



# VISUAL Revenue Management

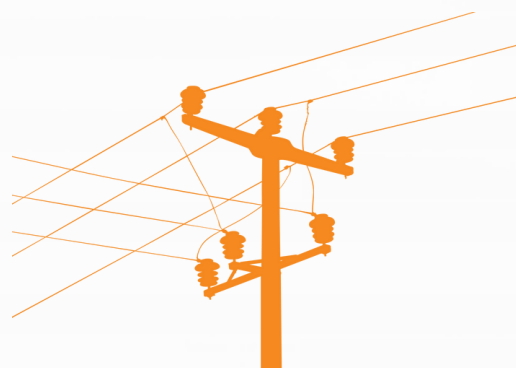
*Revenue Management Solutions*

 a CIGICELL Group Company



*SARPA Annual Convention 2022*

*Case Study in Large Power User Management.*

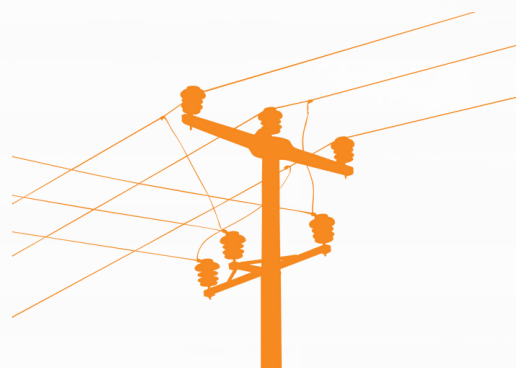


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# CASE STUDY - THE MANAGEMENT OF LARGE POWER USERS(LPU's) THROUGH AUTOMATED METER READING(AMR)

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# CASE STUDY - THE MANAGEMENT OF LARGE POWER USERS(LPU's) THROUGH AUTOMATED METER READING(AMR)

## INTRODUCTION

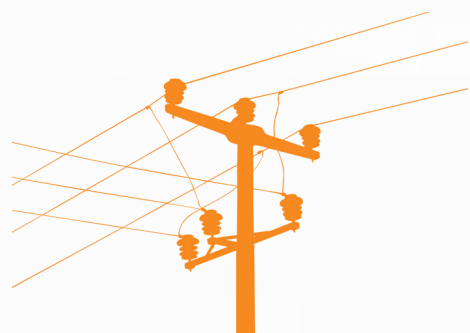
- Municipalities become more and more dependent on the contribution of Large Power Users (LPU) for revenue.
- The majority of the consumers are aware of the need to pay for the services (refer to Tshwane and City of Johannesburg "cut off" actions in February 2022).
- Accuracy of the billing will ensure timeous settlement and steady income stream for the Municipality.
- The need to use technology is ever increasing and recordkeeping of the state of the installations is paramount.
- Revenue losses occur at various levels in the metering process and these losses must be minimized throughout.
- Frequent inspections and commissioning of the installations reduce losses and add to the overall performance of the installation.
- All actions are however done within the guidelines of latest SANS 474 (2018 edition 2).



# CASE STUDY - THE MANAGEMENT OF LARGE POWER USERS(LPU's) THROUGH AUTOMATED METER READING(AMR)

## ***BENEFITS OF AUTOMATED METER READING (AMR)***

- With the complex tariff structures approved by NERSA, the only means to measure the consumption accurately is to use electronic meters, with interval readings, imposed on to the tariff structure to determine the bill.
- I quote from SANS 474:2018
  - ❖ *Multi-rate meter - Energy meter provided with a number of registers, each becoming operative for specified time intervals corresponding to different tariff rates.*
- With an AMR installation properly set up, the need for access to meter readings is thus largely eliminated. Inspections and repairs to the installations are mainly done by exception reports from the Meter Management System.
- The modem allows communication to the meter and can be interrogated from the Meter Management System.



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## TECHNOLOGY USED

- To ensure proper notification of power outages, last gasp modems are installed to send a notification of the power interruption.
- The readings are sent through on the cellphone networks once the installation has power up again.
- The technology we have introduced was to generate Geo-Spatial job cards to teams to minimize travelling.
- Enquiries and reports are set up for reporting and the management of the overall installations.
- NERSA has already indicated that future distribution licenses will be dependent on the identification of all the assets of the licensee.
- The modern tools, to adhere to this requirement, are the use of Geo-Spatial software to plot, audit and record the position and status of the asset. This tool can be developed to serve as an input to maintenance and capital budgets as well.

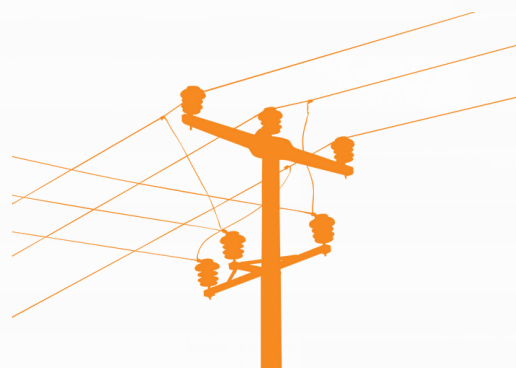
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## SOFTWARE USED

- The in-house software which are being used in Ekurhuleni, was specifically developed, maintained and continuously refined to adhere to the site conditions, type of instructions and ease of operation.
- The software is flexible and can be reconfigured for unique situations.

Allow me to give you a short demonstration of the software.

## Software



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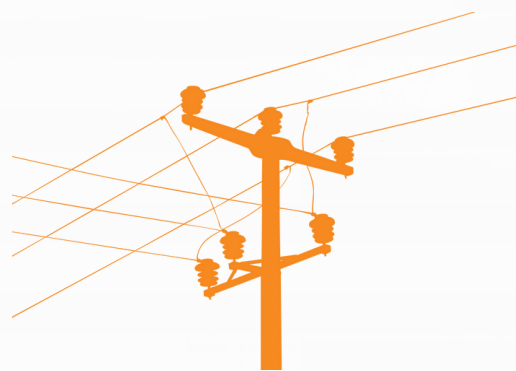
## **CHANGE MANAGEMENT**

- When new technology is launched and introduced, push back is experienced due to the unknown.
- Time and effort must be set aside to train both the customers and end users of the technology.
- Password protected access is essential to ease the fears of the customers and users of the system.
- The 'look and feel' of the portal is important. The page must not be cluttered with too much information but rather dropdown pages to get to the source data.
- A lot of effort has been put into communications to the consumers to get to the required percentage of actual billing on the system. Currently 97 % of the consumers are on and get read on a continuous basis. The 3 % which have not yet been transferred, are due to fault slips, directed to the depots for instances such as welded kiosks, broken equipment on malfunctioning metering transformers.

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## ***SKILLS SETS REQUIRED***

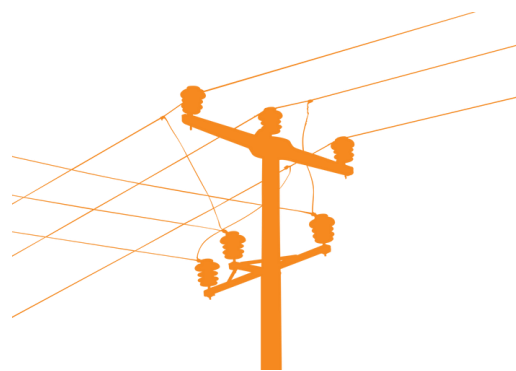
- SANS-474:2018 has clearly identified the skills and experience needed for each type of metering installation.
- This requirements are based on gradual development and on-site experience gained under the supervision of a higher graded team member and an independent test afterwards
- The field teams must be able to identify and trace the circuits and compare it to the circuitry which can be expected to be on site.



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## EASY WINS

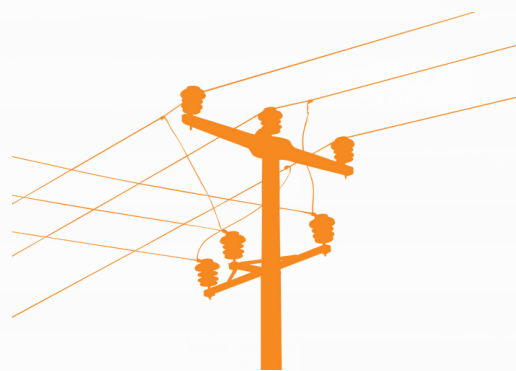
- With AMR, the bill is available on a continuous basis and when retrieved via the internet portal, financial planning can be done by the business for the final bill at month end.
- With a fixed network configuration, energy balance can be done in a defined area for the municipality to track losses and growth in the area.
- A report can be generated to identify repetitive faults and installation findings. This assists in determining the root cause and initiate corrective actions.



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## REVENUE LOSSES

- Revenue losses occur at various levels in the metering value chain.
- Most common is the multiplication factor not being correct. Blown voltage fuses are due to overloading of other equipment on the metering circuits.
- The effect of COVID cannot be underestimated. Consumption has dropped substantially, and some installations are not even at 20 % of the capacity which was installed.
- If a circuit breaker size exceeds the primary CT ratio, the CT will saturate at high loads and under-record the energy consumption. The only explanation I have for such instances, is that the maintenance teams changed the circuit breaker to what is available, without taking these risks into consideration.
- The effect of 'own use' cannot be overlooked. All municipal installation such as buildings, parks, water and sewerage plants must be metered and accounted for.



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## LESSONS LEARNED

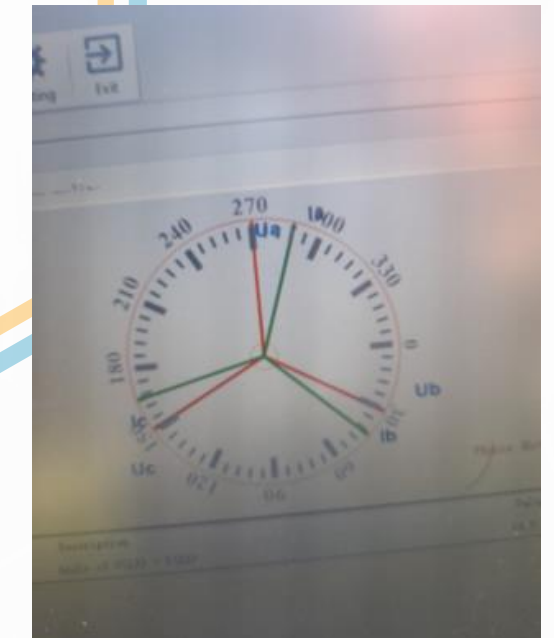
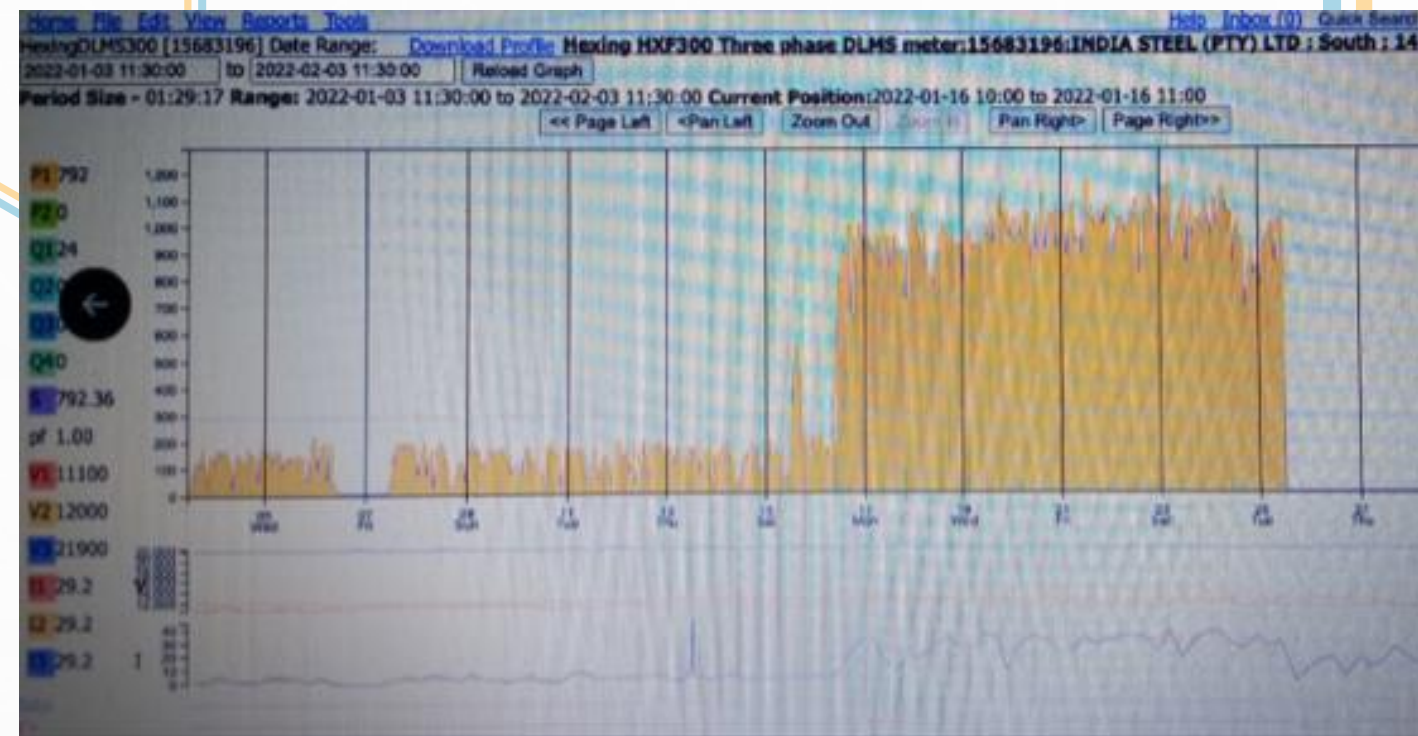
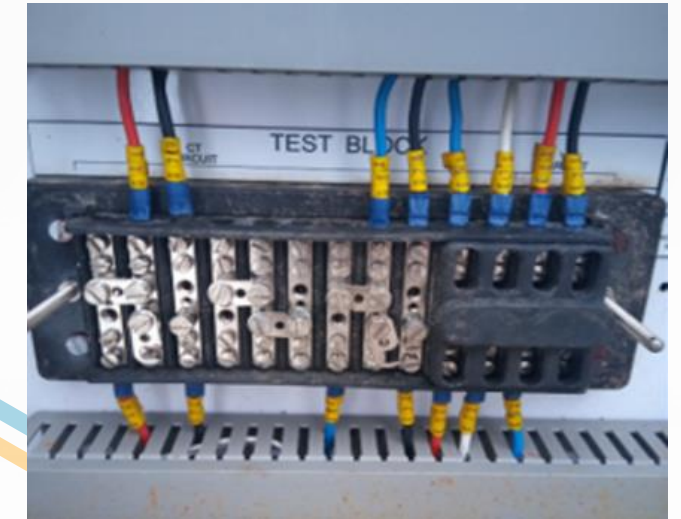
- The use of high-gain antennae assist greatly in communications from places such as basements or where the area is densely populated.
- Some meters can't be found due to incorrect location data, closed businesses or demolished buildings.
- Once the teams are on site, communications to the Meter Management System must be confirmed before the job card can be completed and closed.
- Specific attention are given to the test block. It must be confirmed that the secondary circuit is in a closed loop and the currents and voltages are measured. Cable numbers must be checked, especially in multi range CT installations and sealed afterwards to prevent tampering.
- Phasor diagrams give you a snapshot of the installation. Care must be taken to interpret the phasor in case of a 3 or 4 wire system.
- Sudden changes in load profile trigger alarms. The causes are investigated and corrected to ensure a fair bill to the customer.
- Meters and test equipment must be calibrated, and proof shown on site.
- The tendency of Solar Consultants to sell their business case to install Solar Installations and the effect of negative consumption in the profile where the meter was not properly programmed, however, the municipality still loose the energy sales during times when the margin on sales is high, normally between 09:00 and 16:00

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## LESSONS LEARNED

- Routine commissioning and verification is of the utmost importance to ensure the maximum revenue from energy sales.
- Secondary programming where the multiplication factor is applied on the billing system, proofed to be the best practice.
- 4 Quadrant meters are required to calculate exported energy in the case of embedded generation beyond the meter such as solar installations. Each municipality has different rates for exporting energy
- The value of unique seals for both the terminal block and meter cannot be overemphasized. Broken seals often indicate tampering of the installation. The implementation of anti-tamper tape on the meter to seal off the battery compartment and cradle prevents the opening and tampering of the module.
- Reliance on the cellphone networks come at a price. The 2G and 3G band are unreliable. This leads to a failure in communication during times of high traffic volume in the networks.
- I quote from a newspaper article on 29 April 2021. *"..because of how starved they are for spectrum, Vodacom and MTN have told MyBroadband that they are looking at ways to turn off old 2G and 3G networks to focus on 4G and 5G technologies"*.

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# Thank you!

Questions?  
Clarifications?

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## For More Information

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