TRANSNET

TRANSNET FREIGHT RAIL
a Division of
TRANSNET SOC LIMITED
(Registration No. 1990/000900/06)

REQUEST FOR QUOTATION ("RFQ")

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

ISSUE DATE	:	**30 MAY 2012**
BRIEFING SESSION	:	**13 JUNE 2012**
TIME	:	**10H00**
CLOSING DATE	:	**19 JUNE 2012**
CLOSING TIME	:	**10H00**
OPTION DATE	:	**31 AUGUST 2012**
VENUE	:	**01 VILJOEN STREET, HIEDELBERG**

FOR MORE INFORMATION CONTRACT THEUNS NEL 083 407 7918

TENDER BOX   ALLOCATED AT THE CHAIRPERSON TRANSNET FREIGHT RAIL ACQUISITION COUNCIL, GROUND FLOOR, INYANDA HOUSE 1, 21 WELLINGTON ROAD, PARKTOWN, JOHANNESBURG.

TENDER ENVELOPE TO BE MARKED AS FOLLOWS:
RFQ NUMBER: RFQ NUMBER CRAC/HGR/8605
 DESCRIPTION: PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

SCHEDULE OF DOCUMENTS

1. **Notice to Bidders**
2. **Requisition for quotation**
3. **Compulsory Meeting**
4. **Scope of Work and General specification**
5. **Returnable Schedules / Documents**
6. **Supplier Declaration Form**
7. **Contractual Safety Clauses**
8. **General Tender Conditions (CSS5 – Service)**
9. **Standard Terms and Conditions of Contract (US7 - Services)**
10. **Non-Disclosure Agreement**
11. **Supplier Code of Conduct**

TRANSNET

SECTION 1

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

NOTICE TO BIDDERS

Refer Document attached hereto

Quotations are requested from interested Respondents to supply the above-mentioned requirement to TRANSNET FREIGHT RAIL.

On or after 30/05/2012 the RFQ documents may be inspected at, and are obtainable from the office of TRANSNET Freight Rail Tender Advice Centre, Ground Floor, Inyanda House 1, 21 Wellington Road, Parktown.

A non-refundable tender fee of R150.00 (inclusive of Vat) is applicable per tender (listed below). Payment is to be made to Transnet Freight Rail, Standard Bank Account number 203158598, Branch code 004805. The deposit slip must reflect the tender number and the Company Name.
NOTE: This amount is not refundable.
Receipts to be presented prior to collection of the RFQ

==PLEASE BRING THE VALID DOCUMENT ON THE DAY OF BRIEFING AND ALSO MAKE SURE THAT YOU BRING YOUR SAFETY SHOES AND REFLECTIVE VEST ON SITE==

NAME	**:**	**Neo Sekwati**
Tel	**:**	**(011) 584-0635**
Email		**Neo.Sekwati@transnet.net**

Tenders in duplicate must reach the Chairperson, TRANSNET Freight Rail Acquisition Council, before the closing hour on the date shown below, and must be enclosed in a sealed envelope which must have inscribed on the outside:

Tender No : RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

Closing date and time : 19 June 2012 at 10h00

Closing address (refer options below)

DELIVERY INSTRUCTIONS FOR THIS RFQ:

1 **If posted,** the envelope must be addressed to the Chairperson, TRANSNET Freight Rail Acquisition Council, P .O. Box 4244, Johannesburg 2000 and must be dispatched in time for sorting by the Post Office to reach the Chairperson before the closing time of the RFQ. In the event of the late receipt of a Proposal, the Respondent's franking machine impression will not be accepted as proof that the response was posted in time.

2 **If delivered by hand,** the envelope is to be deposited in the TRANSNET tender box which is located at the main entrance, Inyanda House,21 Wellington road, Park town, Johannesburg and should be addressed as follows:

THE CHAIRPERSON

TRANSNET FREIGHT RAIL ACQUISITION COUNCIL

INYANDA HOUSE

21 WELLINGTON ROAD

PARKTOWN

JOHANNESBURG

2001

The measurements of the "tender slot" are 500mm wide x 100mm high, and Respondents must please

Ensure that response documents or files are not 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.

It should also be noted that the above tender box is located at the main entrance and is accessible to the public 24 hours per day, 7 days a week.

3 **If dispatched by courier,** the envelope must be addressed as follows and delivered to the Office of The Chairperson, TRANSNET Freight Rail Acquisition Council and a signature obtained from that Office.

1. Please note that this RFQ closes punctually at **10:00 on Tuesday 19 June 2012**.

2. If responses are not posted or delivered as stipulated herein, such responses will not be considered and will be treated as "UNRESPONSIVE".

3. NO EMAIL OR FACSIMILE RESPONSES WILL BE CONSIDERED

4. The responses to this RFQ will be opened as soon as practicable after the expiry of the time advertised for receiving them.

5. TRANSNET shall not, at the opening of responses, disclose to any other company any confidential details pertaining to the Quotations received, i.e. pricing, delivery, etc. The names and location of the Respondents will, however, be divulged to other Respondents upon request.

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

7.   No slips are to be attached to the response documents. Any additional conditions must be embodied in an accompanying letter. Alterations, additions or deletions must not be made by the Respondent to the actual RFQ documents.

8. BROAD-BASED BLACK ECONOMIC EMPOWERMENT ("BBBEE")

TRANSNET fully endorses and supports the South African Government's Broad-Based Black Economic Empowerment Programme and it is strongly of the opinion that all business enterprises have an equal obligation to redress the imbalances of the past. TRANSNET would therefore prefer to do business with business enterprises who share these same values and who are prepared to contribute to meaningful BBBEE initiatives (including and not limited to enterprise development, subcontracting and Joint Ventures) as part of their tender response.

Transnet would accordingly allow a "preference" in accordance with the 10% preference system, as per the Preferential Procurement Policy Framework Act 5 of 2000 (as amended) to companies who provide a BBBEE accreditation Certificate. All procurement and disposal transactions in excess of R30000 will be evaluated accordingly. All transactions below R 30,000 will as far as possible be earmarked for EME's.

TRANSNET consequently urges Respondents (Large enterprises and QSE's – see below) to have themselves duly accredited by any one of the Accreditation Agencies **approved** by SANAS (South African National Accreditation System, under the auspices of the DTI).

In terms of Government Gazette No. 32467, Notice No. 810 dated 31 July 2009, as from 1 February 2010 only BBBEE certificates issued by Accredited Verification Agencies of Verification Agencies that are in possession of a valid pre-assessment letter from South African National Accreditation System will be valid.

However accreditation certificates issued by non-accredited verification agencies before 01 February 2010 and which are still within their one (1) year validity period will still be acceptable, until their expiry date provided that the accreditation was done in accordance with the latest codes (i.e. those promulgated on 9 February 2007).

BBBEE Accreditation Certificates issued after the published date i.e. 01 February 2010, by a Verification Agency not approved by SANAS, will NOT be acceptable as from 01 February 2010.

Enterprises will be rated by such Accreditation Agencies based on the following:

(a)   **Large Enterprises (i.e. annual turnover >R35 million):**

> ➢ Rating level based on all 7 (seven) elements of the BBBEE scorecard

> ➢ Enterprises to provide BBBEE certificate and detailed scorecard (to be renewed annually)

(b) **Qualifying Small Enterprises – QSE (i.e. annual turnover >R5 million but <R35 million):**

➢ Rating based on any 4 (four) of the elements of the BBBEE scorecard

➢ Enterprises to provide BBBEE certificate and detailed scorecard (to be renewed annually)

(c) **Exempted Micro Enterprises – EME (i.e. annual turnover <R5m are exempted from being rated or verified):**

➢ Automatic BBBEE Level 4 rating, irrespective of race ownership, i.e. 100% BBBEE recognition

➢ Black ownership >50% or Black Women ownership >30% automatically qualify as Level 3 BBBEE rating, i.e. 110% BBBEE recognition

➢ EME's should provide documentary proof of annual turnover (i.e. audited financials) plus proof of Black ownership if Black ownership >50% or Black Women ownership >30% (to be renewed annually) from their Auditors / Accounting Officers

In addition to the above, Respondents who wish to enter into a Joint Venture (JV) or subcontract portions of the contract to BBBEE companies must state in their Tenders / Proposals the percentage of the total contract value which would 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-contractors, as well as a breakdown of the distribution of the aforementioned percentage allocation must also be furnished with the tender response to enable Transnet to evaluate / adjudicate on all tenders received on a fair basis.

Each Respondent is required to furnish proof of its BBBEE status (Certificate and Detailed Scorecard) and ensure that the documentation is valid at the date of Tender Submission as stipulated above to TRANSNET.

Failure to submit your BBBEE Certificate and Detailed Scorecard will result in a score of zero being allocated for BBBEE evaluation.

Turnover: Indicate your company's most recent annual turnover:
R…………………………………………………………..

- If annual turnover <R5m, please attach auditors / accounting officers letter confirming annual turnover and percentage black ownership as well as Black Women ownership
- If annual turnover >R5m please attach BBBEE certificate and detailed scorecard from an accredited rating agency.

The DTI has created an online **B-BBEE Registry** (http://www.dti.gov.za) in order to provide a central and standardized source of the B-BBEE status of all entities, and to facilitate the flow of this information amongst entities by providing a Unique Profile Number (UPN) per each listing. Existing and prospective suppliers are therefore urged to list their B-BBEE status on the DTI Registry. Hence, entities verified by DTI, will receive the following benefits:

- Their BBBEE status will be verified and confirmed by the DTI, before listing on the Registry
- Listing on the Registry will provide suppliers the option to market themselves on the DTI B-BBEE Opportunities Network. This is a search engine that is designed to help businesses

find B-BBEE compliant entities who match specific requirements in terms of the nature of services/goods provided, region, B-BBEE status or other search criteria.

Transnet supports this DTI initiative and will use the DTI Registry to verify prospective and existing suppliers' BBBEE credentials.

Kindly provide Transnet with your DTI B-BBEE UNIQUE PROFILE NUMBER with all tender submissions.

DTI BBBEE UNIQUE PROFILE NUMBER:

……………………………………………………

Failure to submit your BBBEE information in terms of the above-mentioned clauses will result in a score of zero being allocated for BBBEE evaluation.

9   COMMUNICATION

Respondents are warned that a response will be liable to disqualification should any attempt be made by a Respondent either directly or indirectly to canvass any officer(s) or employee of TRANSNET in respect of an RFQ between the closing date and the date of the award of the business.

A respondent may, however, BEFORE THE CLOSING DATE AND TIME, direct any enquiries relating to the RFQ to the TRANSNET employee as indicated in (2) above.

10.   RFQ SCHEDULE

Respondents will be contacted as soon as practicable with a status update. At this time short-listed Respondents may be asked to meet with TRANSNET representatives. Respondents are to provide a list of persons who are mandated to negotiate on behalf of their company, together with their contact details.

10.1 INSTRUCTIONS FOR COMPLETING THE RFQ

(i)   Sign one set of documents (sign and date the bottom of each page). This set will serve as the legal and binding copy. A duplicate set of documents is required. This second set can be a copy of the original signed Proposal.

(ii)   Both sets of documents to be submitted to the address specified above.

(iii)   The following returnable documents must accompany all Proposals:

- The Respondent's latest audited financial statements;
- The Respondent's valid Tax Clearance Certificate.
- A CD copy where applicable

11.   COMPLIANCE

The Respondent shall be in full and complete compliance with any and all applicable State and Local Laws and Regulations.

12.   ADDITIONAL NOTES:

- All returnable documents as indicated in the Proposal Form (Section 3) must be returned with the response

- Changes by the Respondent to its submission will not be considered after the closing date

- The person or persons signing the Proposal must be legally authorized by the Respondent to do so (Refer Section 4). A list of those person(s) authorized to negotiate on your behalf must be submitted along with the Proposal

- All prices must be quoted in South African Rand

- TRANSNET reserves the right to undertake post-tender negotiations with the preferred Respondent or any number of short-listed Respondents

NB: Unless otherwise expressly stated, all Proposals furnished pursuant to this Request shall be deemed to be offers. Any exceptions to this statement must be clearly and specifically indicated. TRANSNET reserves the right to reject any or all offers.

**FAILURE TO OBSERVE ANY OF THE ABOVE-MENTIONED REQUIREMENTS
MAY RESULT IN THE PROPOSAL BEING REJECTED.**

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13. **DISCLAIMERS**

Respondents are hereby advised that TRANSNET is not committed to any course of action as a result of its issuance of this RFQ and/or its receipt of a Proposal in response to it. In particular, please note that TRANSNET reserves the right to:

- modify the RFQ's Goods or Services and request Respondents to re-bid on any changes
- reject any Proposal which does not conform to instructions and specifications which are detailed herein
- disqualify Proposals submitted after the stated submission deadline
- not necessarily accept the lowest priced Proposal
- reject all Proposals, if it so decides
- award a contract in connection with this Proposal at any time after the RFQ's closing date
- award only a portion of the proposed Goods or Services which are reflected in the scope of this RFQ
- split the award of the contract between more than one Supplier
- make no award of a contract

Kindly note that TRANSNET will not reimburse any Respondent for any preparation costs or other work
Performed in connection with the Proposal, whether or not the Respondent is awarded a contract.

14. **Any PROPOSAL submitted by a Respondent is subject to negotiation and review of the proposed contract by Trans net's Legal Counsel.**

_____
_____

NAME OF RESPONDENT:

_____
_____

PHYSICALADDRESS:

_____
_____

Indent's contact person:	Name:	_____
	Designation:	
_____		
	Telephone:	
_____		
	Cell phone:	
_____		
	Facsimile:	
_____		
	Email:	
_____		

SECTION 2

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91)
WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

REQUISITION FOR QUOTATION

Refer Document attached hereto

REQUISITION FOR QUOTATION

MESSRS: ....
....
....
....

Tel (011)
Fax (011)

ISSUE DATE   30-05-2012

CLOSING
DATE   19-06-2012 (10h00)

	SUPPLY CHAIN SERVICES
	Contact: Neo Sekwati
	Tel: 011 584 0635

Prices in South African currency, including all costs.			
Direct to consignees			
ITEM NO:	**DESCRIPTION**	**QTY**	Price per each
1.	**As per the specification attached**		
Total price			
2.Prices must be V.A.T. exclusive			
3. Direct delivered to:	Heidelberg		
4.Contact person:	Neo Sekwati 011 584-0635		

5.COMPULSARY DOCUMENTS

NOTE
:5.1.Return of tender documents
The tender documents must be submitted on the closing date in **duplicate** and failure
To do so will automatically disqualify your offer.

5.2.The following documents are compulsory, and they must be attached to the tender
document
If **Not** your tender will not be considered.

a) Tax Clearance Certificate
b) Supplier Declaration Form

c) Current Vat Registration No.
d) BBBEE level certification and Score Card

6.   FRAUD HOTLINE

Transnet strives to be fair, equitable and just in all its dealings with tenderers. As such we encourage all tenderers to report any practice, activity or information that they are aware of or become aware of which may result in any perception of or actual fraud being committed against or in the name of Transnet. The hotline details are:-

Hotline telephone: 0800 003 056

Email: transnet@tip-offs.com
Fax: 0800 007 788
       All information received will be treated with the utmost confidentiality

7. BUSINESS ADJUDICATION CRITERIA:

7.1.**"Order winning criteria"**
7.1.1.Competitive pricing
7.2**. "Technical"**
7.2.1 Compliance to specification
7.2.2 Reference
7.2.3 Safety Plan
7.2.4 Compliance to Occupational Health and Safety Act
 7.3.**"BBBEE"**
7.3.1.Provide BBBEE level Certification

SIGNATURE OF TENDERER: _____   Date: _____

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

REQUEST FOR QUOTATION ("RFQ")

RFQ SITE MEETING

A COMPULSORY INFORMATION MEETING WILL BE HELD AT THE FOLLOWING VENUE:

Venue : 01 Viljoen Street, Heidelberg

Time : 10H00

Date : 13 June 2012

The site meeting is compulsory and companies not attending **will be overlooked** during the tender awarding process.

Contact people on sites: **THEUNS NEL 0834077918**

8.1. **ATTENDANCE CERTIFICATE**

This is to certify that…………………………………………………………………..

Representative/s of …………………………………………………………………….

Has/have today attended the Tender briefing in respect of the proposed:

……………………………………   ………………………………………..

TRANSNET'S REPRESENTATIVE   TENDERER'S REPRESENTATIVE

DATE :………………………………….

VERY IMPORTANT

ANY TENDERER NOT ATTENDING THE INFORMATION MEETING <u>WILL</u> AUTOMATICALLY BE EXCLUDED FROM THE BUSINESS AWARDING PROCESS

SIGNATURE OF TENDERER: **Date:**

COMPANY INFORMATION

9 .   STATEMENT OF WORK (S) SUCCESSFULLY CARRIED OUT BY THE TENDERER:

Tenderes are to advise which other companies have they successfully provided or are currently providing similar services.

Service Description	For whom done	Period	Contact person and Telephone or Cell number

SIGNATURE OF TENDERER: **Date: _____**

SECTION 4

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

SPECIFICATION

1 SCOPE

1.1 Identification

Hot Bearing Evaluator and Detector System (HBEDS)

1.2 System overview

The Hot Bearing Evaluator and Detector System shall measure the temperature of the wheel bearings on passing trains. These measurements shall be compared against pre-set alarm levels. If a measurement is evaluated to be above the alarm limits the system shall raise an alarm via the communication channels. The system shall also gather information on the bearing temperatures for statistical analysis and trending studies and communicate this via the communication channels.

1.3 Document overview

This document specifies the functional and interface requirements of a Hot Bearing Evaluator and Detector System (HBEDS) forTransnet Freight Rail.

2 APPLICABLE DOCUMENTS

2.1 Integrated documents

The following specifications, standards and drawings of the exact issue shown form a part of this specification to the extent shown herein. In the event of conflict between the referenced document and this specification, the contents of this specification shall be considered a superseding requirement.

CSE 1154-001 CAT-E48 (Latest issue)	Environmental specification of SPOORNET railway signalling systems.
CSE 1159 –001 CAT X48 (Latest issue)	Standard specification for documentation for signals equipment
-	SPOORNET Rolling stock catalogue
-	SPOORNET Permanent Way Instructions
BBB1715	Non-vital Train Presence Detector (TeePee)

3 REQUIREMENTS

3.1 System definition

The HBEDS shall consist of all the necessary track side components to measure the temperatures on all the bearings of a passing train and communicate the bearing data and alarm information to the identified personnel and systems. (See context diagram)

3.2 Context diagram

See Figure 1 in the appendix: Context Diagram

3.3 Interface Definitions

3.3.1 HBEDS to Integrated Train Condition Monitoring System (ITCMS) interface

3.3.1.1 The interface to the ITCMS shall consist of two communication channels, a primary and a secondary channel to connect the HBEDS to the ITCMS.

3.3.1.2 The primary channel shall be 100BASE-TX Ethernet over CAT5 UTP terminated with RJ-45 connectors and the secondary channel shall be serial communication channel (FIA/TIA-232-E).

3.3.1.3 The secondary communication channel shall be invoked (when configured) upon failure of the primary communication channel to connect to the ITCMS.

3.3.1.4 Transnet Freight Rail shall provide one or more of the following telecommunications channels:

3.3.1.4.1 10BASE-T Ethernet (or better) over CAT5 UTP terminated with RJ-45 connectors employing TCP/IP.

3.3.1.4.2 Direct cable connection (FIA/TIA-232-E).

3.3.1.4.3 Radio modems (FIA/TIA-232-E).

3.3.1.4.4 GPRS Cellular Telephone Network modems (for secondary channels only).

3.3.1.5 The HBEDS shall make provision for the following protocols:

3.3.1.5.1 FIA/TIA-232-E standard. Baudrate, number of data bits, stop and start bits shall be configurable to interface with the equipment.
  * The baud rate selection shall include 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.
  * The data bits selection shall include 7, 8 bits.
  * The stop bit selection shall include 1, 1.5, 2 bits.
  * The parity bit selection shall include None, Odd, Even, Mark, Space.
  * The flow control selection shall include "Xon / Xoff", "Hardware", "None".

3.3.1.5.2 GPRS Cellular Telephone Network with GPRS modems. The interface shall have the capability to interface with the GPRS modems by using Hayes compatible AT commands to control the modems.

3.3.1.5.3 The radio interface shall have the capability to interface with radio modems with FIA/TIA-232-Einterface and allow for the times to establish reception and transmission.

3.3.1.5.4 Ethernet 10/100 network employing TCP/IP.

3.3.1.5.5 The HBEDS shall switch over to the secondary communication channel in the event of primary communication channel failure. This function shall be configurable. The HBEDS shall initiate the communication to the ITCMS. The messages and protocol shall change to match the secondary channel.

3.3.1.5.6 The HBEDS shall contineosly check the primary channel, when in secondary mode to revert back when communications is re-established on the primary channel.

3.3.1.5.7 The HBEDS shall accommodate a message containing self-check configuration parameters from the ITCMS to the HBEDS. The message can include the following configuration options:
  * Execute the self-check after the passage of the train.
  * Execute the self-check after a certain period of time has elapsed. The duration between self-checks shall be configurable.
  * A combination of the above

3.3.1.5.8 The interface shall accommodate a message from the ITCMS to the HBEDS requesting a self-check. The message shall at least contain the following information:
  * Site Identification to identify the unit.
  * Self-check request identifier.

3.3.1.5.9 The interface shall accommodate a message from the HBEDS to the ITCMS acknowledging that the self-check message has been received. The message shall at least contain the following information:

- Site Identification to identify the unit.
- Acknowledgement identifier.
- System Status. (Self-check in progress, System acquiring train information, System Idle)

3.3.1.5.10 The interface shall accommodate a message from the HBEDS to the ITCMS to transfer hot bearing alarm information. The message shall at least contain the following information:

- Message Identifier
- Site Identification to identify the unit.
- Alarm sequence number
- Train Number, if available. If this information is not available the field shall be updated with a unique identifier.
- Total number of vehicles on the train
- Alarm Time
- Vehicle position in the train from the front (in the direction of train travel).
- Axle number on the train from the front (in the direction of train travel)
- Axle number on the vehicle from the front (in the direction of train travel)
- Wagon numbers if HBEDS is fitted with a tag reader
- Side of the vehicle where the alarm occurred with reference in the direction of train travel.
- Direction of travel
- Type of alarm (Absolute Alarm Level, Differential Alarm Level, Average Deviation Alarm Level.)
- Alarm level used for generating the alarm for the particular alarm type.
- Measured value

3.3.1.5.11 The interface shall accommodate a message from the ITCMS to the HBEDS acknowledging the successful transfer of hot bearing alarm information. The message shall also inform the HBEDS if the transfer was not successful. The message shall at least contain the following information:

- Site Identification to identify the unit.
- Acknowledgement identifier
- Result of the transfer

3.3.1.5.12 The interface shall accommodate a message from the HBEDS to the ITCMS to transfer the train condition information. The message shall at least contain the following information:

- Message Identifier.
- Site Identification to identify the unit
- Date and time of the passage of the train.
- Train Number, if available. If this information is not available the field shall be updated with a unique identifier.
- Direction of travel.
- Run in speed of the train
- Run out speed of train
- The outdoor ambient temperature.
- Number of axles on the train.
- Number of vehicles on the train.
- Length of the train in metres.
- Speed of each vehicle
- An entry for each axle containing the following information:
  - Axle sequence number on the train from the front (in the direction of train travel).
  - The axle number from the absolute front of the vehicle if the HBEDS fitted with a tag reader
  - Vehicle sequence number on the train from the front (in the direction

of train travel)
- Wagon numbers if HBEDS is fitted with a tag reader
- Vehicle Type
- Axle sequence number on the vehicle (in the direction of train travel).
- Temperature value for each measurement point on side one of the train in degrees Celsius.
- Temperature value for each measurement point on side two of the train in degrees Celsius.
- Speed of each axle in km/h.
- Distance to the next axle in millimetres

3.3.1.5.13 The interface shall accommodate messages, which will allow for the transfer of the configuration parameters from the HBEDS to the ITCMS. The messages shall at least contain the following information:
- Site Identification to identify the unit.
- Configuration parameter Identifier.
- Configuration values.

3.3.1.5.14 The interface shall accommodate messages, which will allow for the transfer of the configuration parameters from the ITCMS to the HBEDS. The messages shall at least contain the following information:
- Site Identification to identify the unit.
- Configuration parameter Identifier.
- Configuration values.

3.3.1.5.15 The interface shall accommodate a time syncronisation message from the ITCMS to the HBEDS.

3.3.1.5.16 The interface shall have sufficient error detection and correction algorithms to ensure data integrity.

3.3.2 HBEDS to Maintenance technician interface

3.3.2.1 This interface allows technicians to access the train condition information, train alarm information and configuration parameters at the HBEDS site. The interface also provides facilities to assist with maintenance activities, for example system self-checks and diagnostics.

3.3.2.2 All the hardware, software and firmware needed for the functioning of the maintenance technicians interface shall be delivered as part of this specification, complete with documentation as per specification CSE-1159-001 CAT X48 and per par. 7.2 of this document.

3.3.2.3 The HBEDS shall accommodate a means of configuring self-check configuration parameters. The self-check configuration parameter options shall include the following:
- Execute the self-check after the passage of the train.
- Execute the self-check after a certain period of time has elapsed. The duration between self-checks shall be configurable.
- A combination of the above.

3.3.2.4 Access to the interface shall be password protected and the technician shall be able to change the password.

3.3.2.5 The interface shall accommodate a message from the maintenance technician to the HBEDS requesting a self-check on the system.

3.3.2.6 The interface shall accommodate a message from the HBEDS to the maintenance technician informing that a self-check is in progress. The message shall contain at least the system status information, i.e. Self-check in progress, system acquiring train information etc.

3.3.2.7 The interface shall accommodate a message from the HBEDS to the maintenance technician informing the results of the Self-Checks.

3.3.2.8 The interface shall accommodate a message from the maintenance technician to the HBEDS allowing modification of configuration parameters in the HBEDS. The message shall at least contain the following information:

- Configuration parameter to be modified.
- Parameter value.

3.3.2.9 The interface shall accommodate a message for the transfer of hot bearing alarm information from the HBEDS to the maintenance technician. The reply message shall contain data as per par.3.3.1.5.10

3.3.2.10 The interface shall accommodate a message to transfer the train condition information from the HBEDS to the maintenance technician. The reply message shall contain data as per par.3.3.1.5.12

3.3.2.11 The interface shall make provision for the entering, editing and deleting of vehicle axle patterns stored in the HBEDS.

3.3.3 HBEDS to Train presence detector interface

3.3.3.1 Transnet Freight Rail employs equipment at measurement sites to determine if a train is present at the measurement site (TeePee). This information shall also be available to the HBEDS if needed.

3.3.3.2 The interface shall be a voltage free contact open when a train is not present and closed when a train is present within at least 10 meters and not more than 20 meters from the measurement point.

3.3.4 HBEDS to On-board Computer System interface

3.3.4.1 The Telecommunications channel shall be serial (FIA/TIA-232-E).

3.3.4.2 Transnet shall make provision for one or more of the following channels:

3.3.4.2.1 Radio modems (FIA/TIA-232-E).

3.3.4.2.2 GPRS Cellular Telephone Network modems (for secondary channels only).

3.3.4.3 The HBEDS shall make provision for the following protocols:

3.3.4.3.1 FIA/TIA-232-E standard. Baudrate, number of data bits, stop and start bits shall be configurable to interface with the equipment.

- The baud rate selection shall include 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.
- The data bits selection shall include 7, 8 bits.
- The stop bit selection shall include 1, 1.5, 2 bits.
- The parity bit selection shall include None, Odd, Even, Mark, Space.
- The flow control selection shall include "Xon / Xoff", "Hardware" and "None".

3.3.4.3.2 GPRS Cellular Telephone Network with GPRS modems. The interface shall have the capability to interface with the GPRS modems by using Hayes compatible AT commands to control the modems.

3.3.4.3.3 The radio interface shall have the capability to interface with radio modems with FIA/TIA-232-E interface and allow for the time constraints to establish reception and transmission.

3.3.4.4 The HBEDS shall have extra serial ports to facilitate this interface.

3.3.4.5 The interface shall accommodate a message from the HBEDS to the on-board communications system to transfer hot bearing alarm information. The message shall at least contain the following information:

- Message Identifier
- Site Identification to identify the unit.
- Alarm Train Number, if available. If this information is not available the field shall be updated with a unique identifier.
- Total number of vehicles on the train.
- Alarm Time
- Vehicle position in the train from the front (in the direction of train travel).
- Axle number on the train from the front (in the direction of train travel)
- Axle number on the vehicle from the front (in the direction of train travel)
- Wagon numbers if HBEDS is fitted with a tag reader
- Side of the vehicle where the alarm occurred with reference in the direction of train travel.
- Direction of travel
- Type of alarm (Absolute Alarm Level, Differential Alarm Level, Average Deviation Alarm Level.)
- Alarm level used for generating the alarm for the particular alarm type.
- Measured value

3.3.4.6 The interface shall accommodate a message from the on-board communications system to the HBEDS acknowledging the successful transfer of hot bearing alarm information. The message shall also inform the HBEDS if the transfer was not successful. The message shall at least contain the following information:

- Site Identification to identify the unit.
- Acknowledgement identifier
- Result of the transfer

3.3.4.7 The interface shall accommodate a message from the on-board communications system to the HBEDS to notify that the HBEDS did not detect any hot bearing alarms when the train was passing the site. The message shall at least contain the following information:

- Site identification to identify the unit.
- Train number if available
- "No hot bearing alarm" message

3.3.4.8 The interface shall accommodate a message from the on-board communications system to the HBEDS acknowledging the successful transfer of "no hot bearing alarm" information. The message shall also inform the HBEDS if the transfer was not successful. The message shall at least contain the following information:

- Site Identification to identify the unit.
- Acknowledgement identifier
- Result of the transfer

3.3.5 HBEDS to Train interface

3.3.5.1 The HBEDS system shall interface to the train to determine train composition.

3.3.5.2 The system shall identify the vehicle type for all vehicles irrespective of their position in the train. If a vehicle cannot be identified it shall be marked accordingly. The different classifications are:

- Locomotive.
- Wagon.
- Unidentified vehicle.

3.3.5.3 Vehicle wheel patterns of vehicles used by Transnet Freight Rail are available as reference to identify vehicle types (SPOORNET Rolling stock catalogue).

3.3.5.4 The train length can be from a single vehicle to train lengths of more than 400 vehicles.

3.3.5.5 The HBEDS shall generate and send an alarm message to the ITCMS if the HBEDS encounter a train that consists of more than the systems capability.

3.3.5.6 Locomotives can be situated anywhere in the train consist.

3.3.5.7 The train speed can vary from 0km/h to 150km/h over the measurement site.

3.3.5.8 Train movements at a measurement site can be bi-directional.

3.3.5.9 A train can stop and change direction on the measurement site.

3.3.5.10 The HBEDS shall be able to accommodate train acceleration / deceleration over the measurement site.

3.3.5.11 Wheel sensors installed on the rail shall be congruent with Transnet Freight Rail signalling system, railway environment and rolling stock wheel profiles.

3.3.6 HBEDS to Infrastructure interface

3.3.6.1 The HBEDS system shall interface to the existing infrastructure of Transnet Freight Rail.

3.3.6.2 The electrical supply voltage shall be 220V ± 20% at 50 Hz.

3.3.6.3 One or more of the following telecommunications channels shall be provided:

3.3.6.3.1 10BASE-T Ethernet (or better) telecommunications equipment.

3.3.6.3.2 GSM network

3.3.6.3.3 Radio communication equipment

3.3.6.3.4 FIA/TIA-232-E Telecommunications equipment.

3.3.6.4 The system shall be suitable for operation in 3-kilovolt DC traction, 25-kilovolt AC traction, and 50 kilovolt AC traction areas as well as the contamination caused by diesel locomotives.

### 3.3.7 HBEDS to Vehicle bearing interface

3.3.7.1 The HBEDS system shall interface to the bearings on the vehicle to determine the bearing temperature.

3.3.7.2 The position of the centre line of different types of roller bearings in relation to the rail is shown in Figure 3 for all the roller bearings used by Transnet Freight Rail. The surface area to be measured on the roller and friction bearing is indicated in Figure 4. The geometry of the track relative to the roller bearings is shown in Figure 5.

3.3.7.3 The train's lateral movement can be up to 98 millimetres relative to the rail.

3.3.7.4 Some of the bogie types employed in Transnet Freight Rail might obscure the effective measurement area of the bearing, especially if the measurement is made at an angle to the vertical centre line. See par 2.1 "Applicable documents ".

3.3.7.5 The bearings temperature can be between ambient temperature and 1000 Degrees Celsius. The accuracy of the measurement shall be within 2 percent.

3.3.8 HBEDS to Tag Reader Interface

3.3.8.1 The HBEDS system shall obtain the vehicle identification information directly from the tag on the vehicle.

3.3.8.2 The tags fitted to the wagons are Amtech AT5110 passive tags.

3.3.8.3 Every wagon has two tags placed as shown:
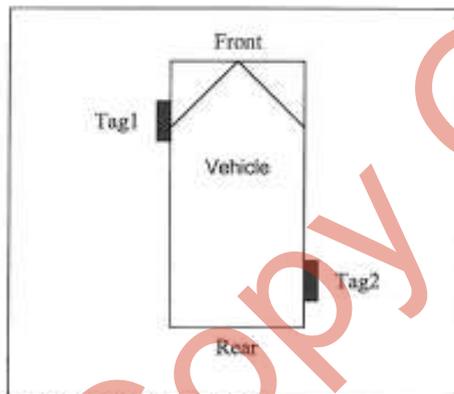
Tag positions for configuration 1

3.3.8.4 The information is captured in two lines of 10 characters each in the tag. The first line is for locomotive or wagon type, which can be up to 5 characters. The second line is for locomotive or wagon number and side where the first eight positions are reserved for the locomotive or wagon number, then a space or underscore and the last character is for the side, which can be either a "1" or a "2".

For example:

For a wagon:

```
C C R 1 _ _ _ _ _ _        (CCR1)
6 3 0 1 3 2 7 4 _ 1        (63013274 tag 1)
```

or for an electric locomotive:-

```
7 E 1 _ _ _ _ _ _ _        (7E1)
E 7 1 0 1 _ _ _ _ 1        (E7101 tag 1)
```

or for a diesel locomotive:-

```
3 4 D 2 _ _ _ _ _ _        (34D2)
D 3 4 2 1 5 _ _ _ 2        (D34215 tag 2)
```

3.3.8.5 The wagon orientation is deduced from the information stored in the tag. If a "1" tag is read from the left side of the train when looking in the direction of travel then the orientation will be "Front". If a "2" tag is read from the left side of the train when looking in the direction of travel then the orientation will be "Rear".

4 TRANSNET FREIGHT RAIL SUPPLIED PROPERTY LIST

- Measurement sites: Transnet Freight Rail shall determine the sites for the installation of HBEDS.
- Electricity supplies shall be provided by Transnet Freight Rail at every site where it is required.

5 TRANSNET FREIGHT RAIL LOANED PROPERTY LIST

Not applicable.

6 SYSTEM CHARACTERISTICS

6.1 Performance characteristics.

6.1.1 Configure the HBEDS

6.1.1.1 The HBEDS shall be configured with a local MMI system.

6.1.1.2 The HBEDS shall be configured with the applicable alarm levels, communication channels selected and all the relevant settings needed to successfully communicate to the ITCMS.

6.1.1.3 The HBEDS shall keep configuration parameters in a non-volatile storage medium.

6.1.1.4 In the event of a power failure the HBEDS shall start up using the stored parameters.

6.1.1.5 The HBEDS shall be able to recover and be fully operational after a power failure.

6.1.1.6 It shall be possible to configure the HBEDS remotely by the ITCMS.

6.1.1.7 The configuration parameters can be modified by the system itself due to changes in the operational environment, or by the maintenance technician with manual intervention.

6.1.1.8 The HBEDS shall automatically store and communicate modified system configuration parameters to the ITCMS.

6.1.1.9 Access to configuration parameters shall be password protected and all stored passwords shall be encrypted.

6.1.2 Initialise the HBEDS

The HBEDS shall use the configuration data initialising the system to be in a ready state for operation.

6.1.3 Detect Train

6.1.3.1 The HBEDS shall detect the presence of a train in time to be ready for measurements.

6.1.3.2 The following two failure modes can occur if a TeePee is used:

- The input fails to inform the system that a train is present.
- The input fails to inform the system that a train has passed.

6.1.3.3 The HBEDS shall detect the first failure mode when wheel pulses for at least two axles are detected but no "TRAIN PRESENT" signal is received on the "Train Presence" input.

6.1.3.4 The HBEDS shall detect the second failure mode when a configurable time (e.g. 12 hours) has passed without the "TRAIN PRESENT" signal falling away on the "Train Presence" input.

6.1.3.5 The HBEDS shall also detect the second failure mode when more than a configurable number of wheels are detected without the "TRAIN PRESENT" signal falling away (e.g. two train lengths).

6.1.3.6 If one of the two faults occurs, the "TRAIN PRESENT" signal shall be ignored and a configurable time–out method for detecting the end of the train shall be used for all subsequent trains.

6.1.3.7 This method of working shall be used until the technician performed corrective maintenance and the TeePee operates correctly again.

6.1.3.8 This failure condition shall be communicated as a self-check failure.

6.1.3.9 This condition shall form part of all subsequent self-check reports, until it is reset.

6.1.4 Time Stamp

The HBEDS shall time stamp the train detection event. The time stamp shall be date and time with the time resolution in ddmmyyyy hh:mm:ss.

6.1.5 Detect Wheels

The HBEDS shall detect the wheels of passing vehicles to count axles and to determine the position of the bearings in relation to the measurement equipment.

6.1.6 Determine Speeds

6.1.6.1 The HBEDS shall determine the run-in, run out, and average speed of the train and the speed for each vehicle.

6.1.6.2 The speed shall be measured within an accuracy of 2% and rounded to a resolution of 1 km/h.

6.1.7 Determine Train Direction

6.1.7.1 The HBEDS shall determine the direction of travel of the passing train for each axle.

6.1.7.2 The direction shall be stored for inclusion into the train condition information.

6.1.7.3 The HBEDS shall detect a train stopping on the detection site.

6.1.7.4 The HBEDS shall maintain train composition in cases where a train stops on the measurement site and changes direction.

6.1.7.5 In the event of a train stopping and changing direction, the maximum value obtained for the bearings being measured more than once shall be stored.

6.1.8 Count Axles

6.1.8.1 The HBEDS shall count all axles on the train.

6.1.8.2 The total axle count of the train shall be independent of the direction of travel.

6.1.8.3 Axles shall be sequentially numbered from the front of the train, starting at axle one.

6.1.8.4 Should the direction of travel of the train change during the passage of the train the system shall continue to keep track of the axles.

6.1.8.5 The HBEDS shall adjust the axle count each time the direction of travel changes as to reflect the total number of axles on the train past the measurement site.

6.1.8.6 The HBEDS shall continue counting the axles once the train starts moving again after it has stopped on the measurement site.

6.1.9 Detect Axles Missed

6.1.9.1 The HBEDS shall detect missed axles and record the positions where the missed axle has occurred.

6.1.9.2 The miscount rate shall be better than one axle in five million axles processed.

6.1.9.3 The HBEDS shall generate an error message reporting to the ITCMS that miscounting occurred and the position in the train consist of the miscount(s).

6.1.10 Recover from Axles Missed

6.1.10.1 In the case of an axle missed the HBEDS shall recover and continue to obtain the correct footprints for the remaining vehicles.

6.1.10.2 The HBEDS shall still be able to correctly allocate, measure bearings and generate alarms after axle detection has failed.

6.1.11 Determine Axle Distances

6.1.11.1 The HBEDS shall determine the distances between the successive axles.

6.1.11.2 The distances shall be accurate to plus minus 50 millimetres and rounded to a resolution of 10 millimetres.

6.1.12 Measure Bearing Temperatures

6.1.12.1 The HBEDS shall measure the temperature of all the bearings on passing trains.

6.1.12.2 The measurement shall be presented in degrees Celsius.

6.1.12.3 The ambient temperature shall not influence the bearing temperature measurements adversely.

6.1.12.4 The HBEDS shall obtain and process temperature measurements for each bearing on the train within the following constraints:

- Irrespective of the direction of travel.
- For train speeds from 0 km/h to 150 km/h.
- Irrespective of train acceleration or deceleration up to 2m/s2.
- Changes in train direction whilst the train is still detected on site.

6.1.12.5 The measurement result shall be immune to the train's lateral movement and vertical movement as described in the "HBEDS to Vehicle Bearing Interface" paragraph, par.3.3.7.

6.1.13 Store Temperature Measurements

The HBEDS shall store bearing temperature measurements in a non-volitile format.

6.1.14 Compile Train Consist

The HBEDS shall compile a train consist using the wheel patterns as per par.3.3.5. and by implementing the algoritns as explained in "The use of pattern recognition algorithms in an Automatic Vehicle Identification system" – see Appendix.

6.1.15 Identify Vehicle Types

6.1.15.1 The HBEDS shall identify the vehicle type for all vehicles irrespective of their position in the train.

6.1.15.2 A vehicle type that cannot be identified shall be marked accordingly. The different classifications are described in the interface paragraph "Train interface", par.3.3.5

6.1.15.3 The vehicle types shall be determined by the measured footprints of the vehicles.

6.1.16 Identify Bearing Types

6.1.16.1 The system shall identify the bearing type of each axle passing the measurement site.

6.1.16.2 Classification shall be either a "roller" bearing or a "friction" bearing.

6.1.16.3 A bearing type that cannot be identified shall be indicated as "unknown".

6.1.16.4 The classification of the bearing type can be done using the average running temperature of the two bearing types. In the case of a friction bearing the average running temperature is 40 degrees Celsius and for the roller bearing this value is 75 degrees Celsius at an ambient temperature of 25 Degrees Celsius.

6.1.16.5 The average running temperature of the different bearing types shall be configurable.

6.1.17 Generate Alarms

Alarms shall be generated as follows:

6.1.17.1 Absolute alarm level - The measured value of the bearing is compared against the absolute alarm value. An alarm is generated when the measured value reaches the configured absolute alarm value.

6.1.17.2 Differential alarm level - The measured value of the left bearing is compared against the measured value of the right bearing. An alarm is generated when the difference between the two measured values exceeds the configured differential alarm value.

6.1.17.3 Average Deviation Alarm Level - The measured value of each bearing is compared against the average of all the bearings on the train. An alarm is raised when the difference between the measured value and the average value exceeds the configured average deviation alarm value.

6.1.17.4 The HBEDS shall not generate hot bearing alarms if it detects heat sources other than the target area of the bearing.

6.1.18 Combine Alarms & Conditions with Train Consist

The HBEDS shall link the alarms and measurements with the correct vehicles in the train consist.

6.1.19 Store Bearing Information

6.1.19.1 The HBEDS shall store alarm and bearing measurement information.

6.1.19.2 The information shall be as per par 3.3.1.5.10 and par 3.3.2.11 per alarm.

6.1.19.3 The system shall store train condition information and hot bearing alarm information in non-volatile memory.

6.1.19.4 The HBEDS shall make provision to store information for a configurable amount of trains up to a 1000 trains. The principle of a "ring buffer" shall be used to store and replace data.

6.1.20 Receive Self check Request

The system shall be able to receive self-check request messages from the ITCMS and the maintenance technician interface. Possible self-check requests shall include:

* Execute the self-check after the passage of the train.
* Execute the self-check after a certain period of time has elapsed. The duration between self-checks shall be configurable.
* A combination of the above.

6.1.21 Perform Self Checks

6.1.21.1 The system shall be able to process a self-check request on all critical components needed to successfully detect and communicate a hot bearing alarm to the ITCMS.

6.1.21.2 The request can be generated automatically in accordance with the self-check configuration settings, or on request from the ITCMS or the maintenance technician interface. Refer to paragraph 3.3.1 "HBEDS to ITCMS interface" and paragraph 3.3.2 "HBEDS to maintenance technician interface".

6.1.21.3 Sufficient self-checks to verify the functionality of the system shall be utilised. The self-check shall include at least the following critical functions:

- All temperature measurements
- Wheel detection
- Train present detection
- Integrity tests (e.g. hot bearing alarm detection, measurement accuracy)

6.1.21.4 If the HBEDS detects the presence of a train while performing a self-check the system shall abort the test if necessary and give priority in measuring the train.

6.1.21.5 The HBEDS shall communicate to the self-check requestor that the self-check has been aborted due to the presence of the train.

6.1.22 Generate Self Check Messages

6.1.22.1 The system shall record and communicate the self-check results on the interface that requested the self-check. The message shall contain at least the following information:

- Site Identification to identify the unit.
- Date and Time when the self-check was executed.
- The result of the self-check.
- The equipment that has failed the self-check.

6.1.23 Receive Time Synchronisation

The HBEDS shall be able to receive time synchronisation messages from the ITCMS. See par. 3.3.1.5.15.

6.1.24 Perform Time Synchronisation

The HBEDS shall update all HBEDS subsystems immediately with the latest time received from the ITCMS.

6.1.25 Communicate to On-Board Computer System

The system shall communicate to the OBCS hot bearing alarms or if no hot bearing alarms were found on the train. Refer to paragraph 3.3.4 "On-board communication interface" for interface details. This function shall be configurable to be enabled or disabled.

6.1.26 Communicate with ITCMS

6.1.26.1 The HBEDS shall transmit and receive information to/from the ITCMS as described in the interface paragraph par 3.3.1 "HBEDS to Train Condition Monitoring System (ITCMS) interface"

6.1.26.2 The hot bearing alarms and bearing temperatures shall be communicated to the ITCMS. Hot bearing alarms shall be immediately communicated after completion of the analysis on the measurement results.

6.1.26.3 After all alarm messages have been communicated, the HBEDS shall communicate the train condition information to the ITCMS.

6.1.26.4 Absolute alarms shall be communicated to the ITCMS in real time. All other alarms shall be communicated in no more than 30 seconds after the last axle has left the measurement site.

6.1.26.5 In the event of a train stopping on the detector site, the train shall be processed to identify any hot bearing alarms for all the vehicles that have passed the measurement point.

6.1.26.6 All system failures and conditions that are not included as part of self-checks shall be communicated to the ITCMS.

6.1.27 Detect Primary Channel Communication Loss

The HBEDS shall continously monitor for communications on the primary telecommunications channel.

6.1.28 Change to secondary telecommunications channel

6.1.28.1 The HBEDS shall change to the secondary telecommunications channel if the primary telecommunications channel fails subjected to configuration parameters.

6.1.28.2 The HBEDS shall change back to the primary channel if it could not establish communications in the configured time on the secondary channel.

6.1.28.3 The HBEDS shall change back automatically to the primary telecommunications channel when communications is re-established.

6.1.28.4 The HBEDS shall employ a "hunting" process to maintain communications.

6.2 Physical characteristics

6.2.1 The system excluding track-mounted equipment shall be installed in a relay room or equipment container.

6.2.2 The equipment in the container or room of the HBEDS shall not exceed 1 metre deep by 1.5 metres wide by 2 metres high.

6.2.3 The HBEDS shall be a fixed installation in a suitable rack or cabinet.

6.2.4 The rack or cabinet shall have lockable castors.

6.2.5 The rack or cabinet shall be accessible from the front and back with hinged doors.

6.2.6 The rack or cabinet shall have sufficient fans and ventilation for cooling.

6.2.7 All track mounted equipment and trackside equipment shall be clear of the minimum structure gauge as defined in the Permanent Way Instruction manual.

6.2.8 All equipment mounted on the sleepers or attached to the rail shall be lower than 100mm from crown height.

6.2.9 Effective deflector plates shall be installed to protect rail mount components from dragging equipment.

6.2.10 The HBEDS shall have sufficient serial ports to accommodate all the serial-based interfaces.

6.2.11 Rail mount equipment shall be protected sufficiently against the overhang of wheels from road-type vehicles travelling on the rails.

6.2.12 The hardware platform shall be a server computer and not a personnel computer if the HBEDS requires a commercial hardware platform.

System availability factors

6.2.13 Mean time between failures for any electronic sub-system shall not be less than 12 months.

6.2.14 The system shall provide test points to measure the various input and output signals from each subsystem using external measurement instruments.

6.2.15 The system shall provide sufficient diagnostic outputs to aid the maintenance technician with corrective maintenance.

6.2.16 The design shall include features to reduce dust build-up and routine maintenance to a minimum. The mounting of the unit shall be such that it facilitates easy set-up and alignment. Resetting and realignment shall be reduced to the absolute minimum.

6.3 Environmental conditions

6.3.1 All equipment shall comply with the relevant sections of Infrastructure (Signals) standard specification no. CSE-1154-001 CAT E48 as applicable to both coastal and inland areas.

6.3.2 Track-mounted, trackside and train-mounted equipment shall operate in ambient temperatures varying from -15 to 50 degrees Celsius, with humidity ranging from 0 to 95% non-condensing. The thermal design of the system shall be such that the increased temperature experienced by system components caused by system packaging and exposure to direct sun light, shall not influence the operation and reliability of the system.

6.3.3 All track-mounted, track side and office equipment shall have comprehensive lightning protection to enable the equipment to withstand, without damage or loss of functionality, severe lightning activity, except for a direct hit. The lightning protection shall comply with the relevant sections of Infrastructure (Signals) standard specification no. CSE-1154-001 CAT E48.

6.3.4 Track-mounted, trackside and train-mounted equipment shall not be adversely affected by exposure to full sunlight, rain, snow, hail or dust.

6.3.5 Track-mounted, track side and train-mounted equipment shall be resistant to spillage from bulk loads commonly found in the railway environment, e.g. coal, lime, sulphur, petroleum products and salts.

6.3.6 Track-mounted, trackside and train-mounted equipment shall be resistant to vandalism, flying ballast stones and equipment dragging from the train.

6.3.7 All track-mounted and trackside equipment shall be capable of withstanding, without damage or loss of functionality, the vibration experienced with the passage of a train. Vibration resistance shall comply with the relevant sections of Infrastructure (Signals) standard specification no. CSE-1154-001 CAT E48.

6.3.8 Electromagnetic susceptibility and radiation limits of the system and all its components shall comply with Infrastructure (Signals) standard specification no. CSE-1154-001 CAT E48.

6.4 Portability

6.4.1 All spare replacement modules shall be small enough to be handled by one technician.

6.4.2 Special packaging that is required for any module in this environment shall be supplied as part of the system.

6.5 Transportability

6.5.1 All spare replacement modules shall be small enough so that it can be transported to site in the boot of a car or on the back of a one ton truck ("bakkie") with a canopy on a service road.

6.5.2 Special packaging that is required for any module in this environment shall be supplied as part of the

system.

6.6 Fail-safety requirements

6.6.1 Although the system is not viewed as a fail-safe system, the mission of the system is critical in the operations of Transnet Freight Rail.

6.6.2 A Failure Mode Effects and Criticality Analysis down to sub-system level shall be supplied.

6.7 Flexibility and expansion

Not applicable

7 GENERAL REQUIREMENTS

7.1 Design and construction

7.1.1 Nameplates and markings

All hardware shall be equipped with durable manufacturer's nameplates bearing at least unit identification, the manufacturer's name, date of manufacture, a serial number, revision number with the current revision status marked, operating voltage and power requirements.

7.1.2 Materials, processes and parts

7.1.2.1 All materials used in the system shall be at least industrial grade.

7.1.2.2 Where possible, materials used shall be SABS approved.

7.1.2.3 Parts shall be supplied with a certificate of origin.

7.1.2.4 All parts shall be available from two independent manufacturers for at least ten years.

7.1.2.5 For critical parts where a second manufacturer cannot be found, stock to allow for production and maintenance for ten years shall be purchased.

7.1.2.6 All dimensions and bolt and nut sizes shall use the Metric standard.

7.1.3 Reliability

7.1.3.1 Mean time between failures for any electronic sub-system shall not be less than 12 months. The contractor shall provide data, which proves these figures.

7.1.3.2 Mean time to replace a faulty module shall be less than 30 minutes (actual working time only).

7.1.3.3 The WTMS shall not be dependant on periodic virus protection updates or checks for reliable operation.

7.1.4 Workmanship

Suitably skilled personnel shall do installation and commissioning.

7.1.5 Interchangability

Not Applicable.

7.1.6 Safety

7.1.6.1 All work shall be conducted within the regulations stipulated in Act 85 of 1993

(Occupational Safety Act) or the latest revision.

7.1.6.2 All trackside work shall be done in accordance with safety procedures laid down by the by Maintenance manager.

7.2 Documentation

7.2.1 The system and its components shall be fully documented in English in compliance with Infrastructure (Signals) standard specification no. CSE-1159-001.

7.2.2 The list of documents that shall be supplied and their contents is described in Standard Specification CSE-1159-001 Category X48.

7.2.3 The technical documentation shall contain all the relevant information of the interfaces to the system in addition to the requirements of standard specification no. CSE-1159-001,

7.2.4 The documentation shall include a full description of the hardware, protocols and message contents used on all interfaces.

7.2.5 The documentation shall be adequate to enable the technical staff of Transnet Freight Rail to be able to interface with the system for purposes of upgrading the HBEDS, extraction of information or integration into existing infrastructure systems.

7.2.6 All decision models to determine alarms and bearing types shall be fully documented and supplied to TFR.

7.2.7 "As Built" set of drawings shall be delivered for each installed HBEDS site.

7.2.8 All documentations and software shall be delivered on CD to TFR apart from the hard copies as prescribed in Standard Specification CSE-1159-001 Category X48.

7.2.9 A functional product specification derived from the functionality in this specification as well as the allocation of the functions to the sub-systems shall be supplied to Spoornet. All future functional changes shall be captured in this product specification before being implemented.

7.2.10 All printed manuals shall be delivered in high quality plastic covered 4 ring binders.

7.3 Logistics

7.3.1 Maintenance

7.3.1.1 Preventative maintenance shall be reduced to the minimum.

7.3.1.2 Any required preventative maintenance should be clearly defined in the maintenance documentation.

7.3.1.3 Preventative maintenance on track-mounted and trackside equipment shall not be required more than once in 3 months.

7.3.1.4 During preventative maintenance, any component on site shall not require more than 30 minutes of work, averaged over the whole installation for one maintenance cycle.

7.3.1.5 An Engineering Technician shall execute first line maintenance with specific training in the functional operation of the system at unit level.

7.3.1.6 An Engineering Technician shall execute second line maintenance with specific training in the operation of the system at component level.

7.3.1.7 All specialised measurement and alignment equipment shall be supplied with the system. The measurement and alignment equipment shall be evaluated by TFR to determine their suitability.

7.3.1.8 All maintenance procedures shall be supplied with the system. The procedures shall be evaluated by TFR to determine their suitability

7.3.1.9 A toolbox equipped with all the necessary high quality hand tools necessary to maintain the HBEDS shall be provided per TFR HBEDS maintenance technician.

7.3.2 Supply

7.3.2.1 Procurement shall be through the standard TRANSNET procedures for the purchase of Railway Signalling Material.

7.3.2.2 The supplier shall guarantee continued local availability of all components of the system, as well as frequently used spares of the components, for a contractually specified period of at least 10 years.

7.3.2.3 The supplier shall guarantee delivery of replacement components or spares for faulty items within 4 weeks of placement of the order.

7.3.2.4 Components that are critical to the functioning of the system shall be available immediately.

7.3.2.5 A comprehensive "recovery" procedure with "ghost" disks where applicable, shall be delivered with each installed HBEDS to enable the TFR maintenance personnel to repair the HBEDS after a catastrophic failure, for example hard disk crashes.

7.4 Personnel and training

7.4.1 Personnel

7.4.1.1 Skilled technicians (T3 / S4) or semi-skilled maintainers will do first line maintenance. This staff will generally not be computer-literate.

7.4.1.2 Highly skilled electronics technicians will do second line maintenance. They will be computer literate.

7.4.1.3 Highly skilled electronics Technicians, Technologists or an Engineer will do third line backup. This staff will have a high level of computer literacy.

7.4.2 Training

7.4.2.1 The supplier shall provide theoretical and practical training in all aspects of operation of the system and first and second line maintenance to a core group of approximately 20 technicians and trainers. This training shall not exceed two weeks.

7.4.2.2 The supplier shall provide extensive theoretical and hands-on training covering the entire system to a group of third line technicians and/or technologists and/or engineers (not exceeding 10). This training shall not exceed one week.

7.4.2.3 The supplier shall submit all course material and syllabus for approval by Transnet Freight Rail prior to training taking place.

8 QUALITY ASSURANCE

8.1 Responsibility for tests

8.1.1 The contractors shall be responsible for the execution of the tests.

8.1.2 The minimum tests to be performed shall be those determined by mutual consent between Transnet Freight Rail and the contractor.

8.1.3 The responsibility for proving the test results shall reside with the contractor.

8.1.4 The contractor shall document the tests and test results in full.

8.1.5 All tests shall be observed and signed-off by the duly appointed representative of Transnet Freight Rail.

8.1.6 Any tests requiring the use of rolling stock shall be arranged by Transnet Freight Rail given sufficient notice by the contractor.

8.2 Tests and examinations

8.2.1 The tests shall be executed to test the functionality of the system using a holistic approach.

8.2.2 The tests shall trace the flow of information to and from the various subsystems to ensure the correctness of information throughout the system.

8.2.3 The tests shall firstly verify correct operation under normal conditions. The tests shall then be repeated using data with known fault content to verify the operation under fault conditions.

8.2.4 The test procedure shall be documented by the contractor in an ACCEPTANCE TEST PROCEDURE (ATP) document.

8.2.5 The ATP shall be presented to Transnet Freight Rail for approval before installation of the HBEDS.

8.2.6 The contractor shall make any changes to the ATP, deemed necessary by Transnet Freight Rail.

8.2.7 Once approved, this ATP together with the System Specification shall be used to determine system compliance during commissioning.

9 APPENDIX
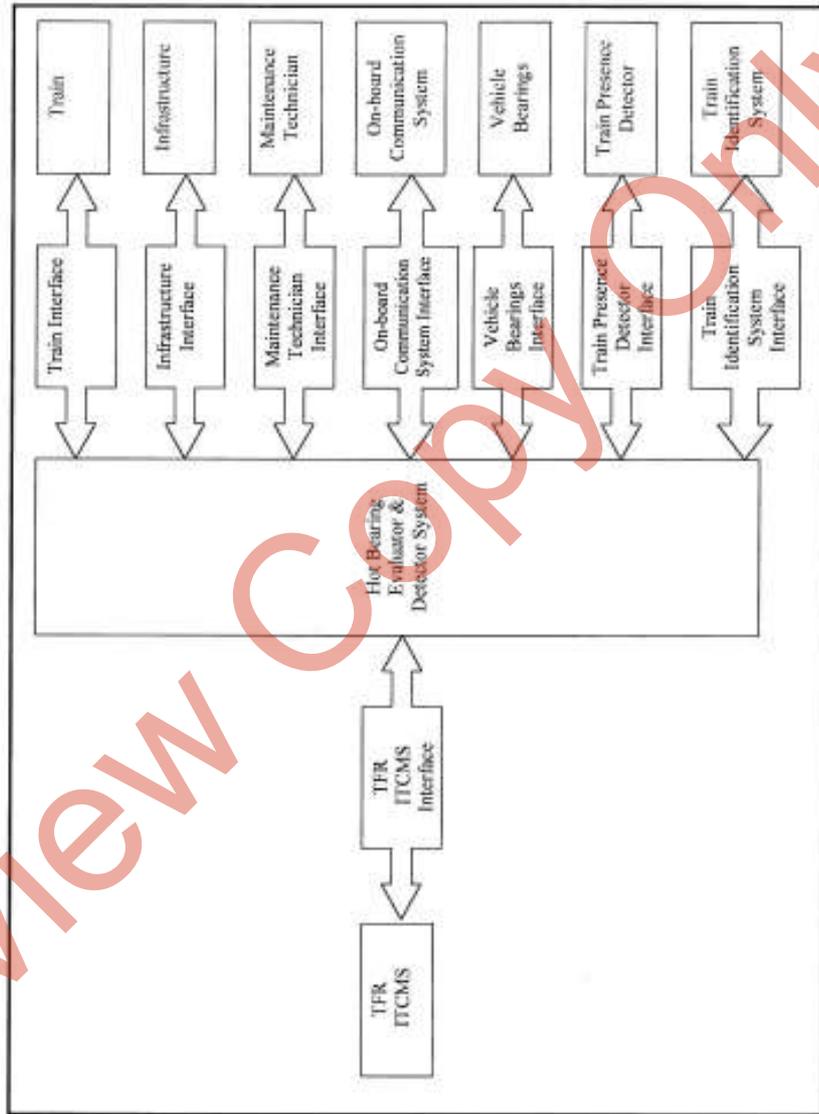
Figure 1: Context diagram
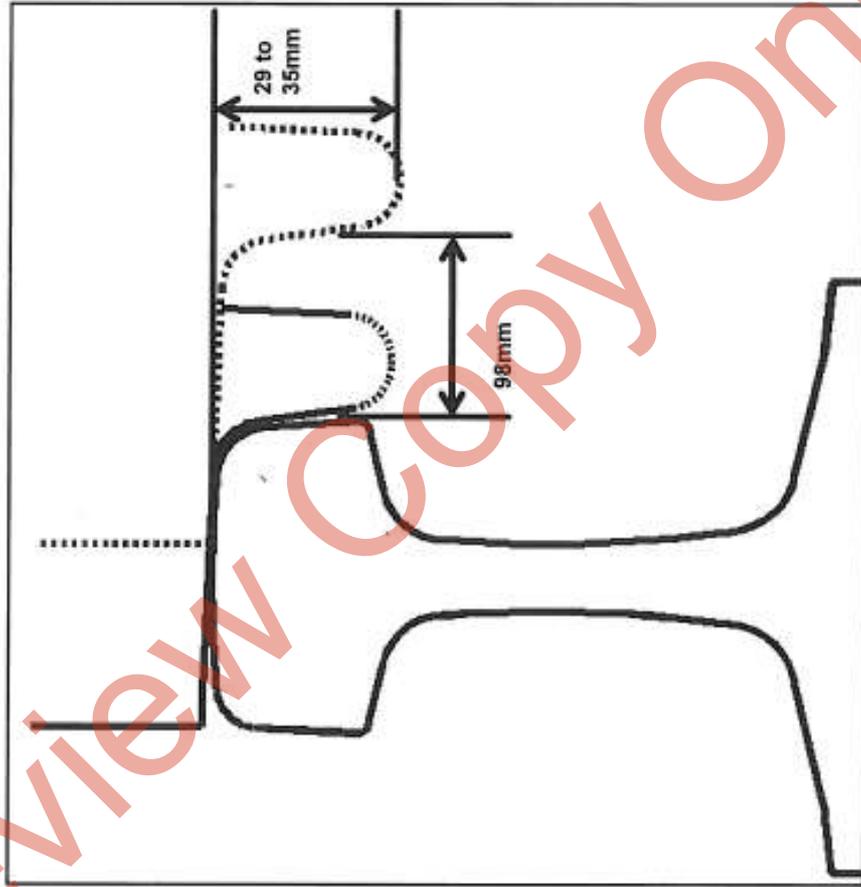
Figure 2: Maximum lateral wheel movement and flange depth.
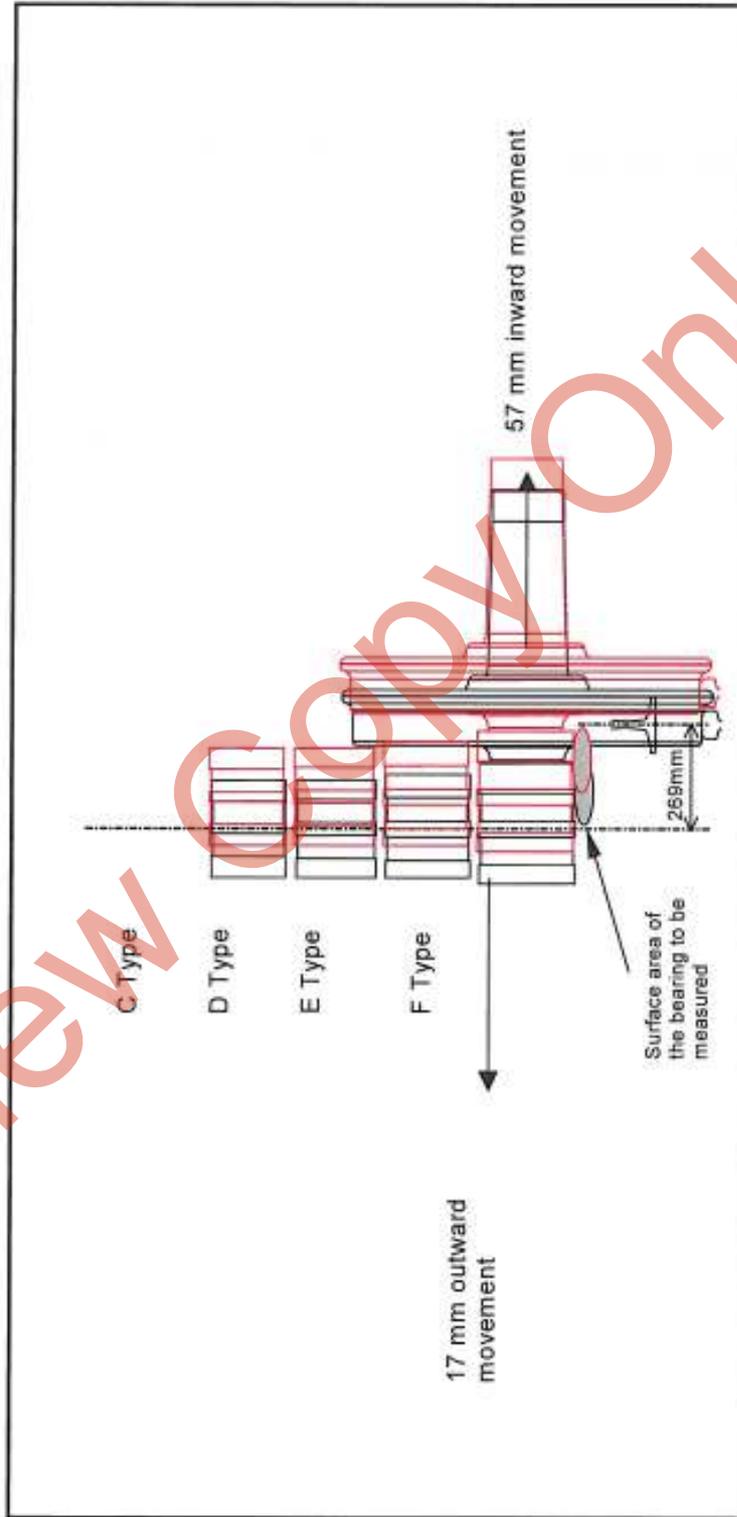
Figure 4: Measuring position on roller bearings, showing inward and outward lateral movement possible

57 mm inward movement

17 mm outward movement

Surface area of the bearing to be measured

269mm

C Type

D Type

E Type

F Type
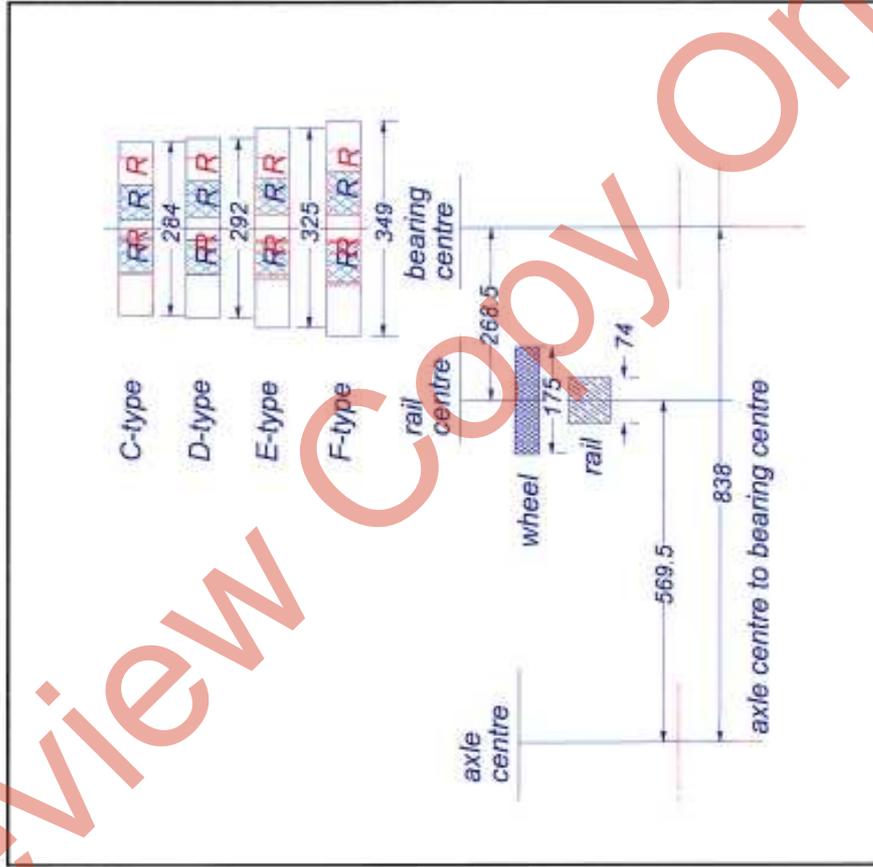
Figure 5: Measurement position for bearing types used by Transnet relative to rail geometry

The use of pattern recognition algorithms in an Automatic Vehicle Identification system

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Abstract

Apart from reading vehicle numbers passed at a given point the Automatic Vehicle Identification (AVI) system employed by Spoornet is required to build a record of the train consist and requires identification of the vehicle types such as wagons and locomotives. This must be accurate even if electronic tags are missing or damaged on some of the vehicles, or when the train speed or direction changes while being measured. In many instances clearance between tracks on a double line section prohibit the installation of reader antennas between the lines. Under these conditions it is required that the train consist shall not be corrupted while two trains pass on a double line at the same site. In order to ensure reliable performance in accordance with these requirements different pattern recognition algorithms had to be implemented on the system. This paper will present the algorithms employed, some of the operational problems experienced as well as unique developments undertaken to solve these problems.

1 Background of the Automatic Vehicle Identification system

The main purpose of the AVI system is to determine train consist at predetermined sites along the railway track [1]. The AVI system consists of field sites as well as an AVI server. The field sites read consist data and send this data to the server which makes the data available in the operational processes of Spoornet. In addition to the RF tag reader's wheel detectors are employed to determine the speed and axle spacing when a train traverses the site. A wheel sensor interface is used to couple the wheel transducers to the site processing unit. Figure 1 shows the layout of a typical AVI field site. Tags are mounted on each side of the vehicles in order to identify front and rear ends of a vehicle [2].
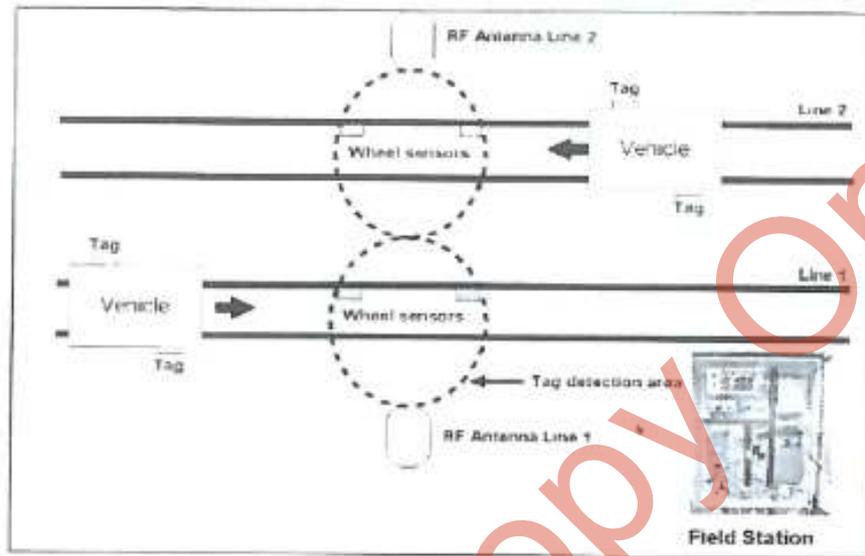
Figure 1: AVI field site.

2 Development of a new wheel sensor interface

The original wheel sensor interface was used to detect train wheels passing the AVI field site, time stamp the wheels detected and send the information to the field station processor via RS232. The initial design made use of proprietary wheel sensors and was integrated as part of the wheel sensor interface. Detection problems were experienced under various field conditions. It was not possible to replace the problematic wheel sensors because of the integrated design. Since wheel sensor data form an important part of the reliability and correctness of AVI consist data, it was necessary to upgrade this part of the initial design. It was decided to specify a new wheel sensor interface with a simple and open interface to accommodate a variety of wheel sensors. This will enable the use of any wheel sensor with a switched output. The upgrade also created the opportunity to implement various algorithms which could withstand real life situations much better. In addition to this other algorithms which was developed as interim solutions were retained, thus making the system upgrade even more robust.

3 Algorithms implemented to improve reliability of data

This section will describe some of the algorithms implemented in order to improve reliability and accuracy of the AVI data. Some of the algorithms were

developed as a backup for the unreliable operation of the wheel sensors while others were implemented as part of the wheel transducer upgrade.

3.1 Determine the direction which the train was travelling

As mentioned the AVI system uses two proximity sensors to detect the wheels of the train. The sequence in which the sensors detect the first wheel was used to determine the direction of travel. In practice a fault conditions occurred when the first sensor failed to detect the train wheel and resulted in reporting the wrong direction of travel. This could create havoc in systems relying on the AVI data.

A new algorithm was implemented to detect the direction of travel even if the systems failed to detect some of the wheels. Figure 2 shows the pulses produced by the wheel sensors as train passes the site. Pulses marked 1 originates at sensor 1, and so on. The principle employed in the new algorithm, is to use the fact that the distances between bogies are much bigger than the distance between axles of a bogie. This can thus be used to identify the middle part of a vehicle. A count associated with first sensor triggered after the middle of a vehicle is accumulated for the whole train. The sensor with the highest count will then indicate the direction of movement. This algorithm will work even if some wheels were skipped or inserted.
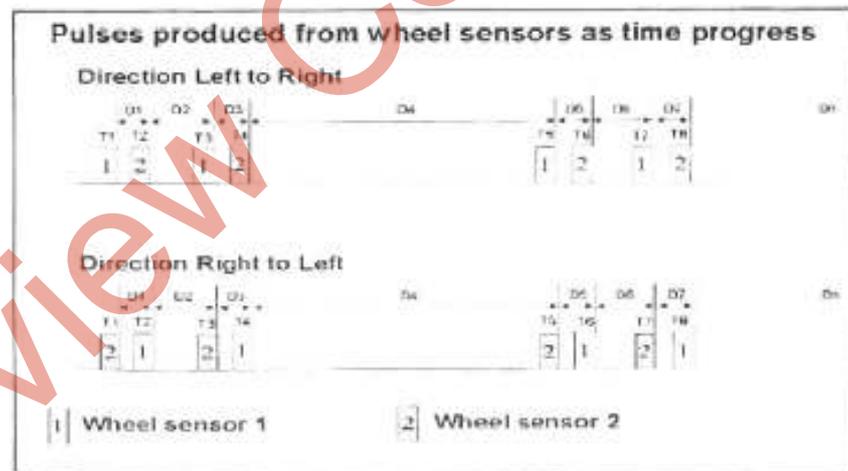
Figure 2: Pulses produced by wheel sensors as the train passes the site.

Mathematical implementation of the algorithm:

1. If $\dfrac{D[i+1]}{D[i]} > 4$ Check which sensor was triggered first

    $D[i]$ Time between wheel-sensor pulses (see Figure 2).

2. Add 1 to the counter for the sensor which was triggered first.
3. Repeat steps 1 and 2 for all wheel pulses.
4. The sensor with the highest count indicates the direction of movement.

3.2 Identify missing tags by using the tags spacing pattern on the train

Another problem which occurred in the system with the unreliable wheel sensors was that the wheel sensor unit failed to detect wheels at high speeds. Since wheel sensor data was not available to check for any missing tags under these circumstances an algorithm was developed to determine missing tags using tag spacing as an input. The principle employed, is to determine a tag time slot in which a valid tag-read must appear. If no tag is found in the tag time slot, then a missing tag is reported for that wagon. The tag time slot (window) is determined by calculating a window related to the previous time spacing between tags (time prediction algorithm). A primary requirement, for this algorithm to work, is that the physical spacing between tags (and thus $T[i]$) must be more or less the same distance. Figure 3 shows the tag spacing and the tag present window.

Wagons with Tags spaced equaly

☐ Tag   ☐☐☐ Tag present window

Figure 3:   Diagram to show the tag spacing and the tag present window

3.4 Correction of skip wheel sensing data

Frequent miscounts from the wheel sensors create an error condition in the system where axles on a vehicle are not detected. This in turn will result in a failure to determine the train consist correctly. For a description of the algorithm developed to solve the problem at hand, the reader is referred to Figure 5 which shows wheel sensor data as time progresses.

- Determine the direction of movement of the train.
- Check the pattern sequencing for any missing pulses.
  From example in picture the following could be true:
    (No Faults: *1212121212121212*)
    (Faults: *1212212121121212*) Bold implies a wheel sensor pair being incomplete
- Calculate time 1 for all the wheel sensor pairs which was found complete.

If an axle is missing insert an axle into the sequence of pulses. If the first one in a pair is missing, insert the pulse by subtract the closest time T from the measured pulse and if the second pulse in a pair is missing insert a pulse by adding the closest time T to the measured pulse. By recognising these inherent patterns for the complete counting sequence, missing wheel sensor pulses can be reconstructed. In addition to this a faulty wheel sensor may be identified and reported.

Figure 4: Wheel sensor data as a function of time.

3.4 Vehicle identification using wheel patterns

Reading the tag on each vehicle identifies the individual vehicles forming part of a given train if the tags are present. If a tag is not present or faulty, an incorrect vehicle count/consist will result. To be able to accommodate this fault consist information is verified and corrected using the wheel sensor data. Identifying vehicles using the wheel sensor data will produce a vehicle list using wheel sensor data. This wagon list is then compared with the wagon list produced from reading the tag data. A vehicle with no tag will be inserted into the final vehicle list if wheels where sensed but no tag was read.

To identify vehicles using wheel sensor data the following algorithm was implemented:

- Gather all wheel sensor events and time-stamp it
- Determine the direction of movement
- Insert any missing wheel sensor events
- Calculate the speed of each axle of the train

$$V(n) = \frac{T(2n) - T(2n - 1)}{D}$$

Where   n is the axle number,

T is the time stamped wheel-sensing event and

D is the distance between wheel sensors.

Figure 5: Wheel sensor pulses for a single wagon.

Table 1: Sample data from the implemented algorithm.

Vehicle num.	Axle Num.	Time Stamp	Wheel sensor	Speed	Measured Distance	Expected Distance	Error	Error Sqr	Error Value
5	2	59273	0						
	2	59768	1	18.37	1.825	1830	5	25	
	3	60741	0						
	3	64975	1	18.34	6.482	6480	-2	4	
	4	65945	0						
	4	66430	1	18.39	1.826	1830	4	16	
	1	67409	0						45
	1	68025	1	18.30	1.979				
6	2	68906	0						
	2	69494	1	18.38	1.83	1830	0	0	
	3	70363	0						
	3	74697	1	18.41	6.476	6480	4	16	
	4	75676	0						
	4	76180	1	18.22	1.832	1830	-2	4	
	1	77157	0						20
	1	77794	1	18.26	2				

- Calculate the distances between axles of the train

$$S(n) = \frac{V(n) + V(n+1)}{2} * T(n+2) - T(n)$$

Where   n is the axle number and
           T is the time stamped wheel-sensing event and
V is the axle speed

- To identify the vehicles take the vehicle spacing from the database of known vehicles and match it against the spacing measured using the wheel sensing data. (Matching is done by subtracting the spacing found in the database for a vehicle from the measured spacing, this difference is the squared and summed to determine the matching value. If the matching value is less than a predefined limit, the vehicle is marked as a possible match. The vehicle with the smallest matching value from the possible vehicle match list, is then used as the identified vehicle).
- The wheel sensor data for this vehicle is removed from the wheel sensor data array and the next vehicle match is extracted from the remaining data.

3.5 Filtering of tags read on the second line (double line installations)

On double line installations it is possible to read tags on the second line when two trains are passing the reader site at the same time. Initially the RF signal was attenuated so that the reader can only read tags on the line closest to it. Although this solves the problem initially it was later found that the RF signal was temperature sensitive and the RF signal strength had to be adjusted frequently. An algorithm to solve this problem was implemented using a combination of time stamped wheel sensor data and tag data to identify the validity of the tag read. Figure 6 shows relationship between the tag and wheel sensor data for this case.
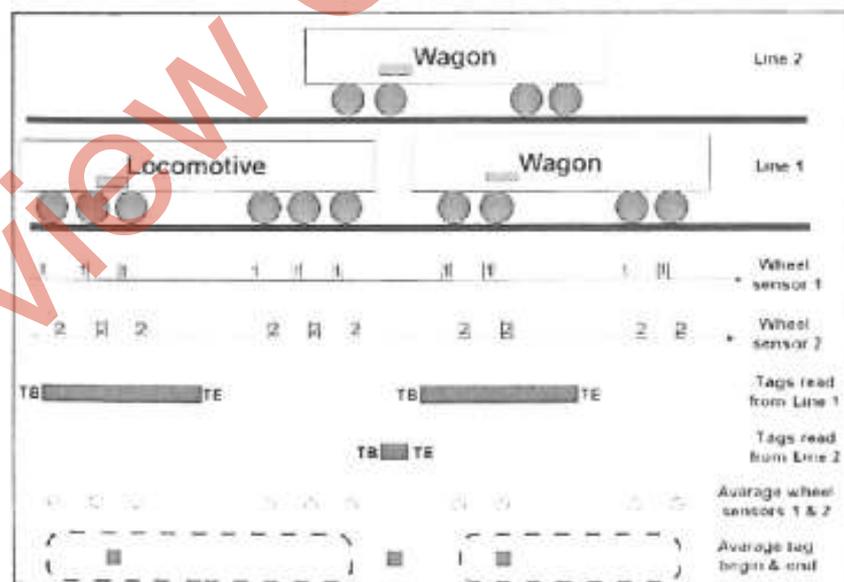
Figure 6:   Tag and axle date as gathered by AVI field site

The algorithm used to filter invalid tags from tag list is presented below:

- Gather all wheel sensor events on wheel sensors 1 and 2 and time stamp each event.
- Read all tags passing the reader and record the time that the tag was read the first (TB) and last time (TE).
- Determine the direction of movement of the train (see previous)
- Insert any missing wheel sensor events (see previous)
- Determine the vehicle consist using the axle data
- Calculate the axle positions of each axle on a vehicle by using the average between wheel sensors 1 and 2
- Calculate position of the tags read by using the average between the first time that the tag was read and the last time that the tag was read.
- Filter any tags which were not present between the first and the last axle of a vehicle
- Rebuild a vehicle list using the wheel sensor data and filtered tag data.

The implementation of this algorithm worked extremely well. During the tests all the attenuation on the RF signal was removed and a test tag was positioned opposite the antenna (far side of the railway line and easily read by the antenna) while a train would pass on the line. Even at very slow speeds where the tag on the other side of the line was clearly visible in the gaps between the wagons, it was not inserted into the wagon list once.

3.6 Find a missing tags number

Losing tags on vehicles is a real life situation and the process of managing these missing tags needs attention. It would be extremely helpful for the maintenance personnel to know the numbers of the vehicles with lost tags.
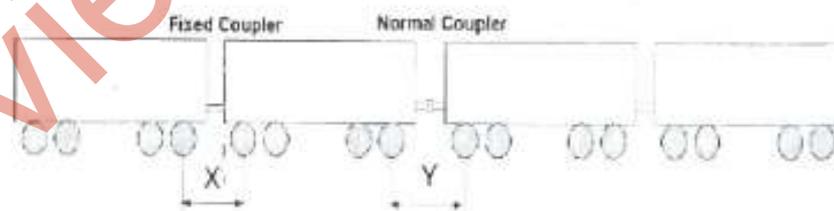
Figure 7:   Orex wagon layout.

From the AVI system one could obtain information on vehicle number X in a train with a lost tag, but there is unfortunately no indication of which vehicle it is. On the Orex iron export line for example, a captive fleet with certain characteristics exist. This could be used to identify the wagon with a missing tag. On this fleet wagons are coupled in pairs with a permanent coupling. The

distance between a permanent coupling and a normal coupling differ. This is used to identify the wagons connected to one another. The partner wagons number is then used to lookup the wagon number for the wagon with the missing tag. Figure 7 shows the wagon layout on Orex.

4 Closing remarks

It was shown that data patterns embedded in the recorded data can be used to improve reliability of a system. Furthermore it can be used to identify faulty system components, rectify fault conditions which may occur and improve the overall data integrity. Most of these algorithms have been tested in service for more than 12 months now and have proved to perform very well, even in the presence of error prone components. Although the substandard wheel detectors were replaced these algorithms were retained to further ensure the fault tolerant operation of the system.

Acknowledgements

The authors would like to thank Mr. A. du Toit for his assistance during the tests and for his valuable input during the development of the algorithms. To the staff of Ansys, for their willingness to alter the configuration of the system and for the implementation of the code Mr A. Surkov for his assistance during the manufacture of the upgrade wheel transducer units.

References

[1] J. Venter, Keeping "Track" of Railway Wagons – AVI the answer?, Railways, October 1985.

[2] D.J. Suttis, Automatic Identification Systems: Strengths, Weaknesses and Future Trends, Automated Identification Systems, November 1985.

Glossary

CD	Compact Disk
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HBEDS	Hot Bearing Detector System
ITCMS	Integrated Train Condition Monitoring System
MMI	Man Machine Interface
OBCS	On-Board Computer System
TCP/IP	Transmission Control Protocol/Internet Protocol
TeePee	Train Presence Detector
TFR	Transnet Freight Rail
UTP	Unshielded Twisted Pair

SECTION 5

RETURNABLE DOCUMENTS

Refer Document attached hereto

C.1.Returnable Schedules / Documents required for tender evaluation purposes (By e.g.

	Returnable Schedules / Documents	YES/NO/N/A
1	Certificate Of Authority For Joint Ventures (Where Applicable	x
2	Schedule of the Tenderers Experience	x
3	Certificate of Attendance at Clarification Meeting	X
4	Labour Payment Schedule	X
5	Supplier Declaration form (version2)	X
6	Letter of Good Standing with the Compensation Commissioner	x
7	Original / Certified BBBEE Rating Certificate With Detailed Scorecard	X
8	Statement Of Compliance With Requirements Of The Scope Of Work	x
9	Certified Copy of Financial Statements (for the past 3 years) including Balance sheets where BBBEE not provided.	x
10	Certified Copy of Share Certificates CK1 & CK2	x
11	Certified Copy Of Certificate Of Incorporation and CM29 and CM9	x
12	Certified Copy of Identity Documents of Shareholders/Directors/Members (Where Applicable)	x
13	Cancelled Cheque	X
14	Original current Tax Clearance Certificate	X
15	Original Vat Registration Certificate	X
16	Copy of BEE Policy/BEE Plan/Employment Policy/Procurement Policy	X

SIGNATURE OF TENDERER: Date: _____

SECTION 6

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

SUPPLIER DECLARATION FORM

Refer Document attached hereto

Transnet Supplier Declaration/Application

The Financial Director or Company Secretary

Transnet Vendor Management has received a request to load your company on to the Transnet vendor database. Please furnish us with the following to enable us to process this request:

1. Complete the "Supplier Declaration Form" **(SDF)** on page 2 of this letter
2. **Original** cancelled cheque **OR** letter from the bank verifying banking details (**with bank stamp)**
3. **Certified** copy of Identity document of Shareholders/Directors/Members (where applicable)
4. **Certified** copy of certificate of incorporation, CM29 / CM9 (name change)
5. **Certified** copy of share Certificates of Shareholders, CK1 / CK2 (if CC)
6. A letter with the company's letterhead confirming physical and postal addresses
7. **Original** or **certified** copy of SARS Tax Clearance certificate and Vat registration certificate
8. A signed letter from the Auditor / Accountant confirming most recent annual turnover and percentage black ownership in the company **AND/OR** BBBEE certificate and detailed scorecard from an accredited rating agency (SANAS member).

NB: ▪ *Failure to submit the above documentation will delay the vendor creation process.*
▪ *Where applicable, the respective Transnet business unit processing your application may request further information from you. E.g. proof of an existence of a Service/Business contract between your business and the respective Transnet business unit etc.*

IMPORTANT NOTES:

a) **If your annual turnover is less than R5 million,** then in terms of the DTI codes, you are classified as an Exempted Micro Enterprise (EME). If your company is classified as an EME, please include in your submission, a signed letter from your Auditor / Accountant confirming your company's most recent annual turnover is less than R5 million and percentage of black ownership and black female ownership in the company AND/OR BBBEE certificate and detailed scorecard from an accredited rating agency (e.g.

permanent SANAS Member), should you feel you will be able to attain a better BBBEE score.

b) **If your annual turnover is between R5 million and R35million**, then in terms of the DTI codes, you are classified as a Qualifying Small Enterprise (QSE) and you claim a specific BBBEE level based on any 4 of the 7 elements of the BBBEE score-card, please include your BEE certificate in your submission as confirmation of your status.
   NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency   (e.g. permanent SANAS Member).

c) **If your annual turnover is in excess of R35million**, then in terms of the DTI codes, you are classified as a Large Enterprise and you claim a specific BEE level based on all seven elements of the BBBEE generic score-card. Please include your BEE certificate in your submission as confirmation of your status.
    NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency   (permanent SANAS Member).

d) **To avoid PAYE tax being automatically deducted from any invoices received from you,** you must also contact the Transnet person who lodged this request on your behalf, so as to be correctly classified in terms of Tax legislation.

e) Unfortunately, **No payments can be made to a vendor** until the vendor has been registered, and no vendor can be registered until the vendor application form, together with its supporting documentation, has been received and processed.

f) **Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products in order that he/she should complete and Internal Transnet Departmental Questionnaire before referring the matter to the appropriate Transnet Vendor Master Office.**

Regards,
Transnet Vendor/Supplier Management *[please substitute this with your relevant Transnet department before sending this document out]*

Supplier Declaration Form

Company Trading Name						
Company Registered Name						
Company Registration Number Or ID Number If A Sole Proprietor						
Form of entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
VAT number (if registered)						
Company Telephone Number						

Company Fax Number		
Company E-Mail Address		
Company Website Address		

Bank Name		Bank Account Number		
Postal Address			Code	
Physical Address			Code	
Contact Person				
Designation				
Telephone				
Email				

Annual Turnover Range (Last Financial Year)	< R5 Million		R5-35 million		> R35 million
Does Your Company Provide	Products		Services		Both
Area Of Delivery	National		Provincial		Local
Is Your Company A Public Or Private Entity			Public		Private
Does Your Company Have A Tax Directive Or IRP30 Certificate			Yes		No
Main Product Or Service Supplied (E.G.: Stationery/Consulting)					

BEE Ownership Details

% Black Ownership		% Black women ownership		% Disabled person/s ownership	
Does your company have a BEE certificate		Yes		No	
What is your broad based BEE status (Level 1 to 9 / Unknown)					
How many personnel does the firm employ		Permanent		Part time	

Transnet Contact Person	
Contact number	
Transnet operating division	

Duly Authorised To Sign For And On Behalf Of Firm / Organisation

Name		Designation	
Signature		Date	

Stamp And Signature Of Commissioner Of Oath

Name		Date	
Signature		Telephone No.	

NB: Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products.

2. VENDOR TYPE OF BUSINESS

(Please tick as applicable) **(* - Minimum requirements)**

2.1	Indicate the business sector in which your company is involved/operating:		
Agriculture		Mining and Quarrying	
Manufacturing		Construction	
Electricity, Gas and Water		Finance and Business Services	
Retail, Motor Trade and Repair Services		Wholesale Trade, Commercial Agents and Allied Services	
Catering, accommodation and Other Trade		Transport, Storage and Communications	
Community, Social and Personal Services		Other (Specify)	
Principal Business Activity *			
Types of Services Provided			
Since when has the firm been in business?			

2.2	What is your company's annual turnover (excluding VAT)? *								
<R20k	>R20k <R0.3 m	>R0.3 m <R1m	>R1m <R5m	>R6m <R10m	>R11 m <R15 m	>R16 m <R25 m	>R26 m <R30 m	>R31 m <R34 m	>R35m

2.3	Where are your operating/distribution centres situated *	

3. VENDOR OWNERSHIP DETAIL

(Please tick as applicable)   **(* - Minimum requirements)**

3.1	**Did the firm previously operate under another name? ***		
YES		NO	

3.2 If Yes state its previous name:*

Registered Name	
Trading Name	

3.3 Who were its previous owners / partners / directors?*

SURNAME & INITIALS	ID NUMBERS

3.4 List Details of current partners, proprietors and shareholders by name, identity number, citizenship, status and ownership as relevant: *

SURNAME & INITIALS	IDENTITY NUMBER	CITI-ZENSHIP	HDI	DIS-ABLED	GENDER	DATE OF OWNERSHIP	% OWNED	% VOTING

3.5 List details of current directors, officers, chairman, secretary etc. of the firm: *

SURNAME & INITIALS	IDENTITY NUMBER	TITLE	DIS-ABLED	GENDER	% OF TIME DEVOTED TO THE FIRM	CONTACT NUMBER

3.6 List details of firms personnel who have an ownership interest in another firm: *

SURNAME	IDENTITY NUMBER	NAME & ADDRESS OF	TITLE IN OTHER FIRM	% OWNED	TYPE OF BUSINESS

& INITIALS		OTHER FIRM			OF OTHER FIRM	

4. VENDOR DETAIL

(Please tick as applicable)   **(* - Minimum requirements)**

4.1   How many personnel does the firm employ? *

	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Permanent						
Part Time						

4.1.1   In terms of above kindly provide numbers on women and disabled per

	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Women						
Disabled						

4.2	Provide Details of Contact Person/s Responsible for Broad Based Black Economic Empowerment (BBBEE) in the Company *		
SURNAME	INITIALS	DESIGNATION	TELEPHONE NO.

4.2.1   Is your company a value adding supplier (i.e. registered as a vendor under the VAT Act of 1991, where NPAT + total labour cost > 25% of total revenue)?

YES		NO	

4.2.2   Is your company a recipient of Enterprise Development Contributions?*

YES		NO	

4.2.3   May the above mentioned information be shared and included in Transnet Supp Database for

future reference? *

YES		NO	

4.2.4 **If you are successful in the tender/contract (where applicable) and this is awarded to your company / organisation, will this have a positive impact on your employment plans? ***

YES		NO	

4.2.5 **If yes (above) kindly provide the following information:**

	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Permanent						
Part Time						

4.2.6 **In terms of above kindly provide numbers on woman and disabled personnel:**

	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Women						
Disabled						

4.2.7 **Are any of your members/shareholders/directors ex employees of Transnet?**

YES		NO	

4.2.8 **Are any of your family members employees of Transnet?**

YES		NO	

4.2.9 **If Yes to points 4.2.7 & 4.2.8, list details of employees/ex-employees**

SURNAME & INITIALS	IDENTITY NUMBER	NAME & ADDRESS OF OTHER FIRM	TITLE IN OTHER FIRM	% OWNED	TYPE OF BUSINESS OF OTHER FIRM

Internal Transnet Departmental Questionnaire (for office use only)

Section 1: To be completed by the Transnet Requesting / Sourcing Department

TFR		TRE		TPT		TPL		TNPA		TRN	
Creat		Amen		Block		Unbloc		Once-Off / Emergency			
Exten		Delete		Undel							

Supplier's trading name	
Supplier's registered name	

Please indicate if the Supplier has a contract with sourcing Transnet OD	Yes		No	

If yes please submit a copy of the letter of	

award	

a) What is being procured from the supplier?

		Yes		No	
i.	Products only	Yes		No	
ii.	Services only	Yes		No	
iii.	Labour only	Yes		No	
iv.	Mix of services and products	Yes		No	
v.	Mix of services and labour	Yes		No	

b) If your answer is **YES** to questions II, III, IV or V in paragraph **a)** above, please indicate whether the relevant **PAYE questionnaires** have been forwarded to the appropriate **Transnet Operational Divisions'** decision making bodies **/ Strategic Supply Management** team for a directive /decision on tax withholding from payments to this supplier.

Yes		No	

c) If your reply to (**b**) is "**NO**", please furnish	

d) Certification and Approval of proposed Vendor Creation/Unblocking/Other Changes by Transnet Official with Appropriate Delegated Authority :

I HEREBY CERTIFY THAT THE TRANSNET DETAILED PROCUREMENT PROCESS (DPP) / PROCUREMENT MECHANISM HAS IN ALL RESPECTS BEEN ADHERED TO AND I THEREFORE APPROVE THE PROPOSED VENDOR CREATION/APPROVAL/OTHER CHANGES TO BE EFFECTED ON THE VENDOR MASTER

Name	Grade	Date								Signature
		Y	Y	Y	Y	M	M	D	D	

Tel No:		**Fax**	

Section 2: To be completed by the BEE Department (this section is for

NARROW BASED (NB)				BROADBASED (BBBEE)				
BEE O/S	BWBE	DPE	MR	CONTB. LEVEL	EME: <R5m	QSE: >R5m <R35m	LARGE: >R35m	VALIDITY DATE

Name		Grade		Date									Signature
				Y	Y	Y	Y	M	M	D	D		
				Y	Y	Y	Y	M	M	D	D		

SECTION 7

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

TRANSNET LIMITED / CONTRACTORS / SUB-CONTRACTORS

CONTRACTUAL SAFETY CLAUSES WHICH WILL FORM PART OF ANY RESULTING CONTRACT

The parties agree on the following arrangements according to section 37 (2) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) to ensure compliance by the mandatory with provisions of the Act.

1) That the contractor is an "employer" in his own right as defined in section 1 of Act 85 of 1993 and that he must fulfill all his obligations as an employer in terms of the Act.

2) The contractor shall comply with the requirements of Act 85 of 1993 in its entirety.

3) Where special permits are required, such as electrical switching, hot work permits, etc. the contractor shall obtain them from a person designated by Transnet Limited for this purpose, and all requirements of the contractor must rigidly comply with the permit.

4) The contractor shall conduct a risk assessment of the work to be performed by a competent person prior to the commencement of work, to identify risks and hazards that persons may be exposed to, analyse and evaluate identified hazards.

5) The contractor shall have a documented Health and Safety Plan based on the risks and hazards identified before commencement of work.

6) The Health and Safety Plan shall include the following:

   6.1 The safety management structure to be instituted with all appointments in terms of the Act and Regulations
   6.2 The safe working methods and procedures to be implemented to ensure work is performed in compliance to the Act.
   6.3 The safety equipment, devices and clothing to be made available by the contractor to his employees.
   6.4 The site access control measures pertaining to health and safety to be implemented.
   6.5 Control measures for ensuring that the Health and Safety Plan is maintained and monitored for the duration of the contract.

7) The contractor shall ensure that all work is performed under the close supervision of a person trained to understand the hazards associated with the work performed and who has authority to ensure that the necessary precautionary measures are implemented.

8) The contractor must appoint a Health and Safety Co-ordinator to liaise with Transnet Limited on matters pertaining to occupational health and safety.

9) The appointed Safety Co-ordinator must liaise at least once a week with the* Health and Safety Section / Risk Manager /Occupational Risk Manager of Transnet Limited.

10) The contractor shall furnish the* Health and Safety Section/ Risk Manager/ Occupational Risk Manager of Transnet Limited immediately with full particulars of any sub-contractor which he may involve in the contract in order that the sub-contractor himself can be made aware of all the clauses in this contract pertaining to health and safety.

11) The contractor shall stop any subcontractor from executing work which is not in accordance with the Health and Safety Plan or which poses a threat to health and safety of persons.

12) The contractor shall ensure that all his employees and visitors undergoes health and safety induction pertaining to the hazards prevalent, proof of such training must be kept on file.

13) In the event where the risk assessment reveals the risk relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a Fall Protection Plan.

14) The Fall Protection Plan shall include:

14.1 A risk assessment of all work carried out from an elevated position
14.2 Procedures and methods to address all the identified risks per location
14.3 Evaluation of employees physical and psychological fitness necessary to work at elevated position.
14.4 The training of employees working from an elevated position.
14.5 Procedure addressing the inspection, testing and maintenance of all fall protection equipment.

15) The contractor shall advise the * Health and Safety Section / Risk Manager/ Occupational Risk Manager of Transnet Limited of any hazardous situations which may arise from work being performed either by the contractor or his sub-contractor.

16) Copies of all appointments required by the act must be given to * Health and Safety Section / Risk Manager / Occupational Risk Manager of Transnet Limited.

17) The contractor shall ensure that a Health and Safety File is available which shall include all documentation as required by the Act, copy of his and his subcontractors Risk Assessment and Health and Safety Plan.

18) All incidents referred to in Section 24 of the Act involving the contractor and his subcontractor on Transnet Ltd premises, shall be reported as prescribed. Transnet Ltd hereby obtains an interest in the issue of any investigation, formal inquiry conducted in terms of Section 31 and 32 of the Act into any incident involving the contractor, his subcontractor, any person or machinery under his control on Transnet Ltd premises.

19) No alcohol or any other intoxicating substance shall be allowed on Transnet Ltd premises. The contractor shall not allow anyone under or suspected to be under the influence of alcohol or any other intoxicating substance on Transnet Ltd premises.

20) A letter of good standing in terms of Section 80 (Employer to register with the Compensation Commissioner) of the Compensation for Occupational Injuries and Disease Act 1993 (Act 130 of 1993) must also be furnished.

21) All clauses in the contract pertaining health and safety forms an integral part of the contract and if not complied with may be construed as breach of contract.

*As applicable

SECTION 8

RFQ NUMBER CRAC/HGR/8605

**PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91)
WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM**

GENERAL TERMS AND CONDITIONS (CSS5 – SERVICES)

Refer Document attached hereto

SECTION 9

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

STANDARD TERMS AND CONDITIONS OF CONTRACT (US7 – SERVICES)

Refer Document attached hereto

SECTION 10

RFQ NUMBER CRAC/HGR/8605

PROVISION FOR THE REPLACEMENT OF KRAAL HOT BOX DETECTOR (TS 91) WITH HOT BEARING EVALUATOR AND DETECTOR SYSTEM

Refer Document attached hereto

NON-DISCLOSURE AGREEMENT

THIS AGREEMENT is made the ………………….. day of ……………………….. 2010

BETWEEN:

(1)   **Transnet Limited** ("Transnet") (Registration Number 1990/000900/06) whose registered office is at 49th Floor, Carlton Centre, 150 Commissioner Street, Johannesburg 2001, and

(2)   [……………………] ("the Company") (Registration Number ……………) whose registered office is at […………………………]

WHEREAS

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

IT IS HEREBY AGREED

1.   Interpretation

1.1   In this Agreement:-

"**Agents**" means directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;

"**Confidential Information**" means Information 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 Proposal 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:-

(i)   is publicly available at the time of its disclosure or becomes publicly available (other than as result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this letter); or

(ii)   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

(iii) 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;

"**Group**" means any subsidiary, any holding company and any subsidiary of any holding company of either party;

"**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;

"**Proposal**" means the aggregation of Transnet's Request for Information (RFI) and Request for Proposal (RFP).

2.   Confidential Information

2.1   The Receiving Party will treat and keep all Confidential Information 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 Proposal or for the subsequent performance of any contract between the parties in relation to the Proposal.

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

(i)   To those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause 2.2 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

(ii)   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 (ii) above, it shall promptly notify the Disclosing Party and co-operate 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 to at least the same standard as the Receiving Party keeps its own Confidential Information. The Receiving Party shall not make any copies or reproduce in any form any Confidential Information except for the purpose of disclosure as permitted in accordance with this Agreement.

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 Receiving Party shall, within seven days of receipt of a written demand from the Disclosing Party or of its ceasing to be interested in the Proposal:

(i) Return all written Confidential Information (including all copies); and

(ii) 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 Receiving Party or on its behalf (including by any person to whom disclosure has been made as permitted under clause 2.3(i) above.

The obligations in this clause 3.3 shall not apply to the extent that (but only for so long as) it is necessary to retain copies for the purpose of providing information to any regulatory authority in accordance with clause 2.3 (ii) above.

3.4 The Receiving Party shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 3.3 (ii) above.

4. Announcements

4.1   Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Proposal 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 [be continuing and shall survive the termination of any discussions or negotiations between the parties regarding the Proposal continue for a period of 3 (three) 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 Proposal and in complying with the terms of this Agreement.

7.   Representations

7.1   Each party agrees that any Information made available to the Receiving Party or its Agents for the purpose of negotiations or discussions in relation to the Proposal will not form the basis of, or any representation in relation to, any contract, nor constitute an offer or invitation by the Disclosing Party.

7.2   Except in the case of fraudulent misrepresentation, the Disclosing Party accepts no responsibility for nor makes any representation or warranty, express or implied, with respect to the accuracy, reliability or completeness of any Information made available to the Receiving Party or its Agents.

8.   Adequacy of damages

8.1   Without prejudice to any other rights or remedies of the Disclosing Party, the Receiving Party acknowledges and agrees that damages would not be an adequate remedy for any breach by it of the provisions of this Agreement and that the Disclosing Party shall be entitled to seek the remedies of injunction, specific performance and other equitable relief for any threatened or actual breach of any such provision by the Receiving Party or its Agents, and no proof of special damages shall be necessary for the enforcement of the rights under this Agreement.

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

9.   Data Protection

The Receiving Party warrants that it and its Agents have the appropriate technical and organizational measures in place against unauthorized or unlawful processing of personal data and against accidental loss or destruction of, or damage to, personal data held or processed by them.

10. General

10.1 Neither party may assign the benefit of this Agreement or any interest hereunder except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.

10.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.

10.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.

10.4 This Agreement may only be modified by a written agreement duly signed by persons authorized on behalf of each party.

10.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.

10.6   T
his 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.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective duly authorized representatives.

TRANSNET LIMITED:

By: ....
   (Signature)

Print name: **_____**

Title: **_____**

Date: **_____**

[*Insert company name*]:

By: ....
   (Signature)

Print name: **_____**

Title: **_____**

Date: **_____**

Suppliers Code of Conduct

Suppliers Code of Conduct

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

These are:

>> Transnet Procurement Policy - A guide for tenderers;
>> Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
>> The Public Finance Management Act (PFMA);
>> The Broad Based Black Economic Empowerment Act (BBBEE); and
>> The Anti-Corruption Act.

This code of conduct has been compiled to formally apprise Transnet Suppliers of Transnet's expectations regarding behaviour and conduct of its Suppliers.

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

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

Transnet will not participate in corrupt practices. Therefore, it expects its suppliers to act in a similar manner.

>> Transnet and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with, and payments to, our suppliers.

>> Employees must not accept or request money or anything of value, directly or indirectly, from suppliers.

Employees may not recieve anything that is calculated to:

- Illegally influence their judgement or conduct or to influence the outcome of a sourcing activity;
- Win or retain business or to influence any act or decision of any person involved in sourcing decisions; gain an improper advantage.

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

Transnet is firmly committed to free and competitive enterprise.

>> Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust practices

>> Transnet does not engage non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting).

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

>> Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities.

These include, but are not limited to:

- Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
- Collusion;
- Failure to disclose accurate information required during the sourcing activity (ownership financial situation, BBBEE status, etc.);
- Corrupt activities listed above; and harassment, intimidation or other aggressive actions towards Transnet employees.

>> Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence must be conducted and the supplier is expected to participate in an honest and straight forward manner.

>> Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

Conflict of Interest

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

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

Show that you support good business practice by logging onto www.transnet-suppliers.net and completing the form.

This will allow us to confirm that you have received, and agree to, the terms and conditions set out in our Suppliers Code of Conduct.

TIP-OFFS ANONYMOUS HOTLINE
0800 003 056