

**TRANSNET SOC LTD**

[Registration No. 1990/000900/30]

REQUEST FOR INFORMATION [RFI]

are sought to establish those parties interested in continued participation in this procurement process

THEREAFTER

THROUGH A SEPARATE "REQUEST FOR PROPOSAL" [RFP] PROCESS

**TO APPOINT NATIONAL SERVICE PROVIDERS TO UNDERTAKE THE PROVISION / SUPPLY OF
DIGITAL RADIO COMMUNICATION SYSTEM NATIONAL.**

RFI NUMBER: HOAC-HO-19557
ISSUE DATE: 21 OCTOBER 2015
CLOSING DATE: 17 NOVEMBER 2015
CLOSING TIME: 10H00 am Central Africa Time

"PREVIEW COPY ONLY"

COMPULSORY RFI BRIEFING SESSION:

DATE: 28 October 2015, 10H00 am



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**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 1: NOTICE TO RESPONDENTS

1 INFORMATION REQUEST

Information is requested from interested persons, companies, close corporations or enterprises [hereinafter referred to as the **Respondent(s)**] to supply the aforementioned information to Transnet.

2 EXPRESSION OF INTEREST [EOI]

Respondents should note that Transnet reserves the right to approach only those entities which have completed and submitted an EOI to Transnet through this procurement process with any subsequent Request for Proposal [RFP] if and when this is issued by Transnet during tender process Respondents who have submitted this RFI/EOI will be notified in due course of the availability of such Respondent documents for collection at a non-refundable charge.

DESCRIPTION	Digital Radio Communication System [the Goods/Services]
BID FEE AND BANKING DETAILS	This RFI is issued free of charge.
INSPECT / COLLECT DOCUMENTS FROM	The Office of the Secretariat, 21 Wellington Street, Parktown
ISSUE DATE AND COLLECTION DATE DEADLINE	Between 09:00 and 15:00 from 21 th October 2015 until 27 October 2015.
COMPULSORY BRIEFING SESSION	Yes Refer to paragraph 3 for details.
CLOSING DATE	10:00 am on Tuesday 17 November 2015 Bidders must ensure that bids are delivered timeously to the correct address. As a general rule, if a bid is late or delivered to the incorrect address, it will not be accepted for consideration.

Any additional information or clarification will be faxed or emailed to all Respondents, if necessary.

3 FORMAL BRIEFING

A formal briefing session will be held but should Respondents have specific queries they should email these to the Transnet employee(s) indicated in paragraph 0 [Communication] below:

A compulsory RFI meeting and/or briefing will be conducted at 15 Girton Road, Parktown on the **28 October 2015**, at **10H00** for a period of ± two (2) hours. [Respondents to provide own transportation and accommodation]. The briefing session will start punctually and information will not be repeated for the benefit of Respondents arriving late.

Respondent's Signature

Date and Company Stamp

- 3.1 A Certificate of Attendance set out in Section 4 hereto must be completed and submitted with your RFI response as proof of attendance is required.
- 3.2 Respondents failing to attend the compulsory site meeting and/or briefing will not be considered as part of the RFI process.

4 RESPONSE SUBMISSION

Proposals must be submitted in a sealed envelope addressed as follows:

The Secretariat, Transnet Acquisition Council
RFI No: HOAC-HO-19557
Description: SUPPLY/PROVISION OF DIGITAL RADIO COMMUNICATION SYSTEM
Closing date and time: **17 NOVEMBER 2015**
Closing address: 21 Wellington Street, Inyanda House 1, Parktown

All envelopes must reflect the return address of the Respondent on the reverse side.

5 DELIVERY INSTRUCTIONS FOR RFI

Delivery by hand

If delivered by hand, the envelope must be deposited in the Transnet tender box which is located at and must be addressed as follows:

THE SECRETARIAT
TRANSNET FREIGHT RAIL ACQUISITION COUNCIL
GROUND FLOOR
TENDER ACQUISITION COUNCIL
INYANDA HOUSE 1
21 WELLINGTON STREET
PARKTOWN

- 5.1 The measurements of the "tender slot" are 400mm wide x 100mm high, and Respondents must please ensure that response documents or files are no larger than the above dimensions. Responses which are too bulky [i.e. more than 100mm thick] must be split into two or more files, and placed in separate envelopes, each such envelope to be addressed as required in paragraph 4 above.

- 5.2 It should also be noted that the above tender box is located at the street level outside the main entrance in Commissioner Street and is accessible to the public 24 hours a day, 7 days a week.

Dispatch by courier

If dispatched by courier, the envelope must be addressed as follows and delivered to the Office of The Secretariat, Transnet Acquisition Council and a signature obtained from that Office:

THE SECRETARIAT
TRANSNET FREIGHT RAIL ACQUISITION COUNCIL
GROUND FLOOR
TENDER ACQUISITION COUNCIL
INYANDA HOUSE 1
21 WELLINGTON STREET
PARKTOWN

If responses are not delivered as stipulated herein, such responses will not be considered.

No email or faxed responses will be considered, unless otherwise stated herein.

The responses to this RFI/EOI will be opened as soon as possible after the closing date and time.

Transnet shall not, at the opening of responses, disclose to any other company any confidential details pertaining to the Proposals / information received, i.e. pricing, delivery, etc. The names and locations of the Respondents will be divulged to other Respondents upon request.

Envelopes must not contain documents relating to any RFI other than that shown on the envelope.

6 BROAD-BASED BLACK ECONOMIC EMPOWERMENT AND SOCIO-ECONOMIC OBLIGATIONS

- 6.1 As described in more detail in the attached BBBEE Claim Form and as prescribed in terms of the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations, Respondents are to note that during the subsequent RFP stage, Transnet will allow a "preference" to companies who provide a valid B-BBEE Verification Certificate.

Since B-BBEE will form part of this RFI process, Respondents are required to complete Section 7 [the B-BBEE Preference Point Claim Form] and submit it together with proof of their B-BBEE Status as stipulated in the Claim Form in order to obtain preference points for their B-BBEE status.

The value of this bid is estimated to be below R1 000 000 (all applicable taxes included) OR exceed R1 000 000 (all applicable taxes included); and therefore the **90/10** system shall be applicable.

Note: Failure to submit a valid and original B-BBEE certificate or a certified copy thereof at the Closing Date of this RFP will result in a score of zero being allocated for B-BBEE.

Note: Should a JV be envisaged the principal Respondent is required to submit the required responses as indicated above.

The commitments made by the successful Respondents will be incorporated as a term of the contract and monitored for compliance.

The value of the forthcoming bid is estimated to be exceed R1 000 000 (all applicable taxes included); and therefore the 90/10 system shall be applicable.

For purposes of this RFI Respondents are required to submit proof of their B-BBEE Status in the form of a valid and original B-BBEE certificate or a certified copy thereof.

6.2 B-BBEE Joint Ventures or Consortiums

Bidders may choose during the subsequent RFP process to enter into a Joint Venture with B-BBEE companies. RFP Bidders will also be required to submit a signed JV agreement between the parties clearly stating the percentage [%] split of business and the associated responsibilities of each party. Alternatively, if such a JV or consortium agreement is unavailable, the partners must submit confirmation in writing of their intention to enter into a JV or consortium agreement should they be awarded business by Transnet through the RFP process. This written confirmation must clearly indicate the percentage [%] split of business and the responsibilities of each party. In such cases, award of

business will only take place once a signed copy of a JV or consortium agreement is submitted to Transnet.

Please indicate below whether your entity has an existing JV, and if so, provide details, including details of the percentage split of business, or whether your entity intends to create a JV relationship for RFP purposes:

6.3 Subcontracting

Transnet fully endorses Government's transformation and empowerment objectives and when contemplating subcontracting during the subsequent RFP process, Respondents are requested to give preference to companies which are Black Owned, Black women Owned, Black Youth Owned, owned by Black People with Disabilities, EMEs and QSEs including any companies designated as B-BBEE Facilitators¹.

If contemplating subcontracting, please note that a Respondent will not be awarded points for B-BBEE if it is indicated in its RFP Proposal that such Respondent intends subcontracting more than 25% [twenty-five percent] of the value of the contract to an entity/entities that do not qualify for at least the same points that the Respondent qualifies for, unless the intended subcontractor is an EME with the capability to execute the contract.

A person awarded a contract may not subcontract more than 25% [twenty-five percent] 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 subcontracted to an EME that has the capability and ability to execute the subcontract.

Please indicate below whether your entity has an existing subcontractor(s), and if so, provide details, including details of the percentage of the contract that will be sub-contracted as well as the B-BBEE status of the sub-contractor/s, or whether your entity intends to create a subcontracting relationship for RFP purposes:

6.4 B-BBEE Improvement Plan

6.5 Transnet encourages its Suppliers to constantly strive to improve their B-BBEE rating. As such, Transnet requests that Respondents to the subsequent RFP submit a B-BBEE improvement plan.

¹ The Minister of Trade and Industry has the power to designate certain Organs of State or Public Entities as B-BBEE Facilitators. As such they will be treated as having rights of ownership held 100% by Black People, 40% by Black Women and 20% by Black designated groups.

Respondents will be requested to indicate the extent to which they will maintain or improve their B-BBEE status over the contract period.

For purposes of this RFI, Respondents are requested to indicate the extent to which they would be prepared to commit to sustaining or improving their B-BBEE status over a contract period by completion of appended hereto.

6.6 Supplier Development Initiatives

Historically in South Africa there has been a lack of investment in infrastructure, skills and capability development and inequality in the income distribution and wealth of a significant portion of the population. There have been a number of Government initiatives developed to address these challenges. In particular, the New Growth Path [NGP] and New Development Plan [NDP] aligns and builds on previous policies to ensure the achievement of Government's development objectives for South Africa.

Transnet fully endorses and supports Government's economic policies through its facilitation of Supplier Development [SD] initiatives. Hence Respondents will be required to submit their commitments with regard to Supplier Development Initiatives over the duration of any subsequent contract.

As an indication of the significance which Transnet places on economic development, in the forthcoming RFP, it is envisaged that Supplier Development will be incorporated into the RFP in the following manner:

Note: Should a JV be envisaged the principal Respondent will be required to submit the required responses as indicated above.

The commitments made by the successful Respondents to the RFP will be incorporated as a term of the contract and monitored for compliance.

Respondents are requested to provide any comments below regarding the proposed incorporation of Supplier Development as indicated above:

7 COMMUNICATION

- 7.1 For specific queries relating to this RFP, an RFP Clarification Request Form should be submitted to Julias.Moeti@transnet.net before **12:00 on 11 November 2015**, substantially in the form set out in Section 12 hereto. In the interest of fairness and transparency Transnet's response to such a query will then be made available to the other Respondents who have collected RFP documents. For this purpose Transnet will communicate with Respondents using the contact details provided to the Secretariat on issue of the bid documentation to the Respondent. Kindly ensure that you provide the Secretariat with the **correct** contact details, as Transnet will not accept responsibility for being unable to contact a bidder who provided incorrect contact details.

8 CONFIDENTIALITY

- 8.1 All information related to this RFP is to be treated with strict confidence. In this regard Respondents 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 Goods, which is either directly or indirectly related to Transnet's business, written approval to divulge such information must be obtained from Transnet.

9 INSTRUCTIONS FOR COMPLETION OF RFI

- 9.1 RFI proposals must be submitted in duplicate hard copies [1 original and 1 copy] and must be bound.
- 9.2 All returnable documents listed in the expression of interest [section 4] in this RFI must be returned with your submission.
- 9.3 The person or persons signing the submission must be legally authorised by the respondent to do so.

10 STATUS OF THIS RFI AND SUBSEQUENT PROCESS

- 10.1 It is envisaged that Supplier/Service Provider will be appointed, through a separate RFP process, to **supply or provide Digital Radio Communication System requirements for the period of six years on an when required basis, commencing in 2016 until approximately 2022.**
- 10.2 It is envisaged that Respondents to this RFI will be subjected to pre-qualification criteria and will be shortlisted in order to proceed to a second stage of evaluation.
- 10.3 This RFI is not an offer to purchase and Transnet is under no obligation to accept any proposals in this process and/or the subsequent RFP which may be issued hereafter.
- 10.4 **As this is a Request for Information only, no business will be awarded through this process.**

11 DISCLAIMERS

- 11.1 Respondents are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this RFI and/or its receipt of submissions in response to it. In particular, please note that Transnet reserves the right and at its sole and full discretion to:
- utilise any information provided to it in response to this RFI to draft the scope of requirements for inclusion in an RFP;
 - take no further action whatsoever, if it so decides
 - withdraw from this process and the provisions of this project at any time;
 - select the RFI and RFP participants based on Transnet's criteria;
 - change the dates of adjudication and submission;
 - not invite RFI respondents for further participation in the RFP process;
 - not bind itself to accept any or all of the RFIs; or
 - increase or decrease the quantities/scope as indicated in the RFI.

- 11.2 Transnet's decisions will be final and no correspondence will be entered into after the selection process. You will be formally notified of your result.
- 11.3 An RFI will only be deemed accepted once written notice is given by Transnet to the successful Respondent(s) and after any amendments have been documented and agreed to.
- 11.4 Kindly note that Transnet will not reimburse any Respondent for any preparatory costs or other work performed in connection with this submission.

**Transnet urges its clients, suppliers and the general public
to report any fraud or corruption on the part of Transnet employees to
TIP-OFFS ANONYMOUS: 0800 003 056**

"PREVIEW COPY ONLY"

**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 2: RFI SCOPE OF REQUIREMENTS

1 INTRODUCTION

The analogue radio technologies that are currently being used are mature and very reliable. Some of the equipment has been recently upgraded to ease the maintenance. The majority of the network is in need of renewal. Since the technologies used are still analogue there is need to consider technologies that are digital in nature. The majority of the digital networks are still new and have not yet reached maturity. Thus a careful search must be done of a digital technology that would fit the current and future needs.

2 BACKGROUND

- (a) Transnet Freight Rail (TFR) operates within the Republic of South Africa and neighbouring states to transport freight, including to and from seaside ports. In the execution of this function Transnet has a radio network.
- (b) The telecommunications regulator ICASA (Independent Communications Authority of South Africa) has issued Transnet Individual Electronic Communication Network Service (I-ECNS) and Individual Electronic Communication Services (I-ECS) licences, and Radio Frequency (RF) spectrum licences. Transnet has radio sites that ensure mission critical communication between different entities (Train with Train Control).
- (c) There are two types of voice based communication in use: namely Conventional and Trunked radio network. The conventional radio network is the largest network consisting of close to 500 high sites (base stations). This is an open channel network which means individuals in the same section get to listen to all the calls in that section. It is used with Radio Train Order (RTO) or Radio Track Warrant (RTW) train authorising systems.
- (d) The other network that Transnet uses is the Trunked radio network based on the MPT1327 standard. This system is used in high congestion areas when users have to share the spectrum. The network currently has over 100 sites in KwaZulu Natal, Eastern Cape, Western Cape, Gauteng and the Natal corridor from Johannesburg to Durban. All these sites make use of the 450-470 MHz spectrum for their coverage needs. The Conventional network also uses UHF channels for linking sites. The UHF channels are also used for shunting operations as well as Tele-control of electrical substations.

Subsequent to the RFI, Transnet will issue a closed RFP to the initial RFI' successfully evaluated responded, to supply or provide Digital Radio Communication System for a period of six years on and as and when required basis.

Please refer to BBG5644, and Appendix B.

3 KEY OBJECTIVES OF THIS RFI PROCESS

The following list of deliverables captures the minimum intent and objectives of the RFI process. Transnet requests all Respondents to assist with the achievement of these objectives by submitting the requested information as indicated below. This will be finalised in the RFP documents following the RFI process:

Your submission should include in detail your proposed methodology, and preliminary program of expected activities. From the RFI and response and/or submissions thereto, Transnet will compile an RFP document which will include an indicative schedule of activities and timelines.

4 GENERAL RESPONDENT OBLIGATIONS

- 4.1 The Respondent(s) shall be fully responsible to Transnet for the acts and omissions of persons directly or indirectly employed by them.
- 4.2 The Respondent (s) must comply with the requirements stated in this RFI.

5 CONFIDENTIALITY AND COMPLIANCE

This RFI and information contained herein or provided for purposes thereof, remain the property of Transnet and may not be reproduced, sold or otherwise disposed of. All recipients of this document (whether a RFI is submitted or not) shall treat the details of this document as strictly private and confidential.

Information disclosed in this RFI is given in good faith and only for the purposes of providing sufficient information to the Respondent to enable submission of a well-informed and realistic RFI.

6 UNDERTAKINGS BY RESPONDENT

It will be accepted that the Respondent, on submitting the RFI response, has read, understood and accepted all the terms and conditions of the document. The submission of an RFI by any Respondent shall presume complete acceptance of the terms and conditions of the document. All qualifications and or exceptions should be noted in the RFI Response document.

7 COSTS TO RESPOND TO THE RFI

All Respondents wishing to submit a RFI response must be in possession of this document, the RFI. Transnet will not be responsible for or pay any expense or losses which may be incurred by any Respondent in the preparation and submission of the RFI and the costs of the RFI at all stages of the RFI process. Costs, if any, will be for each Respondent's own account.

Transnet reserves the right to invite certain Respondents to present or otherwise demonstrate their proposed solution as per their RFI, at the Respondent's own cost.

8 AUTHORITY OF SIGNATORY

- 8.1 If the RFI Respondent is a company, a certified copy of the resolution of the Board of Directors (i.e. personally signed by the Chairman or Secretary of the Board) authorising the person who signs this RFI to do so and any other documents and correspondence in connection with this RFI and/or agreement on behalf of the company, must be submitted with their RFI.
- 8.2 If the RFI Respondent is a partnership, a certified copy of the resolution of the partners (personally signed by all the partners) authorising the person who signs this RFI to do so and any other documents and correspondence in connection with this RFI and/or agreement on behalf of the partnership, must be submitted with this RFI.
- 8.3 If the RFI Respondent constitutes a "one-man business", certified proof must be submitted that the person signing this RFI and any other documents and correspondence in connection with this RFI and/or agreement is the sole owner of the one-man business.

Failure to comply with this clause may result in rejection of the RFI response.

9 OFFERING OF COMMISSION OR GRATUITY.

If a Respondent, or any person employed by him, is found to have either directly or indirectly offered, promised or given to any person in the employ of Transnet, any commission, gratuity, gift or other consideration, Transnet shall have the right and without prejudice to any other legal remedy which it may have in regard to any loss or additional cost or expenses, to disqualify the RFI Respondent from further participation in this process and any other subsequent processes in this regard. The RFI Respondent will be responsible for all and any loss that Transnet may suffer as a result thereof. In addition, Transnet reserves the right to exclude such a Respondent from future business with Transnet.

10 UNDERTAKING BY TRANSNET

In responding to this RFI, Transnet encourages all RFI Respondents to put their best effort into the construction and development of the proposal.

The RFI process will include due governance and the results of the adjudication process will be available to Respondents who are not successful under certain conditions. This will be allowed at the sole discretion of Transnet.

11 RFI SELECTION CRITERIA

The following selection criteria will be used as a guide for adjudicating Respondents. It should be noted that the weighting represents a "balanced scorecard" for selection.

Specific detailed items that are important for the Respondent to consider in the response preparation process include:

- Quality of presentation, reply to the RFI and attention to required detail during the selection process.
- Compliance with the terms and conditions of the RFI documents.
- Satisfaction of the project objectives.
- Compliance to specification, **BBG5645, BBG5644 AND CLAUSE BY CLAUSE QUESTIONER Appendix B.**

RETURNABLE MANDATORY DOCUMENTS AS FOLLOW;

BBG5644; DIGITAL RADIO NETWORK TECHNICAL REQUIREMENTS

ANNEXURE A; CONVENTIONAL RADIO NETWORK

BBG5645; TELECOMMUNICATION REQUIREMENT FOR TRANSNET RAILBOUND TECHNOLOGIES

APPNEDIX B; COMPLIANCE TO BBG5644

FAILURE TO SUBMIT MANDATORY RETURNABLE DOCUMENTS MAY RESULTED DISQUALIFICATION OF BID.

**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 3 : TRANSNET'S RFI INFORMATION

1 STATISTICS []

Please note that the aforementioned information is provided merely as an indication of the size and nature of Transnet's current requirements and consequently does not necessarily reflect the extent of the Goods/Services to be supplied/provided by appointed Supplier(s)/Service Provider(s) through an award of business at any future date.

2 REQUIREMENTS FOR RFI

Respondents expressing an interest to participate in this RFI/EOI stage must qualify in terms of the minimum predetermined requirements and have the capability to supply / provide the full range of Products/ Services, as set out below:

Respondents are required to indicate their existing technical capability by ticking the applicable box in the table below:

PLEASE REFERS TO BBG5645, BBG5644 AND CLAUSE BY CLAUSE QUESTIONER

NB: Evaluation of the various stages will normally take place in a sequential manner. However, in order to expedite the process, Transnet reserves the right to conduct the different stages of the evaluation process in parallel. In such instances the evaluation of bidders at any given stage must therefore not be interpreted to mean that bidders have necessarily passed any previous stage(s).

Note: Transnet will reserve the right to conduct post-tender negotiations with the preferred Respondent(s) during RFP stage.

2.1 FINANCIAL REQUIREMENTS FOR FUTURE AWARD OF BUSINESS

In the event of a RFP following this RFI process, it will be a condition precedent prior to the award of business in terms of that RFP that the successful Respondent demonstrates its ability to fund Transnet's requirements.

**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 4 : EXPRESSION OF INTEREST

I/We _____

[name of company, close corporation or partnership]

of [full address] _____

_____ carrying on business under style or title of [trading as]

represented by _____

in my capacity as _____

being duly authorised, hereby lodge an **Expression of Interest** in the supply / provision of Radio Communication System, over a period of six years, as follows:

ADDRESS FOR NOTICES

Respondent to indicate its *domicilium citandi et executandi* hereunder:

Name of entity: _____

Facsimile: _____

Address: _____

NAME(S) AND ADDRESS / ADDRESSES OF DIRECTOR(S) OR MEMBER(S)

The Respondent must disclose hereunder the full name(s) and address(s) of the director(s) or members of the company or close corporation [C.C.] on whose behalf the RFI is submitted.

(i) Registration number of company / C.C.

(ii) Registered name of company / C.C.

(iii) Full name(s) of director/member(s): Address/Addresses: ID Number/s:

.....

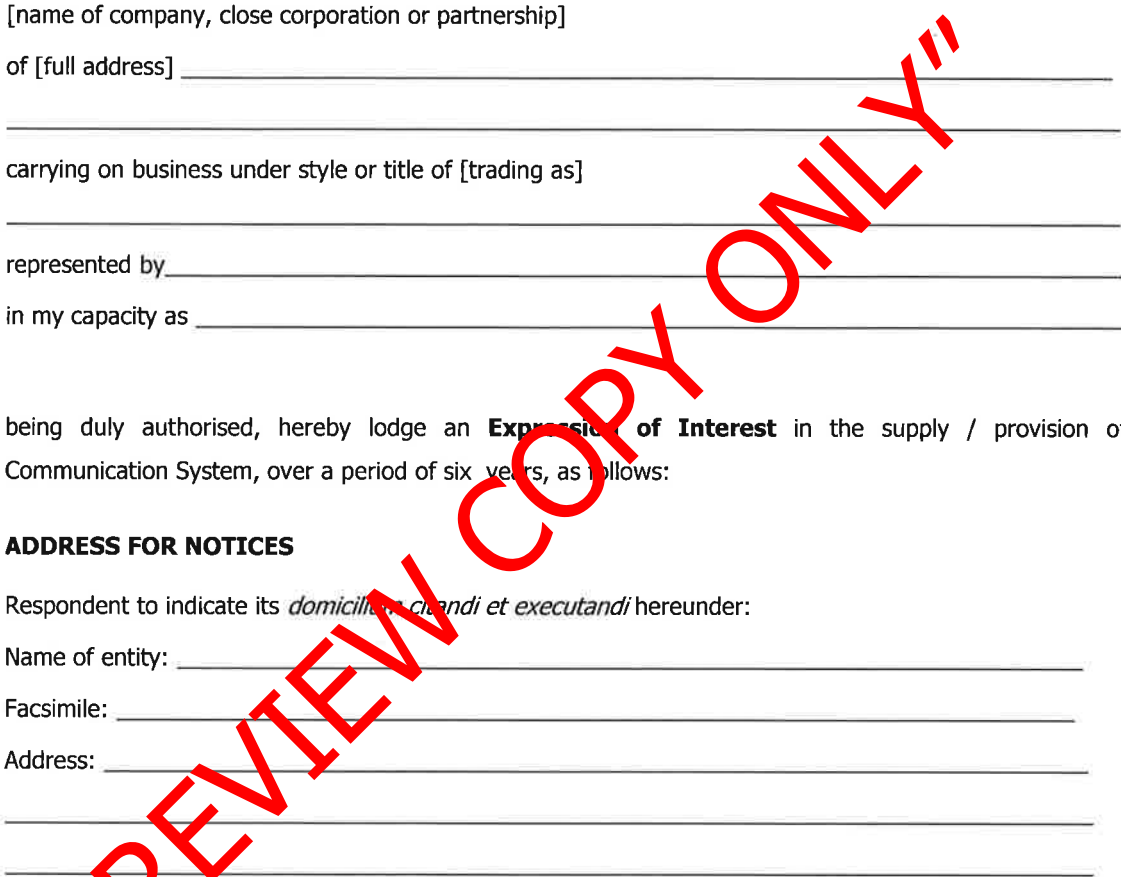
.....

.....

.....

Respondent's Signature

Date and Company Stamp



CONFIDENTIALITY

All information related to a subsequent contract, both during and after completion, is to be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Services, which is either directly or indirectly related to Transnet’s business, written approval to divulge such information must be obtained from Transnet.

RETURNABLE DOCUMENTS

- a) Respondents must submit with their responses to this RFI, **as a minimum requirement**, all the returnable documents indicated below with a [✓]. All Sections must be signed and dated by the Respondent.
- b) In addition to the requirements of section (a) above, Respondents are further requested to submit with their responses the following **Additional Returnable Documents** as detailed below.

Additional Returnable Documents	Submitted [✓]
SECTION 1 : Notice to Respondents	
- Valid B-BBEE Verification Certificate [RSA Large Enterprises and QSEs]	
- Valid B-BBEE certificate from auditor, accounting officer or SANAS accredited Verification Agency [RSA EMEs]	
SECTION 3 : Transnet’s Statistical Information and RFP Particulars	
SECTION 5 : Vendor Application Form	
- Original cancelled cheque or bank verification of banking details	
- Certified copies of IDs of shareholder/directors/members [as applicable]	
- Certified copy of Certificate of Incorporation [CM29/CM9 name change]	
- Certified copy of share certificates [CK1/CK2 if C.C.]	
- Entity’s letterhead	
- Original valid Tax Clearance Certificate [RSA entities only]. If a JV or subcontractor is involved, submit a Tax Clearance Certificate for each entity	
- Certified copy of VAT Registration Certificate [RSA entities only]	
- Certified copy of valid Company Registration Certificate [if applicable]	
ANNEXURE D : B-BBEE Improvement Plan	

PRELIMINARY COPY ONLY

By signing these RFI documents, the Respondent is deemed to acknowledge that he/she has made himself/herself thoroughly familiar with all the conditions governing this RFI including those contained in any printed form stated to form part hereof and Transnet SOC Ltd will recognise no claim for relief based on an allegation that the Respondent overlooked any such condition.

SIGNED at _____ on this _____ day of _____ 2015.

SIGNATURE OF WITNESSES

ADDRESS OF WITNESSES

1 _____
Name _____

2 _____
Name _____

SIGNATURE OF RESPONDENT'S AUTHORIZED REPRESENTATIVE:

NAME: _____

DESIGNATION: _____

Respondent's contact details:

Name.....
Designation.....
Address.....
Telephone.....
Cell Phone.....
Facsimile.....
Email.....
Website.....

Respondent's Signature

Date and Company Stamp



**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 5 : B-BBEE PREFERENCE POINTS CLAIM FORM

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

1. INTRODUCTION

- 1.1 A total of 10 preference points shall be awarded for B-BBEE Status Level of Contribution.
- 1.2 Failure on the part of a Bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System [SANAS] or a Registered Auditor approved by the Independent Regulatory Board of Auditors [IRBA] or an Accounting Officer as contemplated in the Close Corporation Act [CCA] together with the bid will be interpreted to mean that preference points for B-BBEE Status Level of Contribution are not claimed.
- 1.3 Transnet 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 Transnet.

2. GENERAL DEFINITIONS

- 2.1 **"all applicable taxes"** include value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- 2.2 **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- 2.3 **"B-BBEE status 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;
- 2.4 **"Bid"** means a written offer in a prescribed or stipulated form in response to an invitation by Transnet for the provision of goods, works or services;
- 2.5 **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 [Act No. 53 of 2003];
- 2.6 **"comparative price"** means the price after the factors of a non-firm price and all unconditional discounts that can be utilised have been taken into consideration;
- 2.7 **"consortium or joint venture"** means an association of persons for the purpose of combining their expertise, property, capital, efforts, skills and knowledge in an activity for the execution of a contract;
- 2.8 **"contract"** means the agreement that results from the acceptance of a bid by Transnet;
- 2.9 **"EME"** means any enterprise with an annual total revenue of R5 [five] million or less as per the

2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of R10 [ten] million or less as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928;

- 2.10 **"firm price"** means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs and excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract;
- 2.11 **"functionality"** means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder;
- 2.12 **"non-firm prices"** means all prices other than "firm" prices;
- 2.13 **"person"** includes reference to a juristic person;
- 2.14 **"QSE"** means any enterprise with an annual total revenue between R5 [five] million and R35 [thirty five] million as per the 2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of between R10 [ten] million and R50 [fifty] million as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928
- 2.15 **"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;
- 2.16 **"subcontract"** means the primary contractor's assigning or leasing or 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;
- 2.17 **"total revenue"** bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Empowerment Act and promulgated in the Government Gazette on 9 February 2007;
- 2.18 **"trust"** means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person; and
- 2.19 **"trustee"** means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM

- 3.1 The Bidder obtaining the highest number of total points for the evaluation criteria as enumerated in Section 2 of the RFP will be awarded the contract, unless objective criteria justifies the award to another bidder.
- 3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.
- 3.3 Points scored will be rounded off to 2 [two] decimal places.
- 3.4 In the event of equal points scored, the Bid will be awarded to the Bidder scoring the highest

number of preference points for B-BBEE.

- 3.5 However, when functionality is part of the evaluation process and two or more Bids have scored equal points including equal preference points for B-BBEE, the successful Bid will be the one scoring the highest score for functionality.
- 3.6 Should two or more Bids be equal in all respect, the award shall be decided by the drawing of lots.

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

- 4.1 In terms of the Preferential Procurement Regulations, 2011, preference points shall be awarded to a Bidder for attaining the B-BBEE status level of contribution in accordance with the table below:
- 4.2

B-BBEE Status Level of Contributor	Number of Points [Maximum 10]
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

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- 4.3 Bidders who qualify as EMEs in terms of the 2007 version of the Codes of Good Practice must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EME's with B-BBEE Status Level Certificates.
- 4.4 Bidders who qualify as EMEs in terms of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928 are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R10 million or less and the entity's Level of Black ownership.
- 4.5 In terms of the 2007 version of the Codes of Good Practice, Bidders other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 4.6 The Department of Trade and Industry recently revised the Codes of Good Practice on 11 October 2013 [Government Gazette No. 36928]. The Revised Codes will replace the Black Economic Empowerment Codes of Good Practice issued on 9 February 2007. The Revised Codes provide for a transitional period ending 30 April 2015. During the transitional period, companies may elect to be measured in terms of the Revised Codes or the 2007 version of the Codes. Companies which are governed by Sector-specific Codes will be measured in terms of those Sector Codes.

- 4.7 As such, Transnet will accept B-BBEE certificates issued based on the Revised Codes. Transnet will also continue to accept B-BBEE certificates issued in terms of the 2007 version of the Codes provided it was issued before 1 May 2015. Thereafter, Transnet will only accept B-BBEE certificates issued based on the Revised Codes.
- 4.8 In terms of the Revised Codes of Good Practice, Bidders who qualify as QSEs must comply with all the elements of B-BBEE for the purposes of measurement. QSEs that are at least 51% or 100% Black owned are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R50 million or less and the entity's Level of Black ownership. Large enterprises must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 4.9 A trust, consortium or joint venture will qualify for points for its B-BBEE status level as a legal entity, provided that the entity submits its B-BBEE status level certificate.
- 4.10 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.
- 4.11 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialised scorecard contained in the B-BBEE Codes of Good Practice.
- 4.12 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 subcontracting more than 25% [twenty-five per cent] of the value of the contract to any other enterprise that does not qualify for at least the same number of points that such a Bidder qualifies for, unless the intended subcontractor is an EME that has the capability and ability to execute the subcontract.
- 4.13 A person awarded a contract may not subcontract more than 25% [twenty-five per cent] 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 subcontracted to an EME that has the capability and ability to execute the subcontract.
- 4.14 Bidders are to note that in terms of paragraph 2.6 of Statement 000 of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928, any representation made by an entity about its B-BBEE compliance must be supported by suitable evidence or documentation. As such, Transnet reserves the right to request such evidence or documentation from Bidders in order to verify any B-BBEE recognition claimed.

5. B-BBEE STATUS AND SUBCONTRACTING

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

B-BBEE Status Level of Contributor _____ = _____ [maximum of 10 points]

Note: Points claimed in respect of this paragraph 5.1 must be in accordance with the table reflected in paragraph 4.1 above and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or a sworn affidavit in the case of an EME or QSE.

5.2 Subcontracting:

Will any portion of the contract be subcontracted? YES/NO [delete which is not applicable]

If YES, indicate:

- (i) What percentage of the contract will be subcontracted?%
- (ii) The name of the subcontractor
- (iii) The B-BBEE status level of the subcontractor
- (iv) Is the subcontractor an EME? YES/NO

5.3 Declaration with regard to Company/Firm

- (i) Name of Company/Firm.....
- (ii) VAT registration number.....
- (iii) Company registration number.....
- (iv) Type of Company / Firm [TICK APPLICABLE BOX]
 - Partnership/Joint Venture/Consortium
 - One person business/sole propriety
 - Close Corporations
 - Company (Pty) Ltd
- (v) Describe Principal Business Activities
.....
.....
- (vi) Company Classification [TICK APPLICABLE BOX]
 - Manufacturer
 - Supplier
 - Professional Service Provider
 - Other Service Providers, e.g Transporter, etc
- (vii) Total number of years the company/firm has been in business.....

BID DECLARATION

I/we, the undersigned, who warrants that he/she is duly authorised to do so on behalf of the company/firm, certify that points claimed, based on the B-BBEE status level of contribution indicated in paragraph 4 above, qualifies the company/firm for the preference(s) shown and I / we acknowledge that:

- (i) The information furnished is true and correct.
- (ii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 6 above, the contractor may be required to furnish documentary proof to the satisfaction of Transnet that the claims are correct.
- (iii) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, Transnet 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) restrict the Bidder or contractor, its shareholders and directors, and/or associated entities, or only the shareholders and directors who acted in a fraudulent manner, from obtaining business from Transnet for a period not exceeding 10 years, after the *audi alteram partem* [hear the other side] rule has been applied; and/or
- (e) forward the matter for criminal prosecution.

WITNESSES:

- 1.
- 2.

SIGNATURE OF BIDDER

DATE:.....

COMPANY NAME:

ADDRESS:.....

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**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 6 : NON-DISCLOSURE AGREEMENT [NDA]

Complete and sign the Non-Disclosure Agreement appended hereto as Annexure C

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Respondent's Signature

Date and Company Stamp

**RFI for Supply / Provision of Digital Radio Communication System
for Transnet SOC Ltd operating as Transnet Freight Rail**

Section 7 : RFI CLARIFICATION REQUEST FORM

RFI No: HOAC-HO-19557

Deadline for RFI clarification submissions: Before **12:00 on 11 November 2015**

TO: Transnet SOC Ltd
ATTENTION: Julius Moeti
EMAIL: Julius.Moeti@transnet.net
DATE:
FROM:

RFI Clarification No [to be inserted by Transnet]

REQUEST FOR RFI CLARIFICATION:

.....
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"PREVIEW COPY ONLY"

Respondent's Signature

Date and Company Stamp



NON DISCLOSURE AGREEMENT – RFI / EOI

[March 2015]

"PREVIEW COPY ONLY"

THIS AGREEMENT is made between

Transnet SOC Ltd [Transnet] [Registration No. 1990/000900/30]

whose registered office is at 49th Floor, Carlton Centre, 150 Commissioner Street, Johannesburg 2001,

and

the Company as indicated in the RFI/EOI bid response hereto

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 hereof. 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 Bid 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** 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:
 - a) 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
 - b) 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

- c) 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 Bid or for the subsequent performance of any contract between the parties in relation to the Bid.

2.3 Notwithstanding clause 2.1 above, the Receiving Party may disclose Confidential Information:

- a) 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
- b) 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 b) 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.

3. RECORDS AND RETURN OF INFORMATION

- 3.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.
- 3.2 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.
- 3.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:
- a) return all written Confidential Information [including all copies]; and
 - b) 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.
- 3.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 3.3 b) above.

4. ANNOUNCEMENTS

- 4.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Bid without the prior written consent of the other party.
- 4.2 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.

5. 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 Bid and continue thereafter for a period of 5 [five] years.

6. 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 Bid and in complying with the terms of this Agreement.

7. 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.

8. PRIVACY AND DATA PROTECTION

- 8.1 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 Bid 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.
- 8.2 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 Bid and against accidental loss or destruction of, or damage to such data held or processed by them.

9. GENERAL

- 9.1 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.
- 9.2 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.
- 9.3 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.
- 9.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.
- 9.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.
- 9.6 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.

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TRANSNET
freight rail

**RAIL NETWORK TELECOMMUNICATIONS
SPECIFICATION**

**TELECOMMUNICATIONS REQUIREMENTS FOR
TRANSNET RAILBOUND TECHNOLOGIES**

FUNCTION	TITLE & DIVISION	NAME	SIGNATURE
Author:	Senior Engineer Rail Network Telecoms	Muhumbulo Mmbengwa	
Authorised	Principal Engineer Communications Technology	Kululeko Gobhozi	
Approved:	Principal Engineer Rail Network Telecoms	Mlindi Mashologu	
Approved:	Chief Engineer Rail Network Telecoms	Andrew Matseke	
			DATE: 14/09/2015.

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- Rail Network Telecoms
- Transnet Freight Rail
- Transnet and Relevant Third Parties
- Unrestricted

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I. DISTRIBUTION

Once updated, a copy of the latest revision will be published in the document management system in use. An e-mail to this effect will be sent to the relevant personnel or heads of department.

II. DOCUMENT CHANGE HISTORY

ISSUE NO.	DATE ISSUED	ISSUED BY	HISTORY DESCRIPTION

III. RELEVANT DOCUMENTATION

Document	Description

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IV. ABBREVIATIONS, ACRONYMS AND DEFINITIONS

ABBREVIATIONS AND ACRONYMS	DESCRIPTION
3G	Third Generation Mobile Network
APN	Access Point Node
bps	Bits per second
CASDAM	Condition Assessment Systems, Data Analysis And Modelling
CSV	Comma-Separated Values
CTC	Centralised Traffic Control
DVB	Digital Video Broadcast
FLEXMUX	Flexible Multiplexer
FTP	File Transfer Protocol
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IP	Internet Protocol
ITCMS	Integrated Train Condition Monitoring System
kB	kilobytes
LAN	Local Area Network
LAN	Local Area Network
MB	Megabytes
Mbps	Megabits per second
ms	milliseconds
SSH	Secure Shell
TCO	Train Control Officer
TCP / IP	Transmission Control Protocol / Internet Protocol
TFR	Transnet Freight Rail
TRITON	Train condition and movement information communication (On-board Locomotive Communication System)
USRD	Ultrasonic Broken Rail Detector
UDP	User Datagram Protocol
UHF	Ultra High Frequency
VDU	Visual Display Unit
VHF	Very High Frequency
VNC	Virtual Network Computing
WAN	Wide Area Network
WI-FI	Wireless Fidelity
WILMa	Wayside Intelligent Long-stress Management
WIM-WIM	Weigh In Motion Wheel Impact Monitor



1. INTRODUCTION

- 1.1. This document details the technologies that are used within Transnet Freight Rail (TFR) to enable the safe running of trains.
- 1.2. The technologies have been listed with all their telecommunication requirements that need to be incorporated into a single digital Telecommunication network.

2. CURRENT TECHNOLOGIES

- 2.1. The following section lists the types of rail-bound technologies that are in use in TFR, their purpose or function, their current communication interface(s), the latency and any other comments. The purpose of a new communication technology will be to provide communication for legacy, current and future applications.
- 2.2. The suppliers will be required to meet the following requirements with the following ratings for each of the technologies listed below:
 - Mandatory (M) - essential requirements that suppliers must meet;
 - Desirable (D) - requirements that whilst bringing benefits are not essential; and
 - Information (I) - requirements that request information from the supplier typically for evaluation purposes.
- 2.3. Data Acquisition Module (M)

	Description	Supplier Solution
Purpose	Condition based monitoring, early warning of failure and faster remote fault finding	
Current communication interface	No remote communication at present. It should be compatible with the RS232 and RS485 interfaces.	
Size and frequency of transmissions	20 MB files a day.	
Accepted latency	100 ms	
Comments	Condition Monitoring of Substation Equipment. IP communication. IP communication interface with a RS485 standard port. Minimum latency to enable bidirectional commands from Remote location to module. File type is DVB and the size is 20 MB per day.	



2.4. Train Control Environment (M)

	Description	Supplier Solution
Purpose	Control more than 800 Out Stations from 25 Centralized Traffic Control (CTC) centres	
Current communication interface	FLEXMUX connected to Fibre Optic Cable	
Size and frequency of transmissions	20kB and every 100 ms (9.6 kbps)	
Accepted latency	10 ms	
Comments	The network should facilitate the connection via RS232 from the outstations to the CTC which has a local LAN. This enables VDU to be used with the CTC for Train control	

2.5. Tele-control System (M)

	Description	Supplier Solution
Purpose	The system used for Electrical substation control. Over 900 outstations at present.	
Current communication interface	RS232 protocol over FLEXMUX, Radio and copper Cable	
Size and frequency of transmissions	15kB every 5 minutes	
Accepted latency	10 ms	
Comments	System connects to 3 locations countrywide and also has a demand protocol on GSM/GPRS using the Transnet WAN.	



2.6. Telemeter Rear Unit (M)

	Description	Supplier Solution
Purpose	Safe train operation	
Current communication interface	IP over GSM GPRS	
Size and frequency of transmissions	55 bytes every 30 seconds	
Accepted latency	59 seconds	
Comments	The system measures the brake pipe pressure at the rear of the train and communicates it to the driver over VHF. GSM module used to communicate telemetry data to a central TFR WAN server	

2.7. Locomotive Control System (M)

	Description	Supplier Solution
Purpose	Transmission of mission critical data.	
Current communication interface	Manual downloading using Laptops directly interfaced to the locomotive control system	
Size and frequency of transmissions	Up to 80 MB per loco per day	
Accepted latency	10 seconds for emergency messages. 10 minutes for other downloads	
Comments	Optimisation of operational and maintenance practices. Enhances the Energy management objective by monitoring locomotive energy usage and regenerative and brake resistor energy. Expected 1600 new locos to be catered for	



2.8. Ultrasonic Broken Rail Detector (M)

	Description	Supplier Solution
Purpose	Safe train operation by ensuring detection of broken rails	
Current communication interface	TCP/IP GPRS network or TCP/IP over UHF and Rail Telecoms Network	
Size and frequency of transmissions	±100 kB TCP/IP packet transmissions per day or 3 MB per month per site (there are 450 sites spread over the line)	
Accepted latency	Maximum of 15 seconds	
Comments	Current roll-out is on the Iron Ore line and the Coal line	

2.9. WILMa (M)

	Description	Supplier Solution
Purpose	Measurement of rail stresses in continuous welded rails	
Current communication interface	TCP/IP GPRS network or TCP/IP over UHF and Rail Telecoms Network	
Size and frequency of transmissions	±100 kB TCP/IP packet transmissions per day or 3 MB per month per site	
Accepted latency	Maximum 5 minutes	
Comments		

2.10. Radio Network Performance Monitoring (D)

	Description	Supplier Solution
Purpose	To log the signal strength of the radio network for a dynamic survey of the line	
Current communication interface	Manual with radio and Laptop	
Size and frequency of transmissions	2000 messages @500kB twice a day	
Accepted latency	1 hour	
Comments	Possible solutions include Wi-Fi & Triton at fixed locations. A radio solution would prove to be advantageous. A CSV file would be preferable	



2.11. Locomotive Cameras (I)

	Description	Supplier Solution
Purpose	To monitor driver train handling & signal & overhead problems	
Current communication interface	None. Cameras in new locos	
Size and frequency of transmissions	4-10 Mbps	
Accepted latency	1 Hour	
Comments	Download at fixed yards via Wi-Fi & IP	

2.12. Traffic Management System (M)

	Description	Supplier Solution
Purpose	Provision of accurate train position and management information to facilitate execution of the train plan as well monitoring and deviation management	
Current communication interface	IP on the commercial WAN or Technical LAN	
Size and frequency of transmissions	Approximately 100 MB over a 24 hour period	
Accepted latency	3 minutes	
Comments	System implemented on both colour light signalled and Radio train order lines	



2.13. TRITON (M)

	Description	Supplier Solution
Purpose	On-board LAN system for consolidated, multi-channel wireless communication of data for all on-board locomotive systems to the TFR WAN	
Current communication interface	GPRS (Multiple APNs) and Wi-Fi	
Size and frequency of transmissions	50 bytes every 30 seconds of track and trace data. FTP file less than 4MB sent via GPRS, FTP file greater than 4 MB sent via Wi-Fi	
Accepted latency	Variable, less than 30 seconds for Track and Trace	
Comments	System is installed in all locomotives ±2500. This will be installed in any future Locomotives. Digital Technology will be the new interface	

2.14. Train Definition Unit (M)

	Description	Supplier Solution
Purpose	Part of TRITON and used by operations to capture the train number from a driver. This information is used for track and trace of trains and their consignments	
Current communication interface	IP over TRITON	
Size and frequency of transmissions	Up to 200 kB for firmware updates. 50 bytes on start and end of a train trip	
Accepted latency	60 seconds	
Comments		



2.15. Train Communication System (M)

	Description	Supplier Solution
Purpose	Voice communication between driver and TCO on the Coal Line, and communication of train operation data over GSM	
Current communication interface	GSM for voice and data over GPRS	
Size and frequency of transmissions	100kB for post trip reports and 200 bytes every 5 minutes or less	
Accepted latency	30 seconds	
Comments		

2.16. On-Board Computer (M)

	Description	Supplier Solution
Purpose	Active train protection against over speeding or passing designated area of authority	
Current communication interface	UDP over ETHERNET	
Size and frequency of transmissions	50 bytes every 10 meters of movement	
Accepted latency	1000 milliseconds	
Comments	Safety critical system	



2.17. Locomotive Condition Monitoring System (M)

	Description	Supplier Solution
Purpose	Capture and communicate locomotive condition information to centralised servers on the TFR WAN. Retrofitted on new and existing locomotives (approx. 2500)	
Current communication interface	UDP and FTP over TRITON	
Size and frequency of transmissions	1500 bytes UDP packets every 5 minutes and up to 20MB per train per day. Possible remote network access. E.g. SSH, Telnet, VNC over 3G or Wi-Fi	
Accepted latency	60 seconds	
Comments		

2.18. ITCMS (M)

	Description	Supplier Solution
Purpose	Centralised repository of Rolling Stock Condition information	
Current communication interface	IP over commercial WAN	
Size and frequency of transmissions	2MB per train. About 1000 train movements per day	
Accepted latency	30 minutes	
Comments		

2.19. Bearing Temperature Monitor (M)

	Description	Supplier Solution
Purpose	Measure bearing temperature	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	Per train @ 57 600 bps (84kB)	
Accepted latency	5 minutes	
Comments	388 sites country wide	



2.20. Wheel Temperature Monitors (M)

	Description	Supplier Solution
Purpose	Measure wheel temperature	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	49kB Per train @ 9 600 bps	
Accepted latency	5 minutes	
Comments	38 sites country wide	

2.21. Vehicle Identification System (M)

	Description	Supplier Solution
Purpose	Read vehicle tags (numbers)	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	33.5kB Per train @ 57 600 bps	
Accepted latency	2 minutes	
Comments	618 sites country wide	

2.22. WIM-WIM (M)

	Description	Supplier Solution
Purpose	Wheel impact monitor. Weigh in motion.	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	63.5kB Per train @ 9 600 bps	
Accepted latency	5 minutes	
Comments	36 sites country wide	



2.23. Assized Weighbridge (M)

	Description	Supplier Solution
Purpose	SABS approved commercial weighing	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	35.9kB Per train @ 9 600 bps	
Accepted latency	2 minutes	
Comments	23 sites country wide	

2.24. Skew Bogie Detector (M)

	Description	Supplier Solution
Purpose	Weight information and bogie condition	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	60kB Per train @ 9 600 bps	
Accepted latency	2 minutes	
Comments	27 sites country wide	

2.25. CADDAM (D)

	Description	Supplier Solution
Purpose	Condition assessment, data analysis and modelling	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	480kB Per train @ 57 600 bps	
Accepted latency	5 minutes	
Comments	1 site country wide	



2.26. Acoustic Bearing Monitors (M)

	Description	Supplier Solution
Purpose	Measure Bearing Condition through sound signature	
Current communication interface	Multiple, site specific. Final link is TCP/IP	
Size and frequency of transmissions	900kB Per train @ 9 600 bps	
Accepted latency	10 minutes	
Comments	3 sites country wide, May include multimedia sound (.wav) files	

2.27. Wheel Profile Monitoring System (M)

	Description	Supplier Solution
Purpose	Measure wheel profile	
Current communication interface	Multiple; site specific. Final link is TCP/IP	
Size and frequency of transmissions	277kB Per train @ 9 600 bps	
Accepted latency	5 minutes	
Comments	6 sites country wide, May include multimedia image (.jpg) files	

3. REQUIREMENTS OF OTHER TRANSNET DIVISIONS

- 3.1. Due to the Transnet operational environment including the interaction of both rail and ports, the data requirements in the ports tend to be significantly higher than along the rail corridors.
- 3.2. Transnet Freight Rail, as the largest user of data in the Transnet Group, has to factor in the data requirements in the ports when specifying telecommunications technology.
- 3.3. The current requirements for the rail and port interface have tested to be 2.1 Mbps downlink and 276 kbps uplink. The ratio of the tests was 3:1 downlink uplink. Technology proposal must take into account the potential growth in capacity requirements and the change in ratio.

END OF DOCUMENT

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**RAIL NETWORK TELECOMMUNICATIONS
SPECIFICATION**

APPENDIX B: COMPLIANCE TO BBG5644

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1. INTRODUCTION

- 1.1. This is a compliance documents for specification BBG5644 and the required capacity of the company to deliver the project successfully.
- 1.2. The document should therefore be read in conjunction with both the specifications BBG5644 and BBG5645.

2. CAPACITY REQUIREMENTS

- 2.1. The bidder must submit an organogram for the company in their technical capacity submission. The following should be included:
 - 2.1.1. Key personnel with their job specification and/or professional registration
 - 2.1.2. Their repair facilities for all the equipment proposed

3. COMPLIANCE TO BBG5644

- CF – Comply Fully
 CP – Comply Partially
 DNC – Do not comply

CLAUSE	COMPLIANCE CF/CP/DNC	REFERENCE IN SUBMISSION
Mandatory requirement (Disqualifying Criteria)		
3.1. The solutions proposed must be suitable to the South African and regional environment as detailed in the RFSAP(Clause 1.13)		
3.2. Open standard with no propriety implementation(Clause 1.17)		
3.3. An indicative pricing schedule for the proposed network should be included with the proposal submitted to TFR(Clause 2.1.4)		



CLAUSE	COMPLY CF/CP/DNC	REFERENCE IN SUBMISSION
Optional Requirements		
3.4. The proposal can include the cost of transmission network for linking the radio high sites e.g. microwave or optical transmission (Clause 2.2.1)		
Clause by Clause Compliance		
3.5. The digital radio technology proposed must cater for the current voice communication as well as data requirements(Clause 1.1.1)		
3.6. Bidders willing to conduct a pilot of their technology (Clause 1.18)		
3.7. The digital radio technology proposed must cover and exceed the current network capabilities. The network must have the following basic capabilities:(Clause 2.1.1)		
a) Point to Point voice communication		
b) Group calling voice communication		
c) Emergency prioritisation		
d) Train driver to Control station voice communication		
e) Train Dispatcher Console		
3.8. The digital network must cater for data requirements such as the following: (Clause 2.1.2) a) See document BBG5645 titled "Telecommunications Requirements for Transnet Rail bound Technologies"		



Appendix B: Compliance to specification BBG5644

CLAUSE	COMPLY CF/CP/DNC	REFERENCE IN SUBMISSION
3.9. The respondents must indicate the capability of the offered technology to function in the following bands:(Clause 3.1.3)		
a) 450-452 MHz paired with 460-462 MHz (co-existence with IMT technologies)		
b) UHF band 406-426 MHz		
c) Multi bands: UHF and bands above 470 MHz but below 1 GHz (Hybrid network)		
d) Multi bands: UHF and bands above 1 GHz (Hybrid Network)		
3.10. Voice communication general characteristics(Clause 3.1.1)		
a) The digital network should be IP based.		
b) The radio network should have a minimum signal to noise ratio of 20 dB		
c) The network should be able detect interference, report it and reduce the interfering signal		
d) Network components should be software adjustable.		
e) The radio numbering system for both Trunking and Open Channel should be the same		
f) Dual band radio peripherals will be advantageous		
g) The network should be scalable		



CLAUSE	COMPLY CF/CP/DNC	REFERENCE IN SUBMISSION
<p>3.11. Voice conventional Communication network(Clause 3.1.2)</p> <p>a) The network should offer open channel capability that enables frequency plan assignments for sections.</p> <p>b) The switching of the train driver terminal should be automatic depending on signal strength.</p> <p>c) The latency for the voice should be maximum 250ms across the entire cascade of sites</p> <p>d) The adjustment of section frequency assignments should be possible remotely.</p>		
<p>3.12. Voice Trunked communication network(Clause 3.1.3)</p> <p>a) The network should have the capability to achieve a Trunked radio communication.</p> <p>b) The network should have group calling configurable from the network management system</p> <p>c) Site handover should be possible for Trains that receive instruction while still travelling</p> <p>d) The network should have capability to make local, inter-site calls as well as PABX/PSTN calls</p>		
<p>3.13. Digital Network Management Software(NMS) (Clause 3.2.1)</p> <p>a) The NMS must be viewed from a central location for network monitoring</p> <p>b) There should be a technique incorporated into the network to view the status of the network through a password protected portal</p>		

CLAUSE	COMPLY CF/CP/DNC	REFERENCE IN SUBMISSION
c) The NMS must have ability to remotely configure the high sites. This will include setting alarms per individual site		
d) High site fault collection and analysis must be possible (e.g. Availability of Site)		
e) The database management system used must be conventional off the shelf (e.g. SQL Server)		
f) The NMS should have different levels of user access (e.g. Administrator, Supervisor, and User)		
3.14. Digital Dispatching Console(Clause 3.2.2)		
a) The dispatcher should be configurable to user preferences		
b) The dispatcher should be able to access any part of the network; e.g. a dispatcher in Cape Town should have the capability to access a line from Musina to Polokwane		
c) The dispatcher should have tracking accessibility for radio units within the coverage area. There must be capability to show this information graphically on a map		
d) Every dispatcher should have the voice communications recorded		

END OF DOCUMENT

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ANNEXURE A: CONVENTIONAL RADIO NETWORK

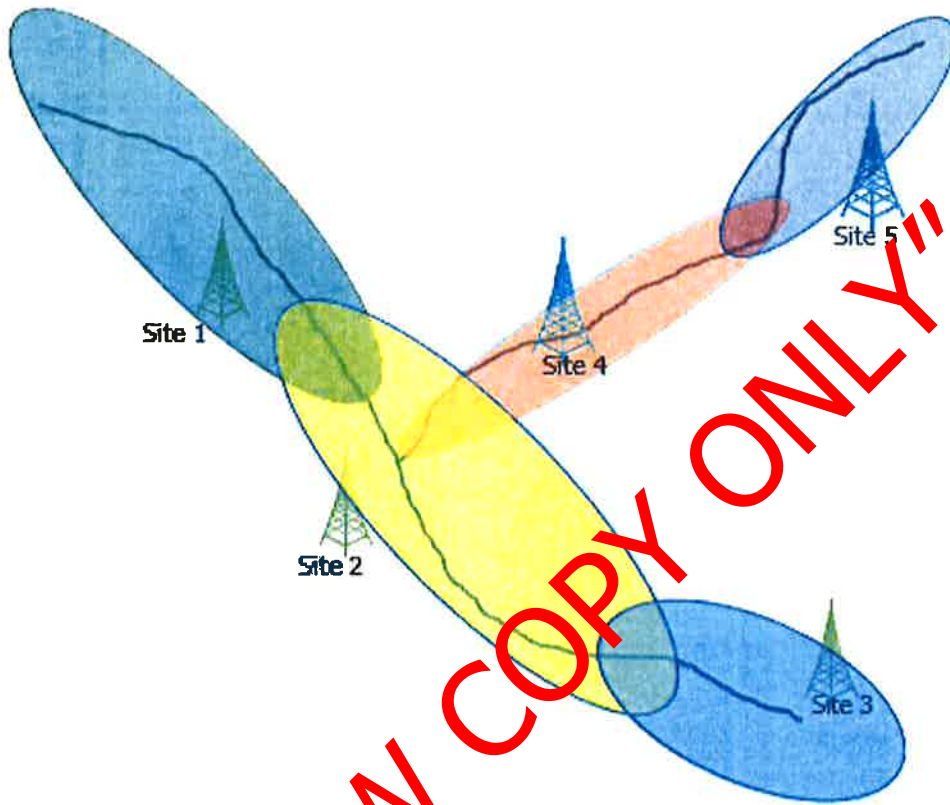


Figure 1: Conventional Radio Network

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**RAIL NETWORK TELECOMMUNICATIONS
SPECIFICATION**

DIGITAL RADIO NETWORK TECHNICAL REQUIREMENTS

FUNCTION	TITLE & DIVISION	NAME	SIGNATURE
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I. DISTRIBUTION

Once updated, a copy of the latest revision will be published in the document management system in use. An e-mail to this effect will be sent to the relevant personnel or heads of department.

II. DOCUMENT CHANGE HISTORY

ISSUE NO.	DATE ISSUED	ISSUED BY	HISTORY DESCRIPTION
1.00	1 July 2015	Andrew Matske	New Document

III. RELEVANT DOCUMENTATION

Document	Description
T-REC-G.114	Transmission systems and media, digital systems and networks
BBG5645	Telecommunications Requirements for Transnet Rail bound Technologies

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IV. ABBREVIATIONS, ACRONYMS AND DEFINITIONS

ABBREVIATIONS AND ACRONYMS	DESCRIPTION
3GPP	Third Generation Partnership Project
ETSI	European Telecommunication Standards Institute
GHz	Gigahertz
GSM-R	Global System for Mobile Communications – for Railway Communication
HBD	Hot Box Detector
ICASA	Independent Communications Authority of South Africa
IMT	International Mobile Telecommunications
IP	Internet Protocol
MHz	Megahertz
ms	milliseconds
NMS	Network Management System
OD	Operating Division (of Transnet Group)
PABX	Private Automatic Branch Exchange
PRASA	Passenger Rail Agency of South Africa
PSTN	Public Switched Telephone Network
RFSAP	Radio Frequency Spectrum Assignment Plan
TETRA	Terrestrial Trunk Radio
TFR	Transnet Freight Rail
UBRD	Ultrasonic Broken Rail Detector
UHF	Ultra High Frequency
WILMa	Wayside Intelligent Long-Stress Management

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1. INTRODUCTION

- 1.1. Transnet Freight Rail operates its own licensed communication network throughout South Africa. The network includes both radio and optical transmission.
- 1.2. The radio network is used by Transnet Freight Rail (TFR) and other Operating Divisions (ODs) of Transnet Group.
- 1.3. This radio network is also utilized by PRASA (Passenger Rail Agency of South Africa) trains when they travel through TFR sections of the rail network.
- 1.4. The radio network is predominantly analogue, and consists of UHF open channel networks, and a trunk network based on the MPT1327 standard.
- 1.5. Both the open channel and MPT1327 trunk networks operate in the 450-470 MHz band.
- 1.6. The telecommunications industry regulator ICASA (Independent Communications Authority of South Africa) has issued Government Gazette No. 38640 dated 30 March 2015, titled "Final Radio Frequency Spectrum Assignment Plan".
- 1.7. The part of the Final Radio Frequency Spectrum Assignment Plan (RFSAP) that relates to the 450-470 MHz band requires the current users of this band, including Transnet, to migrate out of this band as the band has been identified for IMT (International Mobile Telecommunications) technologies.
- 1.8. In the Final Radio Frequency Spectrum Assignment Plan (RFSAP), ICASA has proposed a number of possible destination bands for Transnet. These include
 - 1.8.1. Co-existence within the 450-470 MHz
 - 1.8.2. 410-413/420-423 MHz (2x3 MHz)
 - 1.8.3. 406-426 MHz for TETRA 2x4MHz and 2x3 MHz
 - 1.8.4. GSM-R
- 1.9. TFR requests proposal for a technology solution from the market to replace the UHF MPT1327 trunk and open channel networks, while at the same catering for the necessary frequency migration as called for in the RFSAP.
- 1.10. Suppliers must propose solutions in the above mentioned destination bands.
- 1.11. Suppliers may also propose solutions in the 450-470 MHz band, on condition that such solutions meet the spectral efficiency requirements set out by ICASA in the RFSAP.



- 1.12. Transnet Freight Rail (TFR) has no special preference for a digital radio network solution, and suppliers are encouraged to suggest solutions that meet the operational and technical requirements of TFR.
- 1.13. The solutions proposed must be suitable to the South African and regional environment as detailed in the RFSAP.
- 1.14. The proposed solutions must also be cost-effective for TFR and the other radio network users in the Transnet Group
- 1.15. Suppliers suggesting solutions in frequency bands higher than 450-470 MHz need to note that these bands have the following additional requirements in a network such as the current TFR one; and those proposing solutions in these upper bands must indicate how they will provide for these additional requirements in a manner that is cost-effective for TFR:
- 1.15.1. The rail network of Transnet Freight Rail (TFR) includes corridors that cover long distances. The longest of these is the Iron Ore line from Sishen to Saldanha Bay (approximately 826 kilometres).
- 1.15.2. Migration from the 450-470 MHz band to higher frequency bands will require the addition of new repeater sites. This will add to the cost of such solutions, and to the timelines for implementation due to site acquisition and environmental approval processes.
- 1.15.3. Suppliers suggesting solutions in the bands above 450-470 MHz must clearly indicate the additional costs and environmental approvals, and how they propose to manage these cost effectively and approvals timeously.
- 1.16. The digital radio technology proposed must cater for the current voice communication as well as data requirements.
- 1.17. A critical requirement for the new radio communication network is that it needs to be based on open standards issued by an international communications body (e.g. ITU-T, ETSI, 3GPP). **Any technology based on proprietary standard or open standard with Proprietary implementation without interoperability with multiple vendors will lead to disqualification.**
- 1.18. After evaluation of the proposals for a digital radio solution, Transnet Freight Rail (TFR) is likely to pilot one or more of these solutions for a period of 6 months. The choice of the location of the pilot sites will be influenced by the availability of frequency spectrum from ICASA for test purposes.



- 1.19. The operational requirements of Transnet are such that should TFR choose to pilot a proposed digital radio network solution, then it is highly likely that one of the selected pilot sites may have to be at a location where there is a Transnet Rail and Port operational interface.

2. SCOPE

2.1. Inclusions

- 2.1.1. The digital radio technology proposed must cover and exceed the current network capabilities. The network must have the following basic capabilities:
- (a) Point to Point voice communication
 - (b) Group calling voice communication
 - (c) Emergency prioritisation
 - (d) Train driver to Control station voice communication
 - (e) Train Dispatcher
- 2.1.2. In addition to the voice communication the digital network must cater for data requirements such as the following (a detailed scope of data technologies used is covered in document BBG5645 titled "Telecommunications Requirements for Transnet Railbound Technologies"):
- (a) Bar Codes scanning
 - (b) Vehicle Information System
 - (c) Hot Box Detector (HBD)
 - (d) Drag Equipment Detector (DED)
 - (e) Ultrasonic Broken Rail Detector (UBRD)
 - (f) Wayside Intelligent Long-stress management (WILMa)
 - (g) Axle Counter
 - (h) Load Profile
 - (i) Yard Point Switch
 - (j) Radio Distributed Power
 - (k) End of Train devices (Telemeter)
- 2.1.3. The respondents must indicate the ability of the offered technology to function in the following bands:
- (a) 450-452 MHz paired with 460-462 MHz (co-existence with IMT technologies)



- (b) UHF band 406-426 MHz
 - (c) Multi bands: UHF and bands above 470 MHz but below 1 GHz
 - (d) Multi bands: UHF and bands above 1 GHz
- 2.1.4. An indicative pricing schedule for the proposed network should be included with the proposal submitted to TFR. **Failure to do this will lead to disqualification.**

2.2. Optional items

- 2.2.1. The proposal can include the cost of a transmission network for linking the radio high sites (e.g. microwave or optical transmission).

3. TECHNICAL PARAMETERS

3.1. Voice Communication

3.1.1. General Network Characteristics

- (a) The digital network should be IP based.
- (b) The radio network should have a minimum signal to noise ratio of 19 dB.
- (c) The network should be able to detect interference, report it and reduce the interfering signal.
- (d) Network components should be software adjustable.
- (e) The radio numbering system for both Trunking and Open Channel should be the same.
- (f) Dual band radio peripherals will be advantageous.
- (g) Terminals that can operate both in the UHF bands and above 1 GHz will be preferred.
- (h) The network should be scalable.

3.1.2. Conventional communication

- (a) The network should have the capability to achieve an open channel infrastructure that enables multiple receivers of the voice communication. The infrastructure should be deployed as shown in Annexure A. As shown in Figure 1 of Annexure A the trains in the vicinity of Sites 1, 2 and 3 should be able to hear all the conversations in that region.
- (b) The switching from site 1, 2 and 3 should be done by the terminal in the train without any involvement of the train driver.



- (c) The latency for the voice should be maximum 250 ms across the entire cascade of sites.
- (d) The configuration of cascaded sites should be possible from a central location, thus software configurable.

3.1.3. Trunked Radio Network

- (a) The network should have the capability to achieve a Trunked radio communication. This entails that any authorisations will be on an individual basis between the train and the train controller.
- (b) The network should have group calling configured from the network management system.
- (c) Site handover should be possible for Trains that receive instruction while still travelling.
- (d) The network should have capability to make local, inter-site calls as well as PABX/PSTN calls.

3.2. Management software

3.2.1. Network management system (NMS)

- (a) The NMS must be viewed from a central location for network monitoring.
- (b) There should be a technique incorporated into the network to view the status of the network through a password protected portal.
- (c) The NMS must have ability to remotely configure the high sites. This will include setting alarms per individual site.
- (d) High site fault collection and analysis must be possible (e.g. Availability of Site).
- (e) The database management system used must be conventional off the shelf (e.g. Oracle).
- (f) The NMS should have different levels of user access (e.g. Administrator, Supervisor, and User).

3.2.2. Dispatching Software

- (a) The dispatcher should be configurable to user preferences.
- (b) The dispatcher should be able to access any part of the network; e.g. a dispatcher in Cape Town should have the capability to access a line from Musina to Polokwane.
- (c) The dispatcher should have tracking accessibility for radio units within the coverage area. There must be capability to show this information graphically on a map.
- (d) Every dispatcher should have the voice communications recorded.

END OF DOCUMENT