Eskom	Strategy	Majuba Power Station

Title:	**Tender technical evaluation for the refurbishment of auxiliary turbine pumps**	Unique Identifier:	**ENG/GEN/STG/48**
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Date: 02/10/2024	Date: 07 October 2024	Date:

CONTENTS

1. INTRODUCTION

The purpose of this document is to outline the scope of work that is required for the refurbishment of auxiliary turbine pumps at Majuba Power Station. The Technical evaluation strategy formulated below is to be followed in acquiring such external services.

2. SUPPORTING CLAUSES

2.1 SCOPE

Refurbishment of turbine pumps for Majuba Power Station, on an "as and when" required basis. The scope of work is summarised as follows:

The Contractor shall:

1. Transport the components, within 24 hours after removal and notification from a Majuba Power Station representative, in a suitable transportation cradle from the respective Majuba Power Station to the repair Contractors workshop.
2. Ensure safe transport of the components and equipment from and to the Power Station site, and to and from the Contractors and appointed sub-Contractors. The Contractor will be liable for any losses or damage due to mishandling or incidents during the transport process.
3. Receive the pump and/or associated auxiliary equipment from Majuba Power Station and record on a one pager the as found condition, supported by photographs.
4. Strip and assess the damage, determine spares requirement to enable the Contractor to refurbish and or repair damaged components.
    a. It is the responsibility of the Contractor to send out all the components for refurbishment to the OEM or accredited and agreed-to supplier. The quality of the workmanship will be supervised by the *Contractor* and thus Eskom will hold him liable for sub quality work from others. The Employer reserves the right to inspect any of their components at the Contractors premises when they require too.
5. Ensure that all stripped components are marked with a unique job/project number and small parts are stored in a suitable container, also marked with the unique job/project number (If possible, reference the pump serial number with the job in order to be able to create a refurbishment history profile).
6. Ensure that all parts or stripped components are stored in a manner not to incur environmental or unintended accidental damage.
7. Document all findings in a detailed strip and assessment report which must include photographs to be presented to and discussed with the relevant Majuba Power Station System Engineer.
8. Provide an assessment report advising on the condition of the stripped components, and state if the components are to be re-used or replaced. Either decision must be supported by a technical justification based on specifications and condition.
9. Provide the scope of work which shall be discussed and agreed upon between the Contractor and the relevant System Engineer prior to proceeding with the repair or the refurbishment.
10. Submit the scope of work based on the reviewed assessment report, together with the Quality Control Plan (QCP), check sheets to the Eskom Service Manager or his/her delegate, Majuba Power Station System Engineer or his representative for acceptance and signatures. Once the scope of work and QCPs have been accepted for the Contractor to refurbish and or repair the

pump or associated auxiliary equipment work may proceed in accordance with the agreed scope of work. Any changes to the scope of work must be formally communicated to the Eskom Service Manager or his/her delegate, Majuba Power Station System Engineer or his representative, and agreed to in writing prior to commencing with the repair.

11. Submit a comprehensive quotation to the relevant Eskom Service Manager or his/her delegate for acceptance. The quotation must be submitted after the scope of work and QCP has been accepted and approved. The Eskom Service Manager or his delegate will review the work to be done and the price, and then issue a Task Order for the work to be undertaken.
12. The Contractor communicates in writing to the Eskom Service Manager or his delegate, 72 hours prior to any intervention point/s in the QCP which require client witness. In the event of an urgent job, warranty job or catastrophic failure, the Contractor may send the request in writing, followed by a telephonic call to the Service Manager or his delegate, requesting for a quicker turnaround time from Majuba Power Station System Engineer, QC personnel or his representative
13. Submit a comprehensive time schedule, in MS project or Primavera, to the Eskom Service Manager or his delegate for approval,.
14. Ensure that all tests to be done are done in accordance with the approved and signed QCP, taking into consideration the applicable latest standards in the list of standards, as a minimum.
15. Any new major components supplied by the Contractor to refurbish or repair the pump/s and their associated auxiliary equipment must have certification which complies to EN 10204 Type 3.1 Certification.
16. Acceptance of refurbished and/or repaired pump/s and their associated auxiliary equipment must achieve the performance levels as per original equipment design and specification. These pumps performance must be tested to ensure that they perform at their design parameters and no leaks observed on the mechanical seal.
17. Ensure that the refurbished and/or repaired pump/s and their associated auxiliary equipment are delivered back to Majuba Power Station stores with relevant documentation and in a suitable transportation cradle. Majuba Power Station stores, System Engineer and Eskom Service Manager or his delegate must be made aware of the delivery and furnished with a signed data book at the time of delivery.
    a. Ensure that all scrapped components are returned to Majuba Power Station stores with a scrap certificate at the same time of delivering the refurbished pump or associated auxiliary equipment.
    b. All components delivered to the Power Station should be preserved and packaged or cratered for medium term storage. (2 – 5 years). Crates to be re-useable. Crates should be lift-able by crane or forklift. Crates to be marked with a purchase order number, weight, list of contents, and photos of contents.
18. Ensure that the hard copy and an electronic copy of the data book is sent to Majuba Power Station System Engineer and the Eskom Service Manager or his/her delegate at the time of pump/s and associated auxiliary equipment delivery to site.
    a. The repair Contractor to keep the data available for a minimum duration 10 years.
    b. Ensure that the Majuba Power Station Engineer or his representative reviews and accepts the pump and/or associated auxiliary equipment and signs off all the reviewed relevant paperwork before the pump leaves the Contractors premises.
19. Ensure that all welding repair work done by the Contractor, or his sub supplier is approved by the client, signed by AIA and after completion of the scope, the job must be accompanied by relevant documentation.

20. Welding and NDT work to be done according to the applicable ISO standards and Eskom Welding requirements. It is the responsibility of the Contractor to familiarise himself with the Eskom welding requirements and ensure compliance.
21. Welding procedure specification (WPS) and procedure qualification record (PQR) to be approved by an Eskom Welding Engineer prior to commencing with the work.
22. All welding repair works to have its own QCP which is a separate QCP from the overall pump refurbishment/repair QCP.
23. The Contractor supplies his own engineering services in relation to the refurbishment and repairs of all components. The Contractor shall contact Eskom engineering concerning any major decisions that will affect the refurbishment, repair, installation of the pump on site or its operational capabilities (out of the ordinary repairs).
24. The Contractor shall supply training (engineering, maintenance, and installation) to the client as and when required.
25. The Contractor shall agree to do material analysis as and when required for failure investigation purpose, at his costs.
26. Ensure that this Contract includes the procurement of OEM spares.

2.1.1 Motor-Pump Unit Refurbishment Requirements

Scope of Work: The motor within the motor-pump unit shall be refurbished in accordance with the "Refurbishment of Power Station Electric Motors Standard" (240-56358854). Motors rated at less than 22 kW are generally to be replaced. However, if the refurbishment costs are minimal (i.e., less than 50% of the cost of a replacement motor) and can ensure the reliability of the machine, and if the motor is less than 10 years old, a refurbishment scope submitted by the contractor may be considered.

Testing Requirements: Upon completion of the refurbishment scope, the following tests are to be conducted to verify the motor's performance:

- **Stator Winding Insulation Resistance**
- **Stator Winding Polarization Index**
- **Rotor Winding Insulation Resistance**
- **Rotor Winding Polarization Index**
- **Stator Winding Dielectric Test**
- **Rotor Winding Dielectric Test**
- **Stator Voltage Surge Test**
- **No Load Run** (including measurement of current, current balance, power, power factor, speed, acoustic noise, bearing vibration, bearing temperatures)
- **Temperature Rise, Efficiency, Power Factor** (at duty point and full load)
- **Torque/Speed Characteristic**

Insulation Requirements:

- The insulation class for new winding shall be **Class F**.
- The permitted maximum temperature of the new winding must comply with **Class B** insulation standards.

Documentation: The contractor is required to submit the following documents as per the "Refurbishment of Power Station Electric Motors Standard" (240-56358854):

- **Appendix B:** Proforma Specifications
- **Appendix C:** Monitoring and Testing for Motors
- **Appendix D:** Information Required in Data Pack for Repaired and Refurbished MV Motors
- **Appendix E:** Standard Form for Routine Test Certificates
- **Appendix G:** Miscellaneous Requirements

These documents and test results will form part of the deliverables to ensure compliance with the refurbishment standards and to verify the reliability of the refurbished motor.

Additional

The following additional information is provided to assist the contractor with regards to the pumps to be refurbished

4. TECHNICAL DATA

Pump Serial Number:		PD870118
Pump Data		
Operation		CONTINUOUS
Fluid		CONDENSATE
Pump Temperature (P.T.)		55°C
Specific Gravity at P.T.		0.985
Viscosity at P.T.		NEGLIGIBLE
Differential Head Required		23.4 m
Capacity		236 I.G.P.M.
N.P.S.H. Available		1.95 m
Efficiency %		47.2
Power At Duty		8.57 kW
Pump Speed r.p.m.		1000
Rotation		CLOCKWISE
Bearings:	Radial	IN MOTOR
	Thrust	IN MOTOR
Shaft Seal		BORG WARNER TYPE U 2250-5N4A
Diametral Clearance Between Casing and Impeller Wear Rings		MINIMUM 0.490mm MAXIMUM 0.556mm
Diametral Clearance Between Seal Sleeve and Throat Bush		REFER TO BORG WARNER DRAWING No. A2N03763 FOR DETAILS.

Figure 1:TCT pump

Motor Data

Frame Size	D180LD
Speed	1000 r.p.m.
Voltage	380V
Rating	15kW
Enclosure	TEFV
Bearings	Roller/Ball
Lubricant	Grease

4.1. Components Weighing Over 50 kg.

Casing	------	580 kg
Backplate	------	101 kg
Pump/Motor Adaptor	------	65 kg

Figure 2:TCT pump

Pump Type: 150/150 YD.D

Operation:	Continuous
Fluid:	Condensate Drain Water
Pump Temperature (P.T.):	107°C
Specific Gravity at P.T.:	0.953
Viscosity at P.T.:	As Water
Vapour Pressure at P.T.:	As Water
Suction Pressure:	Flooded
Differential Head Required:	80 m (U1-3) 65m(U4-6)
Capacity:	38.4 kg/s (U1-3) 34.43kg/s (U4-6)
N.P.S.H. Available:	6.8 m
Efficiency %:	62
Power At Duty:	48.5 kW
Pump Speed R.P.M.:	3000
Rotation:	Clockwise on N.D.E.
Bearings:: Radial -	In Motor
Thrust -	In Motor
Shaft Seal:	Borg Warner Mechanical Seal
Diametrical Clearance Between Casing and Impeller Wear Rings	Minimum 0.460mm Maximum 0.526mm
Diametrical Clearance Between Seal Sleeve and Throat Bush	Refer to Borg Warner Drawing No. A2N03496 for details

Figure 3: Flashbox Pumps

Technical Data

Hydraulic Unit Main Pump

Manufacturer	Rexroth
Type	A4VSO250 DR10 RVPB13N
Suction pressure	Design 700 kPa min 350 kPa
Discharge pressure	13.8 to 15.2 MPa
Flow	3.25 l/s

Figure 4: Hydraulic Unit Main Pumps

Turbine Jacking Oil Pumps

Manufacturer	Rexroth
Type	A2F0
Capacity (each delivery)	0.9×10^{-3} m^3/s
Discharge pressure	30 MPa

Figure 5: Jacking Oil Pumps

A.C. and D.C. Seal Oil Pumps

Manufacturer	Plenty Mirrlees
Type	VEA80-3. N.L. 207/158
Capacity	0.0091 m^3/sec.(120 g.p.m.)
Suction	0 MPa
Discharge	0.83 MPa
Speed	1450 r.p.m.

Figure 6: Seal Oil Pumps

Stator Water Pumps

Manufacturer	A.P.E. (ESCOM supply)
Code/Type	Centrifugal

Figure 7: Stator water Pumps

Unit 1-3 BFP AC/DC Lubricating Oil Pumps:

Manufacture: VOITH Turbo

Type: IPC

Size: 7

Delivery: 250

Displacement per revolution [cm^3]: 251.7

Min Speed [min^{-1}]: 400

Max Speed [min^{-1}]: 1800

Delivery at 1500 min^{-1} [l/min]: 377.5

Continuous Pressure [bar]: 210

Peak Pressure [bar]: 250

Motor: 11kW 380V, AC

Motor: 11kW 220V, DC

Unit 1-3 BFP Lubricating Oil Filling Pumps

Manufacture: VOITH Turbo

Type: IPC

Size: 5

Delivery: 50

Displacement per revolution [cm^3]: 50.3

Min Speed [min^{-1}]: 400

Max Speed [min^{-1}]: 2600

Delivery at 1500 min^{-1} [l/min]: 75.4

Continuous Pressure [bar]: 210

Peak Pressure [bar]: 250

Motor: 2.2kW 380V, AC

U1-3 Oil Purifier

Manufacturer: AEM

Type: Three Phase Induction Motor

Type/Frame: QL – 80M1-40, Lithium Based

Voltage: 230V

Amps: 2.59A

Weight: 17kg

Frequency: 50Hz

Power: 0.55kW

Speed: 1390r/min

Power Factor: 0.75

Bearings Type: DE 6204 -2RZ, NDE 6204-2RZ

U1-6 BFP Lubricating Oil AC Pumps

Manufacturer: Rotodel

Model Number: RDRX250L

Type: Rotary Gear Pump

Size: 250L

Flow: 333.3 LPM

Pressure: 11kg/cm^2

Speed: 1440 RPM

SR. No: 4-02834

Cust. PROLUBE

U1-6 BFP Lubricating Oil DC Pumps

Make: Roper Pump

Figure No: 3717 HBFRV

Type: 3

WO: S/N724961

S/N: G-335900 (sample)

U1-6 BFP Lubricating Oil Filling Pumps

Make: Roper Pump

Figure No: 2AM08

Type: 1

S/N: G-330141 (sample)

Unit Design Parameters

Function of Unit:	Remove Water and Dirt from Lube Oil.
Type:	V32 Lube Oil Purifier.
Flow Rate:	29.3 l/min @ 1400rpm
Fluid Type:	Turbine Lubricating Oil ISO VG 32
Limits at Inlet/Outlet:	
Viscosity Limits:	150 CSt Max = 14°C Min
Temperature Limits:	14°C TO 95°C MAX.
Pressure Limits:	-20 KPa to 600 KPa
Test Pressure:	900 Kpa.G
Design Code:	ASME VIII MANUFACTURED TO B.C.P.
Fluid Connections:	
Inlet	1" 25 NB BS 4504 16/3
Outlet	2" 50 NB BS 4504 16/3.
Drain	3/4" BSP.
Vent	6 mm
Pressure Relief	3/4" BSP
DP Connections	1/4" BSP
Level Gauge Connections	3/4" BSP
Electrical Connections:	
Power	380 V 50 Hz 20 KW (Three Wire + Earth)
Pump	
Make:	VIKING
Model:	GG 4195
Volume:	20.9 cm³/Rev
Motor	
Make:	W.E.G.
Frame:	90L Foot Mounting
Power:	1.5 kw
Voltage:	380 Volt 4 Pole 50 Hz
Heater	
Make:	Filpro 18 kW
Power:	18 kW
Voltage:	380 Volt
Design temp Rise:	17.7 Deg C Max single pass.

Figure 8: Unit 4-6 Oil Purifier Technical Specifications

2.1.2 Purpose

The purpose of this tender technical evaluation strategy is to define the Mandatory Evaluation Criteria, Qualitative Evaluation Criteria and TET member responsibilities for tender technical evaluation. The technical evaluation strategy serves as basis for the tender technical evaluation process

Give a clear, concise statement explaining the specific aim of the document and why this document is necessary.

2.1.3 Applicability

This document shall apply to Majuba Power station.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

[1] ISO 9001 Quality Management Systems.

[2] 240-48929482 Tender Technical Evaluation Procedure

2.3 DEFINITIONS

Definition	Description
Maintenance	A combination of all technical, administrative and managerial actions during the lifecycle of an item intended to retain it in, or restore it to, a condition in which it can perform its required function.
Preventive Maintenance	Planned time or schedule based maintenance carried out with the explicit objective of preventing functional failures and is directed towards maintaining the physical condition of the asset / plant or equipment. It includes scheduled overhauls and scheduled replacement of worn out parts or failure prone components.
Corrective Maintenance	The process of restoring asset / plant and equipment which have failed or deteriorated to a state which renders it unable to meet the acceptance criteria required for its particular application.
Condition Based Maintenance	Predictive maintenance carried out because of findings from analysis of parameters measured under a condition-monitoring regime, or from recommendations from reliability analysis.
Refurbishment/Overhaul	The refurbishment or overhaul is the servicing of pumps to OEM specification
Condition Monitoring	Non-intrusive monitoring carried out to determine the physical condition of asset / plant and equipment.
Inspection	Activities, which by means of examination, observation or measurement, determine the conformance of material, parts, components etc., to predetermined specifications and quality requirements.
In-service Inspection	All inspection and testing conducted on plant and equipment at regular intervals and prescribed by regulatory and statutory codes or other types of specification throughout its service life.
Testing	All activities required determining the actual performance or condition of an item.
Tender	A tender refers to a written competitive offer, quotation, proposal made by the supplier in a prescribed or stipulated form in response to an invitation to tender/competitive enquire for provision of assets/goods or services and or the disposal thereof.

2.4 CLASSIFICATION

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

2.5 ABBREVIATIONS

Abbreviation	Description
OEM	Original Equipment Manufacturer
TET	Technical Evaluation Team

2.6 ROLES AND RESPONSIBILITIES

As per 240-48929482: Tender Technical Evaluation Procedure

2.7 PROCESS FOR MONITORING

Not Applicable

2.8 RELATED/SUPPORTING DOCUMENTS

Not Applicable

3. TENDER TECHNICAL EVALUATION STRATEGY

3.1 TECHNICAL EVALUATION THRESHOLD

The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%. **The contractor should submit their file with dividers referencing each of the mandatory and qualitative requirements.**

3.2 TET MEMBERS

Table 1: TET Members

TET number	TET Member Name	Designation
TET 1	Bilal Cassim	Turbine Engineer
TET 2	Zamokuhle Ndhlangamandhla	Manager, Majuba Turbine Maintenance
TET 3	Siyabonga Manana	Electrical Engineer
TET 4	Musa Makhoba	Turbine Engineer

3.3

3.3.1 Mandatory Technical Evaluation Criteria

Table 2: Mandatory Technical Evaluation Criteria

Eskom	**Technical evaluation for capability assessment of service providers for the refurbishment of turbine auxiliary pumps at Majuba Power Station, Score card**		
Section A - MANDATORY REQUIREMENTS	**OBJECTIVE EVIDENCE TO BE PRODUCED**	**Criterion achieved Yes/No**	**COMMENT / REMARK**
Reference list of employers recently where scope was carried out, including gear pumps	The service provider provides demonstrable evidence that the company has been in the pump maintenance, repair and refurbishment business for a period of not less than 5 years. In addition, the service provider supplies a contactable reference list of employers and copies of the SOW, strip down reports and QCPs that was executed in the past 5 years		**Applicable to all service providers**
Service provider to have their own workshop that is capable of conducting repairs, refurbishments, overhauls, reverse engineering and pump performance.	Floor plans to be produced of workshop demonstrating the different areas that is used for refurbishments, rotor balancing and pump performance up to 30KW. Eskom personal will view the workshop at the site.		**Applicable to all service providers**

Service provider to be ISO 9001 certified	Approved ISO 9001 compliance certificate is to be produced		**Applicable to all service providers**

3.3.3 Qualitative Technical Evaluation Criteria for Part 1

Table 3: Qualitative Technical Evaluation Criteria for Part 1

Section B - QUALITATIVE CRITERIA								
KPI - Criteria Evaluation Indicator	**Weight (%)**	**Minimum Criteria Evaluation Requirements**	**Unit**	**0 Non-Responsive 0% 2 Non-Compliant 3.07% 4 Compliant with associated qualifications 6.15% 5 Compliant 7.69%**				**TOTAL RATING**
3.3.2.1 Company leadership, accountability and capability	7.69	The service provider to provide an organogram clearly defining the roles and responsibilities in the management hierarchy • 0 – if there is no organogram and no evidence submitted • 2 – if organogram and evidence is submitted but qualifications not submitted. • 4 – if organogram and evidence is submitted and some qualifications are outstanding. • 5 - if the organogram is submitted with all the relevant qualifications as well as evidence	Number	1	2	4	5	
3.3.2.2 Personnel qualifications	7.69	The service provider provides demonstrable evidence of the available human resources (Core team) including qualifications and levels of	Number	1	2	4	5	

		experience. KEY RESOURCES -1X Engineer BSc Eng/BEng/Btech/National Higher diploma - 1x workshop manager (National N/T/S Diploma (Mechanical Engineering) - 1x QC inspector (Grade 12 with QC certification) - 3x Qualified Fiiters (Trade test certificate and N2 certificate or equivalent - 3x Semi skilled fitters(Grade 10 school qualification) None key Resorces - Trade assistants (Ability to read, speak and write in English) • 0 - Nothing is submitted • 2 – No evidence is submitted • 4 – Partial evidence is provided with associated qualifications. • 5 - All evidence and qualifications are provided.						
3.3.2.3 Basic engineering capability, repair and refurbishment control	7.69	The service provider demonstrates capability to overhaul pumps and key activities and required tests. Detailed method statement for overhauling, pressure testing and performance testing for the centrifugal and positive displacement pumps and gear pumps. Examples of each to be provided. Service provider to provide the following documents • Method statement shall cover the	Number	0	2	4	5	

		following sequential steps for pump refurbishment Sequential steps 1. Disassembly/strip down report 2. Inspection and measurements done 3. Identification of damaged parts process 4. List of typical defects and how each defect will be corrected/repaired during overhaul. 5. Re-assembly of the pump 6. Pressure testing and performance testing An example of the Contractor's typical QCP inline with a method statement above must be provided. • 0 - No evidence is provided • 2 – No previous work but QCP,s are provided for all types of pumps mentioned in 3.3.2.3 • 4 –Service provider provides method statement for overhauling and performance test for all type of pumps mentioned in 3.3.2.3 • but no detailed QCP's. • 5 - All documents are submitted						
3.3.2.4 Equipment and tooling	7.69	The service provider demonstrate compliance to the minimum required equipment and tooling. • 0 – No Tools • 2 – Only sheet with tool list • 4 – Some equipment is shown (e.g. lathe etc)	Number	0	2	4	5	

		• 5 – All necessary equipment and tooling is provided						
3.3.2.5 Purchasing controls of soft goods and spare parts	7.69	The service provider demonstrates his purchasing controls by providing a copy of the documentation for soft spares. • 0 – No response • 5 – Documents supplied	Number	0	2	4	5	
3.3.2.6 Receiving inspection controls	7.69	The service provider demonstrate his receiving inspection controls by using the arrival of a spare component from the Client/Employer as an example. • 0 – No response • 2 – Only previous records are supplied • 4 – only Procedure is supplied • 5 – Both procedure and previous work records are supplied	Number	0	2	4	5	
3.3.2.7 Handing, storage, preservation of material and components	7.69	The service provider provides a procedure for storing soft goods and allows access to the various storage areas. • 0 – No procedure. • 5 – Signed Procedure	Number	0	2	4	5	
3.3.2.8 Control of inspection, measuring and test equipment	7.69	The service provider provides demonstrable proof for the control of inspections, measurements and test equipment. • 0 – No proof provided. • 2 – Only procedure provided. • 4 – Previous work measurements and procedure provided. • 5 – Procedure, previous work measurements and test equipment list	Number	0	2	4	5	

		provided.						
3.3.2.9 Inspection and testing during repair and refurbishment	7.69	The service provider provides copies of inspection, test and measurements records done at their facilities • 0 - No documents provided. • 2 – Only one of the three reports provided. • 4 – Two of the three reports provided. • 5 – All three reports are provided for each type of pump i.e centrifugal, positive displacement and gear .	Number	0	2	4	5	
3.3.2.10 Identification and traceability	7.69	The service provider demonstrates a system that provides a unique identification of individual soft spares, re-usable pump components, new spares. • 0 – No proof provided. • 2 – only tags provided. • 4 – only procedure provided. • 5 – Both procedure and tags are demonstrated.	Number	0	2	4	5	
3.3.2.11 Artisan tool kits	7.69	The service provider shall demonstrate that artisan tool boxes are sufficiently equipped for his scope of capability • 0 - No toolbox • 2 – 30% of the tools required for the task • 4 - 70% of the tools required for the task • 5 –100% of the tools required for the task	Number	0	2	4	5	
3.3.2.12 Basic pump training on all type of pumps	7.69	The service provider provides demonstrable proof of pump basic training interventions for their employees. • 0 – No training at all	Number	0	2	4	5	

		• 5 – Training certificate provided for employees						
3.3.2.13 Motor refurbishment	7.69	The service provider provides demonstrable proof that the company is capable of refurbishment of motors or has a reputable sub-contractor that can conduct this refurbishment. An example must be provided where the company has conducted or appointed a sub contractor for the refurbishment of motors. As a minimum the following must be provided 1. Disassembly/strip down report 2. Inspection and measurements done 3. Identification of damaged parts process 4. List of typical defects and how each defect will be corrected/repaired during overhaul. 5. Re-assembly of the motor 6. Test report displaying the below items • **Stator Winding Insulation Resistance** • **Stator Winding Polarization Index** • **Rotor Winding Insulation Resistance** • **Rotor Winding Polarization Index** • **Stator Winding Dielectric Test** • **Rotor Winding Dielectric Test** • **Stator Voltage Surge Test** • **No Load Run** (including measurement of current, current balance, power, power factor, speed, acoustic noise, bearing vibration, bearing temperatures) • **Temperature Rise, Efficiency, Power Factor** (at duty point and full load)	Number	0	2	4	5	

		Torque/Speed Characteristic • 0- No evidence provided • 2- only strip down report provided • 4- Everything provided besides test report • 5- All information provided						

TET Member Responsibilities for Part 1

Table 4: TET Member Responsibilities for Part 1

Mandatory Criteria Number	TET 1	TET 2	TET 3	TET 4
Reference list of employers recently where scope was carried out, including gear pumps	X	X		X
Service provider to have their own workshop that is capable of conducting repairs, refurbishments, overhauls, reverse engineering and pump performance.	X	X		X
Qualitative Criteria Number	**TET 1**	**TET 2**	**TET 3**	**TET 4**
3.3.2.1 Company leadership, accountability and capability	X	X		X
3.3.2.2 Personnel qualifications	X	X		X
3.3.2.3 Basic engineering capability, repair and refurbishment control	X	X		X
3.3.2.4 Equipment and tooling	X	X		X
3.3.2.5 Purchasing controls of soft goods and spare parts	X	X		X
3.3.2.6 Receiving inspection controls	X	X		X
3.3.2.7 Handing, storage, preservation of material and components	X	X		X
3.3.2.8 Control of inspection, measuring and test equipment	X	X		X
3.3.2.9 Inspection and testing during repair and refurbishment	X	X		X
3.3.2.10 Identification and traceability	X	X		X
3.3.2.11 Artisan tool kits	X	X		X
3.3.2.12 Basic pump training on all type of pumps	X	X		X
3.3.2.13 Motor refurbishment			X	

3.4 FORESEEN ACCEPTABLE / UNACCEPTABLE QUALIFICATIONS

3.4.1 Risks

Table 5: Acceptable Technical Risks

Risk	Description
1.	Company doesn't have in house motor refurbishment facilities but has a reputable subcontractor

Table 6: Unacceptable Technical Risks

Risk	Description
1.	Service provider does not their own workshop that is capable of conducting repairs, refurbishments, overhauls,reverse engineering and pump performance.

3.4.2 Exceptions / Conditions

Table 7: Acceptable Technical Exceptions / Conditions

Risk	Description
1.	None

Table 8: Unacceptable Technical Exceptions / Conditions

Risk	Description
1.	None

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Menzi Mgenge	System Engineer, Majuba Turbine Engineering
Musa Makhoba	System Engineer, Majuba Turbine Engineering
Lutendo Manwatha	System Engineer, Majuba Turbine Engineering
Nombulelo Sithole	Supervisor, Majuba Turbine Maintenance
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5. REVISIONS

Date	Rev.	Compiler	Remarks
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6. DEVELOPMENT TEAM

The following people were involved in the development of this document:

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