“Transnet’s Market Demand Strategy (MDS) is aimed at growth and investment in operations and infrastructure. A market defined delivery and a customer-centred approach. Our focus is on delivering your freight reliably”
Foreword

The South African Heavy Haul Association (SAHHA) is a new platform in South Africa recently established by Transnet Freight Rail, Transnet Engineering, South African Institution of Civil Engineering (R&H Division), South African Society of Railway Engineers (SASRE), University of Pretoria (Chair in Railway Engineering), University of the Witwatersrand.

It is aimed at pursuing excellence in Heavy Haul railway engineering, technology, operations, and maintenance in South Africa. It shall strive to accomplish this mission through the acquisition of knowledge by organizing regional conferences, events, workshops, networking opportunities and other similar initiatives.

South Africa is a member of a well-established International Heavy Haul Association (IHHA), amongst other 9 member countries: Australia, Brazil, Canada, China, India, Norway, Russia, Sweden and the USA. The UIC is an associate member.

(www.ihha.net) for more information). IHHA is a worldwide non-governmental association of railways and railway institutions dedicated to improvement of heavy haul railway operation, maintenance and technology. The establishment of the South African version of the Heavy Haul Forum will ensure that the technical knowledge and case studies shared at IHHA level are cascaded locally for the advancement of Southern African Railways development. In addition, this will also provide an opportunity for technical advancements originating from South Africa to be shared at the international stage.

The IHHA's mission is to pursue excellence in heavy haul railway operation, maintenance and technology, promoting the view that heavy haul railways are one of the best ways to enhance transport capacity while promoting technical cooperation and the exchange of information among members. The Conference is held every four years, and attracts in excess of 700 people.

I am so delighted to announce that South Africa has been selected to host the International Heavy Haul Conference organized by IHHA in year 2019. As a result of this decision, the IHHA board meeting of 2018 will be held in South Africa. During the time of the board meeting in 2018, IHHA members will use this opportunity to confirm readiness of South Africa to host such a big event.

Technical workshops will also be held around the same time of the board meeting. It is there for utmost important that we start demonstrating to the international community that we are indeed ready and organized locally to participate meaningfully in Heavy Haul developments. This conference is one of the ways to showcase our capability.

SAHHA will be launched at the first Heavy Haul Conference scheduled for 8th and 9th September 2014, Emperors Palace, Johannesburg, South Africa. The event provides an exceptional opportunity to exchange technical information about innovation in heavy haul operations, and our aim is to promote further progress in the heavy haul field across the African continent and abroad. Local and international experts and decision makers in the field of heavy haul technology will gather to present and discuss recent advancements in technology, engineering, maintenance and operations.

The conference will also serve as a launch-pad for future heavy haul international conferences in South Africa.

The theme of this conference is 'Technology and Capacity Creation Advancements in Heavy Haul Railways'. This conference will bring together an estimated 300 representatives of designers, constructors, researchers, engineers, managers, as well as suppliers, manufacturers and operators from countries with heavy haul railways. During the Conference there will be a welcome banquet and gala dinner, and visitors will have the opportunity to network.

This first conference offers an exceptional opportunity to exchange technical information and knowledge about heavy haul railways. More than 30 technical abstracts were submitted, to the Conference Technical Committee whereby 18 were selected. It was by no means an easy task because all the abstracts were of a very high standard.

On behalf of the SAHHA Committee, I am delighted to welcome delegates to the first SA Heavy Haul Conference on the 8th and 9th September 2014, Emperors Palace, Johannesburg, South Africa. I would like to take this opportunity to express my heartfelt gratitude to the co-organizers, sponsors, and my fellow colleagues (Dr Robert Stohling, Puel Bester, Rudolph Law) for their sincere support. I wish the Conference complete success.

Yours faithfully,

BRIAN MONAKALI
CHAIRMAN – SOUTH AFRICA HEAVY HAUL
Background

The Purpose of this initiative is to:

- Advance Railway Engineering and specifically Heavy Haul in South Africa
- Bring together all parties in the field of Heavy Haul Rail
- Facilitate the establishment of a common body of knowledge in Heavy haul best practices
- Emphasize the need for Heavy Haul research and international Collaboration.

COMPOSITION OF SAHHA

At this time, the following are the organisations that have shown key interest in establishing the SAHHA. Each of these organisations has nominated a representative who forms part of the SAHHA Committee that is establishing this Heavy Haul Forum. The planning to establish such an Association is done jointly by these organisations.

Founding Committee Members:

Front Sitting (From Left to Right)
- DR Robert Frohling
- Mr Brian Monakali

Standing (From Left to Right)
- Prof PJ Hannes Gräbe
- Mr Mophiwane Marutia
- Mr Rudolph Louw
- Mr Paul Bester
- Mr Johanness Makhushwa
LAUNCH OF THE SOUTH AFRICAN HEAVY HAUL ASSOCIATION (SAHHA)

SAHHA will be launched at the first Heavy Haul Conference scheduled for the 8th and 9th September 2014, Emperors Palace, Johannesburg, South Africa.

The conference will bring together stakeholders from various organizations as well as institutions of higher learning. Local and international experts and decision makers in the field of heavy haul technology will gather to present and discuss recent advancements in technology, engineering, maintenance and operations.

The conference will also serve as a launchpad for future heavy haul international conferences in South Africa. SAHHA also supports research and as a world-class policy research organization dedicated to sustaining a safe, secure and technologically advanced rail network

SAHHA can be used as an avenue for skills and knowledge transfer with highly recognised railways.

South Africa has successfully been selected as the country to host the 2019 International Heavy Haul Conference and the 2018 International Heavy Haul Board Meeting.

BENEFITS OR VALUE TO HOSTING THE CONFERENCE

South Africa as a country is facing a major challenge when it comes to skills development especially in the field of engineering. Government has set a plea to both private and public sector to help with the upliftment of the economy; hence South Africa needs to grab such opportunities through participating in such conferences.

Local and invited international experts and decision makers in the field of heavy haul technology will gather to present and discuss recent advances in the field.

Participants will have the opportunity to exchange information, ideas and innovations with people working in the many interdisciplinary fields aligned with heavy haul technology. The body of knowledge amassed from this conference will benefit South Africa
The Market Demand Strategy
Transnet Freight Rail’s strategic plan aligns with Transnet’s intent and vision. This includes a focus on key segments of the market in order to drive future growth, enhanced accountability, governance and operational efficiency.

- R300bn Capital Investment programme
- Expanding rail, port & pipeline infrastructure
- Increase in capacity to meet Market Demand
- Continued financial stability and strength
- Significant productivity and operational efficiency improvements
- Shift from road to rail, to reduce the cost of doing business and carbon emissions
- Enabling economic growth
- Job creation skills development, localization, empowerment and transformation opportunities

Transnet Freight Rail Core Business
Transnet Freight Rail has changed its operations structure from the three regions to at least six business units in year 2012/01/04. This will enable a much more detailed focus on operations. The six business units are confirmed as:

- Agriculture and Bulk Liquids
- Coal business
- Container and Automotive
- Iron Ore and Manganese
- Mineral Mining and Chrome business, and
- Steel and Cement

These new “Business Units” will be accountable for specific customer groupings and control allocated geographical areas for operational purposes. Allocations of these areas will be based on activity levels related to the customer groupings the units are accountable for. Operations will still be centrally controlled and the central operational structures are being re-aligned to optimise operations across the newly established business units.

Rail Network
TFR owns and maintains a network of 20 500 route km (22 000 track km) connected to ports and the rail networks of neighbouring countries and transport over 80% of SADC freight.

Contact details
15 Girton Road
Inyanda House 2
Parktown
Tel: 0860 690 730
Fax: 0800 007 788
New Business Development:
(011) 544 9721
**Programme**

“Technology and Capacity Creation Advancements in Heavy Haul Railways”

<table>
<thead>
<tr>
<th>MONDAY 8 SEPTEMBER 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>08h00 - 09h00</strong></td>
</tr>
<tr>
<td><strong>09h00 - 09h10</strong></td>
</tr>
<tr>
<td><strong>09h10 - 09h30</strong></td>
</tr>
<tr>
<td><strong>09h30 - 10h00</strong></td>
</tr>
<tr>
<td><strong>10h00 - 10h30</strong></td>
</tr>
<tr>
<td><strong>10h30 - 12h10</strong></td>
</tr>
<tr>
<td><strong>10h30 - 10h55</strong></td>
</tr>
<tr>
<td><strong>10h55 - 11h20</strong></td>
</tr>
<tr>
<td><strong>11h20 - 11h45</strong></td>
</tr>
<tr>
<td><strong>11h45 - 12h10</strong></td>
</tr>
<tr>
<td><strong>12h10 – 12h35</strong></td>
</tr>
<tr>
<td><strong>12h35 - 13h45</strong></td>
</tr>
<tr>
<td><strong>13h45 – 14h10</strong></td>
</tr>
<tr>
<td><strong>14h10 - 14h50</strong></td>
</tr>
<tr>
<td><strong>14h10 - 14h35</strong></td>
</tr>
<tr>
<td><strong>14h35- 14h50</strong></td>
</tr>
<tr>
<td><strong>14h50 - 15h20</strong></td>
</tr>
<tr>
<td><strong>15h20 - 16h10</strong></td>
</tr>
<tr>
<td><strong>15h20 - 15h45</strong></td>
</tr>
<tr>
<td><strong>15h45 - 16h10</strong></td>
</tr>
<tr>
<td><strong>Gala Dinner –</strong></td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>09h00 - 10h15</td>
</tr>
<tr>
<td>09h00 - 09h25</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>09h25 - 09h50</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>09h50 - 10h15</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>10h15 - 10h45</td>
</tr>
<tr>
<td>10h45 - 12h00</td>
</tr>
<tr>
<td>10h45 - 11h10</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>11h10 - 11h35</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>11h35 - 12h00</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>12h00 - 13h00</td>
</tr>
<tr>
<td>13h00 - 13h50</td>
</tr>
<tr>
<td>13h00 - 13h25</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>13h25 - 13h50</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>13h50 - 15h00</td>
</tr>
<tr>
<td>13h50 – 14h50</td>
</tr>
<tr>
<td>14h50 – 15h00</td>
</tr>
</tbody>
</table>
Some of the speakers

Hannes Grabe

BEng (Civil Engineering)  
MEng (Geotechnical Engineering)  
PhD (Geotechnical Engineering)

University of Pretoria – Chair in Railway Engineering

Hannes Grabe is civil engineer, passionate about railways, with experience in the various fields. After completing his under-graduate studies at the University of Pretoria in 1994, he joined Transnet Freight Rail’s Track Technology Centre, Johannesburg. In 1998 he completed an MEng degree in Geotechnical Engineering and from 1999 – 2002 he studied abroad and obtained a PhD in Geotechnical Engineering from the University of Southampton (UK).

This research was focussed on the design life prediction of railway foundations under heavy axle loading. He is currently employed by the University of Pretoria as Associate professor, Transnet Freight Rail Chair in Railway Engineering where he lectures under – and post-graduate courses in Railway Engineering.

Owen Phiri

BSc Eng (Civil Engineering) – Wits

Owen Phiri studied and graduated from the University of the Witwatersrand with a bachelor’s degree in Civil Engineering in 2012.

Started working for Transnet in April 2013 after a brief period as a business analyst in the Foreign Exchange department at First National Bank. Appointed in Transnet Freight Rail’s Capital Planning department headed by Delindile Sinyamunyana as an Engineer –in-Training working on strategic infrastructure projects to meet projected future demands. He later joined the TFR Infrastructure department at the Ermelo depot under the mentorship and guidance of Tamara Mark, where he still focused mostly on infrastructure expansion projects and upgrades like the Majuba Rail Link and the Ermelo 3rd balloon. With the Overvaal tunnel (the Coal Line’s bottleneck) failing under the jurisdiction of the Ermelo Depot, he took on the challenge of bringing the tunnel back to its former glory by eliminating the potential risks to the business that existed due to perway defects inside the tunnel. He is currently employed by Transnet Freight Rail as an Engineer-in-Training responsible for bridge and culvert design for the upgrades portion of the Swaziland Railway Link.

Justice Ngoato

NDip. Engineering Metallurgy

University of Johannesburg

Justice Ngoato is currently employed as Chief Engineering Technician in the Legal and Technical Compliance department within Rail Network Technical.

After completing his National Diploma in Engineering Metallurgy in 2006, he joined Transnet Freight Rail in 2007 at the Metallurgical laboratory in Koedoespoort where he was involved in failure investigations, non-destructive testing as well as flash-butt and exothermic welding processes.

He then joined Infrastructure Maintenance at the Central Office in 2009 where he was appointed as the Technical Officer for the Ultrasonic Measuring Cars (UMC) contracts. In 2012, he then joined the Legal and Technical Compliance department where he is involved in finite element modelling. He also provides technical support regarding track maintenance philosophies and practices.

Ms Gculisile Mavis Mvelase

NDip. Engineering Metallurgy

University of Johannesburg

Ms Mavis Mvelase is currently a Senior Engineer at Transnet Freight Rail in the division of Rail Network Technical. Started working for Track Technology Center in September 2007. She obtained her BSc degree in Civil Engineering in 2006 from University of KwaZulu Natal and BEng Honours degree in Geotechnical Engineering from the University of Pretoria in 2009. She has more than Seven years of experience in geotechnical investigation, design of railway track structures and construction.

She is finalising her master’s degree programme in Civil Engineering at University of Pretoria. Her master’s degree study is focused on the use of Laser Scanning Technology to Quantify Shape Properties of Railway Ballast. This is part of a collaborative research between CSIR and Transnet Track Technology Centre.
Speakers Cont...

Sguda E. Sibande

Received the B.Sc. (Eng.) and M.Sc. (Eng.) degrees from the University of Cape Town and Stellenbosch, South Africa, in 2002 and 2005, respectively. He is registered with the Engineering Council of South Africa (ECSA) as a Professional Engineer (Pr.Eng.) and he is a member of the South African Institute of Electrical Engineers (SAIEEE).

He is currently the committee member of the power committee of the SAIEE (National) and is a former secretary and committee member of the Mpumalanga Province SAIEE. He has previously co-authored and presented two conference papers (SAUPEC, Stellenbosch, RSA 2004 and IEEE Africon, Gaborone, Botswana 2004) and one journal paper (SAIEE Africa Research Journal, 2006) on electrical machines together with Professor Maarten J. Kamper at the University of Stellenbosch. He is a former part time lecturer of Electrical Machines at the Vaal University of Technology (VUT – Secunda Campus).

He is a previous Transnet Bursary student and is currently the Principal Electrical Engineer, Technology Management – Transnet Freight Rail (TFR). He has previously worked as an Engineer (Technology Management, TFR), Product Engineer (Transnet Engineering) and as a Senior Engineer (Sasol Technology). His research interests include renewable energy systems, power systems engineering, pantograph-OHTE interface and design and control of permanent-magnet assisted machine drives.

Mr. Pragasen Pillay

General Manager of Logistics Integration in Transnet Freight Rail from 2011 to present

Mr. Pillay’s career spans 25 years in the rail industry within Transnet. Amongst others, previous posts held include General Manager of Locomotive Maintenance in Transnet Engineering from 2006 – 2011 and National Business Manager of Rotating Machines Transwerk from 2003 – 2006.

His background is in heavy maintenance engineering.

Leonard Msibi – Pr.Eng

BSc. (Maths, Stats) UKZN, HDE (Education) UKZN, GDE (Welding) Wits, BSc.Eng. (Mech) UKZN, MSc.Eng (Mech) UKZN

Leonard Msibi is a mechanical Engineer, and is currently studying PhD(Eng) at the University of the Witwatersrand. He has extensive experience in welding, design of petrochemical equipment. He also has extensive experience in automotive welding.

He was also a lecturer at the school of mechanical Engineering at UKZN. He is now a Principal Engineer at TFR, in Legal and Technical compliance dept, in the technical office. He is running a team that utilises various simulation and Finite Element softwares.
Speakers Cont...

Dr Robert Fröhling

B Eng (Mechanical)
B Eng (Hon) (Structural Dynamics)
M Eng (Mechanical)

Ph.D (Railway Engineering)

Principal Engineer (Mechanical Technology, Transnet Freight Rail)

Dr. Robert Fröhling is a registered Professional Engineer and has more than 30 years of railway experience with extensive experience in rail vehicle system dynamics, vehicle/track interaction, wheel/rail interaction, bogie technology and structural mechanics. To date he has published and/or presented 47 international papers on these core railway technologies. As a Principal Engineer within the Technology Management Department of Transnet Freight Rail, he has the overall responsibility for the following core Mechanical Railway Technologies: Railway Vehicle System Dynamics, Wheel/Rail Interaction, Bogie Technology, Structural Mechanics as well as Locomotive and Wagon Mechanical Design Integrity.

Throughout his career Robert has been and is still is involved in, amongst others, the following professional services:

Chairman of 16th Symposium of the International Association for Vehicle System Dynamics, Pretoria, South Africa;
2nd Vice President of the International Association for Vehicle System Dynamics; Member of the Editorial Board of the Vehicle System Dynamics International Journal of Vehicle Mechanics and Mobility; Member of the Editorial Board of the Journal of Rail and Rapid Transit, Part F of the Proceedings of the I Mech E; Member on the Advisory Board of the Department of Mechanical and Aeronautical Engineering of the Faculty of Engineering. Built Environment and Information Technology at the University of Pretoria; Scientific expert for the second and the third international evaluation of the Chalmers Centre for Railway Mechanics (CHARMEC), a VINNOVA Competence Centre at the Chalmers University of Technology in Göteborg, Sweden, Robert is a fellow of the South African Academy of Engineering (SAAE) and registered with the Engineering Council of South Africa (ECSA) as a Professional Engineer.

JUSTICE NGWENYAMA

ND (Mechanical Engineering)
BSc. Honours (Mechanical Engineering)
ECSA Registered Professional Engineer

Senior Engineer (Train Design Technologies) Transnet Freight Rail

He joined Transnet Freight Rail as an Engineer-in-Training during December 2005, where he gained experience on train dynamics principles and with conducting in-service train testing. He gained vast knowledge in both train design parameters and train operations within TFR Network. After gaining knowledge of data acquisition systems and in-servicing train testing he was promoted to Engineer within Train Design Technology and subsequently promoted to Senior Engineer within Train Design Technologies. He is now responsible for the Train Design Theoretical Analysis and Simulations section within Train Design Technologies. This section oversees all long train operations within the TFR network by conducting simulations of in-train dynamics of proposed services and conducting research into running longer trains.

In addition, when required, he also forms part of the Investigation Team that assists the Corporate Safety Office to conduct derailment investigations. He recently graduated from the Chief Executive’s Talent nurturing program within TFR and has been appointed as a personal coach within Enterprise Risk Management.

He is a passionate railway engineer and is always willing to share his knowledge with colleagues or the community.

Justice is a registered Professional Engineer with the Engineering Council of South Africa (ECSA)
Transnet engineering, an operating division of Transnet SOC Ltd, is the backbone of South Africa’s railway industry with nine product-focused businesses, 132 depots, seven factories and 13,000 employees countrywide. The organization is dedicated to in-service maintenance, repair, upgrade, conversion and manufacture of freight wagons, mainline and suburban coaches, diesel and electric locomotives as well as wheels, rotating machines, rolling stock equipment, castings auxiliary equipment and services.
Sponsors

Platinum Sponsor

TRANSNET

freight rail

delivering freight reliably

Gala Dinner Sponsor

TRANSNET

rail engineering

Other Sponsors

Event Exhibitors

AVENGER MANUFACTURING

TCSE

Wits Transnet Centre of Systems Engineering

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Denkleers • Leading Minds • Dlkqapolo ffa Dhlalefi

Plasser South Africa

TIMKEN
African Soul
Global Perspective