



Transnet Freight Rail

an Operating Division of
TRANSNET SOC LIMITED
(Registration No. 1990/000900/06)

RFI: HOAC HO 8199

REQUEST FOR INFORMATION ON

ENERGY MANAGEMENT ASSESSMENT & OPTIMISATION FOR RAILWAY

OPERATIONS

“PREVIEW COPY ONLY”

Issue Date: 23 Jan 2012

Briefing Session: 31 Jan 2012

Closing Date: 14 Feb 2012

Option Date: 30 Apr 2012



1. INTRODUCTION

Transnet Ltd is the largest and most crucial part of the freight logistics chain that delivers goods to each and every South African. Transnet Freight Rail is the national railway freight operator in this logistics chain and the largest division of Transnet. The company maintains an extensive rail network across South Africa that connects with other rail networks in the sub-Saharan region, with its rail infrastructure representing about 80% of Africa's total.

Transnet has embarked on various initiatives to maximise the capable renewable energy regenerated by introducing new technology locomotives which operates on our heavy haul lines. The principle drive for this initiative is to improve our energy efficiency, contributing to reduce carbon emissions and also assist with the country's current generation capacity constraints.

Realising that our energy consumption is mainly with respect to traction energy, Transnet Freight Rail is desirous of optimising its railway operation in this field. However, the energy efficiency of our supporting operations cannot be ignored.

Transnet invites requests for information from world-class expertise in investigating the aspects stated below.

Transnet Ltd is owned by the government of the Republic of South Africa; general information regarding Transnet may be found at www.transnet.net

2. EXECUTIVE SUMMARY

Transnet Freight Rail requires a detailed energy management strategy to optimise its electrical energy demand in railway operations. Specific focus should be on the following aspects:

- Opportunities offered by new technologies and international best practices for improving railway electrification infrastructure;
- Electrical power factor correction;
- Traction locomotive technologies: Co-generation / regeneration capabilities on some electric traction locomotives;
- Optimal energy- and emissions efficiency of railway traction;
- Information technologies that can be deployed to facilitate the process;
- Energy efficiency of workshop complexes/railway network buildings/TFR office buildings;

The objective of this Request for Information (RFI) is to:

- a) Identify entities that can conduct a comprehensive analysis of Transnet Freight Rail's energy consumption and craft the detailed energy management strategy to optimise its electrical energy demand and consumption in railway operations;
- b) Identify expertise that exist in the area of energy management assessment and strategy formulation;
- c) Identify the scope of solutions that can be offered;
- d) Identify the proposed methodology and scope of conducting such energy management assessment and optimisation service.



3. BACKGROUND ON THE INFRASTRUCTURE AND ELECTRIFICATION SYTEMS

Transnet Freight Rail manages 20 953 route-km of railway lines in South Africa. Of these routes the traction modes are presently as follows:

- 5 041 km Electrified at 3kV DC
- 2 535 km Electrified at 25kV AC
- 861 km Electrified at 50kV AC

The deployment of electrification technologies nationally is illustrated in the following map:



On the electrified lines of the general freight business, diesel haulage is mostly used in local shunting and train compilation activities.

4. REQUIREMENTS

4.1. Rail Network buildings/offices

- Identify power saving/efficiency opportunities in the building/office environment;
- Optimisation of electrical energy demand;



4.2. Electrical Infrastructure Optimisation

4.2.1 With respect to power factor correction:

- Various options exist to optimise power factor in a railway network; these range from permanent installations to dynamic control through the use of new generation locomotives.
- Towards improving energy efficiency of traction supplies, a strategy is required to implement and manage cost effective measures which will minimise energy cost attributable to low power factor.

4.2.2 With respect to railway electrification technology deployed:

- Identify any technology gap that may contribute to energy efficiency.

4.2.3 With respect to power system management,

- A model is required to monitor:
 - Variations in loop resistance and impedance between substations, which impact locomotive performance.
 - Ensure appropriate transformer tap settings to effect optimal performance between substations with respect to load sharing and regeneration.
 - Simulate loads and recalibrate circuit breaker settings to avoid nuisance tripping which cause stop/start operations.
- A real-time system is envisioned at operational centres to monitor the thermal overload of power supplies and prevent subsequent outages.

4.3. Traction Locomotive Technologies

4.3.1 A strategic view is required which proposes a way forward with respect to railway traction energy. In proposing a viable long term traction fuel strategy, the long term future of fossil fuel supplies and the impact on carbon emissions of the traction energy mix must be considered.

- Transnet Freight Rail operates a range of locomotives that were acquired over a period of more than 50 years. The technologies used in the Electric Traction Fleet mix range from that of state of the art, such as in the latest 19E and 15E alternating current locomotives deployed on the heavy haul lines, to older technologies that had over time been partially upgraded with modern technologies.
- Optimal energy- and emissions efficiency of railway traction, specifically recommendations to the Diesel vs Electrical / Diesel and Electrical energy debate.
- The view should express a strategy to migrate from the present reality which reflects the South African context in terms of its large coal reserves as opposed to low reserves of natural gas and crude oil.

4.3.2 Recommendations are required on optimising the load-monitoring information available on locomotives in the energy management system.

4.4. Information technologies that can be deployed to facilitate this process

A strategy is required to implement information technology and systems that will benefit the energy management process.

- Energy metering via on-board technology with visual assistance to Operations to assist with optimizing network capacity.



- Energy metering at points of electrical supply to facilitate management of energy flows resulting from regeneration.

4.5. Co-generation - regeneration capabilities of some electric traction locomotives.

4.5.1 With respect to regeneration on AC electrified lines:

- Transnet Freight Rail in association with Eskom, South Africa's Electricity Utility, has verified the viability and is in the process of implementing improvements in electrical energy efficiency through the use of its new technology heavy haul locomotives on alternating current.
- Negotiations are under way to ensure that Transnet Freight Rail is compensated for the electrical energy returned to the national grid.
- The opportunities and initiatives to optimise regeneration on the AC lines must be investigated against international benchmarks. The scope of recommendations must be indicated.

4.5.2. The opportunities and initiatives to optimise regeneration on the direct current lines must be investigated. In evaluating and illustrating the feasibility of introducing regeneration capability on DC electrified areas with favourable topography, the following is required:

- A detailed evaluation of the benefits to invest in infrastructure and locomotives;
- Industrialised equipment with the capability to return electrical energy to the Eskom grid should be identified.
- The topography of the lines, available locomotives with regeneration capacity, technology and deployment must be evaluated.

4.6. Rolling Stock Compliance

4.6.1. Best practices for conformance in the following areas will be expected:

- Conformance of AC locomotive power correction equipment, as a precondition for operational availability
- Conformance to specification of locomotive Tractive and Braking effort – Assurance through testing and certification of technical compliance.
- Protocol for skew bogies detected.
- Benchmarking of train rolling resistance and development of a model for evaluating specific train configurations.
- Condition of brake equipment on wagons (measurement of wheel temperature profile on trains and a protocol for action).

5. ORGANIZATION AND REQUIRED CONTENT OF RESPONSES TO RFI

- a) Cover letter
- b) Proposed scope of services / solutions that can be offered;
- c) Proposed timelines / hours that will be required to complete the assessment and recommendations;
- d) Reasonable information that Transnet Freight Rail must provide to evaluate options
- e) Proposed value added services based on internationally successful systems, with proposal for implementation;
- f) With respect to the respondent the following information is required
 1. Respondent's background, achievements in the international railway industry, quality accreditations and a synopsis of previous work performed in this area.
 2. Expertise that will be assigned should the respondent be invited to participate in an RFP.
 3. Website address (if applicable)



g) Concepts and ideas

NB. Once all responses and presentations were considered, TFR may at its discretion issue a Request For Proposal (RFP) for the required services. Should TFR decide to issue a Request for Proposal this will be limited to respondents to the RFI.

5. PROPOSED PROCESS OVERVIEW

This RFI is for Energy Management Assessment and Optimisation in the Railway Environment

Activity	Date	Parties
RFI to market	23 rd January 2012	Transnet Freight Rail
Briefing Session	31 st January 2012	Suppliers
Closing date for submissions	14 th February 2012	Suppliers

- Transnet reserves the right to accelerate or retard the above time line schedule according to prevailing circumstances and the operational environment within Transnet.
- TRANSNET will not consider submissions received after the due date and timelines stipulated herein and submissions delivered to any address or deposited in any box other than specified herein will be regarded as late submission/s and will be disqualified.
- Any additional information or clarifications prior to the closing of the RFI should be submitted in writing and will be responded to in writing and may be faxed or e-mailed to all participants.

6. COMMUNICATIONS

Suppliers are to direct all enquiries regarding this RFI to the **RFI administrator**, at the following e-mail address: Shenwin.thomas@transnet.net. All enquiries will be responded to electronically and information shared with all Respondents. Enquiries will be accepted until close of business on 10th February 2012 after which no enquiries will be entertained.

7. BRIEFING SESSION

An information session will be held in the form of a "Questions and Answers" discussion session, at which time any queries will be attended to and responses provided to participating contenders.

Information session details:

Date: 31st January 2012
 Time: 10H00 until 12H00
 Venue: Transnet Freight Rail
 Umjantshi C Boardroom
 Inyanda House 2
 13-15 Girtton Road
 Parktown
 Johannesburg



This RFI document is to be presented at the briefing session and the attached Attendance Certificate MUST be signed by the RFI administrator and such signed certificate must accompany your submission. Although the briefing session is not compulsory, attendance by respondents is strongly recommended.

8. RFI SUBMISSION

Responses should be submitted in triplicate and in written format only (hardcopy).

Responses must reach the Chairperson, Transnet Acquisition Council on or before the closing time and date shown above and must be enclosed in a sealed envelope which must have inscribed on the outside:

“RFI HOAC_HO_8199 – Energy Assessment Management and Optimisation for Railway Operations, Closing time and date: 10h00 Tuesday 14th February 2012.”

If posted, the envelope must be addressed to the Chairperson, Transnet Acquisition Council, P O Box 4244, Johannesburg, 2000 and must be dispatched in time for sorting by the Post Office into P O Box 4244, before the closing time. If a tender is received late, the Tenderer's franking machine impression will not be accepted as proof that the tender was posted in time.

If delivered by hand, the tender is to be delivered to the Chairperson, Transnet Freight Rail Acquisition Council, Inyanda House, 21 Wellington Road, Parktown, Johannesburg, 2001 with the inscription detailed above, appearing on the exterior of a **sealed envelope**.

It should be noted that the above-mentioned tender box is in the foyer of Inyanda House and is accessible to the Public 24 hours a day, 7 days a week.

Please note that this request closes punctually at 10:00 on 7th February 2012.

The envelope must NOT contain documents relating to any other RFI / tender, other than that shown on the envelope.

NO E-MAIL OR FACSIMILE SUBMISSIONS WILL BE CONSIDERED.

9. RFI SCHEDULE

The schedule of this RFI is as follows:

Date of Issue:	23 rd January 2012
Briefing Session:	31 st January 2012
RFI Submission Date:	14 th January 2012
Option / Validity date:	30 th April 2012

It should be noted that suppliers may propose an earlier validity period, but that such submissions may be disregarded for this reason. The above dates are subject to change by Transnet Freight Rail at any time. Transnet Freight Rail will use notify Suppliers of any changes to these dates.

Suppliers are to provide the name and contact details of a duly mandated person with whom Transnet Freight Rail may communicate on behalf of their company.

Name: _____

Tel: _____

Fax: _____

E-mail: _____

**10. INSTRUCTIONS FOR COMPLETION OF THIS RFI:**

- Please ensure that all documents are read and understood
- Create 3 hardcopies of RFI document
- Sign all three sets of documents, sign and date the bottom of each page. All three sets of documents to be submitted to the address specified above.
- Three CD's containing the electronic version of the entire RFI must accompany submission.
- The format and layout of this document is not to be altered at all. Any change to this layout and / or format will result in the offer being disqualified.

11. DOCUMENTS TO ACCOMPANY SUBMISSION:

- US 7 ~ Standard Terms and Conditions of Contract.
- CSS 5 ~ General Tender Conditions

NOTE: Unless otherwise expressly stated herein, all Submissions furnished pursuant to this request shall be deemed to be firm responses. Any exceptions to this RFI must be clearly and specifically noted. TRANSNET reserves the right to reject any or all offers for any reason.

FAILURE TO OBSERVE THE STIPULATED REQUIREMENTS MAY RESULT IN THE RFI BEING DISQUALIFIED.

12. UNDERTAKING OF BIDDERS/ SUPPLIERS

I/WE _____ (name)

Of _____
(company)

submit information on **Energy Management Assessment and Optimisation For Railway Operations** in accordance with the specification requirements and terms and conditions as set out in this document.

13. PROPRIETY ARTICLES USED AS SAMPLES:

When a patented article is used as a sample or when the name of a manufacturer or of a certain trade mark or brand is quoted, it shall only be to indicate the type or quality of the article required and not to limit competition to that article.

14. SIGNING OF RFI / SUBMISSION DOCUMENTS:

By signing the RFI/bid document, I/we acknowledge that I/we have acquainted myself/ourselves with the terms and conditions governing this RFI, including those contained in any printed form to form part thereof and TRANSNET LTD will recognize no claim for relief based on an allegation that the proposer overlooked any such condition or failed to properly take into account for the purpose of calculating my/our RFI/offer prices or otherwise.



15. ADMINISTRATIVE INFORMATION

15.1 Confidentiality of TRANSNET Information

This RFI, and all information provided to the Supplier in connection herewith, is confidential and proprietary information. The Supplier may not disclose this RFI, or any information that TRANSNET may provide the Supplier to assist the Supplier in developing a Submission, to any other person or entity without the prior written approval of TRANSNET. The Supplier may use such information solely for the purpose of responding to this RFI. In the Absence of TRANSNET's prior written consent, the Supplier may not disclose to any third party or person that it has received this RFI, the substance of this RFI, or any TRANSNET decision with respect to the Supplier's Submission. The Supplier may not make copies of this RFI, nor other documents provided to the Supplier in connection herewith, without TRANSNET's prior written consent.

The Supplier will maintain accurate records of the names of persons who have seen this RFI (or other documents provided in connection herewith) and, upon TRANSNET's request, will identify all such persons to TRANSNET.

15.2 Confidentiality of RFI

The Supplier's Submission shall become the sole and exclusive property of TRANSNET. TRANSNET reserves the right to modify, reject or use without limitation any or all of the ideas from the RFI's. TRANSNET will not disclose Supplier's confidential information in the Submission clearly marked as such, i.e., that which is not otherwise publicly available, to any party other than its attorneys, representatives, regulators or consultants in connection with the preparation of this Submission and the evaluation of received Submission/s. In the event any information supplied to TRANSNET is confidential, please note such confidentiality in a separate letter. TRANSNET is willing to execute a nondisclosure agreement acceptable to TRANSNET's legal counsel if requested by the Supplier in connection with the submission of its Offer or further negotiations.

15.3 News Releases

Suppliers who are submitting a response are not at liberty to discuss this RFI outside the TRANSNET Engineering Team. If a Supplier is awarded a contract, they are not to release the details, either orally or in writing, of this RFI without prior written consent of TRANSNET. TRANSNET shall review and approve any written news releases prior to release.

15.4 No Contractual Relationship

Nothing contained in this RFI creates, nor shall be construed to create, any contractual relationship between TRANSNET and any Supplier. TRANSNET makes no commitment in or by virtue of this RFI to purchase any services or supplies from any Supplier. Nor does receipt of any Supplier's RFI place TRANSNET under obligation to enter an agreement to purchase supplies/services ("Agreement") with that or any other Supplier. Such Agreement shall be in a form acceptable to TRANSNET's legal counsel and shall be signed by both parties. The Supplier agrees, however, to incorporate its representations set forth in its response to this RFI concerning performance into the Agreement. Each Submission shall constitute an offer, which remains valid until 30th April 2012. Any Offer submitted by a Supplier is subject to review by TRANSNET's Legal Counsel and negotiation of the offer.

15.5 RFI Costs and Liability

Expenses incurred in preparing and presenting the Offer to TRANSNET is the sole responsibility of the Supplier and may not be charged to TRANSNET in any way. The Supplier specifically agrees that TRANSNET shall have no legal liability of any kind for its actions in releasing this RFI, or considering and choosing among the Submission/s. Nor shall TRANSNET accept any liability



or responsibility for the Supplier's actions vis-à-vis TRANSNET or any third party in receiving and responding to this RFI.

15.6 Amendments to the RFI

TRANSNET reserves the right to amend, modify, withdraw, cancel or terminate this RFI at any time. If the RFI is amended or modified, it will be in writing from TRANSNET. Suppliers are required to acknowledge all amendments in writing.

15.7 Exceptions to the RFI

Any exception to the RFI by the Supplier must be explained in detail in writing. An exception is defined as the Supplier's inability to satisfy a requirement in the manner specified in the RFI. If the Supplier provides an alternative solution, the benefits of the alternative solution must be completely explained as well as any assumption made in proposing such solution. TRANSNET shall not be bound to consider such alternative solutions, but may do so at will.

15.8 Governing Law

The laws of the Republic of South Africa shall govern any agreement between Supplier and TRANSNET.

15.9 Compliance

Supplier shall be in full and complete compliance with any and all applicable state and local laws and regulations, including, without limitation, all Equal Employment Opportunity Commission regulations and requirements.

15.10 Right to Audit

TRANSNET shall have the right to audit Supplier's books and records, upon reasonable advance notice, related to its performance under any agreement entered into between the parties.

15.11 Arbitration

Supplier will be required to agree to TRANSNET's standard arbitration policy

16. DOCUMENTATION.

This RFI consists of the following documentation:

- This RFI document
- General Tender Quotation, Form CSS5
- Transnet Suppliers Code of Conduct



COMBINED DECLARATION REGARDING THE USE OF ELECTRONIC COPIES OF THIS RFI DOCUMENTATION AND CONFIRMATION OF ATTENDANCE AT THE INFORMATION SESSION.

I, _____ (name), a duly authorised representative
of _____

_____ (company name)

hereby note and agree to the following conditions regarding the use of electronic copies of this tender document.

- Under no circumstances will the layout nor format be altered in any way.
- Under no circumstances will any information in the tender document, nor any accompanying specifications and / or annexures be altered in any way.
- No changes will be made to any detail nor requirements, in the accompanying tender documentation.

Furthermore I, the undersigned, UNDERSTAND AND ACCEPT, that should it at any stage be discovered, that the original electronic versions of the RFI documentation, specification/s and / or annexures were changed, it will lead to the immediate disqualification of the tender offer submitted. The disqualification will be enforced at any stage of the RFI process, even if the changes are discovered after the business has been awarded. Transnet will not be held liable and is indemnified against any and all claims, for any costs incurred by such defaulting supplier.

It is furthermore certified that the above named person, representing the above named company, has today:

- Attended the information session
- Is conversant with the requirements of the RFI
- Have received a complete set of the RFI documents

Tender Administrator

Company Representative

Date