM OF IMPROPER INFLUENCING, BRIBERY, CORRUPTION, FRAUD, OR ANY OTHER UNETHICAL CONDUCT ON THE PART OF BIDDERS/ TRANSNET EMPLOYEES. IF, IN THE OPINION OF TRANSNET'S CHIEF OPERATING OFFICER, A TENDERER / CONTRACTOR / SUPPLIER HAS OR HAS CAUSED TO BE PROMISED, OFFERED OR GIVEN TO ANY TRANSNET EMPLOYEE, ANY BRIBE, COMMISSION, GIFT, LOAN, ADVANTAGE OR OTHER COSIDERATION, TRANSNET SHALL BE ENTITLED TO REVOKE THE TENDER / CONTRACT BY FOLLOWING ITS INTERNAL POLICIES THAT GOVERN THE ECLUSION PROCESS. IN SUCH AN EVENT TRANSNET WILL BE ENTITLED TO PLACE ANY TENDERER / CONTRACTOR / SUPPLIER WHO HAS CONTRAVENED THE PROVISIONS OF TRANSNET'S BUSINESS ETHICS ON ITS LIST OF EXCLUDED TENDERERS. THIS LIST WILL ALSO BE DISTRIBUTED TO ALL OTHER STATE OWNED ENTERPRISES AND GOVERNMENT DEPARTMENTS.

TRANSNET INVITES ITS VALUED SUPPLIERS TO REPORT ANY ALLEGATIONS OF FRAUDCORRUPTION OR OTHER UNETHICAL ACTIVITIES TO TRANSNET TIP-OFFS ANONYMOUS,AT ANY OF THE FOLLOWING ADDRESSES / CONTACT NUMBERS:-

TOLL-FREE ANONYMOUS HOTLINE - 0800 003 056
EMAIL - Transnet@tip-offs.com
FAX NUMBER - 0800 007 788
FREEPOST DN 298, UMHLANGA ROCKS, 4320

CONFIDENTIALITY IS QUARANTEED NB: SUPPLIERS MAY BE REQUESTED TO SUBMITT SAMPLES TO THE END-USER.

Item	Qty	Material	Description
00010	7		BASE RADIOS WITH ACCESORIES & TRAINING

R.....
Each

Delivery Date: 31.03.2016

FULL DETAILS OF DESCRIPTION

DATE: ..... SIGNATURE OF TENDERER(S): ....

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TRANSNET FREIGHT RAIL
PROCUREMENT DEPARTMENT

3. ADDITIONAL INFORMATION REQUIRED: (WHERE APPLICABLE)

3.1 THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED:

(A) DISCOUNT: .....

(B) SETTLEMENT DISCOUNT:.....

(C) PRICE/S FIRM: .....

(D) PRICE/S FIRM UNTIL ..... THEREAFTER SUBJECT TO REVIEW.

(E) PRICE/S NOT FIRM: .....

(F) SABS MARK: .....

(G) SABS PERMIT NO: .....

(H) BRAND/MAKE/TYPE: .....

(I) FULL NAME AND ADDRESS OF MANUFACTURER.:

.....

.....

.....

(J) FULL NAME AND ADDRESS OF INSPECTION POINT:

.....

.....

.....

(K) COUNTRY OF ORIGIN: .....

Comply :_____ Does not Comply :_____ Not applicable :_____

Justification : .....

(L) SURPLUS MATERIAL:

TENDERERS MUST INDICATE IF THEY WILL BE PREPARED TO PURCHASE BACK FROM TRANSNET ANY SURPLUS MATERIAL WHICH MAY BECOME AVAILABLE FROM ANY RESULTING PURCHASE ORDER/CONTRACT ORIGINATED FROM THE QUOTATION SUBMITTED.

.....

(M) PAYMENT OVERSEAS:

ONLY IF TRANSNET LIMITED IS REQUESTED BY THE TENDERER TO EFFECT PAYMENT OVERSEAS DIRECT TO THE TENDERER'S PRINCIPAL/SUPPLIER THE FOLLOWING INFORMATION IS REQUIRED:

* EXCHANGE RATE ON WHICH THE QUOTATION PRICE IS BASED: R1,00 (S.A. CURRENCY) BEING EQUAL TO ..... (FOREIGN CURRENCY)
* PERCENTAGE IN RELATION TO THE QUOTATION PRICE TO BE REMITTED OVERSEAS:

.....

* NAME OF COUNTRY TO WHICH PAYMENT IS TO BE MADE:

.....

.....

* APPLICABLE DATE OF EXCHANGE RATE:

.....

* BENEFICIARY'S NAME AND FULL ADDRESS:

.....

.....

DATE: ..... SIGNATURE OF TENDERER(S): ....

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.....

* BENEFICIARY'S BANKERS AND FULL ADDRESS:

.....

.....

.....

* APPLICABLE ACCOUNT NUMBER:

.....

(N) DELIVERY DATE:

TENDERERS MUST FURNISH THEIR ACTUAL DELIVERY AND MANUFACTURNG PERIOD HEREUNDER NOTWITHSTANDING THE DELIVERY DATES SPECIFIED BY TRANSNET.

THE FOLLOWING MUST ALSO BE FURNISHED IN REGARD TO THE ABOVE:

1. PERIOD REQUIRED TO OBTAIN RAW MATERIAL ....**(DAYS)**
2. MANUFACTURING PERIOD. ....**(DAYS)**
3. PERIOD TO TRANSPORT MATERIAL TO DESTINATION. ....**(DAYS)**

MATERIAL NO.	**1.(PERIOD)**	**2.(PERIOD)**	**3.(PERIOD)**

INDICATE THE PERCENTAGE (%)OF THE PRICE THAT IS SUBJECT TO THE VARIABLE COPPER FEE: ----------%.

DATE: ..... SIGNATURE OF TENDERER(S): ....

TRANSNET
freight rail

RAIL NETWORK
TELECOMMUNICATION

SPECIFICATION

CONVENTIONAL OPEN CHANNEL RADIO BASE STATION WITH REMOTE CONTROL FACILITIES

Author:	Divisional Manager Access Rail Network, Telecommunication	G. A. Daly	10 February 2015
Approved:	Senior Engineer Rail Network, Transmission Engineering	M. Mmbengwa	10/02/2015
Authorised:	Chief Engineer Rail Network, Telecommunication	A. Matseke	

Date: 10 February 2015

Circulation Restricted To:

Transnet Freight Rail
Transnet and Relevant Third Parties
Unrestricted

Table of Contents

I. Document Authorisation

FUNCTION	NAME	TITLE & DIVISION		DATE
Reviewed By:	*Freddie Visser*	Frequency Management Rail Network Telecoms		10 FEBRUARY 2015
Reviewed By:	*Chris Muller*	Quality Assurance Rail Network Telecoms		10 February 2015

II. Distribution

Once updated, a copy of the latest revision will be published on the document management system, "Project Wise".

III. Document Change History

ISSUE NO.	DATE ISSUED	ISSUED BY	HISTORY DESCRIPTION
1.00	Oct 2012	Graeme Daly	New Document
1.01	Feb 2015	Graeme Daly	Signature Update

IV. Changes Since Last Revision

CLAUSES	DESCRIPTION

V. List of Abbreviations

ABBREVIATIONS	DESCRIPTION
AC	Alternating Current
Ah	Ampere hour
dBm	Decibel relative to 1 milli watt
LED	Light Emitting Diode
m	Metre
mm	Millimetre
PTT	Press – to - Talk
RBU	Radio Base Unit
RCU	Remote Control Unit
RF	Radio Frequency
RTO	Radio Train Order
Rx	Receive
TCO	Train Control Officer
TFR	Transnet Freight Rail
THD	Total Harmonic Distortion
Tx	Transmit
UHF	Ultra High Frequency
V	Volt
W	Watt
Char	Character
CTC	Central Train Control
CTCSS	Continuous tone code squelch system
dB(A)	Sound pressure A weighted
DC	Direct Current
GPS	Global positioning system
ICASA	Independent Communication Authority of South Africa
ID	Identification
mW	Milli watt
RF	Radio Frequency
TCO	Train controlling officer
UHF	Ultra High Frequency
VCO	Voltage Control Oscillator
VSWR	Voltage Standing Wave Ratio

DEFINITIONS	DESCRIPTION
Base Station	A desktop radio base station with power supply, metal housing, handset, footswitch, goose neck and headset, which is remotely controlled, can operate 4 wire E&M and IP connectivity.
Open Channel	Conventional radio

1. Introduction

1.1. This specification covers the supply of a radio base station that must be remotely controlled with a desktop remote, must operate on both 4 wire E&M and IP connectivity. The radio base station must operate in the Transnet Freight Rail (TFR) Ultra High Frequency (UHF) 400 - 470 MHz bands (without signal degradation or the need to change components and / or modules), in Conventional Open Channel mode.

1.2. The Radio Base Unit, power supply, metal housing are herein referred to as the "RBU"

1.3. The Remote Control Unit and metal housing are herein referred to as the "RCU"

2. Background Information

2.1. Transnet Freight Rail (TFR) is an Operational Division of Transnet Limited SOC, and it has a broad range of telecommunication services. These services include amongst others, radio communications for the safe train Operations.

2.2. This specification calls for the supply of a remote radio base station as described herein.

2.3. The radio base station will be used by the Train Control Officer (TCO) and at Centralised Train Control (CTC) offices for communication with the train driver and crew.

2.4. Bidders should be prepared to demonstrate the functionality of the radio base station set at no cost to TFR.

2.5. TFR reserve the right to request modifications or alteration to the supplier's radio base station with remote facilities before issuing the final approval.

2.6. The successful bidders will be required to supply one complete unit to TFR as a final prototype for approval. Once approval has been granted, the bidders shall be authorised to start with the production for the entire order. No production shall commence prior to the sign-off of the final prototype.

2.7. TFR representatives may conduct visits to the premises of the prospective bidders for inspection of the equipment concerned.

3. Scope of Work

3.1. This specification covers the supply of a radio base station that must be remotely controlled with a desktop remote and must operate on both 4 wire E&M and IP connectivity. The radio base station must operate in the Transnet Freight Rail (TFR)

Ultra High Frequency (UHF) 400 - 470 MHz bands, (without signal degradation or the need to change components and / or modules), in Conventional Open Channel mode.

3.2. The Schedule of Requirements and Pricing (Annexure "A") contains the quantities of the equipment to be supplied.

4. Compliance

The radio offered shall comply with clause "9" as described below - Conventional Open Channel UHF Radio

5. Radio Base Station Requirements

The radio base station set, shall comprise of the Radio Base Unit (RBU) and the Remote Control Unit (RCU).

5.1. Radio Base Unit (RBU)

5.1.1. The RBU shall be used in conjunction with the RCU. All the functionality of the RBU shall be available on the RCU.

5.1.2. Shall be supplied with a 15 pin D-type male connector at the rear to connect the RBU to the RCU.

5.1.3. Provision should be made for additional 5 (five) RCU ports should it be required (optional) and this will be specified in the schedule of requirements. (Annexure "A")

5.1.4. Shall be supplied with a standard screened multi-core cable (2.5m or 20m) terminated with 15 pin D-type female connector on both sides.

5.1.5. There shall be provision made for additional 4-wire E&M circuit at the rear to interface into the transmission network for an extended remote control.

5.1.6. There shall be provision made for an IP circuit at the rear to interface into the transmission network for an extended remote control.

5.1.7. Provision should be made for programming of the radio and must be accessible without opening the RBU.

5.1.8. Shall have a 9-pin D-type male connector at the rear for a data port for Tx and Rx purposes.

5.1.9. Shall include a 600 ohm balanced audio line output at the rear via a 2-pin (RJ9) connector for voice logging. Both Transmit (Tx) and Receive (Rx) audio shall be available.

5.1.10. Shall have a robust connector mounted at the rear for the handset.

5.1.11. There shall be provision made at the front side for the headset.

5.1.12. There shall be provision made at the rear panel for the gooseneck desktop microphone.

5.1.13. There shall be provision made at the rear for the Press-to-Talk (PTT) footswitch.

5.1.14. The metal casing shall be powder coated in Charcoal and must be mountable in a 19" (inch) rack. The rack mounting plates must be removable and be provided with rubber feet underneath.

5.1.15. Shall contain a forward facing speaker and shall contain a two way switch for enabling or muting the speaker, at the RBU when the RCU is used. This functionality shall not affect the volume operation of the RCU when it is connected.

5.1.16. The volume for the speaker shall be controlled via the handset and on the front panel.

5.1.17. Shall have a 2 way "Hi/ Low"- speaker switch in front.

- Position 1 for normal operation (high volume, depending on the handset and volume control setting).
- Position 2 for low volume operation. The low volume for position 2 must be soft but not completely muted.
- Provision must be made to mute the audio should it be mounted in a 19" cabinet when the RCU is connected.
- Provision must be made that when the RCU is not connected to the RBU must not be muted.

5.1.18. Shall operate normally while the standby battery is been charged. When the mains fail, the RBU shall operate from the battery without an interruption.

5.1.19. Shall have Light Emitting Diode (LED) indications. The indications will show Green for the charging condition and Red for charger failure.

5.1.20. Shall have a battery backup to supply a standby time of at least 4 hours.

5.1.21. The unit shall incorporate a load shedding circuitry that operates when the battery voltage reaches 11.0 Volt (V), for a 12 V system.

5.1.22. Shall be mounted with a 3-pin mains connector (Kettle Plug) for mains power on the rear panel.

5.1.23. Shall be supplied with a 1.5m black cord for 220 V mains AC. The cord must be supplied with a matching plug (refer to clause 5.1.21) and a standard 15 A, 3-pin mains plug.

5.1.24. Shall have a facility that will switch the battery supply circuit off for storage purposes.

5.1.25. Shall have a metal hook mounted on the front side of the unit, for the handset.

5.1.26. All outputs, inputs, switches and positions for the above must be clearly labelled.

5.2. Remote Control Unit (RCU)

5.2.1. The RCU shall have a rugged metal casing which is aesthetically pleasing to be placed on top of the desk. The casing shall be powder coated in Charcoal and shall have rubber feet underneath.

5.2.2. There shall be a 15 pin D-type male connector on the rear panel for connecting the RCU to the RBU.

5.2.3. Shall contain a forward facing speaker.

5.2.4. The volume for the speaker shall be controlled via the handset and on the front panel.

5.2.5. Shall have a 2 way "Hi/ Low"- speaker switch in front.

- Position 1 for normal operation (high volume, depending on the handset and volume control setting).
- Position 2 for low volume operation. The low volume for position 2 must be soft but not completely muted.

5.2.6. The power for the RCU shall be supplied from the RBU power supply unit. When the cable is connected (refer to clause 5.1.4), the RCU shall be powered up.

5.2.7. There shall be two LED's in front, the Green LED for "POWER ON", showing that the RCU is in a ready and functional state. The Red LED for "Tx", and will become active when the PTT is pressed.

5.2.8. Shall have a robust mill spec connector mounted at the front for the handset.

5.2.9. There shall be provision made at the front side for the headset.

5.2.10. There shall be provision made at the rear panel for the gooseneck desktop microphone.

5.2.11. There shall be provision made at the rear for the Press-to-Talk (PTT) footswitch.

5.2.12. The RCU shall have a metal hook mounted on the front side of the unit, for the handset.

5.2.13. All outputs, inputs, switches and positions for the above must be clearly labelled.

5.2.14. An 8 DIGIT (10 mm) Alpha Numeric display must be installed that displays the Train Number that is currently in Communication.

5.2.15. There must be a display of time on a 5 DIGIT(10 mm) LED display

5.3. Handset

5.3.1. Shall have a keypad, microphone, PTT and a volume control.

5.3.2. Shall have a 2m fully stretched curly cord and shall work up to 5m via an extension cable.

5.3.3. Shall be terminated with a robust mill spec connector.

5.3.4. Shall be able to connect directly to the RBU or the RCU.

5.4. Desktop Microphone

5.4.1. A rugged high quality flexible goose neck desktop microphone with a PTT shall be supplied.

5.4.2. Shall be supplied with a 2m fully stretched curly cord cable.

5.4.3. Shall be terminated with a 4-pin XLR connector.

5.4.4. Shall be able to connect directly to the RBU or the RCU.

5.5. Headset

5.5.1. A rugged single ear headset with a PTT and a flexible boom microphone shall be supplied.

5.5.2. Shall be supplied with a 3m curly core cable.

5.5.3. When the headset is plugged in, it shall default the external speaker to the low volume operation.

5.5.4. The headset shall be able to connect directly to the RBU and the RCU.

5.6. Headset Wireless (Optional)

5.6.1. Shall operate in a 5m radius and shall operate seamlessly without any interference where other wireless headsets have been deployed or in operation in the same radius.

5.7. PTT Footswitch

5.7.1. A rugged PTT footswitch shall be supplied.

5.7.2. Shall come with a 3m cable.

5.7.3. The footswitch shall be terminated with female connector.

5.7.4. Shall be a common PTT for the headset and the gooseneck desktop microphones.

5.7.5. Shall be able to connect directly to the RBU or the RCU.

5.8. E & M Signalling (4 wire)

5.8.1. Inputs "E" Lead: 12 to 50 V DC not exceeding 1 A (isolated contacts - Two wire & polarity free).

5.8.2. Output "M" Lead: Voltage free contact - 50 Vdc 1 A (isolated contacts - Two wire)

5.8.3. When the RBU is used as a Remote console there must be no RF transmission.

5.8.4. When the RBU is connected as a remote console there must be DATA Tx/Rx

5.9. Audio

5.9.1. The voice logging audio output level shall be 0 dBm, adjustable ± 3 dB, with a Radio Frequency (RF) signal modulation of 1.5 kHz, and a modulating signal of 1.0 kHz. The Tx and Rx audio levels shall be equal.

5.9.2. An audio mixer circuitry with level adjustments shall be provided to ensure an equal level from all the different microphones.

5.9.3. The audio lines between the RBU and RCU shall be 600 ohm balanced lines. The return loss shall be ≤ -25 dB.

5.9.4. The audio output levels between the RBU and RCU shall be -10 dBm adjustable ± 3 dB.

5.9.5. The audio frequency response 300 Hz to 3000 Hz shall be ± 0.5 dB with reference to 1.0 kHz.

5.9.6. The THD shall be ≤ 0.5 %.

5.9.7. The signal to hum and noise ratio shall be ≥ 40 dB.

5.9.8. The audio power to the loudspeaker shall not be less than 2.0 W at a THD of ≤ 2.0 %.

5.9.9. All the audio lines shall be protected against induced power surges.

6. Mains Power Supply

6.1. The mains supply shall be 220 V AC ± 10 %; 50 Hz ± 5 %.

6.2. Primary panel mount fuse protection is required and must be accessible without opening the RBU.

6.3. Mains surge suppression is required to protect the power supply unit.

6.4. An ON/OFF switch shall be provided at the rear of the RBU. The MAINS ON indication shall be provided on the front panel of the RBU.

7. DC Power Supply

7.1. To comply with Specification SPC 00140 dated 2006

7.2. Fuse protection is required at the output of the DC power supply and must be accessible without opening the RBU.

8. General

8.1. The speakers of the RBU and the RCU shall be quiet during an idle state and no induction noises shall be heard.

8.2. The RBU and the RCU shall fully mute when transmitting or receiving data.

8.3. The data port shall only be on the RBU.

8.4. All connectors on the RBU and the RCU shall be labelled.

8.5. All the connectors shall be of the latching/locking type.

8.6. Technical handbooks must be professionally printed in English and a copy must be submitted on compact disc (CD).

8.7. All the requirements for clause 10 of Appendix A concerning documentation must be complied with.

9. CONVENTIONAL OPEN CHANNEL UHF RADIO

9.1. Scope

9.1.1. This specification covers the RADIO design requirements of Transnet for the supply of open channel Base Station Radio transceivers and associated equipment for use at CTC and TCO offices.

9.1.2. This specification must be read in conjunction with BBD 8635 version 7 (or later) - Angle Modulation Radio Equipment.

9.1.3. The RBU must be fitted with a TFR Approved Radio.

9.2. Compliance

The design must comply with this specification.

9.3. Service Conditions

9.3.1. The equipment offered must be suitable for continuous operation under the following conditions:

Ambient temperature	:	–10° to 60° Celsius.
Relative humidity	:	As high as 95 %.

Altitude	:	0 to 2 000 metres.
Air pollution	:	Heavily saline laden industrial and locomotive fumes containing metallic dust.

9.3.2. Component parts, including wiring, must be manufactured and processed to ensure reliable operation under these conditions.

9.3.3. The equipment must be suitable for operation under the stated conditions without the use of blower fans, heaters or air-conditioners etc.

9.4. General Requirements

9.4.1. The radios must be ICASA type approved as well as TFR Rail Network (Rail Network Telecoms Quality Assurance) type approved.

9.4.2. It must be possible to update the parameters and files over the air. (Optional)

9.4.3. The software to program the radio must be compatible with Microsoft Windows XP or later.

9.4.4. The radios supplied must be programmed for open channel working within the 132 channels allocated to Transnet in the 400 - 470 MHz with no degradation to the radio performance or the need for components or module changes. The radio must be able to select any of the channels for simplex and duplex mode operation, at low power. It must be possible for Rail Network Telecom radio maintenance personnel to reprogram the radios if required to do so at a later stage.

9.4.4.1. The radio RF output power must be adjustable between 3 and 20 watts software selectable.

9.4.4.2. The radio must be able to be programmed to 3-watt transmitting power output on simplex and Duplex mode without affecting the radio performance.

9.4.5. Radios must have the following facilities:

9.4.5.1. Audio output power must be greater than 4 watts RMS into a 4 ohm loudspeaker. The minimum power must be 1 watt RMS with volume control set to minimum.

9.4.5.2. The radio must operate from a ±13.8 volt DC power supply.

9.4.5.3. The radio must be of the "boot mount" type whereby the radio / control head or radio / handset can be linked via cable and work up to 10 m apart.

9.4.6. Transmit failure must be indicated on the handset or displayed.

9.4.7. Signal strength must be indicated on the handset or display in trunk and conventional mode.

9.4.8. The Tx and Rx frequencies must be reversible, selectable per user defined plan (Tx high, Rx low or vice versa) in the 400 - 470 MHz band with no degradation to the radio performance or the need for components or module changes.

9.4.9. VSWR monitoring and faulty antenna indication must be displayed.

9.4.10. User programmable plan selection must be available.

9.4.11. VCO lock/unlock indication must be displayed.

9.4.12. Software version must be available for display.

9.4.13. The audible data should be muted in both Tx and Rx mode.

9.4.14. "Data Tx" should be indicated on the display.

9.4.15. The selection between modes should it be required must not be complicated.

9.4.16. The radio must support CTCSS.

9.4.17. Audible alarms to let operator know that the user can speak or failure to find a site must be available (short beep or long beep).

9.5. Interfaces / Connectors

There must be the following connectors or functionally equivalent connectors on the rear panel of the radio:

9.5.1. A RS-232C/V.24 15-pin high density D-type female connector, for connection to an external data device, and for programming of the radio.

9.6. Frequencies

9.6.1. The radio must operate in half duplex mode, with a duplex frequency spacing of 10 MHz, as follows:

9.6.2. The transmit frequency must be in the range 400 — 470 MHz.

9.6.3. The receive frequency must be in the range 400 — 470 MHz.

9.6.4. Channel spacing must be 12.5 kHz. Channel 1 must be defined as 465.0 MHz transmit and 455.0 MHz receive. The radio must be capable of operating on all channels in the specified range.

9.6.5. A combination of UHF channels in the above frequency band will be used.

10. Open Channel Operation

10.1. When the radio is configured for working OPEN CHANNEL, the following facilities must be activated:

10.1.1. Transmit time–out–timer: This timer must be activated each time the PTT button is pressed, and must disable the radio's transmitter if any continuous transmission lasts longer than a programmable period (typically 30 seconds to 240 seconds).

10.1.2. Receiver Scanning: The receiver shall scan a selectable set of channels (plans) if so specified in the schedule of requirement (a separate channel plan and scanning specification will be provided). If receiver scanning is specified, the radio must scan the assigned channels and select the best signal.

10.1.3. Busy channel lockout: (Carrier–detect transmit–inhibit.) The transmitter must be disabled if, within the last scan period, RF carrier greater than 6 dB above the usable sensitivity of the radio is detected for more than 0.5 seconds. If the channel is busy and the user presses the PTT button the radio must ignore the PTT button, and no RF must be transmitted.

10.2. RS-232 pins

Pin 1	Channel Busy Status - RS-232
Pin 2	Receive data
Pin 3	Transmit data
Pin 5	Ground
Pin 6	Radio activation status - RS-232
Pin 8	Network Type - RS-232

10.3. 16 Channels must be available in conventional mode.

10.4. The data transmission and reception should be unlimited in open channel mode (optional).

10.5. The selection of conventional channels must be barred in simplex/shunt mode and vice versa.

10.6. The radio must mute received data.

10.7. The radio must request an 8-digit numerical number in open channel mode, which will be used to identify the radio or train. After pressing the enter button the standard open channel mode must be entered. Selecting the plan and signal strengths display (optional).

- This will ensure positive identification of radio/trains and ensure messages are referenced to the correct radio/train.
- The radio must not operate without this number (001234 is a valid number).

10.8. It must be possible to check and change the 8-digit train number in open channel mode from the handset (optional).The standard open channel mode must be entered after the execution of this function.

10.9. The handset/display must indicate when the radio is busy transmitting or receiving data by displaying the characters "Sending" and "Receiving".

- The standard Tx and Rx LED's on the handset/display must also light up.

10.10. The radio must output an indication on the data port when the PTT is released. The radio must keep transmitting for a pre-defined period to allow the sending of data without switching the repeaters off.

Port output = $20#

10.11. An indication of channel busy or busy transmitting must be available on the data port.

- Raising a data port pin high or low if busy or get the info from the data port.

10.12. It must be possible to call the base in open channel mode by entering the base ID number on the handset and transmit the ID over the air (optional).

10.13. The handset must display the GPS coordinates on request (optional).

10.14. Calls Established by User

10.14.1. Normal Calls;

10.14.2. When the user needs to make a call he must check the channel busy indication to ensure that the channel is not busy. If the channel is free (radio in normal mode) he may operate the PTT button;

10.14.3. If selective calling is enabled the radio must automatically transmit its identification code when the PTT button is released (optional).

11. Handset

11.1. The handset must incorporate the microphone. (Loudspeaker optional).

11.2. There should be a volume control on the handset, with pre-set minimum volume as per clause 4.5.1.

11.3. PTT switch should be included in the handset.

11.4. The handset should be coupled to the radio via a 1 m curly cord (fully stretched 1.5 – 2 m).

11.5. The handset should be robust and should withstand the severe operating and climatic conditions as specified for the radio.

11.6. The handset microphone should incorporate an acceptable form of noise cancelling technology.

11.7. The keypad should have back lighting with automatic brightness control.

11.8. Indications via LED's on the handset/microphone/radio should include Transmit, Receive and or Service, RTO, Busy and Scan.

11.9. All modes of operation, functions and selections should be done from the handset keypad.

11.10. The display intensity should be such that it must be clearly visible during the day and night under various lighting conditions.

11.11. The handset/microphone should work up to 10 metres from the radio via an extension cable.

11.12. The handset should have a robust locking type connector fitted, which is easily removable from the radio or extension.

11.13. The handset can form part of the radio installation or be a user issue.

11.14. The display should be a high efficiency 8 character 5X5 dot matrix or similar type readable from 1.8 m with a viewing angle X axis 55 degree and Y axis 65 degree or 2 line LCD with scrollable options.

12. Connectors

The connectors required must be suitable for use with communications circuits and power feed circuits.

13. Electrical Characteristics

13.1. The contacts must withstand a breakdown voltage of 2 000 volts RMS.

13.2. The contacts must be silver plated, 1.5 mm in diameter and rated for 11 amperes continuously.

13.3. The contact resistance must be equal or smaller than 1.5 milli ohm.

14. Mechanical Characteristics

14.1. The insulator must be a neoprene elastomeric material.

14.2. The contacts must be silver plated and must be suitable for at least 500 mating/un-mating operations.

15. Climatic Conditions

15.1. The connector must operate from -40 °C to +85 °C.

15.2. The connector must seal as per NFC.20010-IP61.

15.3. The connector must be spray resistant as per NFC.20611.

16. Applicable and Relevant Documentation

The equipment must comply with the latest issue of the following specifications:

APPLICABLE

DOCUMENT NO.	DESCRIPTION	LOCATION
BBD8635	Technical Specification and Methods of Measurement for Angle Modulated Radio Equipment	Rail Network, Quality Assurance
ISO 9000	Quality Management Systems	Document Control Centre

RELEVANT

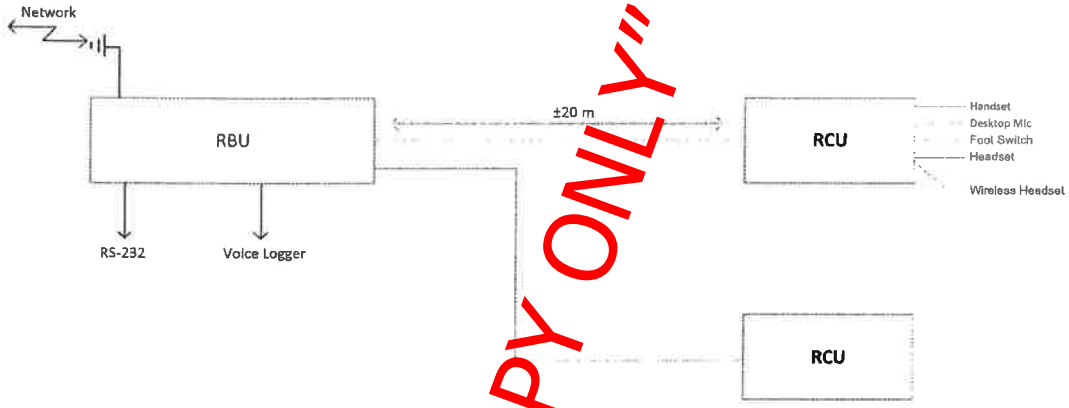
The following additional specifications are referred to:

DOCUMENT NO.	DESCRIPTION	LOCATION
ITU V.24	RS 232	External

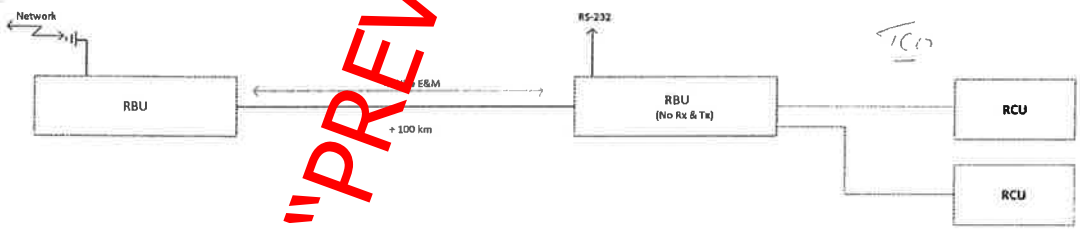
END OF DOCUMENT

Appendix A: Typical Configuration Diagrams

Configuration 1



Configuration 2



TRANSNET

CLAUSE BY CLAUSE COMPLIANCE SCHEDULE.

The compliance response is to contain ONLY the following statements, "Comply", or "Do not comply".

Where "Do not Comply" are applied, remarks as to the reason for the deviation from the requirement are required.

NB: Please sign the last page of Clause by Clause Compliance Schedule.

Description	Compliance response	Explanation/Deviation /Reason
1. Introduction		
2. Background Information		
3. Scope of Work		
4. Radio Compliance (Channel UHF)		
5. Radio Base Station Requirements		
5.1. Radio Base Unit		
5.1.1.		
5.1.2.		
5.1.3.		
5.1.4.		
5.1.5.		
5.1.6.		
5.1.7.		
5.1.8.		
5.1.9.		
5.1.10.		
5.1.11.		
5.1.12.		
5.1.13.		
5.1.14.		
5.1.15.		
5.1.16.		
5.1.17.		
5.1.18.		
5.1.19.		
5.1.20.		
5.1.21.		
5.1.22.		
5.1.23.		
5.1.24.		
5.1.25.		
5.1.26.		
5.2. Remote Control Unit		
5.2.1.		
5.2.2.		

5.2.3.		
5.2.4.		
5.2.5.		
5.2.6.		
5.2.7.		
5.2.8.		
5.2.9.		
5.2.10.		
5.2.11.		
5.2.12.		
5.2.13.		
5.2.14.		
5.2.15.		
5.3. Handset		
5.3.1.		
5.3.2.		
5.3.3.		
5.3.4.		
5.4. Desktop Microphone		
5.4.1.		
5.4.2.		
5.4.3.		
5.4.4.		
5.5. Headset		
5.6. Headset Wireless (Optional)		
5.7. PTT Footswitch		
5.7.1.		
5.7.2.		
5.7.3.		
5.7.4.		
5.7.5.		
5.8. E & M Signalling (4 wire)		
5.8.1.		
5.8.2.		
5.8.3.		
5.8.4.		
5.9. Audio		
5.9.1.		
5.9.2.		
5.9.3.		
5.9.4.		
5.9.5.		
5.9.6.		
5.9.7.		
5.9.8.		
5.9.9.		
6. Main Power Supply		

6.1.		
6.2.		
6.3.		
6.4.		
7. D c Power Supply		
7.1.		
7.2.		
8. General		
8.1.		
8.2.		
8.3.		
8.4.		
8.5.		
8.6.		
8.7.		
9. Conventional Open Channel UHF Radio		
9.1. Scope		
9.1.1.		
9.1.2.		
9.1.3.		
9.2. Compliance		
9.3. Service Conditions		
9.3.1.		
9.3.2.		
9.3.3.		
9.4. General Requirements		
9.4.1.		
9.4.2.		
9.4.3.		
9.4.4.		
9.4.4.1.		
9.4.4.2.		
9.4.5. Radios must have the Following facilities:		
9.4.5.1.		
9.4.5.2.		
9.4.5.3.		
9.4.6.		
9.4.7.		
9.4.8.		
9.4.9.		
9.4.10.		
9.4.11.		
9.4.12.		
9.4.13.		
9.4.14.		
9.4.15.		

14. Mechanical Characteristics		
14.1.		
14.2.		
15. Climatic Conditions		
15.1.		
15.2.		
15.3.		
16. Applicable and Relevant Documentation		
Appendix A: Typical Configuration Diagrams		
Configuration 1		
Configuration 2		

Date

Signature

TRANSNET

ANNEXURE: A

Schedule of Quantity

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE
1	**Radio Base Housing Unit (RBHU)** Radio, Battery backup, Speaker, Metal case, Various I/O's.	7		
2	**Remote Control Unit (RCU)** Speaker, Metal case, Various I/O's.	7		
3	**Handset** 2m – fully stretched curly cord 5m - Extension Cable for the handset **(Optional)**	7		
4	**Desktop Mic** 2m – fully stretched curly cord	7		
5	**Footswitch PTT** 3m - black cable	7		
6	**Headset** Wireless or 3m - black cable	7		
7	**Link Cable** 2.5m, 6 pair individually screened cable	7		
8	20m, 6 pair individually screened cable **(Optional)**	7		
9	**Training at Ground Level, Ri[illegible] Street**			
Total Price excluding Vat:				