ETHEKWINI ELECTRICITY ANNUAL REPORT 2023/2024

FOREWORD

As the Electricity Unit, it is our privilege to be able to serve our communities to the best of our ability. The challenges faced in the past year have allowed us to test our mettle and emerge wiser. The fast-paced evolution and boisterous energy environment has kept the Unit on tenterhooks as we navigate this period of uncertainty.

The unit has worked tirelessly this past year to ensure that electricity provision is sustained and that maintenance projects are positioned strategically to ensure the continued strength of our electricity grid.

To modernise our operations, the unit developed and implemented technology inspired projects that expanded our fault reporting channels and created interactive meter reading submission options for our customers.

With that being said, the last year has not been one without its own challenges. The theft and vandalism of electrical infrastructure continues to be a frequent occurrence that dents service delivery. While our Revenue Protection teams remain diligent in their efforts to combat this scourge, the issue seizes to grind to a halt. We have increased security patrols in high theft zones. While this has proved to be effective, the cost of these services is steep, pushing up our expense budget.

Moreover, the ever-increasing energy costs are putting immense pressure on all South African municipalities. This has a devastating impact on all spheres of society. As costs spiral out of control, it is inevitable that revenue collection difficulties will rise. The unit is now faced with a unique challenge of advancing innovative solutions that will ensure sustained revenue collection rates.

As we continue to electrify our communities and grow our economy, we must intensify our efforts towards of energy efficiency and demand side management. Having concluded yet another challenging year, I would like to thank my staff for their commitment and effort thus far, in serving our customers to the best of their ability. They have displayed unbending resilience and untamed character in the fulfilment of our collective duties of service. My team and I remain resolute in our mission to serve.

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HV OPERATIONS DEPARTMENT

DEPARTMENT OVERVIEW

The HV Operations Department is responsible for the planning, construction, operation, and maintenance of eThekwini Electricity's primary network of high voltage cables, lines, and substations. The projects undertaken by this department are to provide for increased bulk capacity and to improve the reliability of the regions HV electricity supply. Accordingly, they are typically large, high-cost projects which require considerable time and attention to satisfy environmental legislation in the first instance and then 30 months or more in the construction phase. The branch prides itself in reliable, state of the art solutions for the delivery of high voltage power from its intake points to customers and secondary networks.

HV PLANNING BRANCH

The HV Planning Branch is responsible for planning the Electricity Unit's primary network of high voltage (HV) underground cables, overhead transmission lines, switching stations and substations. The timeline for providing HV infrastructure spans several years and therefore necessitates careful planning to ensure that there is sufficient HV infrastructure in place to meet the demand of all customers in a sustainable manner. The HV Planning Branch is the custodian of the transmission network master plan which is inclusive of a 20-year capital program that allows for HV network development, reliability, and refurbishment requirements. Analysis of the transmission network is conducted using power system analysis software for network load flow, voltage stability and fault level studies. Application for Council funding, acquisition of land and servitudes, environmental impact assessment approvals and completion of preliminary designs are also completed by the branch.

HIGHLIGHTS:

- The Branch reviewed and approved a 7,3 MW solar photovoltaic application, the largest plant capacity approval, by a municipality outside of Eskom's IPP process.
- It further reviewed the transmission network master plan.
- It successfully reached an agreement with PRASA and Transnet to migrate supply voltages to 11 kV and or 132 kV which paves the way for completing the phase out of the aged 33 kV and 132/33 kV networks.

CHALLENGES

- Forecasts for the expansion of high voltage networks in the northern and western suburbs was provided by Tongaat Hulett Developments, this project is now under business rescue. This has a terrible impact on planned new high voltage infrastructure roll out by both Eskom and Ethekwini Electricity.
- The branch was severely affected by delays in the 33 kV network phase out due to delays in projects required to replace these sources of supply.
- It was unable to handover completed design packages for projects due to capital funding constraints.

UPDATE ON EXISTING PROJECTS

- 132/11 kV Automobile Supply Park Substation (ASP) at Reunion – pre-feasibility stage.
- 132 kV Oil Filled Cable Replacement to SAPREF Refinery – on hold.
- 132 kV Oil Filled Cable Replacement in Inner City – pre-feasibility stage.
- 132/11 kV Sukuma Substation Bus Section – Planning process complete – awaits funding.
- 132/11 kV Sunningdale Substation Bus Section – Planning process complete – awaits funding.
- 132/11 kV Morelands Substation Upgrade – Planning phase in progress, design finalised.
- 132/11 kV Moriah Substation – on hold due to lower power forecast by Developer.
- 132/11 kV Phoenix Industrial Park Substation Bus Section and Transformer Replacement – Planning process complete – await funding.
- 132/11 kV Chatsworth Substation Bus Section Installation and Transformer Replacement -Design proposal stage.
- 132/11 kV Roberts Substation Switchboard Replacement, Protection Upgrade and Boundary Wall Construction – Resolving approval from Department of Water and Sanitation in terms of Water use Act.
- 132/11 kV Sibaya Substation – alternate substation sites being reviewed.
- 132/11 kV Verulam Substation – Planning process complete – await funding
- 275/132 kV Durban South Substation Transformer Replacement and Switchgear Upgrade – Design proposal stage.
- 132/11 kV Toyota Substation 132 kV Bus Section – MOA complete – need to identify savings to fund this project.
- PRASA Durban Station Substation migration of 33 kV to 11 kV supply – construction phase
- PRASA Booth Substation migration of 33 kV to 11 kV Supply – servitude acquisition
- 132 kV Ottawa/Umgeni Overhead Transmission Line upgrade – pre-feasibility stage.

ACHIEVEMENTS

• Staff within the branch developed skills to assess embedded generation applications.

HV PROJECTS BRANCH

HV Projects Branch is responsible for the detailed design, specification of equipment and management of major system reinforcement projects which include cables, lines and substations with voltages ranging from 275kV to 11 kV.

HIGHLIGHTS

• Commissioning of various 132/11 kV Transformers at La Mercy, Mobeni South, Addington and Clermont substations.

• Completion of the 11 kV Prospecton Substation switchboard.

• Completion of the deluge systems at two new substations which are critical to the final commissioning of these substations.

CHALLENGES

• Funding constraints impeding progress on projects.

• Discontinuation of one of the key contracts for transformers.

CURRENT PROJECTS

• Alice Street 132/11 kV Substation: Upgrade of the substation with two additional transformers and replacement of the existing 11kV board. Construction currently under way onsite.

• Austerville 132/11 kV Substation: New 132/11 kV substation aimed at relieving the aged 33/11 kV sub stations in the Jacobs area and further reinforcing the 11 kV network. Civil works is in progress.

• Avoca 132/11 kV Substation: The commercial and residential load demand in the area has increased and firm capacity needs to be upgraded from 30 MVA to 60 MVA. Commissioning is in its final stages.

• Bulwer 132/11 kV Substation: The commercial and residential load demand in the Glenwood area has increased and the 11 kV system needs to be reinforced. Civil work has been completed, 132 kV cables have been installed and 11 kV board and ICAP equipment are in procurement stages.

• Cathedral 132/11 kV Transformer: New transformer to be procured to replace old unreliable transformer.

• Durban South 275 kV Bus Section: Required to improve security of supply at this strategic substation. Installation of plant and equipment pending network constraints.

• Jameson Park 132/11 kV Substation: The commercial; and residential load demand in the area has

increased resulting in the need to upgrade the existing 33/11kV Substation and replace it with two new 30 MVA 132/11 kV transformers, associated plant and equipment. Cables and GIS. ICAP commissioning in final stages. Transformers to be done as phase 2.

- KE Masinga 132/11 kV Substation: The commercial and residential load demand in the city has increased and the 11 kV system needs to be reinforced. A Major plant has been installed and cable works have been completed. ICAP is in its final commissioning stage.
- Kingsburg 132/11 kV Substation: The commercial and residential load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. A detailed civil works design is in progress.
- Klaarwater 275/132 kV Substation: Upgrade current four 250 MVA transformers to 315 MVA due to the increase in load. The first two transformers have been commissioned.
- Kloof 132/11 kV Substation: New 132/11 kV substation aimed at replacing the ageing Kloof Substation and increasing reliability in the area. Civil works completed. Electrical equipment to be installed once Stockville and Mahogany Substations are in the final stages. Overhead line designs are being undertaken.
- La Mercy 132/11 kV Substation Reinforcement: The commercial and industrial load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Two additional transformers have been installed, one commissioned and the last one in final commissioning stage.
- Lotus Park 275/132 kV Substation: Replacement of the old obsolete protection and control equipment with the newer IEC 61850 compliant integrated control and protection (ICAP) equipment. Commissioning in progress.
- Mahogany Ridge 132/11 kV Substation: The commercial and residential load demand in the Westmead and Mahogany Ridge areas has increased, and the 11 kV system needs to be reinforced with additional 60 MVA firm capacity. Civil works and 132 kV overhead line designs have been completed. Installation of the overhead lines in progress.
- Ntuzuma 132/11 kV Transformer. Replacement of the old transformer that had failed. New transformer installed. Commissioning of the protection equipment in progress.
- Ottawa 132/11 kV Substation: The commercial and industrial load demand in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Additional transformers have been installed. Procurement of other equipment in final stages.
- Rossburgh 132/11 kV Substation: New 11 kV capacity to replace the 33 kV network that is being phased out. ICAP commissioning in final stage.

- Springpark 132/11 kV Substation: The commercial and industrial load demand in the Springpark area has increased and the 11 kV system needs to be reinforced. Civil works completed and critical equipment has been delivered. Awaiting 11 kV gear and ICAP equipment.
- Stockville 132/11 kV Switching Station: New switching station proposed to feed the new proposed sub stations in Mahogany Ridge and Kloof areas. This switching station will also feed the existing Westmead, Marrianridge, Hillcrest and Waterfall Substations, which will eliminate security of supply risks and operational limitations applicable to existing circuits. Civil works currently underway on site and the installation of the 132 kV overhead line in progress.
- Umbogintwini 132/11 kV Substation: Civil works complete. Switchgear and transformers to be procured.
- Umdloti Beach 132/11 kV Substation: The commercial and residential load in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. Transformers installed and commissioning of the protection and control equipment in final stages.
- Umgeni 132/33/11 kV Substation: Replacement of the old obsolete protection and control equipment with the newer IEC 61850 compliant integrated control and protection (ICAP) equipment. Commissioning in progress.
- Umlazi 132/11 kV Substation: Replacement of the damaged 11 kV switchboard. Completed and awaiting the final re-commissioning of existing transformers.
- Underwood 132/11 kV Substation: New 132/11 kV substation to increase the capacity in the area. Civil works have been completed and 132 kV GIS equipment installed. 132 kV Cable installed. Awaiting procurement of ICAP equipment and 11 kV gear.
- Woodlands 132/11 kV Substation: Upgrade of the current 132/33 kV substation. Civil works design underway.
- Westmead 132/11 kV Substation: New 132 kV bussection required to improve the security of supply in the Westmead area. Civil work design being undertaken.
- Replacement of the old 11 kV withdrawable switchboards with new fixed pattern type at Bayhead, Esplanade, Isipingo, Marrianridge and Toyota Substations. Procurement in final stages.
- Newlands 132/11 kV transformer: Replacement of the old, failed transformer. Awaiting the procurement of transformers.
- Waterfall Substation: The commercial and residential load in the area has increased and the firm capacity needs to be upgraded from 30 MVA to 60 MVA. New transformer to be procured to replace one of the old unreliable transformers. Civil work designs underway.

HV SUBSTATIONS BRANCH

The HV Substations Branch is responsible for the operation and maintenance of equipment that has voltage ranging from 11 kV up to 275 kV. The main intake points from Eskom are at the four 275 kV National Key Point Substations. The 275 kV is then transformed to 132 kV; 132 kV transformed to 33 kV and 11 kV, and 33 kV is then transformed to 11 kV and in few cases to 6,6 kV.

The types of equipment that the HV Substation Branch is responsible for includes busbars, capacitors, circuit breakers, instrument transformers, isolators, lightning masts, power line carriers, power transformers and surge arresters.

HIGHLIGHTS

- The branch managed to repair and energize Pineside Substation switchgear following its previous catastrophic failure.
- Upgrades were done at the Durban North Substation (National Key Point) guard house.
- There was demolition and reconstruction of Klaarwater Substation (National Key Point) guard house.
- Refurbishment of critical high voltage transformers
- Refurbishment of 11kV switchgear at various strategic substations.
- Refurbishment of 132 kV hydraulic leaking circuit breakers at various strategic substations.

CHALLENGES

- Copper theft in high voltage substations remains a challenge that threatens the functionality of substations.
- Poor turnaround time for general substations maintenance from Architecture Department.

FUTURE PLANS

- The branch plans to replace stolen copper earth conductors with copper clad steel conductor to mitigate copper theft.
- Refurbishment and repair of 132 kV SF6 leaking circuit breakers.
- Refurbishment of 132 kV GIS switchgear to extend its useful life.

HV LINES BRANCH

The HV Lines Branch is responsible for the operation and maintenance of the high voltage overhead lines network consisting of 163 circuit kilometres of 275 kV, 485 circuit kilometers of 132 kV and 13 circuit kilometres of 33 kV overhead line.

HIGHLIGHTS

The Branch completed the installation of HV Lines towers theft detection units to act as an early warning system during theft of tower members and prevent the collapse of its towers.
It further managed to minimize its electrical faults through effective and proactive maintenance of HV lines.

The following contracts are in place and are assisting in the maintenance of HV lines assets:

- E.9406-A: Refurbishment of line towers
- E.9668: Theft detection unit contract
- E.9699: Procurement of 132 kV and 275 kV insulators
- E.9431: Bush Clearing contract
- E.9788: Professional Engineering, project management Services
- The Branch awaits the awarding of the following key contracts:
- 27636-5E: Refurbishment of line towers (Renewal of E.9406-A for next two years)
- 27660-5E Bush Clearing (Renewal of E.9431 for the next three years)
- 27982-5E Theft detection (Renewal of E.9668 for the next three years)
- 30765-5E Procurement of 132 kV and 275 kV insulators (Renewal of E.9699 for the next three years)

CHALLENGES

- The encroachment of asset servitude and corridors remain the highest risk to infrastructure. This challenge needs proper enforcement of Municipal laws and policies.
- Illegal electricity connections exploit high voltage pylon towers to attach wires for elevation and such crime delays/prevents inspection and maintenance of such infrastructure. In most cases, officials are intimidated and threatened.
- Illegal dumping prevented access for inspection and maintenance.

- The Branch's inability to retain staff has resulted in high staff turn-over. This bared negative conse quences for the branch as it fell short on special skills and high level of competency associated with working in high voltage lines environment.
- Suitable off road (4×4) vehicles are still a challenge as access roads are becoming more difficult to negotiate with the encroachment of informal settlements and developments within the power line corridors. This will be mitigated by working with Roads and City Fleet Department to build suitable access roads and procure suitable vehicles, respectively.
- Staff have been denied access by private property owners.
- Soil erosion on access routes and bridges make daily operations difficult.
- HV Lines Building: minor maintenance of leak proofing the roof at the boardroom, filing room and distribution board is partially completed, painting is outstanding. Walls are cracking and paint is peeling off.

PRIORITY PROJECTS COMPLETED

Refurbishment of the following assets has been completed:

- Ottawa-Cornubia 132 kV line
- Durban North-Old Fort Grid 132 kV line
- Ottawa – Umdloti 132 kV line
- Lotus Park – Plangweni 132 kV line
- Lotus Park – Isipingo 132 kV line
- Completed repairs of assets which were damaged by major faults:
- Stringing of OPGW on Lotus Park – Plangweni 132 kV T1 -T12
- Access route from T26 to T24 -Klaarwater – Woodlands
- Stringing OPGW from T1 to T7 and phase conductors from T4 to T5 Klaarwater – Coedmore 132 kV line.

FUTURE PLANS

The following key lines have been prioritized as refurbishment execution projects due to a limited budget allocation for the branch:

- Ottawa-Durban North (continuation) 275 kV
- Klaarwater-Woodlands 132 kV
- Umgeni-Avoca 132 kV
- Durban North-Parlock 132 kV
- Illovo-Durban South 275 kV
- Ottawa-Canelands 132 kV T17-T53

- Quarry-Roberts 132 kV
- Umgeni-Reservoir Hills 132 kV
- Quarry-Bellair 132 kV
- Parlock-Umgeni 132 kV
- Ottawa-Parlock 132 kV T1-T18
- Klaarwater-Quarry 132 kV
- Lotus Park-Plangweni 132 kV

- **Building Access routes (bridges) to Umgeni-Avoca and Umgeni-Reservoir hills.**
- **Hillcrest-Waterfall, investigate solution for access and maintenance of monopole structures.**
- **Fault path indicators have been procured and the Branch is awaiting integration with Communication for implementation.**
- **Research on utilizing drones for overhead line inspections.**
- **Continue with asset construction and refurbishment projects.**
- **Participate on national and international technical platform to learn and share knowledge with other utilities.**
- **Conduct research on the use of satellite images to monitor and control servitude encroachments.**
- **Take advantage of weather information systems to analyze electrical network disruptions and improve response times during adverse weather conditions.**
- **To procure a tractor and lay bed (tow-truck) to mitigate challenges experienced with access routes and use it for the transporting of our TLB and tractor.**
- **Installation of step bolts for the following lines:**

- Tee-Mariannridge T1-T10
- Klaarwater-Coedmore T1-39
- Durban North – Parlock
- Klaarwater – Umgeni
- Bellair – Rossburgh

- **Conductor repair of La Mercy-Tongaat T12-T13.**
- **Re-insulation of the following towers:**
- Bellair-Mayville T1-T11
- Tee-Duffs Road T1-T3
- Hillcrest-Waterfall T1-22 and T38-49
- Ottawa – Durban North
- Bellair-Rossburgh, T11 replacement (tower struck by a truck)

HV CABLES BRANCH

The HV Cables branch is responsible for operation and maintenance of the 132kV and 33kV underground power cable assets that form part of the primary network. HV Cables is also responsible for the construction and the maintenance of 11kV cables within the boundaries of high voltage substations. The construction of 132kV cables is managed by the HV Projects branch then handed over to HV Cables on commissioning for operation and maintenance.

HIGHLIGHTS

- The branch successfully maintained its 132 kV Cables, and reduced faults to at least two faults at this Voltage level in the 2023/2024 financial year, the only circuit being, Umgeni-Pinetown No.1 and No.2 132 kV XLPE cables.
- The branch also repaired all 132 kV cables that fail due to third party damages, which are caused by fibre installation contractors, 132 kV XLPE Cable Repaired Cornubia – Sunningdale.
- A reduced number of faults was a result of the annual condition monitoring performed using bi-annual inspections, Cable outer sheath insulation integrity testing.
- The maintenance of aged 33 kV oil filled cables, and 33 kV Gas insulated cables was part of the branch's weekly tactical maintenance schedule.
- The branch put in place a 36-month contract to procure Test equipment, i.e. VLF, PD detector, Fault Locator.
- The Insulation Upgrade on cable terminations on 11 kV SBV Switch gear programme was implemented.

CHALLENGES

Congella – Glenwood 33 kV Gas-filled cable - Access for both maintenance and repairs has become almost impossible over the recent years. Both shacks and dwellings have been built over sections of the cable routes. The cable servitude remains on the overgrown vegetation potion, making it difficult to access by vehicles and excavation. All gas cables stock at HV Cables stores has been depleted. The gas cable accessories, terminations and joints are obsolete.
the city which have resulted in several cable damages during excavation or drilling. Third parties excavate without locating underground services and damage cables. Where damages are minor, third parties backfill without notifying eThekwini Electricity, and these damages cause major faults at a later stage.

Copper Theft - Copper theft challenge persists. 11 kV transformer loop cables, copper earthing bars and copper piping in oil cubicles are the most targeted.

Maintenance of pressurised cables – Delays in completion of cable replacement projects have led to the continued operation of aged gas and oil filled cables. There are leaks in several cables due to ageing as these cables have been in service for over 40 years.

NEW TECHNOLOGIES

High voltage cables network consists of 132 kV and 33 kV oil filled cables, these cables have been in service way over their design life, oil leak detection has always been a challenge which delays repairs, the branch has completed an investigation looking at technical and financial viability of using PFT oil leak detection that can be included on the maintenance contract.

FUTURE PROSPECTS

Training and Development of staff - HV cables staff is competent to perform works at 11 kV and up to 33 kV. The branch's future focus is to continue to develop competencies for performing works in all relevant technical areas up to 132 kV. The branch plans to improve cable link boxes for existing 132 kV XLPE underground bonding cubicles. The Underground link boxes are subjected to moisture. This makes it challenging for preventative maintenance with the upright link boxes that are easy access for theft.

HV NETWORK CONTROL BRANCH

The High Voltage Network Control Branch comprises of four divisions: HV Network Control, System Performance, Network Management and Control Systems.

The HV Network Control Division is responsible for the safe operation and efficient performance of the High Voltage Network, which incorporates two HV Network Control Centres with remote control and alarm facilities. eThekwini's primary transmission network, being the supply from 275 kV down to 6.6 kV is manned, monitored, and controlled 24/7 from these network control centres using a sophisticated Supervisory Control and Data Acquisition (SCADA) system.

The System Performance Division is responsible for network optimization, ensuring the HV Network can meet the demand for electricity, statistical reporting, and quality of supply to the bulk points for the 11/6.6 kV distribution system and large industrial customers that are connected directly to the HV Network.

The Network Management Division is responsible for the installation and maintenance of the SCADA System that is required for the efficient monitoring and control of the Unit's critical HV and MV infrastructure.

The Control Systems Division is responsible for the installation and maintenance of SCADA-related field equipment and physical security systems at HV substations.

HIGHLIGHTS

As part of the Unit's physical security initiative, the branch continues to install CCTV and electric fence systems with the strategic objective of curbing rampant theft at HV substations. All our highly critical substations are now fully kitted with the latest state-of-the-art internet protocol (IP) CCTV cameras.

Customer Engagement Activities: The branch is actively working on understanding customer pain points and address concerns related to quality of supply. To achieve this, it plans to explore tailored solutions and have increased the deployment of quality-of-supply monitoring systems at key network locations. These efforts allow us to better identify and respond to issues, improving service reliability and customer satisfaction.

As part of the Branch's digitization strategy, the Network Management Division is currently implementing a switching application to transition away from manual record-keeping. This initiative enhances operational

efficiency, improves data accuracy, and supports a streamlined, modernized approach to network management.

CHALLENGES

The HV Network Control Branch suffered the loss of key experienced staff in various divisions as eThekwini Electricity struggles to retain a full complement of authorised HV control officers and engineering scarce skills.

NEW TECHNOLOGIES

As requests for renewable grid connections increase, the Network Management Division is exploring the acquisition of new software to manage the Distributed Energy Resource (DER) ecosystem. This software will support seamless integration of renewable energy sources, enhance grid stability, optimize energy flow, and enable real-time monitoring and control of distributed assets. These capabilities will help ensure a resilient, sustainable, and efficient energy network.

With the rise in cybersecurity threats, we are focused on strengthening cybersecurity measures at high-voltage substations to enhance grid resilience. By implementing advanced protective measures, we aim to safeguard critical infrastructure, ensure reliable grid operations, and reduce vulnerabilities to potential cyberattacks. This proactive approach will contribute to a more secure and resilient energy network.

MV/LV OPERATION DEPARTMENT

Department Overview

The MV/LV Operations department is responsible for the planning, construction, operation, and maintenance of the Unit's medium and low voltage network. The Department plays a major role in connecting new customers to the electrical grid, thus helping to spread electrical services to all sectors of the Community. The Department is also responsible for providing public/street lighting technologies into the city. Further to the above roles, the Department manages and controls all medium to low voltage substations.

Advancements in technology with the benefit of cost/operational optimization is driving significant changes in the electricity supply industry and the MV/LV Department is strategically embracing these advancements to improve the overall operation, stability, and reliability of the network. The Department has embraced the Internet of Things and the 4th Industrial Revolution and is working on various strategies towards the implementation of a Smart Grid, so that we can better serve our customers.

NETWORK CONTROL BRANCH

The Network Control branch is responsible for the management of Medium and Low Voltage electrical network. This branch is divided into three streams to assist in the effective and efficient management of the electrical network including various types of outages. The Medium Voltage stream consists of three regional Control Rooms whereas the Low Voltage stream has six of the Control Rooms, geared to manage the field crews to safely restore the electricity supply. The Faults stream is the dedicated first line response to all reported faults and emergencies. Our teams work tenaciously at ensuring that customers have a safe and reliable supply of electricity.

HIGHLIGHTS & LOWLIGHTS

The branch welcomed new staff and management to the team. With their extensive experience and wealth of knowledge, they will play a pivotal role in steering its strategic initiatives toward improving the security and quality of supply.

A reflection of the branch's ongoing commitment to operational excellence was visible during the 2024 General Elections. It took a proactive stance in having dedicated teams and standby staff to provide back-up power and temporary lighting to ensure services remained uninterrupted at voting stations. Throughout the year, the branch continued to invest in significant research and work in promoting technological development to improve the electrical network. These advancements, with the implementation of multiple devices and systems will enable us to adapt to the dynamic needs of the digital age and security of electricity supply.

It is important to acknowledge that despite our best efforts, external factors can occasionally impact our service delivery. The high rate of illegal connections, damage to equipment from severe weather conditions and theft of infrastructure on the electrical network remain a challenge.

One such significant event in this financial year was the tornado that struck Tongaat and surrounding areas. The inclement weather conditions associated with this natural disaster caused disrupted the branch's operations and service provision in the affected areas. In the aftermath of this tornado, our teams worked swiftly to restore supply.

For the period under review the following work requests were received.

TYPE OF FAULT	NUMBER OF INCIDENTS
LV Faults	**471 760**
MV Faults	**5 639**
Total	**477 399**

CHALLENGES

- Expiration of VPN keys which impacted on the OT system downtime.
- Restructure reduced resources to attend to field operations.

RISKS & OPPORTUNITIES

- The Smart Metering project presents an opportunity to leverage cyber security opportunities for Network Control.
- Conducted a cyber security audit to assess maturity of the network to improve reliability and secure the OT network from potential threats in the future.
- Vandalism and theft of infrastructure.

Short description of new technologies/innovations employed within the branch

- Revision of cyber security framework and implementation roadmap.
- Improved data integrity and reporting.
- An operational dashboard for MV/LV Network Controller to dispatch and manage work more effectively.
- Intervention project between Communication Networks and Network Control for improved communication between the SCADA Master Station and the remote sites.

NEW PROJECTS & PROGRESS ON EXISTING PROJECTS

The project for the improvement of communication links in Brownfield Projects in conjunction with the Information and Communication Technology Branch, the Communication Networks Branch and the Internet Service Providers. This will leverage the tools and expertise of the branches to improve outage management.

The Distribution Automation project is continuing with the new build projects and potential maintenance if budget increases are permitted. The branch has procured new equipment to continue with the maintenance of existing infrastructure and the replacement of decommissioned and failed equipment.

The intelligent medium voltage devices, remote terminal units (RTU), assists in restoring outages more efficiently through early fault detection, fault finding and load flow analysis. The branch anticipates a reduction in system outage duration and expect a greater security of supply. In this financial year 11 distributor substations have been commissioned.

It is currently embarking on a Security Project to mitigate vandalism and theft with the procurement of an Access Control and Intruder Alert (ACIA) system. This project aims to tackle 100 sites in the next financial year. The substations shall be monitored 24/7 at a central monitoring control room with armed response. It also aims to replace substation doors in eThekwini Electricity's (EE's) distributor substations with advanced technology which incorporates the following features:

a) Access control.
b) Intruder alert.
c) Tamper protection of all connected ancillaries.
d) Be a "camera-ready" system.
e) Pepper spray system.

The implementation of an Advanced Distribution Management System (ADMS) project is still a priority. The project timeline has been delayed due to various issues, however despite these setbacks, we will strive to achieve our strategic objectives and look forward to the project advancement. The solution shall add value to the electrical distribution utility by tying the utility's customer information to a model of the electrical network. Thus, allowing the utility to improve the quality of information given to customers, as well as improving response times by making better use of the outage information provided by customers & other sources. The system shall have functions and features to handle distributed energy resources and monitor the grid impacts thereof.

CONSTRUCTION PLANNING & WORKS

The core functions of this branch are to design and construct electrical infrastructure to connect new customers to the grid. Demands on the electrical network increase with the addition of new customers, and the higher consumption from existing customers. The network must be upgraded to ensure adequate reliability and quality of supply.

HIGHLIGHTS

- The branch attained some of its key performance targets regardless of the challenges faced that had limited the ability to undertake work.
- It maintained a full complement of management team during the year in review.
- A House Services Contract was awarded.

LOWLIGHTS

- Supply Chain Management (SCM) challenges severely affected the performance of the branch and its commitment to delivering service customers.
- Resource availability has affected the ability to undertake work.
- Delays associated to renewal of the reticulation contract has impacted the ability to undertake projects.

CHALLENGES

- Materials shortages experienced due to delays in the procurement process resulting in project delays.
- Labour contracts were delayed in the procurement process with the House services contract only being awarded in the second half of the financial year.
- Vehicle unavailability caused delays for the project execution teams.
- Shortage of tools due to budget cuts.

RISKS & OPPORTUNITIES

- Service delivery backlogs steadily increasing.
- Capital Budget constraints impeding the ability to undertake critical network.
- Hijacking of Council vehicles as well as theft and vandalism of field equipment.

NEW TECHNOLOGIES/INNOVATIONS EMPLOYED WITHIN THE BRANCH.

- Small scale embedded generation applications have seen a steady increase in numbers.
- Installation of new generation smart prepaid meters, aligning with current technological trends.

NEW PROJECTS & PROGRESS ON EXISTING PROJECTS

CENTRAL REGION:

Informal Settlements:

- Kennedy Road informal settlement - Project complete.

Formal Housing:

• Intuthuko Junction – Project in progress.

New Supply:

• 162 King Dinizulu – Project complete.

Network replacement:

• Reservoir Hills Major – Project complete.

Network improvement:

• Turners Avenue – Project complete.

CENTRAL WESTERN REGION:

Informal Settlements:

• Ekukhanyeni (3 phases), electrical reticulation - Project complete.

Formal Housing:

• Kloof Ext. electrical reticulation – Project complete.

New Supply:

• Bulk Supply to Shongweni Mall – Project complete.

• Manchester Road – Project complete.

Network replacement:

• Marrianridge to Milkyway DSS, MV cable replacement – Project in progress.

Network improvement:

• Kwa-Nyuswa, circuit improvement – Project complete.

NORTHERN REGION:

Informal Settlements:

• Gumtree Road informal settlement, service connections – Project in progress.

• Chappas informal settlement, service connections – Project in progress.

• Mqhawe Housing, service connections – Project in progress.

New Supply:

• Brickworks – Food Lovers, electrical reticulation – Project complete.

• Salta development – Project in progress.

Network replacement:

• Old North Coast Road, MV cable replacement – Project Phase 1 complete.

Network improvement:

• Ntuzuma/Inanda, circuit improvement – Project in progress.

NORTHERN WESTERN REGION:

Informal Settlements:

• Redcliffe Area 2 informal settlement, electrical reticulation – Project complete.

• Unnamed Rd - Off Hazelmere Dr, Canelands, electrical reticulation – Project complete.

New Supply:

- Trade Zone 2 – La Mercy Airport – Project complete.
- 20 Hlawe – ERF 777 La Mercy – Project complete.
- 1 Garden Manor Crescent Phoenix – Project complete.
- 11 Drift Road Canelands, Verulam – Project complete.
- 240 Old Main Rd, Whetstone Business Park – Project complete.
- 237 Old Main Rd, Whetstone Business Park – Project complete.
- 61 Marshall Drive, Mount Edgecombe – Project complete.
- Lindokuhle Area vic. Pringle Dam – Project complete.

Network replacement:

- Ohlange DSS to Phoenix North Major Substation, cable replacement – Project in progress.
- Trenence Park DSS to Verulam Major Substation, cable replacement – Project in progress.

Network Improvement:

- Mira Way, Verulam – Project in progress.
- Russom Street, Verulam – Project complete.

SOUTH-WESTERN REGION:

Informal Settlements:

- CC Demat Informal Settlement reticulation – Project complete.
- 63 Grassmere Dr, Intake Rd, electrification - Project complete.
- Mawelewele, Welbedacht West, electrification - Project complete.
- Mfeka Place, Lamontville electrification - Project complete.

New Supply:

- 316 Chamberlain, Jacobs, MV/LV UGM construction - Project complete.
- 43 Valerie Road, Memorial Park, UGM construction & MSS - Project complete.
- 90 Bangay Road, Montclair, UGM construction & SS - Project in progress.
- 5 Beach Road, Bluff, MV/LV UGM construction - Project complete.
- 666 Main Road, Queensburgh, MV/LV UGM construction - Project complete.

Network Improvement:

- 26 Phillip Frame Street, Jacobs, DSS Commissioning - Project complete.
- Golden Poppy Crescent, Shallcross, LV UGM construction - Project complete.
- 46 Progress Ave, Chatsworth, LV UGM construction - Project complete.

Network replacement:

- Madundube, roadworks replacement - Project complete.

SOUTHERN REGION:

Informal Settlements:

- Ekuthuleni Transit Camp, Umlazi T, Reticulation and house services complete.
- Uganda Informal Phase 4, Umlazi T, Reticulation and house services is complete.

Formal Housing:

- Kanku Road Housing Project, Isipingo HillsReticulation and house services Complete.
- Nyala Avenue, Umlazi J Reticulation and house services in progress.

New Supply:

- 175 Kingsway Road, Warner Beach, new supply is in progress.

Network replacement:

- 211 Street 1713, Umlazi T Underground cable replacement is in progress.
- 95 Refinery Drive, Prospecton, Switchgear replacement is complete.
- 25 Refinery Drive, Prospecton, Switchgear replacement is complete.
- 1B Baltex Road, Prospecton, Switchgear replacement is in progress.
- Network improvement:
- P212 and Sbu Magwanyane, Madundube, Network Improvement is in progress.
- Sbu Mkhize Drive/P212, eNkanyisweni Shozi, Network Improvement is in progress.

MAINTENANCE PLANNING & WORKS BRANCH

The Maintenance Planning and Works Branch is responsible for inspection, maintenance planning and maintenance implementation on all medium and low voltage apparatus as well as the repair of associated faults on the electrical distribution network within the municipal supply area. The Branch comprises of six regional Maintenance Works Depots and a Maintenance Planning Division based at the Electricity Headquarters. The Branch consists of a Senior Manager, Managers, Specialist Engineer, Engineers, Technicians, Electricians, and the various levels of administration as well as assistant staff.
The maintenance of eThekwini Electricity's distribution network is vital in ensuring the integrity and reliability of supply to the City's large customer base. This division prides high standards and strives to comply with various national standards and the Power Quality Charter to meet the requirements of customers.
With the ever-growing and ever-aging Electricity Unit's distribution network, the Maintenance Planning Division is constantly seeking strategies to better manage and maintain all the assets installed on the distribution network to ensure reliable electricity supply for all customers of eThekwini Electricity.

HIGHLIGHTS

- Percentage schedule attainment achieved is 71%.
- Some maintenance depots managed to reduce the out of commission equipment to the acceptable number.
- Central depot managed to commission Ridgeview Major to 2 Kalanden DSS cable that was stolen few years ago during Harry Gwala Highway expansion.
- Central depot managed to commission Ridgeview Major to Jack Marten DSS cable that was also stolen few years ago.
- The branch increased the number of multi-competent artisans from 35 to 43.
- The branch had a NOSA star rating of 5 at the end of the financial year 2023/24.
- It further managed to open three out of six standby facilities after they were initially closed thereby allowing faster restoration times for outages.

LOWLIGHTS

- The scourge of NDM vehicle hijackings hinders service delivery and causes trauma to staff.
- High rate of cable theft further depletes the limited OPEX budget.
- The shortage of material in stores contributed to the delay in restoring supply to customers.
- The shortage of vehicles (trucks) lead to the Artisans doubling up on existing vehicles thereby reduce productivity.
- The limited number of posts for technical staff such as Electricians lead to the number of contractor teams, by far, exceeds the number of electricians that are permanently employed by eThekwini Electricity.
- The lack of Controls in the Enterprise asset Management system (JDE) lead to some staff members requisitioning material without the proper authorisation.
- The reliance on Architectural Services lead to some capital projects not being completed as Architectural services could not carry them through.
- Poor productivity of staff due to lack of tools and equipment.
- Protest action following outages, this results in staff not being able to attend to faults during normal working hours and having to execute repairs on overtime or whenever community unrest has subsided.

CHALLENGES

- The reduction of both capital and operating expenditure had an impact on the branch's ability to carry out actions associated with service delivery.
- The unavailability of material in stores created frustration within the staff when they were called to restore supply to customers after electrical faults had occurred.
- Implementation of budget checking created over budget on stores requisition that led to depots not being able get material on time to conduct repairs.
- The continuous uncontrolled excavations within the metro result in constant outages due to increased number of cable damages being encountered.
- The scourge of vandalism in electrical networks that resulted in electrical supply interruptions. In some cases, the vagrants destroyed distribution substation (DSS) doors and made the DSS's their place of stay.
  This became a safety issue as they could break clearance to live electrical equipment and be electrocuted.
- Theft of electrical infrastructure has resulted in a higher number of customers affected by electrical supply outages and an increased operational cost to maintain supply to customers. The delay in the implementation of substation security contract has severely hampered the unit's efforts to curb the scourge of theft of electrical infrastructure.

RISKS AND OPPORTUNITIES

- The theft posed a high risk to the reliability of the electrical networks. Infrastructure security programs will provide an opportunity for the unit to implement a holistic and robust infrastructure security solution that will address all identified high-risk assets.
- Uncertainty of supply due to copper theft caused by high scrap value of the material which is a

world-wide phenomenon. The drive of the unit to move away from the use of high scrap value conducting material is reducing the effects of copper theft on the reliability of supply.

- Ratio of employees to the number of customers supplied poses a risk in the unit's ability to promptly respond to customer needs. The opportunity of implementing proposed organogram will allow for a more streamlined and customer centric approach to the delivery of supply to customers.
- The reliability on external contractors creates a scenario where the organisation does not act swiftly to increase its human capital.
- The ageing network infrastructure poses a risk on the reliability of the network and make it susceptible to frequent failures. Network strengthening projects presents an opportunity for the units to look at network demand and load growth patterns within its area of supply to demand to optimise its upgrade network initiatives.
- The amount of non-tactical maintenance by far outweighs the work done on tactical maintenance.

NEW TECHNOLOGIES/INNOVATIONS EMPLOYED WITHIN THE BRANCH

- The branch has employed circuit breaker analysers test equipment to be utilized to measure performance on MV breakers.

NEW PROJECTS AND PROGRESS ON EXISTING PROJECTS

- The MV/LV problematic cables replacement project has been proposed and it is awaiting approval.

LIGHTING PLANNING BRANCH

The planning, design, inspection, and maintenance planning of the public lighting infrastructure for the eThekwini Municipality is undertaken by the Lighting Planning Branch. This includes the planning and design of new lighting installations, upgrading of existing lighting infrastructure, maintenance and maintenance planning of existing installations, research and investigation into new lighting technologies and bulk lamp replacements.

THE LIGHTING PLANNING BRANCH HAS 3 DIVISIONS, WHICH ARE:

- **Lighting Planning & Design**
- **Lighting Research & Investigation**
- **Lighting Maintenance Planning**

Repairs and maintenance accounts for 80 percent of the operating budget and this is further broken down into planned lighting maintenance, bulk lamp replacement and pole painting. Currently, the municipality is responsible for keeping lights on in approximately 213 000 streetlight installations, 250 parks, 12 beaches, 17 subway lanes, 31 swimming pools and 93 stadia and sports fields.

The Branch has filled all vacancies within its structure and continues to work on building their skills and experience. The long-term goal of the branch is to implement modern, energy efficient and effective public lighting systems that are vandal proof as well as systems that could be easily monitored and controlled.

Lighting Planning & Design Division is primarily responsible for the planning and design of capital projects.

The Lighting Research and Investigation Division is responsible for all activities related to the Electricity Procurement Forum as well as the Bid Specification, Bid Evaluation and Bid Adjudication Committees. Contracts up to the value R200 000 000 were handled by this division, this past financial year.
The Maintenance Planning Division is responsible for the inspection and identification of hazards on the public lighting system. Major challenges are illegal connections and infrastructure theft. A summary of the division's activities are as follows:

- Continued inspections of street light poles, arms, fittings, and infrastructure to identify hazardous conditions.
- Preventative maintenance due to identified hazards, repairing, and redesigning in advance
- Poles testing for all poles along highways, freeways, and major routes.
- Identifying losses caused by cable theft.
- High mast inspections along the beaches, townships, and roads
- Inspections of sport fields, park, and footpaths.

NEW TECHNOLOGIES/INNOVATIONS

- The most significant change was the implementation of the LED technology strategy across the whole spectrum of the luminaire range. In other words, no older technology HID luminaires will be used. By implementing this strategy, the branch plans to reduce its carbon footprint. The branch achieved 58% LED retrofits for this financial year.
- Another factor for consideration is an integrated daylight switch which is more reliable than previous versions. The new proposal is that the daylight switch must have the same lifespan of the luminaire.

NEW PROJECTS & PROGRESS ON EXISTING PROJECTS

- Many of the projects undertaken by the branch involves liaison and interaction with other units within the municipality and external entities such as Roads Provision, Architectural Department, Parks, Leisure & Cemeteries, Roads and Stormwater, Catalytic Projects, Tongaat Hulett and a host of developers and external electrical consultants. The branch plans and designs conventional and special lighting projects for these entities and considers any specific requirements for each of them.
- Plans are also underway to replace many of the ageing high mast structures such as 18m, 40m and 45m in various areas such as Lamontville, Durban CBD, Mustering Fields, Kings Park Diving Pool, and Phoenix Industrial Park.
- **ETA IRPTN** (eThekwini Transport Authority, Integrated Rapid Public Transport Network) continues with building new roads and widening existing routes to accommodate Bus lanes. Lighting Division Planning play a vital role in advising the design consultant of lighting standards and new technologies, checking and approving lighting designs, have an oversight role during construction and accept hand-over on completion of project.
- The use of vandal-proof reinforced steel poles will also be more widely used due to large-scale theft of cables from poles and cutting-down of poles.

OTHER PROJECTS INCLUDE:

- Contract for anti-vandal pole covers for steel poles
- Modification of steel poles to include anti-vandal cover plate
- Smart Streetlighting and Solar Streetlighting test sites
- Solar Lighting for Highmasts
- Continual redesign of street lighting by removing 9m gum poles and replacing with 9m steel poles and concreting of underground cables where large scale theft and vandalism have occurred viz. Higginson H/way, MR577
- Procurement of vandal-proof steel and concrete pole cover plates
- M13/Essex Terrace, Sherwood
- Vusi Mzimela Road, Cato Manor
- Ablution floodlighting for informal settlements
- LED lighting on new IRPTN Bus Routes: MR 577 (Newlands East Drive to Marble Ray Drive), N2 to Inanda Road Sea Cow Lake, Teakfield Road to North Coast rd.
- Continued expansion of the LED street lighting rollout across all wattages to replace HID lamps.
- Redesign of the reinforced steel pole to incorporate additional security measures
- Redesign of the highmast pole to incorporate anti-vandal proof measures
- Dube Tradeport, Agrizone 2 – new lighting infrastructure
- Florida Road, Morningside – decorative lighting

LIGHTING WORKS BRANCH

The Lighting Works Branch is responsible for the construction and maintenance of streetlights for eThekwini Municipality's entire area of supply. Beyond responding to complaints from the public, the Lighting Works Branch is responsible for the maintenance repairs of inspections conducted by the branch's Lighting Planning inspectors.

HIGHLIGHTS & LOWLIGHTS

- Installation of high mast lights at intersections, highways, and stadiums.
- The branch was able to manage streetlight maintenance of the city with very limited resources.
- The escalating streetlights infrastructure theft across the city.
- The purchase of LED fittings with extended 10-year warranties.

CHALLENGES

- The unavailability of bucket trucks (vehicles) to conduct streetlights maintenance.
- Ongoing theft of streetlight infrastructure.
- Damage to streetlight poles because of vehicle accidents.

RISKS & OPPORTUNITIES

- Theft and damage to lighting infrastructure.

NEW TECHNOLOGIES/INNOVATIONS

- All current replacements are energy-saving LED luminaires.

NEW PROJECTS & PROGRESS ON EXISTING PROJECTS

- Replacement of incandescent fittings with LED fitting using grant funding

TECHNICAL SUPPORT DEPARTMENT

DEPARTMENT OVERVIEW

The Technical Support Department provides a diverse range of specialist services to the Electricity Unit. The department comprises of eight branches, namely, Communication Networks Branch, Electrical Workshops Branch, Infrastructure Asset Management Branch, Mechanical Workshops Branch, Network Drawing Office and Survey Branch, Protection and Test Branch, SHERQ & Training Branch and Technology Services Branch. Collectively, these branches ensure that all resources are effectively and efficiently utilised so that value is added to the internal and external customers of the Electricity Unit.

COMMUNICATION NETWORKS BRANCH

The Communication Networks Branch's mission is to provide reliable and resilient communication services for business applications which improve operational efficiency and risk management in the provision of electricity, public lighting, and other energy services.

HIGHLIGHTS

The branch continued work on the "Core Network Project." The scope of work for 2023-2024 financial year included creation of automated reports using a Network Management System to track the operational network performance against service policies. The evaluation on the need for "Long Haul" fibre optic transceivers in network switches was completed.

- The alarm monitoring system audit and installation for tele-protection inter-tripping schemes were completed for 12 substations.
- Two Chief Technicians submitted applications for ECSA registration as Professional Technologists.
- A Section 36 for contract EE.222, Supply & Delivery of SDH Equipment and Support of Existing SDH Multiplexer Network Management System was established. SDH network equipment was delivered in June 2024.
- A service level agreement (SLA) was signed between Communication Networks Branch and the HV

NETWORK CONTROL BRANCH FOR SCADA SERVICES.

- An SLA was signed between Communication Networks Branch and Protection and Test Branch for tele-protection services.
- 500 services were captured into the Communication Networks' SharePoint site.
- Minor amendment of EE.222 was approved to allow for the procurement of new network management system hardware and software.
- Improved cybersecurity between communication network management systems (LAN) and substations (WAN), by implementing a firewall between the LAN and WAN.

- 10 Pilot cable clearances were completed, and three cables were decommissioned.
- The rollout of Tetra radios and training to field staff commenced.
- Tetra Dispatch console, AVL and voice logger were installed in a MV Network Control Room, and a dispatch console was installed in the HV Network Control Room.
- Maintenance of Wi-Fi radios, point-to-point links and LoRa end nodes were 100 % completed.
- A cellular service was provided for MV SCADA at 5 Jack Martins distributor substation (DSS) while the fibre is being rerouted due to SANRAL construction.
- Six communication service reports were created and automated to be emailed quarterly to measure the performance of various services against the respective policies.
- Cybersecurity firmware updates were implemented to four Moxa PT7828 substation routers.
- CCTV communications infrastructure were installed and commissioned, enabling visibility to six Major Substations.
- Communications infrastructure have been commissioned at 12 new DSSs.
- A 100% data network maintenance was performed on core and backhaul switches – 223 In-station and 220 Out-station.
- The refurbishing of office space fostered a sense of team building and increased staff morale. Staff appreciated their work environment. This activity promoted other staff outside the branch to also care for their workspaces.
- The gathering of Communication Networks Branch staff during lunch to celebrate, before major holidays assisted in diversity, improved workplace harmony, mental health and created a culture of inclusion.

LOW LIGHTS

- There was an insufficient contracted services budget assigned to the Communication Networks Branch by the Expenditure Unit. This prevented fibre optic repair work from being undertaken which increased the backlog of "out of service" infrastructure.
- Three vehicles seconded from the Communication Networks branch were not returned or replaced.
- Delays in vehicle servicing or repairs continue to impact daily operations.
- 55 pilot links were tested and found to be faulty.
- Equipment within DSSs continue to be vandalised or stolen.
- OPGW communications infrastructure could not be repaired due to the lack of the HV line repair contract.
- UGM fibre cable faults could not be repaired due to the lack of a maintenance contract and funding.
- Delays were experienced due to budget for contracted services for FortiGate firewall configuration as part of the DSS SCADA communication replacement project.
- 20 streetlights remain without electricity for more than a year in Pinetown and New Germany and this is impacting negatively on the Wi-Fi mesh that is operated in the area.

CHALLENGES

- Support from SCM was lacking in aiding with various tenders.
- Introduction of finance orders without adequate prior training and support.
- Support from Administration in operating and maintaining facilities is still lacking.

- Access to ICT resources were lacking to support staff from efficiently functioning off site.
- Support from City Fleet was lacking to aid in reliable vehicle repairs or replacements.
- Severe lack of funding to support the fibre cable infrastructure repair backlog for both UGM and OPGW.
- Letter of Award for minor amendment to EE.222 received in end of July 2024. There was no funding for procurement in 2024-25. Item had to be added onto the HSI report for transfer of funds to allow procurement.
- Poor support from ESRI in resolving system level issues has delayed progress in the implementation of the Communication Networks GIS telecommunications model.
- Difficulty in securing funding for the core network upgrade project. The project has fallen "below the line" on the capital budget request as well as the adjustment budget for 2023/2024.

ELECTRICAL WORKSHOP BRANCH

This Branch was established to ensure that all equipment received from the manufacturers are tested prior to installation into the electricity network. The branch is also responsible for repairing equipment which has failed. In addition, the branch is also responsible for supplying other Departments with insulating oil which is utilised for transformers and switchgear. Over the years this branch has evolved to undertake specialised intrusive maintenance on MV switchgear and transformers.

ACTIVITIES

- Testing of new received equipment to make sure they meet specifications determined by Technology Services Branch prior to installation on site.
- Repairing damaged and leaking equipment, including transformers, auto-reclosers, switchgear and mini-substations both at the workshop and on site.
- Disposal of cables which are returned from site due to failure. These cables are cut into one metre lengths to prevent being utilised illegally back into the electricity Network. Goods for Disposal form is used to receive the cables from the Contractors for confirmation of job completion and payment.
- Disposal of switchgear and related equipment including transformers due to failure and irreparable conditions.
- Supply of regenerated oil to the MV/LV Operations and HV Operations Departments, which is utilised in electrical apparatus.

HIGHLIGHTS

- Oil Plant was maintained, thereby producing high quality oil for the business.
- Overhead crane was repaired, ensuring continuous workflow.
- Purchased a VLF (pressure tester) ensuring quality service.
- Started the process to establish the "Switchgear Centre of Excellence" ensuring quality service to the business.
- Installed cameras and lighting throughout the workshop to reduce risk of theft.
- Changed the process to cut cables in the Reclamation Division, using a nail gun instead of cutting, thereby reducing the resources required and time required to process scrap cables.

LOWLIGHTS

- Accumulation of huge amount of equipment in the workshop due to no disposal contract in place. Prices obtained via quotation process too low.
- Contracts for disposal of cable and scrap expired thereby causing accumulation of scrap metal and cable.

CHALLENGES

- The workshop buildings are old and require rehabilitation, with lack of funds posing a serious challenge.
- No contracts in place for disposal of equipment creating huge backlogs in the workshop.
  New projects & progress on existing projects
- Establishment of Switchgear Specialised Maintenance Division. Recruitment and training of staff in progress. Procedures based on OEM requirements to be compiled.
- Feasibility study on fire protection around oil storage tanks using conventional deluge system or non-flammable gas being considered.
- Fire protection for oil plant has been handed to Architecture Department to complete.

INFRASTRUCTURE ASSET MANAGEMENT BRANCH

The purpose of the Infrastructure Asset Management Branch is to manage the planning and implementation of the branch within the Electricity Unit through provision of leadership in respect of defining and aligning the management, financial and functional key performance areas that support the Unit's objectives as well as the City's strategic objectives.

HIGHLIGHTS

The Branch filled four Works Coordinator posts to assist the branch enhance the level of support it provides to several maintenance branches within the Electricity Unit. This enhanced level of support is expected to accelerate the Unit's maturity in work planning and control activities, which will have a direct impact on network performance. These appointed Works Coordinators were arranged a Maintenance Planning and Scheduling course given by an external service provider. The course was structured such that these Works Coordinators were able to understand the requirements of each of the steps in the Maintenance Work Management cycle, associated responsibilities, and the industry best practices.

The branch continued with the implementation of Lumada Asset Performance Management (APM) system in 2023-24. The Lumada APM User Training Guide document has been compiled to provide Electricity Unit's technical staff with information which can be used to self-learn APM and understand the basics of what data integrates with APM from Ellipse. The scope of first phase of implementation included power transformers and HV circuit breakers. There are currently 306 assets (power transformer and HV circuit breakers) that are currently monitored. This tool transforms real-time and historical asset data into strategic insights of the condition, performance, and risk of assets. This will be a key tool that will be utilised to prevent asset failures while optimising asset lifecycle costs and assisting in renewal or replacement decisions. APM allows business to move asset maintenance into condition based, predictive and reliability centred maintenance.

- The branch embarked on a work order backlog analysis specifically for the HV Substations Branch to reduce the amount of outstanding work orders. The number of backlog work orders have reduced from over 3 000 to just under a 700 work orders.

- The Service Delivery and Budget Implementation Plan (SDBIP) performance indicator 'Percentage of Planned Maintenance Performed' reported by the Branch on behalf of Electricity Unit reached 92% in 2023 24 financial year as opposed to the approved target of 60%. This performance indicator is reported on a quarterly basis for the financial year as percentage of cumulative planned preventative maintenance jobs and cumulative completed maintenance jobs.
  Lowlights
- The resignation and promotion of one of the Works Coordinator, resulted in a constraint level of support the branch provides to the MV/LV Operations Department maintenance depot.

KEY ACTIVITIES OR PROJECTS

Some of the initiatives that the branch will embark on during the 2024-25 financial year include, but not limited to:

- Review and finalise the asset management related strategic documentations. These are the Strategic As set Management Plan (SAMP), Asset Management Plan (AMP) and 10-year budget plan. The Unit's AMP is an input into the City's Integrated Asset Management Plan (IAMP), which forms part of the Service Delivery and Budget Implantation Plan (SDBIP).
- Review, finalisation and sign-off of the Unit's infrastructure related key business processes.
- Stabilisation of the Lumada APM and full integration with Ellipse and other relevant systems. The APM tool will be used to identify power transformers that need remedial work based on the asset health index (AHI), thereby deriving value out of the use of the tool.
- Provide support on the implementation of field service manager (FSM) module across the Electricity Unit.
- Drive the asset realignment project that aims at aligning the Unit's asset register with the requirements of both Generally Recognized Accounting Practices (GRAP 17) and Cities Infrastructure Delivery Management System (CIDMS). Part of the project scope will also aim to achieve alignment between the technical and financial asset registers. The Asset Realignment Rules for Determinations of an Asset document have been compiled with the aim to conduct a pilot with full iteration for the approach for HV Lines Branch; and
- Engagements with the Lighting Works Branch to implement work planning and control (WPC) meetings in that branch so that maintenance work can be planned and scheduled accordingly.

MECHANICAL WORKSHOP BRANCH

The Mechanical Workshop Branch provides a specialist mechanical support service to the Electricity Unit. These are the Works Programming Division, Fitting, Machining & Rigging Division and Welding Workshop Division. The Branch is involved in a wide range of repetitive fabrication, production, and maintenance. There are also diverse mechanical tasks that change daily as per customer's requirements, but in line with the branch being a mechanical support function to the electricity distribution network.

Routine activities include costing, planning, design, research and purchasing of materials and equipment for works orders received, manufacturing of galvanised equipment, repairs to fibreglass ladders, maintenance and fabrication of electrical equipment, installation of support structures, rigging services and safety inspections. The branch also is also responsible for the manufacturing and repair of electrical infrastructural equipment and component fabrication.

HIGHLIGHTS

- The compressor and load testing machine tender specifications were drafted and submitted to the BSC for approval.
- The Branch has installed a 2 500 mm × 1 500 mm noticeboard to display current and upcoming MMD projects, as well as progress and challenges for each project. This improves communication in the Branch and will be used as a tool to track progress on a weekly basis, as well as to increase productivity.
- The Branch completed and delivered all urgent projects to main stores on time and on budget.

LOWLIGHTS

- The resignation and retirement of two of the Branches key resources, namely the Technician and the Artisan Plater/Welder, resulted in a significant decline in the level of support the Branch provides to the Electricity Unit.
- No building maintenance is being done, which poses safety hazards and has caused staff morale to be at its lowest.
- Works orders that are given to the Branch have no funds allocated to them, which causes delays in the services provided.

CHALLENGES

- Insufficient capital budget allocation for purchasing machinery in the Branch.
- The workshop buildings are old and require rehabilitation and Administration turnaround times for repair and maintenance of building defects in the Branch.
- The Branch has experienced excessive delays at City Fleet, which resulted in a shortage of vehicles to respond to customer's requests on time.
- Finance process challenges, due to changes that have been made without training clerical staff on how to issue finance orders, create GRN and receipt the invoices.

FUTURE PLANS

- Procurement and installation of a testing facility for all fabricated brackets to continuously ensure reliability of manufactured galvanised equipment.
- Upgrade the compressed air system to ensure adequate pressure at the farthest outlet.
- Acquire new rigging equipment to perform specialised functions within the Unit.
- Develop and implement a safe operating procedure for streetlight pole covers.

NETWORK DRAWING OFFICE & SURVEY BRANCH

This is a support Branch to the Electricity Unit which comprises of six Divisions, namely Administration, Geographic Information Systems (GIS), Network Records, Special Projects, Survey Services and Utility Plans. The focus of the branch is to maintain an accurate geo-spatial representation of all underground and overhead electrical assets in a connected network, provide an efficient GIS, support other enterprise systems and first line GIS user support to all GIS users and provide a survey service.

The Administration Division provides an administrative service to the five internal Divisions. A printing and scanning service to the Electricity Unit as well as external service providers that are contracted to the Unit. The Division also scans all as-built documents to an image repository.

The GIS Division maintains and supports the GIS desktop and web applications, database, back-end technologies, hosting hardware and software licensing. The division is also responsible for researching, developing, and implementing new GIS solutions, tools and processes related to the use of the GIS and the electrically connected network by the Unit to efficiently plan, maintain, and manage the electrical reticulation infrastructure.

The Network Records Division is responsible for updating and maintaining an accurate geo-spatial representation of the underground and overhead electrical network in the GIS to provide information for operations and technical systems. The division also provides Draughtspersons at the Unit's Construction and Maintenance Depots to assist the technical staff with reticulation information in the GIS.

The Special Projects Division uses CAD technology to update and maintain the Low Voltage Circuit Diagram database and make these diagrams available on the Unit's scanned document repository. This division produces design and documentation for the Unit and updates drawings in the codes of practice for the Technology Services Branch.

The Survey Division provides survey services to internal and external customers by; confirming survey information and servitude boundaries to avoid encroachments, surveying overhead lines, underground cables and equipment location for the Unit, locating cable and pole encroachments for insurance claims as well as tracing cables for accurate cable location. The division also surveys and creates layout plans for the electrification of informal settlement projects.

The Utility Plans Division attends to all wayleaves, provides electrical network information to internal and external customers and responds to all written correspondence received by the branch.

HIGHLIGHTS & LOWLIGHTS

- Four staff are currently studying towards a Bachelor of Commerce Degree in IT Management.
- Two staff are currently studying Bachelor of Arts degree in Environmental Management.
- One staff member is currently studying towards the Esri GIS Diploma.

- One staff member has completed a Degree in Public Administration.
- The Branch achieved a three-star NOSA rating.
- The Branch attended twenty EMA arranged courses and five Manager arranged technical courses that were planned on the Workplace Skills Plan.
- Twenty new Standard Operating Procedures (SOPs) were added to the existing SOPs in the Branch.
- Two new vehicles were assigned to the Branch, and this has made it easier to provide an efficient support service to the Electricity Unit.

CHALLENGES

- Inability to fill vacant GIS Analyst posts has created a backlog with the capture of the as-builts of the network reticulation.
- Inability to upgrade existing and to acquire additional computer desktop hardware has strained the resources in the Branch.
- Delays and unavailability of information (as-built drawings and master data change documents) to update the electrical network reticulation database.
- Poor maintenance of buildings and offices, particularly the lifts at the HQ building, have created enormous challenges for staff with disabilities to access the building.
- The Unit's scan database has been updated by the ICT Branch, but there is a significant backlog of Distribution Applications and as-built sketches that needs to be scanned and uploaded.
- The data migration for the electric and communications models has created the need to implement data improvement plans to enhance the quality of the data in both models. The backlog capture of data into the communications data model is still a work in progress.

NEW TECHNOLOGIES

- A new application to assist the Business Risk Branch to spatially capture and analyse theft incidents and patterns, was developed.
- A new application to spatially identify maintenance routes for the inspection of MV equipment was developed. The data in this application will need to be reviewed before it is published on the Staff GIS Viewer.
- The Survey Division has completed the compilation of the specification for the procurement for a Scanning Total Station for the Division. There was no funding in the current financial year to procure this equipment.

NEW PROJECTS

- The Survey Division has contributed to the development of a new electronic application module for all new survey requests. The implementation has temporarily been put on hold due to the upgrade of Ellipse, being prioritised.
- Consultation with the Infrastructure Asset Management Branch has commenced to implement work planning and control in the Survey Division.
- Significant progress was made to upgrade GIS software from ArcMAP to ArcGIS Pro, which is necessary to leverage the many enhancements in GIS technology.

PROGRESS ON EXISTING PROJECTS

- Four informal settlements were surveyed, to assist the MV/LV Network Panning Branch to create new designs for these informal settlements.
- The implementation of the Designer Module for MV/LV Planning Branch is a work in progress for the Electric Model. Some gaps to the existing CAD technology have been identified and will be addressed going forward.
- The Branch is exploring the creation of a proposed layer to expose planned designs to the Unit.

PROTECTION & TEST BRANCH

The Protection and Test Branch compromises of five technical divisions, namely, DC Systems, Protection Engineering, Protection Maintenance, Protection Test and Protection Construction. These divisions are collectively responsible for the forward planning, analysing, designing, updating, setting, configuring, testing, commissioning, auditing, maintaining, and repairing of all protection and DC systems in the Electricity Unit's network. The optimal operation of the protection and DC systems is vital as it is these systems that will ensure the rapid and selective isolation of the electrical supply under fault conditions thereby reducing risk to the plant, people, and the environment. The Branch is also responsible for the investigation of protection and DC system related mal operations. In addition, the branch provides other crucial services like cable fault location as well as various equipment testing, commissioning, and repair services to the Electricity Unit.

HIGHLIGHTS

- Multi-disciplinary engagements with Toyota to discuss reliability of supply to the Southern surrounding area.
- Implementation of a busbar protection scheme to secure supply to the Pineside area.
- Procurement of strategic spares and protection relays.
- Upgrade of the protection on the 33 kV supply to Underwood Road Substation from pilot to fibre.
- Approval of protection schemes and evaluation of grid impact studies with respect to protection on many SSEGs that facilitate faster approval of customer applications by the Electricity Unit.
- Publishing a paper to the Global Forum of the Protection, Automation and Control community on the challenges faced by the Protection and Test Branch on the implementation of IEC 61850.
- Protection and Test staff representing the Electricity Unit on the CIGRE Executive Board and Southern Africa CIGRE Conference in the organising committee.
- The old DC systems in 21 distributor substations were successfully replaced.
- The MV protection mal operations were completed within the average of 4,26 working days.
- The MV protection settings calculations were completed in the average of 6 days.
- The DIFR for 2023-24 was zero and the NOSA star rating was 5.
- The Chief Engineer: Protection Engineering was invited by Schneider to represent Africa customers in the process of design and development of protection relays.

LOWLIGHTS

- Loosing key staff members with years of experience to retirement.
- Perpetual IED failures where manufacturers do not support replacements.
- The branch's inability to procure current injection test sets due to non-compliant bids.
- Failure of the Prospecton 11 kV switchboard due to loss of DC to the protection relays.
- Strike action in March 2024 that impacted work of staff.
- Failure to secure a contract to procure DC systems for HV substations.
- Delay to secure the contract to procure cable fault location machines to replace the old machines that frequently fail.
- Delay in replacing the old and unreliable Test Officer vehicles.
- Hijacking of two NDM vehicles with recovery.

CHALLENGES

- The SCM process remains the biggest challenge. The decision to change contract number system where the E-number system was replaced by system derived numbers, led to the delay in acquiring contract to procure protection testing machines.
- The constant budget cut by Finance department was and is still a challenge in the procurement of contracts.
- The lack of internal expertise on implementation of IEC 61850 led to reliance on external contractors. Hence, the projects get delayed as external contractors also have limited resources.
- The delay in the replacement of old 11 kV boards that still have the frame leakage protection poses a threat to the reliability of protection system. The plan was to replace the boards through the HV Projects Branch. However, the absence of contracts and the delays in the SCM processes reduced the rate of board replacement.
- The restoration of full protection schemes at Edwin Swales Substation remains a challenge as the causes of flooding are still not attended to.
- The continuous vandalization of distributor substations (DSSs). The DSSs get replaced by switch pillars and that process has a negative effect on protection grading and co-ordination.
- The commissioning of new DSSs without cable/line differential protection is still a challenge. The primary plant protection gets to be protected by the back-up protection. In some of the existing DSSs, the unit protection is still decommissioned owing to the absence communication networks between the substations.
- The number of faults in the MV cable networks that provide auxiliary supply to HV substations equipment including the battery chargers, caused the DC voltage in substations to drop below minimum DC voltage levels required by substation equipment. There are cases where the HV Network Control Room was forced to switch off the entire substation to protect the substation plant and equipment from being de stroyed by long lasting high magnitude fault currents where protection could not work due to the absence of DC voltage.
- The high volume of MV and LV cable faults is still a challenge to the stability of the electrical networks. It also causes the Test Officers to spend more time on cable fault location at the detriment of other duties that they need to perform.

NEW TECHNOLOGIES

- There was no new technology that was introduced in the last financial year.

NEW PROJECTS & PROGRESS ON EXISTING PROJECTS

- The project to reinstate the transformer and busbar blocking scheme at Pineside Substation was completed.
- The successful replacement of DC systems in 21 DSSs.
- The F and G cards in F650 GE protection relays at Tongaat Substation, LaMercy Substation, Ottawa Substation and Addington Substation were replaced.

SHERQ & TRAINING BRANCH

The SHERQ and Training Branch is responsible for the planning, implementation, and monitoring of systems to ensure compliance with various legislation throughout the Electricity Unit. This includes conducting risk assessments, undertaking safety and environmental inspections and audits, providing technical and safety related training as well as competency accreditation to all persons engaged in construction and maintenance works, conducting investigations into machinery-related incidents, and introducing effective measures to prevent recurrences. The branch is also responsible for various technical skills development programs and special projects that are related to development of Artisans, Technicians and Engineers such as Apprenticeship, Learner/Candidate Technician and Candidate Engineer training programs. The Technical Training Division of the branch is fully accredited by Quality Council for Trades and Occupations (QCTO) under the Department of Higher Education and Training as a Skills Development Provider for aspiring electricians as well as an official Electrical Trade Test Centre.

As part of the skills outreach program, the branch is highly involved in various career symposiums promoting Electrical Engineering to school learners and tertiary students as a career choice. The branch offers bursary schemes to qualifying students with good academic results who are pursuing Electrical/Electronic/Computer Engineering studies at the university level.

CHALLENGES

- Budget constraints in the Municipality had a negative impact on budget that is required to upgrade the existing technical training facilities to comply with the new curriculum for the Electrician trade qualification as required by the Department of Higher Education and Training.

HIGHLIGHTS & LOWLIGHTS

- Vigorous health and safety compliance inspections and random safety audits conducted by safety personnel had a positive impact on reducing the high rate of health and safety incidents.
- Funds were made available to address some of the critical maintenance issues at the Training Centre which were positive for boosting staff morale and providing service delivery.
- Successful implementation of the online booking system of training facilities.
- Successful recruitment of learner technicians into a 3-year training programme for Learner/Candidate Technicians.

- Failure to comply with the new QCTO Electrician trade test requirements due to budget constraints.

FUTURE PLANS

- Establishing the PV Green Card Training and Testing Centre which will be responsible for training and assessments of PV Installers that are accredited by the South African Photovoltaic Industry Association (SAPVIA).
- Expansion of the technical training facilities and organogram of the branch to cater for future programs and training needs.

TECHNOLOGY SERVICES BRANCH

This Branch consists of three different divisions, namely, the Engineering Division, Quality and Investigation Division as well as the library. These divisions collectively ensure that the electrical products procured are fit for purpose by compiling the correct technical specifications, ensuring quality control at stores, and investigating equipment failures.

One of the functions of the branch is conducting research into cost effective ways of distributing electricity. This function can be divided into two namely, the cost of goods purchased, and the costs associated with the installation, operation, maintenance, and disposal of the said goods. Over and above the issues relating to construction and maintenance, safety of staff and public is high on the agenda both during the selection of a particular type of good and during its application. The branch's primary goals include the adjudication of all tenders for technical equipment, material and services supplied to the Unit as well as the creation and maintenance of all technical codes of practice and instructions used by Electricity Unit's staff and contractors.

The branch continued with its active participation in NRS Workgroups and SANS Workgroups in conjunction with other municipalities, Eskom, mines, and major suppliers. This participation intended to promote uniform requirements for equipment and design methods used in distribution systems.

HIGHLIGHTS

- The Branch successfully advertised and awarded most contracts, despite encountering several non-technical challenges in the SCM tender process and operating with an incomplete technical staff complement.
- The Branch established guidelines for the preparation and evaluation of tenders to assist newcomers to the Branch and standardise the methodologies employed. If approved, this document is anticipated to become the standard across the Electricity Unit.
- The Branch revised and refined tender document clauses related to the conditions of tender and conditions of contract to streamline the tender evaluation process and ensure effective contract management after the tender award. Special focus was given to the tender evaluation procedure, contract price adjustments and contract start and end dates.

LOWLIGHTS

- The process of awarding tenders continues to be painstakingly long. The Branch is currently commencing the contract renewal process at least 14 months prior to expiry of the existing contract. In some instances, this length of time is still proving to be insufficient.
- The ongoing construction activities in the building created poor workplace conditions, resulting in a decline in face-to-face interaction. Additionally, limited network connectivity further hindered virtual communication.
- The Branch was unable to advertise and fill vacancies due to financial constraints imposed on the Unit.

CHALLENGES

- The deferrals at bid committees, due to non-technical reasons that were beyond the scope of the Branch, remained a major challenge. These delays will and have resulted in some contracts not being awarded timeously.
- The navigation around the tender process remains challenge. Apart from the delays experienced in the various stages of the process, the failure of many recommended bidders to extend their bid price validity because of the time lapse from the date of tender closing, led to even further delays in finalising the award of contracts. These delays have resulted in some contracts not being awarded timeously or being declared as a non-award.
- The resulting non-awards of tenders detailed above affected the supply of certain stock items. The Branch therefore had to undertake additional evaluations to find alternative products and materials to replace the said items to ensure adequate stock items were available to maintain the electrical supply to consumers.
- The lack of feedback regarding tender status after approval by the Bid Adjudication Committee presents another challenge. The Branch often discovered that a tender was awarded from the bidders before official communication was received.

RISKS & OPPORTUNITIES

- The Electricity Unit continues to face the risk of copper cable theft. A previous attempt to introduce a theft deterrent solution for the aerial concentric cable resulted in a non-awarded contract. However, the opportunity still exists with the ongoing revision of the national rationalized specification (NRS) on which the Unit's specification is based. The latest revision will allow for the inclusion of a broader range of theft-deterrent cables, creating an opportunity to re-advertise a contract for theft-deterrent aerial concentric cables as well as theft-deterrent streetlighting cables.

NEW PROJECTS & PROGRESS ON THE PROJECTS

- The constant increase in electricity theft from miniature substations (MSSs) has caused a significant number of MSSs to fail prematurely. While several low-voltage solutions have been researched and im plemented, they have yielded limited success, as perpetrators quickly learn to circumvent these deterrents. In response, the Branch partnered with the relevant OEMs to investigate alternative solutions

that could be employed on the MV side of the MSS. A comprehensive technical specification for the MV solution was developed and all the new MSSs procured on the recently awarded MSS contract have the mentioned MV solution implemented.

- The extensive research conducted into alternative conductor materials for use in house service cables to deter theft, resulted in the development of a technical specification for a specialised cable featuring copper clad aluminium alloy conductors. A tender for the procurement of this specialised cable was issued. Unfortunately, the contract was not awarded, as the proposed technology was still in its early stages and no compliant bids were received. The Branch remains committed to actively researching alternative technologies and theft deterrent methods.
- The research into specialised doors that can be utilised at the Unit's distributor substations is being finalised. The proposed door design aims to reduce the migration of salt laden air and vermin into the substation which has proved detrimental to the plant and equipment within the substation as well as also prevent unauthorised access and the subsequent theft of electrical infrastructure. The results and recommendations from the research will be presented to the business shortly. Following this presentation, a technical specification for the relevant doors will be finalised.
- The adoption of heat shrink technology for LV cable joints is being explored by the Branch. This technology offers several advantages, including lower material costs, reduced storage space requirements, an extended shelf life, and a wider range of applications.

CUSTOMER & RETAIL SERVICES DEPARTMENT

Department Overview

The Customer and Retail and Services Department provides a customer contact and retail services function for the Electricity Unit. The Department consists of more than 5 branches that collectively perform a diverse range of important functions.

PRICING & MARKETING BRANCH

MARKETING BRANCH

The Marketing Branch manages the image of the Electricity Unit for the City by ensuring effective communication with residents and that Electricity Unit's media and public relations matters are attended to. It balances electricity sustainability with safety and awareness and engages with the community on key issues such as electricity theft and service delivery.

KEY OBJECTIVES

- Public Engagement: Raise awareness on electricity services, safety, and tariffs.
- Community Liaison: Foster communication between the Unit and its customers.
- Electrification: Coordinating the electrification of informal settlements.

COMMUNITY ENGAGEMENT

- Conducted school visits, career fairs, and community workshops on electricity safety, careers, and awareness (For example, DUT and UKZN Careers Fairs).
- Created educational materials on electricity theft and safety, distributed widely.
- Created social media content like electricity-related videos and social media cards and increased the Unit's social media outreach, reaching over 600,000 residents on Facebook alone.

PUBLIC RELATIONS

- Engaged in Sizakala Roadshows, Ratepayer Association meetings, and ward committee workshops.
- Produced digital media content for City publications and external media publication/ distribution, in partnership with the City's Communications Unit.

CHALLENGES

- Staffing: Marketing experienced four key staff members leaving, three being supervisors of the respective regions.
- Limited Resources: Struggled to attend all community meetings due to staff shortages and fleet limitations.

REVENUE PROTECTION BRANCH

The Revenue Protection Branch encompasses all utility activities that ensure minimization of losses from both a revenue and a cost perspective. This is achieved through efficient disconnections of illegal connections and customers whose accounts are in arrears, thus enforcing credit control measures and ensuring that revenue is collected timeously.

Highlights

- Routine Inspections: Routine inspections were conducted across Business and General customers, prepaid meters, and Residential Credit customers. These inspections ensure that meters are functioning correctly, minimizing potential losses from faulty or tampered metering.
- Token Identifier (TID) Project: The Token Identifier (TID) Project has been a significant achievement, with over 260,000 active meters successfully installed, ahead of the November 2024 deadline. This has bolstered the monitoring capabilities and efficiency of the electricity network.
- Rate Clearance Applications (RCA) Inspections: The branch has conducted thorough inspections on metering devices for Rate Clearance Applications (RCA), ensuring that any outstanding revenue is collected before property transfers. An increase in the number of RCAs has positively impacted revenue collection.
- Growth of Change-Over Applications: There has been a notable increase in Change-Over Applications (C/O), as more customers transition from credit meters to prepaid meters. This shift helps customers better manage their consumption and reduces revenue losses.
- Forensic Investigation Contract: A key milestone was the awarding of the Forensic Investigation Contract towards the end of the year. This initiative has led to a positive impact on revenue collection by enabling t

he identification and prosecution of individuals involved in illegal connections and meter tampering.

- Prepaid Sales Drop: A sudden drop in prepaid meter sales was noted, attributed to faulty meters. The branch is working towards replacing these meters to address the decline in sales and recover lost revenue.

CHALLENGES

- Rising Electricity Losses: Historically, electricity losses have averaged below 8%. However, in the 2023/2024 period, these losses have risen significantly, now averaging between 10% and 13%. Several factors contribute to this increase, including:
- Availability of Meters: A shortage of meters has hindered efforts to replace faulty or tampered meters promptly, contributing to revenue loss.
- Mushrooming Informal Settlements: The growth of informal settlements has led to an increase in illegal connections, further straining the distribution network.
- Change-Over Applications: The growing number of 80/20 change-over applications places additional pressure on resources to complete installations.
- System Integration Delays: Integration issues between systems have caused delays in processing data and raising charges for meter faults or tampering.
- Staffing Gaps: Unfilled positions within the Revenue Protection branch are impacting the efficiency of operations and turnaround times.
- Solar Installations: An increasing number of customers are installing solar panels without following the correct application process. This causes reverse flow into the grid, leading to issues with conventional meters, which can negatively impact revenue.
- T-Joint Connections: T-Jointed connections remain a challenge, as these types of reticulations hinder the effective disconnection of non-paying customers and facilitate illegal connections.

SUGGESTED SOLUTIONS

To address the challenges faced by the Revenue Protection branch, the following solutions are proposed:

- Filling Vacant Positions: As workload increases, it is critical to fill vacant positions to prevent current staff from being overworked. Prompt recruitment will ensure that the department can maintain efficiency.
- Continuous Meter Supply: Ensuring a consistent flow of meters is essential to address the issue of faulty or bypassed meters. Timely availability of meters will help prevent revenue loss due to meter issues.
- Annual Review of Service Level Agreements: The service level agreement (SLA) between Revenue] Protection and Revenue Management must be reviewed annually to ensure that both branches meet their objectives efficiently and effectively.
- Public Awareness of Solar Installations: A clear process for solar panel installations must be communicated to the public. This includes a requirement for the replacement of conventional meters upon application to prevent reverse electricity flow.
- T-Joint Connection Remediation: The removal of T-jointed connections in problem areas should be prioritized. Collaboration with other departments will help facilitate the transition to more reliable and secure connections.

RISKS

Several risks impact the effectiveness of Revenue Protection efforts:

- Load Shedding and Solar Installations: Despite a temporary break in load shedding, there remains a risk of businesses and residents continuing to move to solar installations, which often bypass the correct application processes. Incorrect installations can cause reverse flows into the electricity network, impacting revenue collection.
- Informal Settlements and Illegal Connections: The rise in informal settlements has led to more illegal connections, which overload the electricity network. This not only increases maintenance costs but also poses a risk to the integrity of the grid, affecting legal customers.
- Meter Availability and Prescription Risk: The lack of availability of meters poses a risk of revenue loss through prescription. If faulty meters are not replaced within three years, the municipality can only recover revenue from the last three years, leading to substantial losses.

OPPORTUNITIES

- Training and Competency Development: The Revenue Protection branch has launched a comprehensive training program for electricians, certifying them in Revenue Protection work. This competency development will improve the department's ability to secure contracts and ensure a steady flow of qualified resources.
- Staff Development: The shortage of staff has provided opportunities for existing employees to gain valuable experience in vacant positions. This experience will enable staff to apply for higher positions once they are advertised.
- Enhanced Tampering Detection: Field investigations have led to better awareness and detection of increasingly sophisticated tampering methods. This has enabled staff to become more observant and effective in identifying and addressing tampered meters.

FUTURE DEVELOPMENTS

- Completion of TID Roll-Over: The Revenue Protection branch, in collaboration with other stakeholders, will continue the implementation of the Token Identifier (TID) Roll-Over until the completion of the project. This will further enhance metering accuracy and revenue protection.
- Metering & Technology Upgrades: Future plans include the continued rollout of smart meters, which will help prevent reverse flow from solar installations and ensure that all customers are billed accurately. The integration of advanced metering systems will be a cornerstone of the branch's efforts to improve revenue protection.

METER ENGINEERING BRANCH

The core responsibility of the Meter Engineering Branch is to ensure all metering equipment used for billing purposes are appropriately specified, tested, installed, and maintained. To ensure these objectives are executed efficiently, the branch is sub divided into specialized divisions. These sections are Advanced Metering & Projects, Metering Workshop, Whole Current Metering (Construction and Maintenance) and the Bulk Metering division.

HIGHLIGHTS

Staff underwent comprehensive training and re-skilling on updated processes and procedures.
Significant progress has been made in aligning the branch's business processes with ISO 9001 standards, demonstrating our ongoing commitment to quality management and operational standardization.

LOWLIGHTS

Delays in the procurement of metering equipment have disrupted operations, negatively impacting both routine activities and technical functions.
A reduction in funding has led to project delays, affecting the branch's long-term planning and hindering the execution of critical initiatives.
Several key positions remain vacant, resulting in increased workload and pressure on existing staff, which has adversely impacted operational efficiency.

CHALLENGES

The failure of testing equipment, combined with financial constraints, contributed to a growing backlog. Testing labs were unable to process stakeholder requests, leading to extended turnaround times for meter tests. Financial limitations have been the most significant challenge, restricting the branch's ability to operate effectively and achieve its objectives.
A shortage of meters has created operational difficulties, impeding the branch's ability to meet increasing demand and perform essential tasks.

RISKS & OPPORTUNITIES

The closure of businesses due to financial challenges has resulted in numerous terminations of metering connections.
The lingering effects of the pandemic, riots, and floods continue to impact the branch's strategic goals and overall performance.
Rising electricity costs have driven customers to explore alternative energy sources, such as solar power. This shift could reduce the demand for municipal electricity, potentially affecting the branch's long-term business model.

CUSTOMER SERVICE BRANCH

This Customer Services Branch is responsible for the processing of all applications for supply, registration of customers for billing purposes, meter reading services, auditing of meter readings, resolving meter reading account queries/disputes, technical advisory service, and the cashiering facilities. There are six Customer Service Centres around the eThekwini Municipality area of supply. There has been a lot of emphasis placed on service delivery, to which the branch has allocated a lot of resources to address service delivery concerns.

CHALLENGES

- The branch struggled to recruit sufficiently experienced staff to meet its goals.
- Lack of funds challenged the continuation of projects such as the construction of a new Customer Service Centre.

HIGHLIGHTS

- The launch of the new DA online system proved that eThekwini Electricity is leading the pack as the first metro in the country to use it.
- The branch created the meter reading portal that is set to assist customers submit their meter readings from the comfort of their own homes.
- The new Queuing Management System and Customer Survey System are both in procurement stages.
- The branch has also digitized its customer service offering1 which will enhance customers communication with the department electronically.
- The branch's efforts to secure its Centres' ISO 9001 status is at an advanced stage.

LOWLIGHTS

- Delays in finalizing lease agreements.
- Financial constraints which results in key positions not being filled.

CONTACT CENTRE BRANCH

The Electricity Contact Centre plays a vital role in handling reports of electricity faults and outages from eThekwini Electricity consumers, available 24/7 throughout the year. The trained operators at the centre are well-equipped to assist with logging faults, addressing load shedding concerns, helping with prepaid meters, reporting streetlight issues, and managing cases of theft or damaged equipment, along with other administrative inquiries that enhance eThekwini Electricity's service delivery.

The Contact Centre has a combination of technology, systems, and processes that work together seamlessly to ensure efficient operations, enhance customer satisfaction, and drive business success.

The significant increase in calls and the improvement in key performance metrics at the Contact Centre during the last financial year are positive indicators of both the growing demand for customer support and the success of initiatives aimed at improving service quality and operational efficiency. This growth highlights the commitment to continuous improvement in customer service and the Contact Centre's ability to scale effectively to meet increasing demands.

Key Metrics Overview:

- Total Calls Received: Over 1 million calls received in the last financial year (an increase of 270,000 calls compared to 2022/23).
- Call Answer Rate: Increased by 12% compared to 2022/23. This reflects an improvement in our Contact Centre's efficiency and capacity to handle calls.
- Call Abandoned Rate: Reduced by 18% compared to 2022/23. The 18% is a significant improvement, suggesting that fewer customers are hanging up before they get through to our call centre agents.

- More Self-Service References (+500,000): The increase in self-service transactions, with over half a million more reference numbers processed, indicates that the centre has made strides in promoting automation, self-service platforms, and digital tools.

HIGHLIGHTS

While keeping in line with the branch's continued effort to enhance service delivery, embracing digital technology to streamline fault reporting has been a great initiative. The introduction of multiple electronic fault reporting platforms ensured that our customers can quickly and easily report electrical issues while improving operational efficiency. These platforms automatically generate a reference number upon submission, and this number acts as a tracking mechanism throughout the fault resolution process. Once a fault is reported, it is immediately integrated into our fault reporting system and queued for assignment to a fault investigation team on a 24-hour basis. These channels also ensure that customers have flexibility and accessibility based on their preferences.

By using an AI-powered WhatsApp chatbot for customer support, the Contact Centre delivered efficient, 24/7 assistance to the customers, handling repetitive tasks, and reducing the burden on human agents. This enhances overall customer satisfaction while allowing support teams to focus on more complex and high-value interactions. In addition, the use of social media has been another invaluable tool for eThekwini Electricity to engage with consumers in real-time, provide critical updates, and handling customer queries. By using platforms like Facebook and Twitter to broadcast important information such as load shedding schedules, power outage alerts, and general queries, we created a more informed, engaged, and satisfied customer base.

LOWLIGHTS

While the Contact Centre's performance has improved significantly, there were some challenges that had a negative impact for both employees and customers.

Below are some negatives experienced in the last financial year:

- Burnout: Because we received higher call volumes, our call centre gents were typically required to handle a high volume of calls, often with a focus on speed and efficiency. This led lead to emotional exhaustion, fatigue, and burnout.
- Dealing with Angry or Upset Customers: Call Centre Agents are the first point of contact for customers experiencing frustration or anger. Constantly handling upset customers can take a mental toll, leading to stress, anxiety, or even depression.
- Technology and System Limitations: the increase in call volumes led to technical failures. System downtimes and technical issues disrupted service delivery and created delays in call handling, leading to customer dissatisfaction and additional stress for Call Centre Agents.

RISK & OPPORTUNITIES

RISKS

- Operating a contact centre comes with several inherent risks that can impact performance, customer satisfaction, and even the municipality's reputation. These risks range from operational inefficiencies to employee well-being challenges. Below are some of the key risks faced by the Contact Centre:

- Excessive Hold Times: the increase in call volumes leads to long waiting times for customers to speak to an agent which can lead to frustration and high call abandonment rates.
- Outdated or Inefficient Technology: some of the systems still being used in the Contact Centre are outdated. Using outdated technologies or legacy systems can severely limit a call centre agent's ability to handle customer inquiries efficiently leading to longer response times, inefficiencies, and a poor customer experience

OPPORTUNITIES

- Invest in Technology: Implement modern, secure systems that integrate with CRM tools, AI, and automation for more efficient call handling.
- Training and Support: Provide regular employee training on customer service skills and dealing with difficult situations to reduce burnout and service mistakes.
- Employee Well-Being Programs: Address burnout with stress management programs, flexible work options, and career development opportunities.
- Proactive Customer Communication: Be transparent with customers about any potential service disruptions, delays, or data issues to maintain trust and satisfaction.

THE BRANCH'S CONTACT DETAILS ARE AS FOLLOWS:

- **Toll-free: 080 311 1111**
- **WhatsApp: 076 791 2449**
- **Email: electricity.faults@durban.gov.za**
- **Website: https://webfaults.durban.gov.za/WebsiteFaultsEllipseProd/Outages**
- **The City's Mobile App**
- **Social media: @eThekwiniM (Twitter & Facebook)**

HUMAN CAPITAL DEPARTMENT

The Human Capital Branch is a business partner to the Electricity Unit. The branch is divided into three key functions which are Human Capital Services, Payroll and Leave Administration and Recruitment and administration.

The strategic intention of the Human Capital Branch is to attract, acquire and onboard skilled labour at the right time, promote good relations between line management, trade unions and the workforce, timeous and accurately process payroll, employee training, development and talent retention.

The Human Capital Branch is partnering with Occupational Health to manage the process of undertaking pre-employment medicals and perioding medical assessments. As a caring employer it is important to ensure that wellness interventions and employee support is initiated at an early stage of diagnosis. Employee wellness is one of the contributors to an engaged and productive workforce.

During the 2023/2024 financial year, Human Capital partnered with line management and filled eighty-eight (88) vacant posts, out of one hundred and fifteen posts advertised (115). Posts filled comprised of scarce skills posts which immensely contributed to the service delivery mandate of the Electricity Unit.

Out of 88 recruits, thirty-two (32) were black females which demonstrates the efforts and importance of supporting the City's transformation agenda.

Fig.1

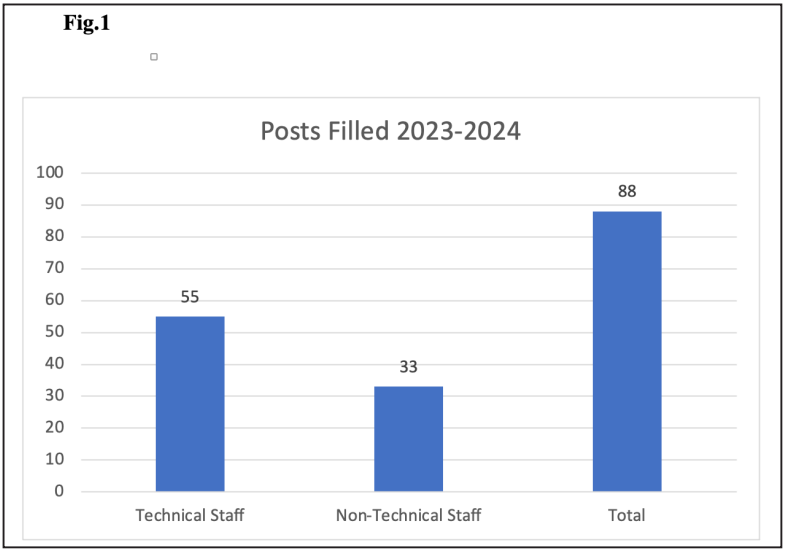


Fig. 2

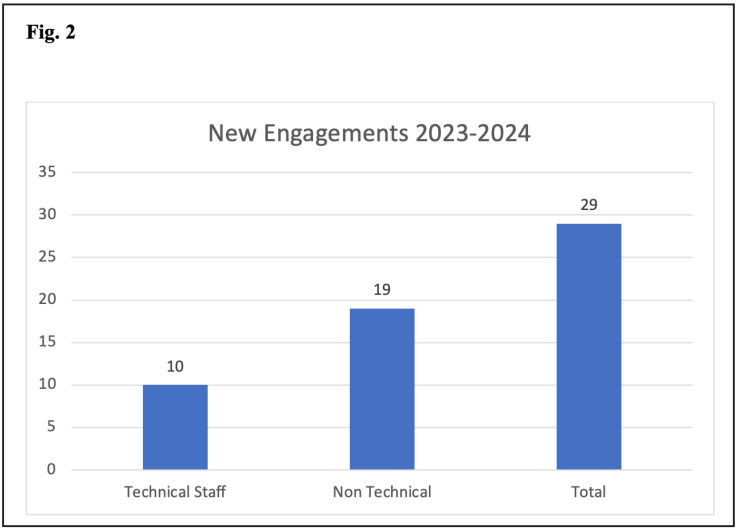


Fig.3

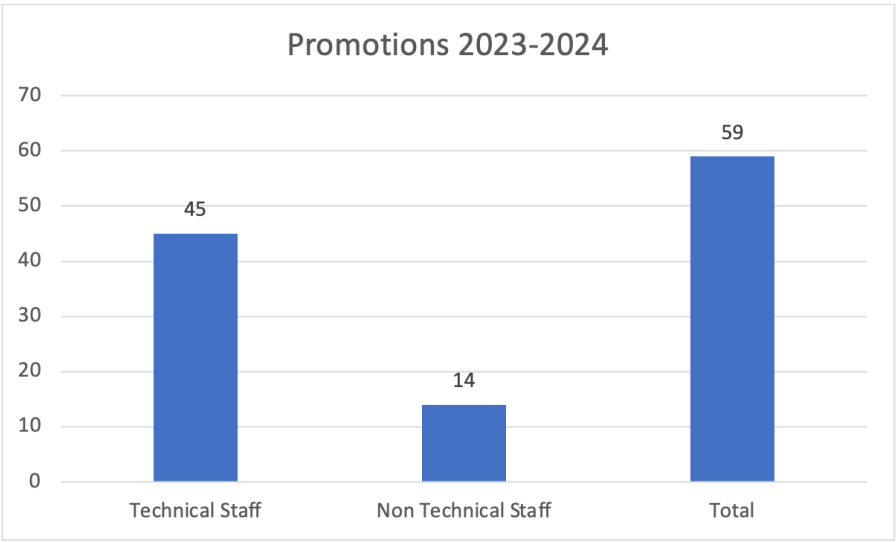
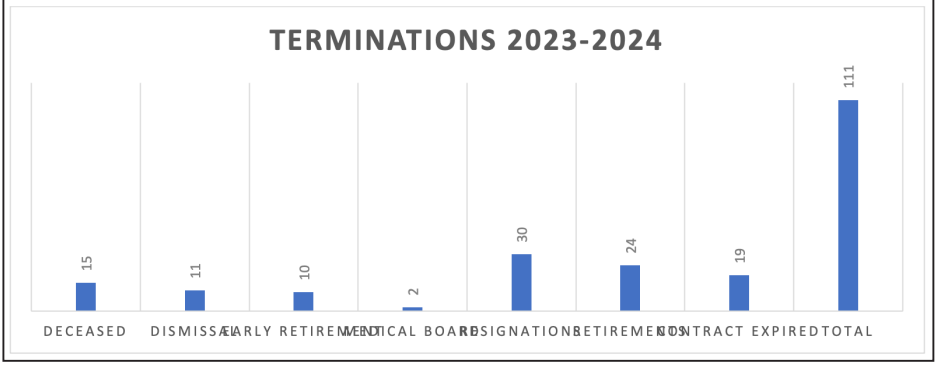

Promotions 2023-2024
70
60
50
40
30
20
10
0
45
14
59
Technical Staff
Non Technical Staff
Total

Fig.4


TERMINATIONS 2023-2024
15
11
10
2
30
24
19
111
DECEASED
DISMISSAL
EARLY RETIREMENT
MEDICAL BOARD
RESIGNATIONS
RETIREMENTS
CONTRACT EXPIRED
TOTAL