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FOREWORD

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INTRODUCTION

Calibration of equipment needs to be carried out on a regular basis to prevent it from deviate or malfunctioning as a result of hard operating conditions, mechanical shocks or exposure to extreme temperature or pressure. To assure accuracy in instrument calibration, it is vital to ensure that each component of the measuring instrument is conforming to its specified standards and manufactures' requirements. Some equipment shall be calibrated more regularly with greater accuracy depending on application and governing standards. City requires a Service Provider for repair, maintenance and calibration of its test and measuring equipment in line with relevant legislations. Procurement of the above service will enable safety, reliability and longevity of said equipment as well as compliance.

1 SCOPE

This document covers the standardised requirements for the maintenance, repairs and calibration of test equipment. The scope entails routine maintenance, repair and, as well as calibration in line with relevant legislature. The test equipment shall include the following: Oil Laboratory Equipment, Medical Equipment, and Electrical Test and Measuring Equipment as listed in the attached BOQ.

2 NORMATIVE REFERENCES

The following standards and specifications contain provisions that, through reference in the text, constitute requirements of this guideline. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards and specification listed below.

SANS/IEC 61010 – Part 1: Safety requirements for electrical equipment for measurements control and laboratory use. Part 1: General Requirements

SANS/IEC 61326 – Part 1: Electrical equipment for measurement, control and laboratory use – EMC requirements. Part 1: General Requirements.

SANS 451:2008 Spirometry – Generation of acceptable and repeatable spirometry

SANS 10083:2013 The measurement as assessment of occupational noise for hearing conservation purposes

ISO/IEC 17025:2017 - General Requirements for the Competence of Testing and Calibration Laboratories

ISO/SANS 9001:2015 - Quality Management Systems

SANS OHSAS 18001:2011 - Occupational Health and Safety Management Systems — Requirements

SANS/ISO 14001:2015 – Environmental Management System

ISO 15189:2012 - Medical laboratories — Requirements for quality and competence

3 DEFINITIONS AND ABBREVIATIONS

Definition	Description
Accredited	The fact of being officially recognized, accepted, or approved of, or the act of officially recognizing, accepting, or approving of something
Accuracy	The degree of closeness between a measured value and the true or nominal Value
Adjustment	The operation that is intended to reduce the differences between the values indicated by an instrument and the values realized by a reference standard to within a predetermined tolerance.
Calibration	The set of operations that establishes, under specified conditions, the relationship between the values indicated by a measuring system and the corresponding values of a quantity realized by a reference standard or a working standard.
Calibration interval	A specified or designated period between calibration adjustments or verifications. During this interval the instrument should remain within specific performance levels, with a specified probability, under normal conditions of handling and use.
Calibration sticker	A sticker affixed to an instrument that shows its calibration status. The sticker typically indicates the instrument's identification, who performed the last calibration and when, and the date of the next scheduled calibration.
Certification	The process of earning an official document, or the act of providing an official document, as proof that something has happened or been done:
DAYS	Working days
Degradation	A gradual reduction in an instrument's performance that proceeds until the instrument fails to meet its performance specifications.
Drift	A slow variation over time in the performance of an instrument. In contrast to "degradation", the instrument may continue to operate within its performance specifications.
Fixed instrument	Equipment fastened to a support, or otherwise secured in a specific location [IEC 60050-826:2004, 826-16-07, modified]
Hand-held instrument	PORTABLE EQUIPMENT intended to be supported by one hand during NORMAL USE
Maintenance	Activities required or undertaken to conserve as nearly, and as long, as possible the original condition of an asset or resource while compensating for normal wear and tear.
portable instrument	equipment intended to be carried by hand [SANS 61010-1, modified]
Repair	To put into good order something that is injured, damaged, or defective, making whole or sound something broken, torn, or injured, Applies making like new without completely replacing.
SANAS	The South African National Accreditation System (SANAS) is the body responsible for carrying out accreditations in respect of conformity assessment, as mandated through the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act (Act 19 of 2006)

Definition	Description
ANAB	The American ANSI National Accreditation Board (ANAB)
ILAC	International organization for accreditation bodies operating in accordance with ISO/IEC 17011
test instrument	This is an instrument which by electromagnetic means tests, measures, indicates or records one or more electrical or physical quantities, also non-measuring equipment such as signal generators, measurement standards, power supplies for laboratory use, transducers, transmitters, etc. Note: This includes <i>portable instruments, hand-held instruments and fixed instruments</i> [SANS 61010-1, modified]
traceability	A process whereby the indication of a measuring instrument can be compared, in one or more stages, with a national standard for the measured in question.

4 REQUIREMENTS

4.1 General Requirements

Test equipment shall be grouped and classified according to end user groups to ensure compliance with both national and international standards.

Calibration shall be performed to restore and ensure accuracy of the test equipment

Test equipment shall be inspected on regular basis to detect any malfunction.

The accredited laboratories/workshops shall provide reports for the work that has been done, which includes test, diagnosis or calibration reports to report and recommend on the condition of the test equipment.

A sticker indicating the last and the next calibration date shall be attached to every test equipment.

The Service Provider shall ensure that all maintenance, repair and calibration work is done according to stipulated legislature.

4.2 Maintenance

Maintenance work shall include the testing of faulty test equipment, after faulty equipment is repaired, testing due to non-performance of the test device, testing after any modifications or alterations are done (including settings). This shall be done according to the Original Equipment Manufacturer's instruction manual, and it shall be done on regular intervals or at the request of the test equipment owner. A report shall be issued by the Service Provider, detailing what work was done; what parts were replaced or repaired, stating any warranties or guarantees are given on the parts. The report will also give the next expected date of the next maintenance. The report shall be given to the test equipment owner.

4.3 Repairs

All repair work shall include restoration, testing as well as calibration of test equipment. This shall be done according to the Original Equipment Manufacturer's instruction manual, and it shall be done at the request of the test equipment owner. A report shall be issued by the Service Provider detailing the extent of the repairs, explaining any warranties or guarantees on the new replacement parts and recommendations.

4.4 Calibration

This shall be done according to the Original Equipment Manufacturer's instruction manual. The results of the calibration shall be plotted in such a way that they can be comparable with previous

results and the trending can be done. A report shall be issued by the contactor, and it shall include the results and recommendations and the validity period of the calibration on the equipment. The report shall include a certificate from an accredited laboratory/workshop and the accreditation logo clearly shown on the certificate.

4.5 City Power’s Responsibilities

City Power shall be responsible for the overall management of the test equipment as follows:

- 4.5.1 City Power shall coordinate routine maintenance/ inspection of test equipment in accordance with manufacturer’s requirements.
- 4.5.2 City Power shall make requests for the test equipment to be repaired, maintained and or calibrated.
- 4.5.3 City Power shall inspect the repair, maintenance and calibration work done by the Service Provider to ensure compliance.
- 4.5.4 City Power providing support and access to the test equipment on site.
- 4.5.5 City Power shall oversee and coordinate the Service Providers’ activities.

4.6 Service Providers Responsibilities

- 4.6.1 The Service Provider shall oversee and manage routine maintenance/ inspection of test equipment in accordance with manufacturer’s requirements
- 4.6.2 The Service Provider shall execute Repair, maintenance and calibration of test equipment.
- 4.6.3 The Service Provider shall collect, transport and send test equipment to certified test Lab’s for calibration as to IEC 17025:2017.
- 4.6.4 Service Provider shall be responsible for and resolve all defects found following the repairs and or calibration work.
- 4.6.5 The Service Provider shall furnish City Power’s representative with diagnosis, repair and calibration reports for all the work executed.
- 4.6.6 The Service Provide shall ensure that the work is completed within defined times as per Table A.
- 4.6.7 The Service Provider shall provide all necessary resources needed to complete the work.

5 SERVICE REQUEST MANAGEMENT

5.1 Priority levels

Service Requests shall be classified as follows:

- 5.1.1 *Priority Level 1 (Mission critical).*

This is defined as a failure, which severely limits users to perform their duties and affects business continuity. This is typically a situation where critical business continuity is affected. .

- 5.1.2 *Priority level 2 (Urgent).*

This is defined as a failure that results in diminished functionality or performance (E.g. the Equipment still works and requires Maintenance or Calibration).

- 5.1.3 *Priority level 3 (medium priority)*

System or equipment issues which fall in this category are qualified as not time critical and shall be solved during normal scheduled maintenance or upgrades to the system.

PRIORITY	DESCRIPTION	CONDITION
1	CRITICAL	TOTAL EQUIPMENT FAILURE
2	URGENT	EQUIPMENT STILL FUNCTIONAL BUT NOT UP TO STANDARD
3	MEDIUM	MAINTENANCE AND REPAIR CALIBRATIONS

The following priority levels and response times shall apply and be adhered to by the Service Provider.

5.2 Response times

5.2.1 Response time priority level 1.

Service Provider’s technical representative shall contact the City Power’s technical representative within 1 hour of the initial request for service being requested. Priority effort shall be maintained to restore the system or provide a workaround resolution.

5.2.2 Response time priority level 2.

Service Provider’s technical representative shall contact the City Power’s technical representative within 1 Day of the initial request for the requested service. Priority effort shall be maintained to restore the system or provide a workaround resolution.

5.2.3 Response time priority level 3.

Service Provider’s technical representative shall contact the City Power’s technical representative within next business day. Solutions shall typically come in the form of inspection, testing or calibration.

TABLE B RESPONSE TIMES:

PRIORITY	RESPONSE TIME	COMMENCEMENT	MAXIMUM TIME TO REPAIR	MAXIMUM TIME TO MAINTAIN	MAXIMUM TIME TO CALIBRATE	LOAN REQUIREMENT
1	1 HR	2 HR	24 HOURS	NA	48 HOURS	WITHIN 1 DAY
2	1 DAY	1 DAY	1 WEEK	1 WEEK	1 WEEK	WITHIN 2 DAYS
4	1 DAY	1 DAY	1 MONTH	1 MONTH	1 MONTH	WITHIN 2 WEEKS

Loan equipment shall be provided during repair, maintenance or calibration subject to severity as per table above.

6 ACCREDITATION AND CERTIFICATIONS

Repairs and calibration work shall be done by accredited and certified workshops in compliance with standards listed below.

SANS 451:2008 Spirometry – Generation of acceptable and repeatable Spiro grams

SANS 10083:2013 The measurement as assessment of occupational noise for hearing conservation purposes

SANS 17025: 2017: General requirements for the competence of testing and calibration laboratories

7 DOCUMENTATION

The following documents shall be provided for the specific work done on the test equipment as applicable.

- 7.1 Calibration Report
- 7.2 Calibration Certificate
- 7.3 Diagnosis Report
- 7.4 Service report

8 WARRANTIES AND GUARANTEES

All work done shall have a warrantee period of at least one year.

9 TRAINING

9.1 A necessary certified training course shall be offered to relevant City Power staff. The training shall include handling, storage and installation of fittings.

- 9.2 The associated costs for the certified training course shall be given per person and shall be fixed for the period of the contract at no cost to City Power.

10 QUALITY MANAGEMENT

A quality management system/plan shall be set up to assure the quality during manufacture, installation, removal, transportation, and disposal. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001:2015. The details shall be subject to an agreement between the purchaser and supplier.

11 ENVIRONMENTAL MANAGEMENT

An environmental management system/ plan shall be set up to ensure the proper environmental management and compliance is adhered to during manufacturing, installation, removal, transportation, and disposal. Guidance on the requirements for an environmental management system shall be found in ISO 14001:2015 standards. The details shall be subject to an agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy.

12 HEALTH AND SAFETY

A health and safety system/plan shall be set up to ensure proper management and compliance during manufacture, installation, removal, transportation, and disposal. Guidance on the requirements of a health and safety plan shall be found in ISO 45001:2018 standards. The details shall be subject to an agreement between City Power and the Supplier.

ANNEXURE A -BIBLIOGRAPHY

None

ANNEXURE B - REVISION INFORMATION

DATE	REV.NO	NOTES
May 2013	0	First issue
June 2020	1	Second issue Change document from guideline to standard. Amended entire document. Include medical equipment. Listed relevant governing standards.
July 2021	2	Third issue
August 2024	3	Forth issue General editing Added clause 9 (Training) Updated ISO on clause 10,11 & 12