



## **TERMS OF REFERENCE**

### **REQUEST FOR A SERVICE OF CONDUCTING THE OCCUPATIONAL HYGIENE SURVEYS & ENVIRONMENTAL ASSESSMENT AT TRANSNET ENGINEERING (TE), UITENHAGE REGION**

## 1. INTRODUCTION

Transnet Engineering business strives to conduct its business activities within the framework of a Safety, Health and Environmental Management based on ISO 14001, OHSAS 45001, NOSA, National Railway Safety Regulator Act, 2002 (As amended), including SANS 3000-4:2001 (Human Factor Management) and OHS Act, 85 of 1993 as amended and other SHE related legislations. TE Uitenhage region comprises of approximately three (3) Maintenance depots (inclusive of sub depots and in-service) and five (3) businesses within the factory.

The organisation is dedicated to in-service and out of service maintenance depots (en-route maintenance of rolling stock), repair, upgrade, conversion, refurbishment and manufacturing of freight wagons, diesel and electric locomotives as well as wheels, rotating machines, rolling stock equipment, castings, auxiliary equipment and support services.

Some of the activities like spray painting, shot blasting, cleaning of components with chemicals, gas burner operations, steam cleaning will require personal sampling and stack monitoring. AIA should identify such activities and sampling points / areas as well as accessibility to these areas.

Transnet Engineering invites proposals from suitably qualified and registered Service Providers or Approved Inspection Authority (AIA) to conduct Occupational hygiene monitoring at its businesses across the region.

The need for this monitoring comes as a result of legislative requirements, SANS requirements, TE policies and code of practices and its commitment to prevention and minimize health hazards in the work environment.

## 2. LEGAL REQUIREMENTS

Transnet Engineering (TE) requires that Occupational Hygiene Surveys be carried out in line with the following, but not limited to, legal requirements:

- Occupational Health & Safety Act (Act 85 of 1993) as amended and all regulations incorporated under this Act
- The National Environmental Management Act, Act 107 of 1998
- National Environmental Management: Air Quality Act 39 of 2004
- All applicable South African National Standards (SANS) referred to in the Occupational Health and Safety Act (Act 85 of 1993 as amended), as well as Railway Safety Legislation (SANS 3000-4:2011 (Section 5 Physical Environmental factors) and all regulations incorporated under this Act.
- Transnet Engineering SHE IMS Corporate Standards and Policies
- Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993)
- TE code of practices
- International standards and Best practices
- TE Ambient Noise standard
- TE Ambient vibration standard
- Ergonomic Regulations 2019

### 3. AIA COMPETENCY

- The service provider must be an Approved Inspection Authority (AIA), approved by the Department of Labour and in the process of SANAS accreditation. The valid Certificate of approval must accompany the quotation. TE will require a valid / recent copy of the certificate with each report supplied.
- The service provider must have a Certified Ergonomist registered with accredited ergonomic institution for conducting ergonomic assessment.
- Personnel involved in the services of the Approved Inspection Authority must be registered with the Southern African Institute of Occupational Hygiene (SAIOH). TE will require copies of the certificates with each report supplied.
- The Approved Inspection Authority must include at least one Occupational Hygienist.
- Assistant Occupational Hygienists must be under the direct supervision of the Occupational Hygienist if they are to conduct monitoring surveys.
- An Occupational Hygiene Technologist must be registered with SAIOH and hold a valid legal competency certificate. TE will require copies of the certificates with each report supplied.
- Site inspection by the AIA is imperative before submitting quotations so as to be familiar with the occupational health hazards and risks in the workplace.

### 4. MONITORING EQUIPMENT REQUIREMENTS

#### **An AIA must:-**

- Be in possession of technical equipment required for sampling.
- Be able to provide the valid calibration certificates for each piece of equipment used for sampling.
- Be accountable and responsible for the correct operation and calibration of all equipment used, whether it belongs to them or not.
- The Laboratory where sample analysis are conducted should be ISO 17025:2005 Accredited
- Be accountable and responsible for the result obtained if external accredited analytical laboratories (e.g SANAS) are used for sample analysis.
- Instruct the laboratory on specific method of sampling analysis required (in accordance with legislation and SABS/SANS codes).
- Certify that the given method was used for the sampling analysis. Any deviation from the sampling method must be recorded and the reason for such deviation must be motivated.
- Give applicable explanation, control measures and recommendations regarding findings and non-conformances as part of her/his report
- Consider the working environment and existing control and give recommendations which are applicable to reduce the exposure level.

## 5. SCOPE OF WORK

The following surveys or assessments will need to be conducted at TE Uitenhage Region :

### 5.1 Identification and Evaluation Occupational Health Stressors

For risk identification, AIA shall list all activities from the start of its process to the end and identify the following stressors:-

#### 5.1.1 Chemical Stressors

- Dust (e.g. Asbestos, Silica, etc)
- Smoke (e.g. Smoke from stacks, etc)
- Fumes (e.g. Exhaust emissions from Diesel Locomotives, metal fumes, welding fumes etc)
- Mist (e.g Spray Painting)
- Gases (e.g. Hazardous chemicals) and
- Vapours (e.g. Lead from soldering processes)

#### An AIA shall:-

- Conduct **Hazardous Chemical Substance Risk** identification, assessment and recommend control measures, and compile a Risk Register clearly indicating all the identified activities.
- Conduct air monitoring to determine the measurement of the airborne concentrations of the HCS to which employees are exposed and rate these in terms of the significance as outlined in the **HCS** Regulation. Refer to chemical stressors in 5.1.1 and also consider other chemical substances not mentioned above.
- The **Hazardous Chemical Substance risk assessment** section of the assessment shall be undertaken in compliance and with due consideration to Section 8 of the Occupational Health and Safety Act (Act 85 of 1993), OHSAS 18001 section 4.3.1 and SANS 16001 section 4.3.1. This also to include train operators and shunting teams entering areas where HCS are used or other areas of exposure (SANS 3000-4:2011).
- All other **Hazardous Chemical Substance** risks of current activities, products and services and new activities (new developments, modified activities, services or new projects, non-routine, emergencies) shall also be identified during these assessments.
- Evaluation should be done in accordance with monitoring strategy Occupational exposure sampling strategy Manual (173-1973).
- Evaluate the exposure of critical grades such as shunters, yard officials, tractor operators and locomotive drivers to loco / hunslet/funkey/ tractor exhaust fumes in cab ,Dust areas ,Exposure to commodity in wagons and tankers and environment of shunting e.g. move into shot blasting/ spray painting area
- Consider regulation applicable for specific activities e.g. Asbestos and Lead.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separate from site-specific recommendations.

## 5.1.2 Physical Stressors

- **Illumination**

- **Competent person shall:-**

- Measure the illumination level and compare with statutory requirements as per environmental regulation for workplaces as well as Human Factor standard (SANS 3000-4:2011) (e.g. Inside Cabs of shunting equipment such as Traverser, Funkey Locomotives, Whiting, etc) for each activity as well as yards where train activities are conducted, Lighting where coupling takes place, head light of shunting equipment (Tractor/funkey/hunslet/etc.) for visibility of rails, points, cross overs, walk area, etc) and security perimeters.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separate from site-specific recommendations.
- Schematic drawing indicating workshop layout in comparison to sampling points to be included in the report.

- **Noise**

- **An AIA shall:-**

- Establish equivalent noise level from activities where the noise level is 85dB (A) or higher.
- Indicate all noise sources and area/zone on relevant maps and attach to the report.
- Take measurements at approximate position of the employee's ear who receives the higher noise level as contemplated in the South African Code of Practice for the measurement and assessment of occupational noise for hearing conservation purposes, SANS 083-1983 (as amended).
- The measured level must be representative of an 8hr work period.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls i.e. Elimination, Substitution, Engineering Control, Administrative control and PPE as the last resort. Any general recommendation(s) must be outlined separate from site-specific recommendations.
- Schematic drawing indicating workshop layout in comparison to sampling points to be included in the report as well as Human Factor standard (SANS 3000-4:2011) (e.g. inside Cabs of shunting equipment, employees working in in-service areas between rolling stock in yards, load box testing, exposure of Yard officials and wagon examiners, Tractor drivers, etc.)
- For Human factor standard ( SANS 3000-4:2011) Environmental noise that interfere with critical communication instructions, noise-induced fatigue and negative impact on health and lifestyle. Noise rate level of 75 dB for railway safety activities including shunting, examination and maintenance of locomotives and wagons in the In-services environment as per Railway Safety management: SANS 3000-1:2009

- **Thermal Conditions**

**An AIA shall:-**

- Identify and evaluate thermal stressors in accordance with Environmental regulations for work places 1987 under OHS Act 85 of 1993, as well as Human Factor standard (SANS 3000-4:2011) (e.g. employees exposed to harsh environmental conditions in winter and summer and working outside during shift work when doing train operation duties work especially in in-service yards at places like New Brighton, Queenstown, Middelburg and De Aar, etc. as well as inside cabins of shunting equipment). This must be conducted during winter and summer months and during night shift duties).
- Provide practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls.

**(a) Heat stress**

**An AIA shall:-**

- Identify sources of heat to the body.
- Ensure measurement is carried out in accordance with ISO code of practice 7243 and Environmental Regulations for workplaces OHS Act 85, 1993.
- Provide a calibration certificate of the monitor.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.

**(b) Cold Stress**

**An AIA shall:-**

- determine areas, occupants or tasks that place workers at risk of Hypothermia or cold related incidents.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.
- recommendations and appropriate control measures, taking into consideration the hierarchy of controls.
- **Identify and evaluate cold stressors in accordance with Environmental regulations for work places 1987 under OHS Act 85 of 1993, as well as Human Factor standard (SANS 3000-4:2011)**

- **Ventilation and In-door air quality**

**An AIA shall:-**

- Measure air velocity to determine if the air breathed by employees does not endanger their health as determined by the Occupational Exposure Limit (OEL).
- Take into consideration the carbon dioxide, Carbon monoxide, Nitrogen dioxide, Sulphur dioxide, Formaldehyde and Soot content of the air in line with Regulation 5(c) of the Environmental Regulations for Work Places.
- Measure ventilation and efficiency of extractions systems in the spray painting booths, shot blast booths and other similar systems.
- Apply best practices and legislative requirements.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.

- **Vibration**

**An AIA shall:-**

- Identify all sources of vibration and classify whether they affect whole body vibration (WBV) or vibration affecting the upper limbs or hand arm vibration syndrome
- Comply with international standards for measuring WBV. Provide practical recommendations and appropriate control measures as well as Human Factor standard (SANS 3000-4:2011) (e.g. Inside Cabs and on shunting equipment, handling of controls and shunting staff hanging onto rolling stock during shunting movements, Testing air and vacuum brakes).
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.

### **5.1.3 Ergonomics (Human Factors in Design)**

**An AIA shall:-**

- Conduct ergonomic assessment to consider human abilities and limitations in relation to work positions and machines in line with the new Ergonomic Regulation.
- **Identify and evaluate ergonomics risks, also taking into consideration Human Factor standard (SANS 3000-4:2011) (e.g. Inside Cabs of shunting equipment, Operational equipment such as Point tumblers, Commode handles, Access to shunting equipment, walk ways, employees**

**in the In-services environment examining and maintaining locomotives and wagons, manual lifting operations, etc.).**

- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.
- The assessment to be conducted by a Certified Ergonomist registered with accredited ergonomic institution with experience in manufacturing or engineering field.

NB: Ergonomic Assessment to be conducted in terms of the Ergonomic Regulations 2019 requirements for the Businesses highlighted in red, see Annexure A.

#### **5.1.4 Silica Dust Monitoring**

**An AIA shall:-**

- Conduct assessment to determine area that emit silica dust in accordance with OHS Act 85 of 1993 requirements (Where applicable)

#### **5.1.5 Environmental Surveys or Assessments**

**An AIA shall:**

- Conduct Environmental Noise Surveys to determine the impact the business operations could be having on the surrounding environment (should be conducted both day and night)

#### **5.1.6 Health Risk Assessment**

**Baseline Process**

**An AIA shall:-**

- Determine the current state of the occupational health risks associated with TE activities.
- Gather information about work and work practices e.g. identify raw products, additives added to the product involved.
- Obtain inventory of Hazardous chemicals and MSDS's.
- Determine number of employees exposed
- Identify control measures in place
- Determine Likelihood of exposure
- Determine frequency and duration of exposure
- Determine potential severity of exposure
- Provide quantitative ratings.
- Provide site-specific practical recommendations and appropriate control measures, taking into consideration the hierarchy of controls. Any general recommendation(s) must be outlined separately from site-specific recommendations.

## **5.2 It is required from Service Providers to:**

- Allow TE Compliance and Regulatory Affairs employees to participate during the entire occupational hygiene process, specifically drawing their attention to critical observations made during surveys.
- Demonstrate to TE Compliance and Regulatory Affairs employees how the pre- and post-measuring activities are performed.
- Allow TE Compliance and Regulatory Affairs employees to perform pre- and post-measuring activities.
- Allow TE Compliance and Regulatory Affairs employees to explain to employees what is being done (under supervision).
- Allow TE Compliance and Regulatory Affairs employees to record all the necessary data on field sheets.
- All the activities must not affect or compromise the occupational hygiene services provided by the Service Provider.

## **6. Business Activities**

### **6.1 Locomotive Maintenance Businesses**

- Administrative duties, walking, moving, climbing, placing, inspection, examining, maintenance, repairing, shunting, receiving, stacking, sorting, changing, charging, transporting, lifting, dismantling, assembling, securing, operating, handling, greasing, welding, flame cutting, testing, storing, crack testing, grinding, removing, replacement, soldering, unblock of sandbox, cleaning, washing, stencilling, measuring, profiling, re-railing, adding chemicals, painting, waste management, sweeping of floors, showering and eating.

### **6.2 Wagons Maintenance Businesses**

- Administrative duties, walking, moving, climbing, placing, inspection, examining, maintenance, repairing, shunting, receiving, stacking, sorting, changing, charging, transporting, lifting, dismantling, assembling, securing, operating, handling, greasing, welding, flame cutting, testing, storing, crack testing, grinding, removing, replacement, stencilling, measuring, profiling, re-railing, adding chemicals, painting, waste management, sweeping of floors, showering and eating.

## **7. DELIVERABLES**

- Hygiene Surveys reports for each one of the surveys as follows:
  - Report for each Business and per Depot and Sub-depot and per stressor
  - Conduct the Regional Feedback Session for the businesses giving summary of all the surveys that were performed and critical issues for Regional Business attention
- Final reports must be submitted in hard copies and also in electronic format

## 8. WORK SCHEDULE:

The Respondents must submit with their proposals a detailed schedule of the work to be undertaken as this will form part of the adjudication criteria. The schedule should also indicate time frames and be accompanied by a detailed budget breakdown per business. The expected delivery date will be discussed with a successful tenderer.

## 9. GENERAL REQUIREMENTS:

The Respondents must:

- **Clearly set out the proposed methodology for achieving the required objectives.** The detailed schedule/programme to be submitted with the proposal must include but not be limited to e.g.
  - Specific deliverable
  - key milestones;
  - inter-relationships between activities,
  - time for the completion of the entire project, etc
- **Indicate the probable cost and time elements of their proposal.** The costs should be broken down per each businesses and also costs for travel, accommodation, sampling test, material and analysis.
- Submit an extensive company profile, providing details of similar or associated work done;
- Demonstrate a proven track record Curricula Vitae of all human resources to be deployed in the project; Show clear capacity for delivering adequate services;
- Be able to commence work at short notice if successful;
- **Expected lead time to be six (6) months including the submission of reports.**

Transnet Engineering promotes Black Economic Empowerment (BEE) and details thereof with Regards to this assignment should be provided. Prospective service providers should supply BBBEE certificate with this proposal.

## 10. ADJUDICATION PROCESS

Transnet Engineering reserves the right to:

- Adjudicate proposals in terms of Transnet procurement procedures;
- To approve sub-contractors or joint venture partners. If deemed necessary, a short presentation and or interview may be required from candidates, for which adequate notice will be given;

- To cancel this project at any time;
- To decide to call for a second round of specific and detailed submissions should it deem appropriate;
- Not accept any proposal in part or in full.

## **11. ACCEPTANCE OF PROPOSALS**

Transnet Engineering does not bind itself to accept lowest cost proposal nor will it furnish any details or enter into any communication relating to the non-acceptance of any or all proposals.

## **12. AGREEMENT**

A formal agreement will be concluded with the successful tenderer as soon as the procurement process has been completed.

## **13. PENALTIES**

Penalties for the late completion of the work will be raised in accordance with Transnet Engineering's Service Agreement, which will be concluded with the successful tenderer.

**Note:** Refer to Attached **Annexure A** for Transnet Engineering's Businesses to be included in this scope.

## **14. Business Included: (Annexure A)**

## ANNEXURE A

### 1. Uitenhage Region Businesses

#	LOCATION	MAIN OPERATIONAL BUSINESS	ESTIMATED KILOMETERS FROM Uitenhage CENTRE	REQUIRED HYGIENE MONITORING	STAFF	PRICE
1.	<b>Uitenhage</b>	Admin(Offices)	0	<ol style="list-style-type: none"> <li>1. Ventilation &amp; Indoor air quality stresses</li> <li>2. Illumination</li> <li>3. Ergonomics stressors</li> </ol>	40	
		Wagons Manufacturing	0	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>	321	
		Wheels Business	0	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>	71	
		PEMM	0	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> </ol>	58	

				7. Vibration 8. HBA 9. Environmental Noise		
		Product Development(PD)	0	1. Chemical stressors 2. Noise 3. Thermal stressors 4. Ventilation & Indoor air quality stresses 5. Illumination 6. Ergonomics stressors 7. Vibration 8. HRA 9. Environmental Noise	19	
2.	<b>Uitenhage</b>	Faculty of Engineering (Centre)	0	1. Chemical stressors 2. Noise 3. Thermal stressors 4. Ventilation & Indoor air quality stresses 5. Illumination 6. Ergonomics stressors 7. Vibration 8. HRA 9. Environmental Noise	46	
		Faculty of Engineering (Swartkops)	32	1. Chemical stressors 2. Noise 3. Thermal stressors 4. Ventilation & Indoor air quality stresses 5. Illumination 6. Ergonomics stressors 7. Vibration 8. HRA 9. Environmental Noise	10	
		Faculty of Engineering (New Brighton)	37	1. Chemical stressors 2. Noise 3. Thermal stressors 4. Ventilation & Indoor air quality stresses 5. Illumination 6. Ergonomics stressors 7. Vibration 8. HRA 9. Environmental Noise		

		Faculty of Engineering (North End)	40	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>		
		Faculty of Engineering (Cambridge)	600	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>	19	
3.	<b>Swartkops</b>	Locomotives Maintenance	32	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>	87	
		Rotating Machines	32	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. PCB Exposure</li> <li>9. Environmental Noise</li> </ol>	20	

4.	<b>New Brighton</b>	Wagons Maintenance	37	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. HRA</li> <li>9. Environmental Noise</li> </ol>	92	
5.	<b>Cambridge</b>	Locomotives Maintenance	600	<ol style="list-style-type: none"> <li>1. Chemical stressors</li> <li>2. Noise</li> <li>3. Thermal stressors</li> <li>4. Ventilation &amp; Indoor air quality stresses</li> <li>5. Illumination</li> <li>6. Ergonomics stressors</li> <li>7. Vibration</li> <li>8. Crystalline Silica</li> <li>9. Environmental Noise</li> </ol>	37	

**TOTAL COST = R\_\_\_\_\_**

**Terms of reference approval (Occupational Hygiene Surveys – Uitenhage Region)**

**Approval by: Amanda Tongo Signature**



**Date:** 17August 2023