

IURPA/SCRPA/SURPA 2012 Training Seminar



The impact Prepaid Metering had on the development of Revenue Protection processes in South Africa The SARPA Strategies to minimize losses

The SARPA Strategies to minimize losses

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GOAL OF PRESENTATION

- 1) To explain the important role that the introduction of prepaid meters played in the development of Revenue Loss Management processes in Utilities in South Africa
- 2) To share the frustrations of those that had to develop new processes to minimize losses at their Utilities
- 3) Warning to Utilities worldwide that we should not fall into the same trap of being complacent, whilst introducing intelligent metering systems.
- 4) In SARPA we decided in future to develop strategies and ensure that the level of standards and specifications are high and that operational processes are developed before implementation of new metering strategies

OVERVIEW OF SOUTH AFRICA





CAUTION MEN AT WORK

Women work all the time-Men have to put up signs when they work.



LOSS INDICATOR - SOUTH AFRICA

The average non technical losses of utilities is calculated approx 15%

One of the biggest Utilities in South Africa's total energy losses are approximately 6%.

Approximately 2.34% are technical and 3.66%, non-technical losses. This represents a 40/60 split.

What should be noted is the fact that a 1% loss in energy equates to approximately \$ 78 000

Thus energy losses are of great concern to the electricity business in South Africa, where losses of approx \$1.5 billion are recorded annually





HISTORICAL OVERVIEW OF REVENUE PROTECTION IN SA

- 1) It was common belief at the time that losses were only caused by "non-payment" and "line losses" (technical losses)
- 2) Credit Control officials were dependent on feedback from meter readers and consumers regarding metering issues (meters not functioning correctly).
- 3) No revenue protection actions technician sent to "fix the problem"
- 4) Complete ignorance regarding tampering, seen as "nuisance complaints" – changing meter only remedy

ONE OF THE MOST DANGEROUS THINGS IN LIFE IS....

WHEN PEOPLE DON'T KNOW

THAT THEY DON'T KNOW !

WHAT DID WE COME UP AGAINST

- > OLD COMMUNITY vs. NEW COMMUNITY
- ➤ NON PAYMENT CULTURE
- ➤ HOW TO TREAT THE COMMUNITY FAIRLY
- > CULTURAL ISSUES
- > PERCEPTIONS
- ➤ TECHNOLOGICAL WARFARE
- > NEW BILLING ARCHITECTURES
- ➤ STAYING AHEAD OF THE "UNLAWFULL ACTS"



HISTORICAL OVERVIEW OF PREPAID METERS

- 1) Many projects were initiated as part of the electricity for all campaign" Meters were installed in their thousands by sometimes semi skilled personnel or contractors.
- 2) Eskom Protective Services Department (who had personnel surplus at the time) were subsequently tasked to conduct a field study, in order to identify risks and any shortcomings in some of the prepaid metering projects.
- 3) It became known that some prepaid meters were not functioning correctly due to unknown reasons.
- 4) Areas were identified and members were provided on job training to inspect meters and a "door to door" inspection was initiated.



WHAT IMPACT DID PREPAID METERS HAVE ON UTILITY PROCESSES

- 1) <u>Revenue Loss Management processes</u> needed to develop processes to inspect meters and detect tampers
- 2) <u>Credit Control processes</u> Needed to develop different methods of disconnections to address these issues
- 3) <u>Meter maintenance processes</u> more failures than conventional meters therefore needed a new plan
- 4) <u>Meter installation processes</u> retrofitting of meters / new installations and updating of data
- 5) <u>Billing processes</u> replaced by vending processes

WHAT IS THIS?





NO ! It is a cash register!





REVENUE PROTECTION PHASES

- (1) INFORMATION PHASE
- (2) DENIAL PHASE

- (3) ACCEPTANCE PHASE
- (4) IDENTIFICATION PHASE
- (5) IMPLEMENTATION PHASE
- (6) REALIZATION PHASE
- (7) PLANNING PHASE



THREATS IDENTIFIED AND THE IMPACT ON REVENUE MANAGEMENT

- 1) <u>Tampering with meters</u> illegal acts were detected and had to be dealt with by doing audits
- 2) <u>Vending</u> It became necessary to draw reports to detect no / Zero consumption reports
- 3) Loss of data Lack of control procedures resulted in information been lost and "ghost metering"
- 4) <u>Control of information</u> Criminals exploiting the system which leads to "ghost Vending"
- 5) <u>Illegal connections</u> with most of the connections been done overhead, it became easy to connect houses illegally



CHALLENGE TO FIND ANSWERS TO COUNTER THESE THREATS

- 1) <u>Staying ahead of the criminal acts</u> it is impossible to stay ahead of criminals as their intelligence, knowledge of flaws in systems and drive to obtain financial gain is superior
- 2) <u>Making the meters "tamper proof"-</u> placing the trip switch inside the meter, covers, common base meters, split metering and protective structures
- 3) <u>Developing effective methods of inspecting meters</u> the term "auditing of meters" were accepted and methods of conducting these actions are called sweeping, consumption,
- 4) <u>Developing safe processes to disconnect / reconnecting</u> <u>premises</u> – remedial actions processes like "rag"

THE GAMES WE PLAY





Meter removed and illegal connections made to base plate

METER MISSING

CABLES TO 13 OTHER HOUSES

PREPAID METER TAMPER









WHAT IS THE WORST ILLEGAL CONNECTION YOU HAVE EVER SEEN ?

> MEN WOULD SAY IT WAS A WOMAN DRIVER







SOME CHALLENGES WE FACED

In the Khayelitha project the losses came down from 29% to 19%

We then came to the realization that consumers were actually "reloading" their tokens.

Intensive study - found a meter where the memory would become full after **160 transactions** and then the old tokens would be erased.

Meter manufacturers denied any knowledge of this at the time

Utilities replaced thousands of these meters. In the abovementioned project **23 000 meters** were replaced and the losses dropped to **9%**.

Later another meter was identified that has the same problem. Thousands of these meters are still in use across the country.



OPERATIONAL BAD PRACTICES

- Staff under trained and badly equiped
- Focussed on quantity rather than quality
- Focussed on disconnecting in the wrong areas
- Little positive interaction with consumers
- Systematic costly "Sweeping audits"





ISO REVENUE PROTECTION DIAGRAM





DEVELOPMENT OF PROCESSES AND GUIDELINES

- 1) <u>Auditing Processes</u> NRS 055 Guideline to Revenue Protection and ISO
- 2) <u>Sealing Procedure</u> Generic Sealing strategy, NRS 096 (1) and (2)
- 3) <u>Credit Control Procedures</u> remedial actions, retrofitting of meters and payment of fines
- 4) <u>Administration processes</u> Generic forms e.g. audit forms, tamper notices, cut off notices, scheduled faulty meter replacement processes
- 5) <u>Generic Bylaws</u> City of Cape Town and Buffalo City



NO ACTION

RINGFENCE AREA

SPLIT METERING/PROTECTIVE ENCLOSURE STRATEGY
















Flow rate restriction

SHARING KNOWLEDGE WITH THE CUSTOMER

WHAT SHOULD WE DETERMINE

1) The first point of departure is to distinguish between

- who could pay
- who did not want to pay
- those who could not afford to pay.





NEGATIVE REACTIONS

- Departments work in silo's, "them and us"
- Politicians sometimes sided with the community
- Law Enforcement officials refuse to assist in operations
- Residents become hostile towards all Utility staff members and it is difficult to perform maintenance task

How nice "We were at war with our consumers"

CUSTOMER INTERACTION

HOWICK TRANSITIONAL LOCAL COUNCIL 5, Howick 3290, KweZulu-Natal, Tat: (0332) 306124, Fax: (0332) 304183

COMMUNITY CENTRE

ATOT IS

Prepared by Community Life Projects

HOWICK TRANSITIONAL LOCAL COUNCIL HOWICK PLAASLIKE OORGANGSRAAD UMKHANDLU WOGUOUKO WESIFUNDADOLOBHA SASE HOWICK MASAKHANE

CUSTOMER EDUCATION

Electricity Theft is Dangerous and a Crime



WARNING!



Tampering with electricity supply is a dangerous crime. It could result in serious injury or death, or lead to a fine and / or imprisonment.

This message is from the Kenya Power & Lighting Co. Ltd., in the interest of public safety

COMMUNICATION STRATEGY



www.operationkhanyisa.co.za







*** * PRIMEDIA





THERE **ISA** SILENT CRIME **ON THE RISE IN** SOUTH AFRICA

6-

COMMUNITY MOBILISATION

THE

POWER

IS IN

YOUR

REPORT ELECTRICITY THEFT ANONYMOUSLY SMS 32211

1

NDS

PHANSI NGAMA KONG

3/11/2010 22:17

19/11/2010 22:54

NG

PR REAL REPORT

/11/2010 03 28

MOBILISING BUSINESS

South African Chambers of Commerce Conference and Energy Indaba 2011





THE CHALLENGES WE FACE NOW

- 1) <u>Calculate non technical losses</u> NRS 080 developed
- 2) <u>Need to adapt metering systems to minimize losses</u> Prepaid to "split" to "AMR" to "Smart" metering
- 3) <u>Be proactive in your approach</u> Revenue Loss Forum
- 4) <u>Train officials to operate intelligent metering systems</u> only skilled technicians would be able to audit meters
- 5) <u>Make sure that new metering systems are compatible</u> with current software applications need to do a study
- 6) **System backups** To be performed on a monthly basis

South African Revenue Protection Association



SMART METERING REVENUE MANAGEMENT STRATEGY IN SOUTH AFRICA

<u>SMART METERING</u> <u>INTRODUCTION IN</u> <u>SOUTH AFRICA</u>

 Smart Metering is no longer a question of "GO" or "NO GO" - it is now only a question of "WHEN?" and "HOW?".



REGULATORY LEGISLATION IN SOUTH AFRICA



Notice R.773 states that by the 1st January 2012:

- "a licensee should install a facility to remotely control the supply of electricity to any electric geyser that does not incorporate a solar heating water facility"
- 2) "a licensee must install a facility to remotely control the supply of electricity to heating, ventilation and cooling systems in its area of supply (and) link a swimming pool drive and heating system to a facility that enables the licensee to remotely control its supply of electricity



REGULATORY LEGISLATION

Notice R.733 continues with:

 "an end user or customer with a monthly consumption of 1 000 kwh or more must have a smart system and be on a time of use tariff not later than 1st January 2012"

Technological advancement

MOSQUITO REPELLANT WATCH



CLASSIC REVENUE PROTECTION vs SMART REVENUE PROTECTION

PREPAID

SMART / AMR

- 1) Meters audited by hand
- 2) Tampering identified through no or zero consumption reports
- 3) Disconection on site by switching or cutts
- 4) Reconnection and normalization on site

- 1) Status checked remotely
- 2) Tamper identified remotely
- 3) Disconnection done remotely
- 4) Reconnection done remotely



SYSTEM SECURITY

The subject of cyber security is not clearly understood by the utility industry, or worse, it is downplayed as being a low risk area.

The issue regarding **ghost vending** has made us more aware of this aspect and made the STS Association to take revenue protection aspects more serious

The term "enemy within" speaks for itself as we have time and again identified employees of the utilities who tamper meters, change consumer data and supply information to non ferrous theft syndicates



WHAT DO WE EXPECT WILL CHANGE IN SOUTH AFRICA?

- Nothing will change with regard to First line reaction, as it will still be necessary to check discrepancies regarding metering, seals and customer information.
- It will also now be necessary to set and man a Control Centre to coordinate all the information coming back.
- We predict no reduction in Revenue Protection personnel (in big Utilities we might even need more people)
- Losses will not magically come down it will only be managed better.

SARPA STRATEGY



NRS STANDARDS

NRS 055 - Reviewed 3rd time and published Revenue Protection Guideline

NRS 059 - Reviewed 2nd time and published Theft of earthing at substations

- NRS 080 Second Revision underway Standard to calculate non-technical and technical losses
- NRS 096 Reviewed 2nd time and published Sealing Standard
- NRS 101 Completed and published (new) Utility Metals Thefts

South African Revenue Protection Association





SARPA REVENUE RECOVERY PROJECT



South African Revenue Protection Association





NON FERROUS METAL THEFT



The illegal trade in non-ferrous metals has become

a multi million rand trade in South Africa

The escalating theft of cables from Service Providers like the Municipalities, Spoornet, Eskom, Telkom and Metrorail networks affects normal electricity supply, rail transport, telephone/cellphone networks, banks, hospitals and many more industries dependent on these services.





NON FERROUS CRIME COMBATTING COMMITEE









THIEF SHOCKS HIS BUM OFF

DIE Cape Frats se jongste servial beer het in 100 volt encols context. Breint Patterson 15, het probeer om elektroniese toerusting te steel uit in substation. Die jong dief laat meda meer as dertig charges van hustrank teen hom. Maar al die salve is uit die hot gegooi omdat tij 'n minoris. Verlede week het Brent as stelery tot 'n skolwende einde gekom. Dood

Hy istamper dood toe hy probeer het am elektriese toerusting te varwyder uit 'n sub-stasie in Parow. Nou wej hy vir sy lewe in Tygerberg Hospitaal. Die tiener het orga brandwonde op sy gesig, nak en hande. Brant se pa Allan Patterson, 51, sê sy kind steel om ay tik verslawing te voer. Allan sê: "Hy is my baba maar ek kan nie jok oor wat hy doen nie. "Hy steel nie vir kos nie maar vir tik." Brant se suster Lee-Ann Patterson, 18, sê haar broer is in 'n bale serious loestand.

> "Hy lyk soos 'n munny met al die verbande en hy is op 'n hartmasjien," så Lee-An. Polisie woordvoerder Elliot Sinyangans så: "Die saak 'van malicious skade aan eiendom en diefstal word ondersoek."

VADER: Allan sê Brent steel vir tik



GESKOK: Brent is in die hospitaal



THIS IS WHAT HAPPENS IF YOU PLAY WITH ELECTRICITY



TRAINING FOR EXCELLANCE



TRAINING LAW ENFORCEMENT


SOUTH AFRICAN REVENUE PROTECTION ASSOCIATION

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