



**SUPPLY, DELIVERY, TESTING,  
CALIBRATION AND COMMISSIONING TO  
UPGRADE THE 6E1 MOTOR  
ALTERNATOR TESTBAY FOR  
ROTATING MACHINES BUSINESS.**

**ROTATING MACHINES DEPOT, 150 EEL  
ROAD, UMBILO INDUSTRIAL, UMBILO.**

**REFERENCE No: OPS\_RM\_DBN\_ SOW\_043**

**Revision 0**

**Date of release: April 2025**

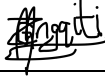
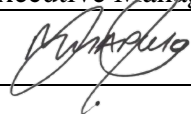
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## DOCUMENT AUTHORITIES

Departments	Facilities and Infrastructure
Department Affected	Rotating Machines Business
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## 1. INTRODUCTION

This specification is for the:

#	TASK	REQUIRED
1	Design	
2	Manufacture	
3	Assess	
4	Structural Drawings	
5	Supply	✓
6	Delivery	✓
7	Documentation	✓
8	Testing	✓
9	Calibration	✓
10	Training	✓
11	Commissioning	✓

Of the specified:

#	ITEM	REQUIRED
1	Supply, delivery, testing, calibration and commissioning to Upgrade of 6e1 MA Test bay for Rotating Machines Business.	✓
2	Submission of project completion documents.	✓

## 2. SITE INSPECTION

- 2.1 All prospective contractors shall be required to undertake a compulsory site inspection to fully acquaint themselves with all aspects involved.
- 2.2 Arrangements to visit the site and confirmation of the date and time of the site inspection shall be made with Transnet Engineering Contract Manager.
- 2.3 The site inspection certificate shall be completed and countersigned by the contract Manager on the day of the visit and must be submitted with the tender documents.

## 3. INFORMATION REQUIRED

- 3.1 Offers will not be considered unless full particulars and sufficient literature are provided at the tendering stage to enable Transnet Engineering Technical Officers the opportunity to assess each technical offer properly.
- 3.2 Prospective Contractors will complete the relevant questionnaire in full and must indicate whether their offer complies with each item of the specification
- 3.3 Should there be insufficient space for furnishing full details; contractors shall provide the additional details in their covering letter. The additional details shall be numbered in accordance with the applicable clause specified in the specification.

- 3.4 As prospective contractors are considered to be experts in their field, they are obliged to identify any shortcomings, such as omissions or sub-standard requirements, to the completeness of this specification. These must be brought to the attention of Transnet Engineering at tender stage with alternatives to address these shortcomings. However, each offer shall be quoted for separately.

#### 4. TECHNICAL REQUIREMENTS

The following regulation and codes must be complied with:-

- **The Occupational Health and Safety Act – Act 85 of 1993.**
- **SANS 17025 : 2005 General requirements for the competence of testing and calibration laboratories**

- 4.1 Except where otherwise provided for in the specification, all equipment offered will comply with the requirements of the relevant standard specifications of the SABS, if published, otherwise with the relevant standard of the British Standards Institution in force at the time of tendering.
- 4.2 Where equipment offered complies with the recognized standards of the country of manufacture and not specifically with the standards required by this specification, such equipment will be considered at the discretion of Management. In this case, tenders shall state fully all respects in which the equipment departs from the standard laid down in this specification.
- 4.3 The successful tender will at the conclusion of the installation provide a document along the lines “that the installation complies with national/international requirements and that all selected /designed items are compliant with Act 85 of 1995 and SABS practices applicable to the installation. The equipment has been commissioned/ calibrated and employees as specified have been trained and found competent to operate the plant.”

#### 5. SPECIFIC REQUIREMENTS

**Any person with the intention of tendering shall ensure that the information below is complied with.**

##### 5.1 Operating Environment

- Indoors – workshop environment.

##### 5.2 Scope of work

Item no.	Requirements This specification covers the minimum requirements.
5.2.1.1	Supply and install new measuring instruments.
5.2.1.2	<u>On handover, the following documents shall be supplied for each measuring instrument:</u> <ul style="list-style-type: none"> <li>• 1 set of hard copies.</li> <li>• Testing and measurement manual.</li> <li>• Standard operating procedure.</li> </ul>
5.2.1.3	<b>Calibration certificates</b> <ul style="list-style-type: none"> <li>• Each measuring instrument shall be tested and calibrated. Valid calibration certificates shall be submitted to the Project Manager.</li> <li>• The period from date of calibration and date of submission of calibration certificates shall not be greater / older than 1 month.</li> </ul>
5.2.1.4	<u>All measuring instruments shall be supplied with probes, attachments, accessories, etc. necessary to support easy and convenient testing and measurements.</u>

Item no.	Requirements This specification covers the minimum requirements.
5.2.2	<b>Supply 1 x complete Load Test facility for the 6e Motor Alternator Set</b>
5.2.2.1	<ul style="list-style-type: none"> <li>The facility must have rated Isolator switch for Main Power On/Off as and when required.</li> <li>The 0-4Kv Variac is available for the supply power to the MA set.</li> <li>The facility will be controlled by an existing manual control panel and a new touch screen control. A new selector switch must be installed to select between the two.</li> <li>The facility must have software and 20Gig memory to record the following parameters for each set tested for the duration of the test of 1 (one) hour               <ul style="list-style-type: none"> <li>1. Input Motor Load Voltage</li> <li>2. Input Motor Load current</li> <li>3. Output Load Voltage</li> <li>4. Output Load Current</li> <li>5. Speed</li> </ul> </li> </ul>
	Supply and fit an Output Load Selector switch for 3 level Load settings
5.2.2.2	Measurement of Speed of the set: 2000RPM
5.2.2.3	Control the Load Input Voltage 0-4Kv DC Voltage on the existing Variac
5.2.2.4	Measure motor Load Input Current: 0-100Amps and shunt field current 0-100Amps
5.2.2.5	Supply, Control and measure Excitation voltage from 0-200Volts DC at 10Amps
5.2.2.6	Measure and control Output Load current from 0-830Amps
5.2.2.7	Measure temperature x 2 from 0-200 degrees Celsius with suitable sensors
5.2.2.8	Vibration measured remotely from 0-10mm/s
5.2.2.9	New Load resistor bank supplied and fitted to carry 830amp load
5.2.2.10	Supply and fit new load switch gear to control various load settings
5.2.2.11	Supply and fit Ducted cooling with air flow system of 5 cubic feet/minute to cool resistor banks
5.2.2.11	Complete drawings of the control and power circuits must be completed and supplied
5.2.2.12	All the above-mentioned parameters must be measured and projected onto a touch screen of size 500mmx 300mm
5.2.2.13	On the existing Control panel, the following digital meters must be fitted
(a).	Supply voltage to set – 3-4Kv DC and Motor input current
(b).	Load output DC current x 3
(c).	Load Output Voltage DC
5.2.2.14	A suitable sliding roof must be supplied and fitted into the load test area
(a).	This roof must be controlled by a remote control
(b).	The roof must also serve to contain the noise levels during load testing
(c).	Size of the area for the roof cover required is 8m x 3,2m
5.2.2.15	Supply and fit a new Power circuit and control circuit cables and a suspended power connection box for the testing of the MA set and aligned to carry the specified load voltage and current
5.2.2.16	Fit new interlocks for the inter-leading door to the High voltage compartment to protect personnel against High Voltage .
(a).	The door must be locked during testing process.
(b).	Once door is open, power must be isolated and earth
(c).	A suitable printer must be supplied and fitted for printing of test report

5.2.2.17	Supply and fit a new Thermal Imaging camera, with minimum requirements below.
(a).	<ol style="list-style-type: none"> <li>1. Sensitivity – &lt;40mK milli kelvin. (lower the value, the more sensitive)</li> <li>2. Pixels / Resolution - &gt; 49000 pixels</li> <li>3. Minimum focus - 0.15m</li> <li>4. Internal memory - 500 images</li> <li>5. Display - 3.5" (8.9 cm landscape) touchscreen 640 x 480 LCD</li> <li>6. Temp range - -20 ° C to 550 ° C, 256 x 192 (49,152 pixels), 27 Hz refresh rate, 28 ° x 20 °</li> </ol>
5.2.2.18	<p>The contractor shall supply the following documents in 1 set of PDF files in a USB memory stick and 3 sets of hard copies for all upgraded components and systems.</p> <p><b>Operation</b> Operation Manual</p> <p><b>Maintenance</b> Maintenance Manual Critical Spares List</p> <p><b>Electrical</b> Electrical Schematics Electrical parts lists (including manufacturer and supplier part numbers). Details and backup of computer programmes.</p> <p><b>Mechanical</b> Mechanical Assembly drawings Mechanical Parts Lists (including manufacturer and supplier part numbers).</p>

### 5.3 Supply and delivery

- The equipment shall be supplied and delivered at Transnet Engineering, 150 Eel Road.

### 5.4 Testing

- All tests to be done on site.
- Additional tests can be ordered by Transnet Engineering.

### 5.5 Completion / handover

- A testing period of 1 month (744 hours for 24/7 shifts and 248 hours for 8 hour shifts).
- No equipment will be accepted by TE without the satisfaction of the conditions above.

### 5.6 Warranty

- The warranty period shall be 24 months.
- The contractor shall undertake to repair all faults due to bad workmanship and/or faulty materials during a period of 24 months, calculated from the date that the completed plant installation is accepted by TE.
- Any latent defects that become apparent during the warranty period shall be rectified to the satisfaction of TE at the cost of the supplier.
- The supplier shall agree to replace at his/her cost any defective items discovered within the guaranteed period.

**Note:** All work to be completed in each respect by suitably qualified person.

## **6. OTHER INFORMATION RELATED TO THE SCOPE**

- 6.1 This specification states the minimum requirements relating to the work and in no way absolves the contractor from responsibility for sound engineering practice. Any omissions or sub-standard requirements of this specification must be brought to the attention of Transnet Engineering at tender stage and optional prices for addressing such omissions must be provided.
- 6.2 Any matter relating to this work, which requires a decision from Transnet Engineering shall be presented to the Project Manager in charge.
- 6.3 All offers shall be completed in every respect with this specification. Only completed tenders shall be considered
- 6.4 The Technical Officer reserves the right to have the proposal checked independently by a third party.
- 6.5 Tenders must allow for monthly progress and clarification meetings on site initially and after commissioning for defect meetings when required. A meeting will be held after issuing of the tender to establish the exact scope and magnitude of the contract. No tender will be considered unless it has this Certificate signed by the Engineer or his representative.

## **7. HEALTH AND SAFETY REQUIREMENTS**

- 7.1 All equipment whether detailed in this specification or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended and all other applicable legislation including specific set of regulations and local authority bylaws where applicable.
- 7.2 All the necessary safety equipment such as guards over rotating equipment shall be supplied and the equipment shall comply fully with all the requirements of the South African Occupational Health and Safety Act, Act 85 of 1993 and all other applicable legislation including specific set of regulations and local authority bylaws where applicable.

## **8. SPECIALIST SUB-CONTRACTORS**

- 8.1 Only specialist sub-contractors who have previously successfully completed work of the type and extent specified in this document should be engaged.  
The tenderer shall provide the technical officer with sufficient proof of having suitable experience regarding the design and manufacturing of similar equipment. To this end, complete and detailed reference list shall be submitted with the tender. Reference list shall include addresses as well as contact person who may be visited for inspection of the equipment during the adjudication period.
- 8.2 The tender shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.
- 8.3 The tenderer shall be prepared to commit themselves in writing to the technical officer with an adequate, experienced and stable project team for the duration of the contract.
- 8.4 Transnet Engineering will not consider any Tenderer's offer that, in the sole opinion of Transnet Engineering, does not have adequate experience in the design and manufacture of such equipment.
- 8.5 Contractors shall do the installation simultaneously with other contractors on-site busy with other work and shall plan work that it integrates with other work performed.



## 9. EQUIPMENT

- 9.1 The required items shall be complete in all respects.
- 9.2 Tenderers shall supply a list of all materials proposed as well as the addresses of the local support companies.

## 10. GENERAL REQUIREMENTS

Operation will be in the following conditions:

Altitude	Sea level
Ambient temperature	0°C to 45°C
Relative humidity	50% to 100%
Atmosphere	Heavy saline

## 11. DEFINITIONS AND ABBREVIATIONS

**CLIENT** Transnet Engineering Durban

**TECHNICAL OFFICER:** Project Manager, Transnet Engineering Durban

**CONTRACTOR** Contractor appointed under this specification document

## 12. GENERAL

- 12.1 The successful tenderer will be subjected to a workshop inspection by Transnet Engineering, to ensure that the facilities are to the satisfaction of the Transnet Engineering in terms of the quality control and equipment capabilities for manufacturing such type of equipment.
- 12.2 The tenderers shall guarantee that the rating and size etc. of the equipment offered, will be adequate to perform the duties required.

## 13. PENALTY CLAUSES

- 13.1 Due to the criticality of this project, penalties will be levied for late deliveries.