MANGAUNG
AT THE HEART OF IT ALL

CENTLEC
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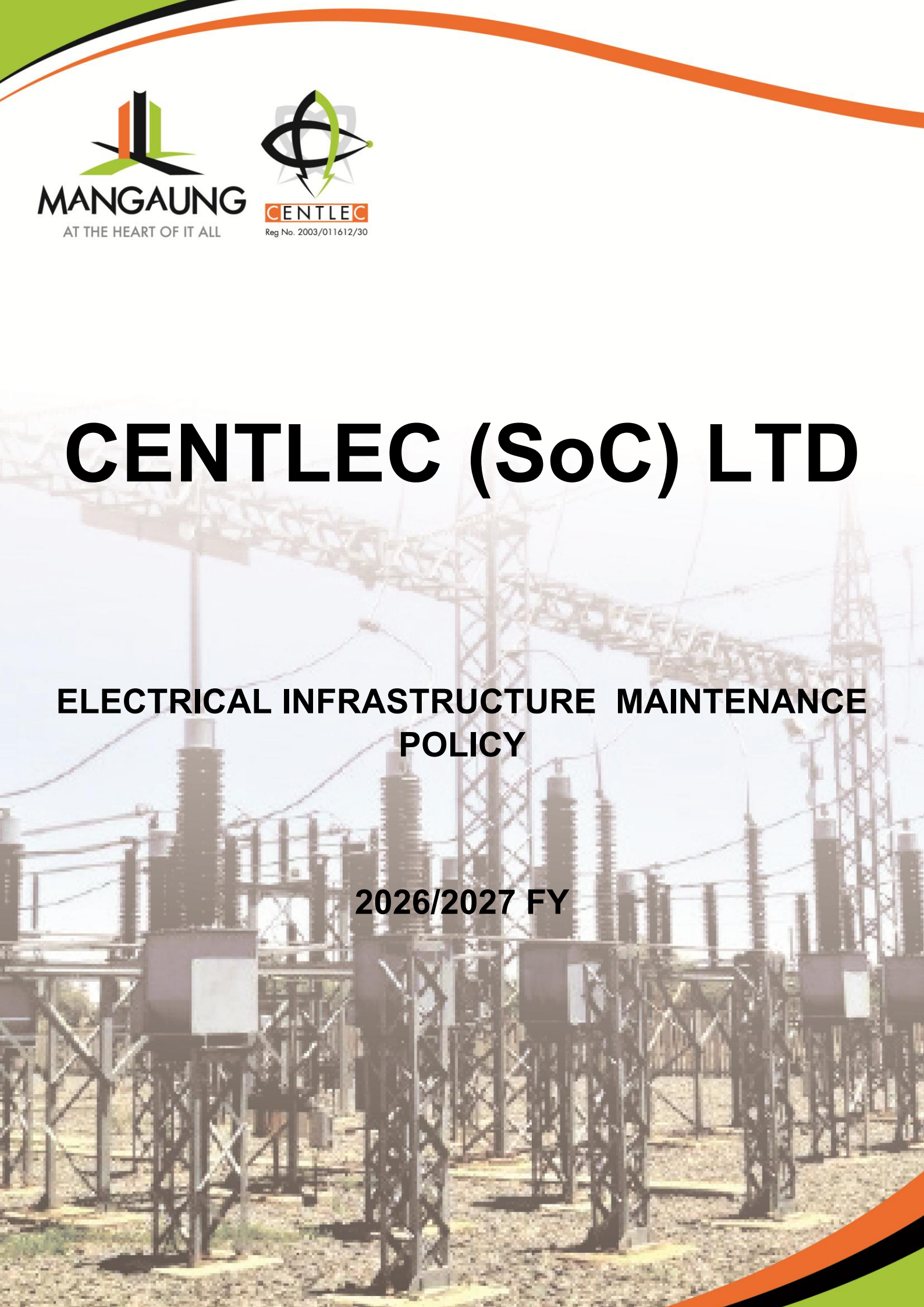
CENTLEC (SoC) LTD

ELECTRICAL INFRASTRUCTURE MAINTENANCE POLICY

2026/2027 FY



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"To be a reliable energy utility of choice that enables social and economic upliftment"

INTRODUCTION

This policy was prepared to provide guidelines to supply CENTLEC (SoC) Ltd's (Centlec hereafter) different maintenance sections with an acceptable maintenance policy. It is believed that an acceptable maintenance policy is the first step in implementing a maintenance program that will improve the quality of electricity supply to the end user.

1. Scope

The objective of this document is to set out guidelines in order to optimize maintenance on all electrical equipment in the distribution area of Mangaung Metro Municipality.

This document applies to the maintenance of electrical networks and equipment operated at voltages up to and including 132kV, including all associated control, Protection- and Supervisory Control and Data Acquisition (SCADA hereafter) systems, lighting and metering installations.

2. Terms, definitions and abbreviations

For the purposes of this policy, the following terms, definitions and abbreviations apply.

2.1 Terms and definitions

Competent Person

Person who is able to, and authorized to carry out the designated functions.

Condition-Based Maintenance

Maintenance done based on information from tests, inspections and/or conditions which predict when maintenance is necessary, rather than on time in service or number of operations.

Corrective Maintenance

Maintenance carried out after fault recognition and intended to put an item into a state in which it can perform a required function (IEC).

Inspection

Visual or audible (or both) examinations that can be assisted by mechanical or electrical (or both) means, that will detect obvious unsatisfactory conditions or discrepancies (IEC modified).

Item

Any part, component, device, subsystem, functional unit, equipment or system that can be individually considered (IEC).

Life Cycle Cost

Net present value of the sum of all the direct and indirect costs incurred to acquire, install, commission, operate, maintain, decommission and dispose an item throughout its life.

NOTE: The maintenance component of the life cycle cost should include the costs of risk, spares, labour, maintenance facilities and equipment, transport, site establishment and any special training.

Maintenance

Combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function (IEC).

Maintenance Philosophy

System of principles for the organization and execution of the maintenance (IEC).

Maintenance Policy

General approach to the provision of maintenance and maintenance support based on the objectives and policies of owners, manufacturers, users and customers (IEC).

Overhaul

Work done with the objective of repairing or replacing parts which are found to be out of tolerance by inspection, tests, examination, or as required by the manufacturer's maintenance manual, in order to restore the item to an acceptable condition.

Preventive Maintenance

Maintenance carried out at predetermined intervals or according to prescribed criteria and intended to reduce the probability of failure or the degradation of the functioning of an item (IEC).

Pure risk

Risk which results only in loss, damage, disruption or injury with no potential for gain, profit or other advantage.

Redundancy

Existence of more than one means exist for performing a required function (IEC).

Refurbishing

Re-instatement of items to their original condition and intended performance with consideration for cost and current technology for the purpose of extending the plants useful life expectancy.

Repair

Corrective maintenance in which manual actions are performed on the item.

Retrofit

Modifications done to an item to incorporate improvements in design to ensure enhanced operating performance.

Risk

Chance of loss, or the probability that an undesired event may occur, multiplied by the cost of that event if it does occur.

Risk Management

Managerial function which has the objective of protecting people, assets and profits of a business, by eliminating or minimizing the potential for loss from pure risk and the provision of funds to recover from losses that do occur.

Run-To-Failure

Failure of an item, which has intentionally not been subject to preventive maintenance.

2.2 Abbreviations

KPI	Key Performance Indicator
MT	Mean Time (**measures the average time lapsed between breakdowns)**
MTBF	Mean Time Between Failures (for a particular type of item)
MTTR	Mean Time To Repair (for a particular type of item)
QA	Quality Assurance
RCM	Reliability Centered Maintenance
RTU	Remote Terminal Unit (for supervisory)
IDMT	Inverse Definite Minimum Time Curve (time versus multiples of pick-up)
VHF	Very High Frequency
UHF	Ultra High Frequency
FEP	Front End Processor
SCADA	Supervisory Control And Data Acquisition
HV	High Voltage
MV	Medium Voltage
LV	Low Voltage
NERSA	National Energy Regulator of South Africa
SANS	South African National Standards
OHSA	Occupational Health and Safety Act

3. Maintenance Policy

CENTLEC's Maintenance Policy is based on a combination of maintenance practices. Maintenance schedules are designed from a combination of factors including machinery/equipment manufacturer's recommendations, engineering best practices, condition monitoring, internal policies and regulatory policies.

3.1 Maintenance Philosophy:

The maintenance philosophy includes, but is not limited to the following maintenance practices:

3.1.1 Corrective maintenance
3.1.2 Condition based maintenance,
3.1.3 Preventative maintenance and
3.1.4 Visual and Audible routine inspections

When dealing with different components, the above is achieved through one, or a combination of the following actions:

3.1.5 Service (Scheduled),
3.1.6 Repair,
3.1.7 Overhaul,
3.1.8 Replace,
3.1.9 Retrofit or Refurbish
3.1.10 The implementation of appropriate management programs.

The above maintenance philosophies and practices that are used in each application in such a way that the following minimum requirements are met:

3.1.11 Standard Operating Procedures (internal),
3.1.12 Key Legal Requirements such as the following,

3.1.12.1 Competence: Only qualified personnel should maintain and inspect medium and high-voltage infrastructure.

3.1.12.2 Regulatory Compliance: Adhere to the Electricity Regulation Act, OHSA, the Electrical Installation Regulations, SANS standards, and NERSA's guidelines for safety and reliability.

3.1.12.3 Safety Inspections: Regular inspections, maintenance, and testing of high-voltage equipment are required to ensure the system is functioning correctly and safely.

3.1.12.4 Environmental and Insurance Considerations: Environmental impact assessments and insurance standards must be met to ensure legal compliance and operational safety.

3.2 Maintenance Planning:

Maintenance plans are prepared to meet all the requirements of the maintenance philosophy. Each maintenance plan shows the detail of the specific item and the timeframe of services, replacement, upgrading, etc. Maintenance plans shall continuously be developed, documented, approved and updated as necessary.

However, to be able to meet all the requirements this plan, personnel, vehicles, tools, equipment, material and specialised services must be available and in place. Feasibility is limited to the use and the full implementation of a management program, the capturing of all data and the implementation of management reports.

3.3 Maintenance Work:

Maintenance is carried out according to the maintenance plans by competent trained personnel that dispose of the necessary skills and experience, the availability thereof, as well as the availability of tools, plant, material and equipment, etc. and with specialized

maintenance being outsourced on an ad hoc base.

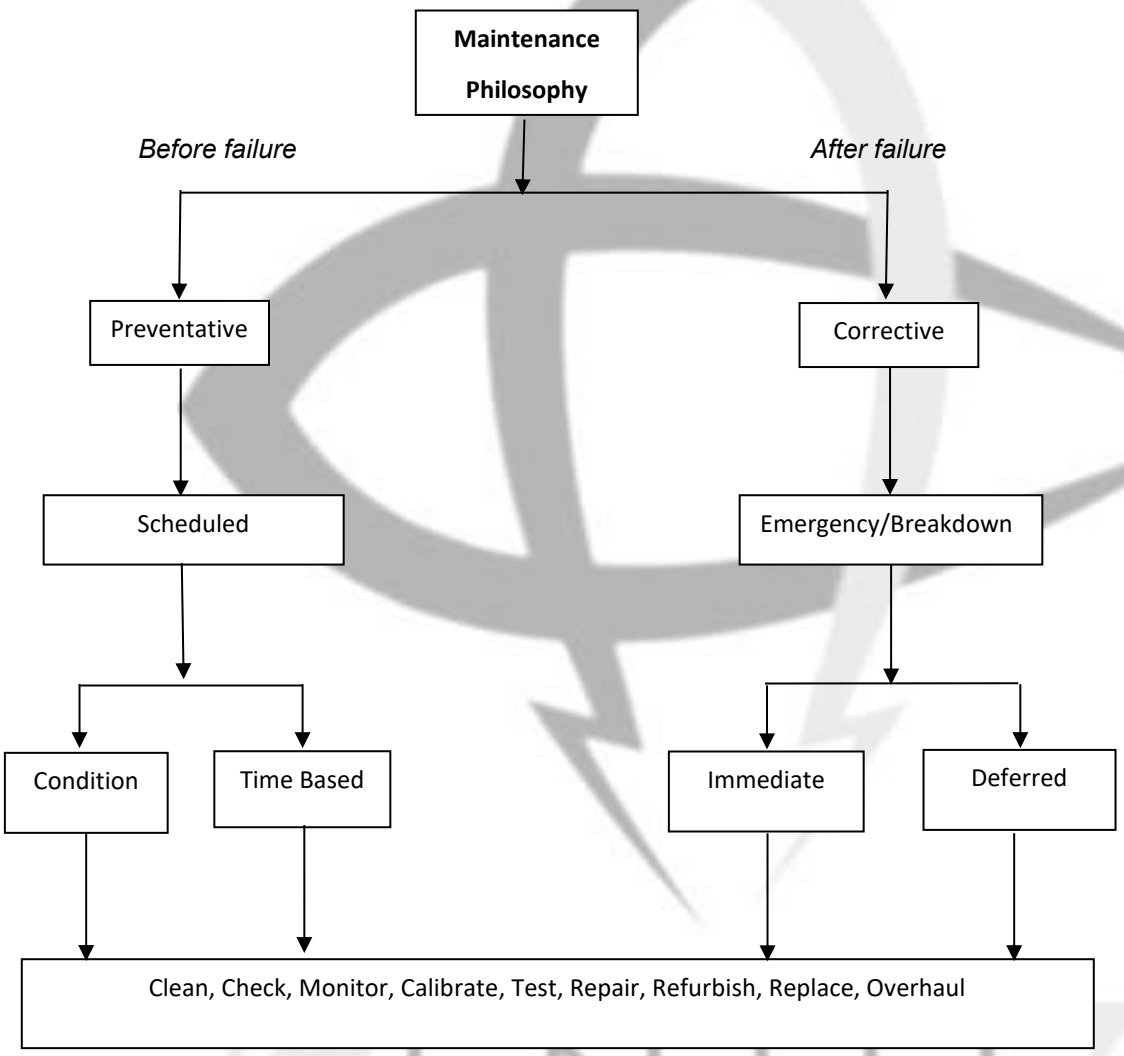
3.4 Maintenance Management:

A Maintenance Management System (program) to support the maintenance policy is kept in a manual / computerized database and includes the following:

3.4.1 Register of plant assets, maintenance planning and performance measurement systems. (KPI's)

3.4.2 Maintenance KPI's are set in accordance with the maintenance plans and annual objectives and are monitored on a weekly / monthly / yearly basis against a balance scorecard.

All maintenance is performed according to the diagram below.



4. NETWORK OPTIMIZATION

Annual Maintenance Plan (Protection, SCADA & Test)

4.1 NETWORK OPTIMIZATION (ELECTRICAL PROTECTION UNIT)

4.1.1 *Maintenance Plan (Operational Budget)*

Preventative maintenance on protection panels is done on a "Time-base" basis. All maintenance is scheduled according to manufacturer's recommendations, engineering best practices or departmental policies. Fifty-percent (50%) of all maintenance is done in-house as personnel are trained and possess the necessary skills and experience, with specialized ad hoc maintenance been outsourced.

Maintenance of the Protection section are scored against a weekly KPI scorecard and include the following:

4.1.1.1 Inspection of all protection equipment at Distribution Centres once every six (06) months whereby all the protection equipment will be visually inspected (equipment include: all relays, wiring and communication devices). This includes Medium and High Voltage centres. The health of all tripping circuits will also be determined during these inspections. Inspection sheets will be completed.

4.1.1.2 Inspection on all primary- and secondary substations at least once every year whereby all the protection equipment will be visually inspected (equipment include: all relays, wiring and communication devices). The health of all tripping circuits will also be determined during these inspections. Inspection sheets will be completed.

4.1.1.3 To visually inspect all primary- and secondary substations at least once every year. (Equipment include: all relays, wiring and communication devices.) The health of all tripping circuits will also be determined during these inspections. Inspection sheets will be completed.

4.1.1.4 Perform routine maintenance and tests on all Distribution centre protection equipment once every year. Routine tests include the following:

1) All feeder bays (IDMT- and Differential relays)
2) Re-commission all distribution transformers

4.1.1.5 Perform routine maintenance and tests on all primary substation protection equipment once every two years. Routine tests include the following:

1) All feeder and incomer bays (IDMT- and Differential relays)
2) Re-commission all local transformers (where applicable)

4.1.1.6 Perform routine maintenance and tests on all secondary substation protection equipment once every three years. Routine tests include the following:

1) All feeder and incomer bays (IDMT- and Differential relays)
2) Re-commission all local transformers (where applicable)

4.1.1.7 A routine test form will be completed, logged and filed for every relay tested.

4.1.1.8 Evaluate all existing protection schemes once every three (03) years in order to determine if the schemes used are effective, efficient and up to date regarding technology as well as acceptable practices.

4.1.2 *Maintenance Plan (Capital Budget)*

Upgrade existing Protection panels, schemes and communication equipment as per capital budget. This upgrading is determined by the Mean Time to Failure of the specific relays.

4.2 SCADA

4.2.1 *Maintenance Plan*

Preventative maintenance on SCADA (supervisory) equipment is done on a “Time-base”

bases and all maintenance is scheduled according to manufacturer's recommendations, engineering best practices or departmental policies. Maintenance is done in-house as personnel are trained and possess the necessary skills and experience. Activities include:

4.2.1.1 Visually inspect and test all batteries on all types of RTUs on a quarterly basis.

4.2.1.2 Replace all RTU batteries every three (03) years

4.2.1.3 Calibrate and test all types of RTU's analogue outputs, digital inputs and digital outputs on a yearly basis.

4.2.1.4 Check all modems and radio equipment of all types of RTUs and the repeater on a yearly basis. This check include frequency deviations, transmitter output and receiver sensitivity. These inspections include a visual inspection of the aerials.

4.2.1.5 Upgrade applicable software every six months if upgrades are available.

4.2.1.6 Visit all main station VHF-and UHF FEPs on a monthly basis to verify data validity. Functions looked at during these inspections are: mapping, communication statistics, analogue values, controls and digital inputs.

4.2.1.7 Visually inspect all types of RTUs on a quarterly basis.

4.2.1.8 Any problems on the SCADA system are reported as and when it occurs, and is repaired. A repair takes priority over routine maintenance activities.

4.3 TESTING UNIT

4.3.1 Maintenance Plan (Operation Budget)

Preventative maintenance on the outer sheath of 33kV cables is done on a "Time-base" bases and all maintenance is scheduled according to manufacturer's recommendations, engineering best practices or departmental policies. All maintenance is done in-house as

personnel are trained and disposes the necessary skills and experience, with only specialized ad-hoc maintenance been outsourced.

To perform cable sheath tests on all 33kV cables on the distribution network in order to determine potential breakdown in the cable sheath insulation. These tests are important due to the fact that any sheath failure may cause moisture to enter the cable. This moisture tends to break down the cable primary insulation, and may shorten the life expectancy of the cable. These tests should be performed on a yearly basis.

5. PRIMARY PLANT (SUBSTATIONS) AND MAINTENANCE

5.1 Annual Maintenance Plan (Operational Budget)

Preventative maintenance on Substation equipment is a combination of “Time-base” and “Performance base” and all maintenance is scheduled according to manufacturer’s recommendations, engineering best practices or departmental policies. Most of all maintenance is done in-house as personnel are trained and dispose over the necessary skills and experience, with only specialized ad hoc maintenance being outsourced. Activities include:

5.1.1 Inspect all Distribution Centres, combined Medium and High Voltage substations, once every three (03) months in order to promote general housekeeping, detect and repair conspicuous defects and to ensure the general safety of all employees.

5.1.2 Inspect all Medium Voltage substations at least once every four (04) years and perform safety tests, earth resistance tests, detect and repair conspicuous defects and to ensure the general safety of all employees, operators and members of the public.

5.1.3 Perform routine maintenance and service all Medium Voltage substations once every four (04) years.

5.1.4 Service all circuit breakers after forced tripping has occurred under fault condition in order to ensure operator safety.

5.1.5 Perform routine maintenance and service all Medium and High Voltage circuit breakers, isolators and other associated equipment once every two (02) years.

5.1.6 Perform routine maintenance and services on all Distribution transformers as follows:
1) Short term – three (03) monthly
2) Medium term – Annually

5.1.7 Long term - Every four (04) to six (06) years (Depending on number of tap changer operations).

5.1.8 Inspect and service all 110 V batteries in Distribution Centres once every three (03) to six (06) months depending on type.

5.1.9 Service and condition all 32V batteries in substations once every three (03) months.

5.1.10 Check and test all Capacitor Tripping units in substations once every six (06) months.

5.2 Annual Maintenance Plan (Capital Budget)

Replacement, Refurbishment or Retrofitting of existing plant and equipment with the effect to extend the life span, to increase capacity or performance of an asset are budgeted for under the Capital Budget. Items are identified on the bases of Performance, Safety and Age (availability of spares) and this type of maintenance is done on an on-going bases in order to prevent unforeseen breakdowns, unsafe conditions and extended power failures.

This is an essential element of maintenance in order to prevent aging of equipment to an extent where equipment failure is at high risk and expenditure exceeds available capital.

5.2.1 Replacement of 32V Batteries and Chargers: 32V Substation Batteries systems have a life span of ten (10) to twelve (12) years under ideal conditions, but various factors, like environmental temperature, charging cycles, depth of discharge, etc. reduces its reliable service life and needs to be replaced at an average rate of ten percent (10%) per year. (Average 10 years service).

5.2.2 Replacement of 110V Batteries and Chargers: 110V Substation Batteries systems have a life span of twenty (20) years under ideal conditions, but various factors, like environmental temperature, charging cycles, depth of discharge, etc. reduces its reliable service life and needs to be replaced at an average rate per year. (Average 15 years service).

5.2.3 Replacement of Overloaded Transformers: Existing transformers often exceed their capacity due to network extension and normal load growth and needs to be replaced with a transformer with larger capacity. Overloaded transformers lead to failures due to overheating and poor quality of supply. This is mostly unforeseen and is only done on an as need bases.

5.2.4 Replacement of decrepit 33 kV Bulk Oil Switchgear: Bulk Oil Circuit breakers installed on the 33kV network, some dating back to 1952, needs to be replaced as spares are now unobtainable and the manufacture of this type of technology and specific models has long been discontinued.

5.2.5 Replacement of decrepit 11kV switchgear: Continuous upgrading and replacement of switchgear on the 11kV network are essential to ensure adequate fault handling capacity, operator safety and prevent long power outages and loss of income. The expected life of switchgear ranges between fourty (40) to fifty (50) years, although this can be extended by retrofitting the switching mechanism and protection equipment, and to refurbish the panel in certain cases. Where switchgear fault levels are too low, these panels need to be replaced to ensure operator safety during switching operations. Availability of spares often determines the serviceability of equipment.

6. OVERHEAD AND UNDERGROUND NETWORKS (HV AND MV NETWORKS)

6.1 Maintenance Plan (Operational Budget)

Preventative maintenance on Transmission lines and cables are done on a "Time-base" bases and all maintenance is scheduled according to manufacturer's recommendations, engineering best practices or departmental policies. Most of all maintenance is done in-house as personnel are trained and dispose over the necessary skills and experience, with specialized ad hoc maintenance being outsourced.

Objectives of the Transmission section are scored against a weekly basic KPI scorecard and include the following:

6.1.1 Inspection on the 33/132 kV Transmission overhead network once every three (03) months. During these inspections a visual inspection of all line equipment will be done.

6.1.2 Inspection on the 11 kV Transmission overhead network once every twelve (12) months in order to promote general housekeeping and to detect/repair conspicuous defects to ensure the general safety of all employees. During these inspections a visual inspection of all line equipment will be done. (Equipment includes: Sectionaliser, Recloser, disconnector switch, pole mounted Transformers, poles, insulators, expulsion fuses and conductors).

6.1.3 Physically check every single component of the total 11 kV Transmission overhead network once every five (05) years to ensure the general condition of the network be the same as when initially constructed.

6.2 Maintenance Plan (Capital Budget)

Replacement and refurbishment of existing 11/33/132kV electrical infrastructure equipment with the effect to extend the life span, to increase capacity or performance of

an asset are budgeted for under the Capital Budget. Items are identified on the bases of Performance, Safety and Age (availability of spares) and this type of maintenance is done on an on-going bases in order to prevent unforeseen breakdowns, unsafe conditions and extended power failures.

This is an essential element of maintenance in order to prevent aging of equipment to an extent where equipment failure is at high risk and expenditure exceeds available capital.

7. OVERHEAD AND UNDERGROUND NETWORKS (LV NETWORKS)

7.1 Maintenance Plan (Operational Budget)

Preventative maintenance on Low Voltage lines are done on a “time-base” bases and all maintenance is scheduled according to manufacturer’s recommendations, engineering best practices or departmental policies. Most of all maintenance is done in-house as personnel are trained and dispose over the necessary skills and experience, with specialized ad hoc maintenance being outsourced. Activities includes:

7.1.1 Inspection of the Low Voltage overhead network once every five (05) years in order to promote general housekeeping, detect and repair conspicuous defects and to ensure general safety of all employees and consumers.

7.1.2 Routine Service of the Low Voltage overhead network once every ten (10) years in order to clean up and tidy lines and cross arms and repair conspicuous defects and to ensure general safety of all employees and consumers.

7.1.3 Perform routine earth loop tests at least once every ten (10) years to verify the earth impedance to the source of the power supply at each individual installation to comply with the set standard and in order to ensure safety.

7.1.4 Perform routine inspection and maintenance once every ten (10) years on overhead house connections.

7.1.5 Routine maintenance is done on distribution boxes and meter boxes after a visual inspection once every ten (10) years, this forms part of the preventative maintenance plan.

7.1.6 Over Current and Low Voltages occurring during winter months on the LV network are recorded and this information is passed on to the Design and Development division for a review of the low voltage network designs, upgrading and strengthening of existing infrastructure.

7.2 Maintenance Plan (Capital Budget)

Replacement and refurbishment of existing LV electrical infrastructure equipment with the effect to extend the life span, to increase capacity or performance of an asset are budgeted for under the Capital Budget. Items are identified on the bases of Performance, Safety and Age (availability of spares) and this type of maintenance is done on an on-going bases in order to prevent unforeseen breakdowns, unsafe conditions and extended power failures.

This is an essential element of maintenance in order to prevent aging of equipment to an extent where equipment failure is at high risk and expenditure exceeds available capital.

7.2.1 Identify and rectify problems found on existing meter and distribution boxes installed. Due to movement of soil some of these meter and distribution boxes are covered and not accessible to Meter Readers and Centlec's own employees.

7.2.2 Replacement of decrepit overhead house connections (single conductors).

7.3 Streetlights

7.3.1 Maintenance Plan (Operational Budget)

Streetlights are maintained mainly on a spot replacement basis as reported by street light scouts or by the public, whereas a group replacement strategy is followed when maintaining high mast lights on main routes. On main route and on high mast lights all lamps are replaced when more than thirty-percent (30%) of the lamps on a high mast have failed and the remaining lamps have reached seventy-five (75%) of their expected life. Other identified areas, like main thorough roads, the CBD, etc. are also handled on a group replacement basis.

7.3.1.1 Repair complaints involving a single streetlight within 3 working days, from the date first reported.

7.3.1.2 Repair faults due to supply failure, cable faults, damaged poles etc. within five (05) working days, from the date first reported.

7.3.1.3 Handle public complaints the next working day or as soon as possible thereafter, within three (03) working days, from the date first reported.

7.3.1.4 Service and maintain high mast lights on a routine basis, once every two (02) years.

7.3.1.5 Produce and install decorative lighting on street light poles during the festive season, or during other special event that are hosted in Mangaung Metro Municipality area every year or when requested.

7.3.1.6 Inspect and service decorative lighting once a week during festive season to ensure the best possible effect.

7.3.2 **Maintenance Plan (Capital Budget)**

7.3.2.1 Identify and replace decrepit aluminium streetlight cables.

7.3.2.2 Identify and replace decrepit street light luminaries, out-reach brackets and poles.

8. METERING

8.1 Annual Maintenance Plan (Operational Budget) - Metering

Preventative maintenance on Metering equipment is done on a "time-base" and "performance base" bases in order to optimise maintenance performance. The NRS 057 –Code of Practice for Electricity Meters is used as guidance and will be implemented on the long term. All maintenance is scheduled to optimise performance, implementing short term, medium term and long term objectives and in accordance with manufacturer's recommendations, engineering best practices, condition monitoring, and internal policies. All maintenance is currently done in-house.

Objectives of the Metering section are currently done on a paper system. Implementation of a meter management system will give effect and make it possible to measure and check the performance against a KPI scorecard and shall include the following:

8.1.1 Inspect all Medium Voltage Bulk kWh/kVA Metering installations at least once every twelve (12) months in order to promote good housekeeping, detect conspicuous defects and possible tampering, check meter seals and to ensure general safety.

8.1.2 Inspect all Low Voltage Bulk kWh/kVA Metering installations at least once every twelve (12) months in order to promote good housekeeping, detect conspicuous defects and possible tampering, check meter seals and to ensure

general safety.

8.1.3 Perform routine checks at least once every five (05) years to verify the total integrity of all the platinum bulk metering installation (key customers) to comply with the set standards.

8.1.4 Perform routine checks at least once every ten (10) years to verify the total integrity of all the other bulk (kWh/kVA) metering installation to comply with the set standards.

8.1.5 Perform routine earth loop tests at least once every ten (10) years to verify the earth impedance to the source of the power supply at each individual metering installation to comply with the set standard and in order to ensure safety.

8.1.6 Test and replace the bulk kWh/kVA meter(s) at all the 10 MVA ≥ Medium Voltage Bulk installations at least once every five (05) years with a calibrated meter(s) to verify and certify the accuracy and the safety of that specific metering installation.

8.1.7 Test and replace the bulk kWh/kVA meter(s) at all the 1 MVA ≤ 10 MVA Medium Voltage Bulk installations at least once every ten (10) years with a calibrated meter(s) to verify and certify the accuracy and the safety of that specific metering installation.

8.1.8 Test and replace the bulk kWh/kVA meter(s) at Low Voltage Bulk installations at least once every ten (10) years with a calibrated meter(s) to verify and certify the accuracy and the safety of that specific metering installation.

8.1.9 Test and replace all the Rotating Disc kWh meter(s) at least once every twenty (20) years with a calibrated meter(s) to verify and certify the accuracy and the safety of that specific metering installation.

8.1.10 Test and replace all the Electronic kWh meter(s) (prepaid and other) at least once every ten (10) years with a calibrated meter(s) to verify and certify the accuracy and the safety of that specific metering installation.

8.1.11 Perform routine maintenance on all the domestic meter boxes at least once every ten (10) years to check and maintain the installation to ensure that circuit breaker covers are in position, live parts are covered and earth connections are in place.

8.1.12 Perform routine maintenance on all the 8-way/6-way/4-way meter boxes at least once every ten (10) years to check and maintain the installation to ensure that circuit breaker covers are in position, live parts are covered and earth connections are in place.

8.1.13 Perform routine maintenance on all the meter boards in the meter rooms (blocks of flats/large buildings) at least once every five (05) years to check and maintain the installation to ensure that circuit breaker covers are in position, live parts are covered and earth connections are in place.

8.1.14 Inspect at all the ripple receiver relays controlling the geyser loads at least once every ten (10) years to check the switching load on the network and to ensure the functionality of load control relays.

8.1.15 Compile short term maintenance planning.

8.1.16 Compile medium term maintenance planning.

8.1.17 Compile long term maintenance planning.

8.2 Annual Maintenance Plan (Capital Budget) - Metering

Replacement, Refurbishment or retrofitting of existing plant and equipment with the effect to extend the life span, to increase capacity or performance of an asset are budgeted for under the Capital Budget. Items are identified on the bases of Performance, Safety and Age (availability of spares) and this type of maintenance is done on an on-going bases in order to prevent unforeseen breakdowns, unsafe conditions and extended power failures.

This is an essential element of maintenance in order to prevent aging of equipment to an extent where equipment failure is at high risk and expenditure exceeds available capital.

8.2.1 Replacement of Proprietary Pre-paid meters: old technology putting enormous strain on the Vending System (data communication overheads), tend to go into a fault mode after a power failure and its reliable service life has expired. (Average 10 years service) (Short to Medium term project).

8.2.2 Replacement of Thermal operated Bulk kWh/kVA meters that cannot accommodate time differentiated peak/off-peak tariffs. (Short to Medium term project).

8.2.3 Replacement of Voltage Transformers where the accuracy class and minimum specifications do not comply with the set standards of NRS 057. (Short to Medium term project).

8.2.4 Replacement of Current Transformers where the accuracy class and minimum specifications do not comply with the set standards of NRS 057. (Short to Medium term project).

8.2.5 Replacement of Ripple receiver relays (old technology) as spares are now unobtainable and the manufacture of this type of technology and specific models has long been discontinued. (Short to Medium to Long term project).

8.2.6 Replacement of Quality of Supply instruments where the minimum standards were changed (NRS 048) and only replacement of instruments can accommodate retrieval/capturing of data. (Short to Medium to Long term project).

END