



U.S. & INTERNATIONAL ENERGY EXPERTS SHARE BEST PRACTICES ON LOSS REDUCTION & REVENUE PROTECTION

METERING, BILLING & LOSS REDUCTION: A REGIONAL WORKSHOP FOR DISTRIBUTION UTILITIES

Johannesburg, South Africa – Senior utility executives, regulators and ministry officials from more than twenty companies and organizations recently participated in a USAID- and Power Africa-funded regional workshop which focused on improving distribution utility performance and solvency. Participants from the Botswana, Namibia, Lesotho, Philippines, South Africa, Swaziland and the United States met with their peers from utilities, meter and software manufacturers and financial institutions to learn about strategies, technologies and techniques for improving distribution utility performance. The participants discussed a range of issues, including strategies for reducing technical losses, combatting electricity pilferage and meter tampering and how best to integrate smart grid



Workshop participants from all 7 countries gather with international experts in Johannesburg, South Africa.

infrastructure, new information and data analysis technologies and advanced meters. The participants also learned about the importance of customer service and proactively engaging the community to achieve loss reduction targets and protect the utility's revenue over the long term. The utilities that have made the greatest improvements in

electricity reliability and energy efficiency have learned the importance of loss reduction, customer engagement, and revenue protection. The workshop highlighted three important topics: the importance of loss reduction to system stabilization; the relationship between smart metering, AMI and revenue enhancement; and billing and collections best practices, prepayment systems and new technologies.

This program targeted electric utilities from Power Africa Initiative countries. Launched by President Obama in June 2013, Power Africa aims to double the number of people who have access to electrical power in sub-Saharan Africa. Power Africa will bring to bear a wide range of U.S. government tools to support investment in Africa's energy sector. From policy and regulatory best practices, to pre-feasibility studies and capacity building, to long-term financing, insurance, guarantees, credit enhancements and technical assistance, Power Africa will provide coordinated support to help African partners expand their generation capacity and access.

The workshop was organized and conducted by the U.S. Energy Association (USEA) on behalf of USAID.

REDUCTION OF TECHNICAL LOSSES – TECHNOLOGIES AND SOLUTIONS

Each of the participating utilities spoke about their current technical and commercial figures and the steps they have taken to reduced such losses. Other utility representatives discussed challenges they face with aging, obsolete or



Jeff Carivau of an Electric System Manager at the Los Angeles Department of Water and Power (LADWP) describes how his department handles outages and service restoration.

faulty transformers, switch gear, and other distribution equipment. Noel Modesto from Visayan Electric Company (VECO) shared VECO's experience in the Philippines utilizing data and technology (including distribution automation, SCADA and distribution management systems or DMS) combined with customer input to prioritize maintenance projects and distribution system improvements. By focusing investments on specific upgrades – from GIS solutions on crew vehicles to undergrounding of selected distribution lines – both companies have been able to utilize data to address customer concerns and make more impactful improvements. Some of these investments address asset reliability and ease of service restoration after extreme weather, while others seek to limit load shedding or, in the case of undergrounding, make pilferage and wildlife-caused faults less likely. Later in the workshop, Imraan

Mohamed from Itron, Gert Booyesen from GE Energy Management, Martin Sanne from Siemens, and Dave Tarr from Landis + Gyr provided further details regarding the latest technical solutions. The four speakers described how increasingly smarter grid operations can reduce technical losses to negligible levels by finding faults faster, reducing outage time and collecting, and managing and analyzing data in real time.

COMBATTING NON-TECHNICAL LOSSES – BILLING AND COLLECTION BEST PRACTICES

Many of the utilities discussed their persistent troubles with commercial or non-technical losses in their distribution networks. Commercial losses are broadly grouped into two categories: unbilled energy losses and energy usage which is billed but uncollectable. Unbilled energy losses are typically the result of theft in one form or another. Mr. Doug Bashford from ESKOM shared photographs of various forms of meter tampering and bypassing – ranging from the crude and obvious to the ingenious and difficult to detect. Mr. Noel Modesto from the Visayan Electric Company (VECO) in the



Noel Modesto, an Engineer at the Visayan Electric Company (VECO) details VECO's customer service and community

Philippines gave different examples of how to combat electricity theft, and stressed the importance of proactively engaging and educating the community, as well as prosecuting those who continue to steal electricity. He also explained that utilities in the Philippines have published the names and photographs of convicted thieves in local news media, alongside apologies from the parties in question, which has helped create a social stigma against electricity theft. Mr. Bashford also emphasized the need to be persistent in making the case – both to the public and to the courts –for why electricity theft is not a “victimless crime” and how the utility’s inability to collect revenue for its services makes it nearly impossible to provide reliable electric power.

INTEGRATING SMART GRID TECHNOLOGIES

Most of the workshop participants were keenly interested in introducing various smart grid technologies to their distribution systems or upgrading existing systems to increase efficiency, response time, and central control of dispatch and distribution management. They asked many questions of the manufacturers and service providers present: Landis + Gyr, GE Energy Management, Siemens, and Itron. Many questions focused on the benefits of pre-paid metering systems and the various ways that utilities can accept payment. Other questions focused on technical capabilities and features of various systems. For example, participants and presenters discussed the potential benefits of utilizing Automated Metering Infrastructure (AMI), handheld meter reading devices, supervisory control and data acquisition (SCADA), and other smart grid technologies. In particular, many participants were interested in the potential to collect, manage, analyze and utilize data about their customers and how they use electricity – something that is rarely done in Southern Africa at present, but which could greatly improve a utility’s ability to manage its network efficiently, avoid outages, and plan effectively for expansions or upgrades.

RESULTS & RECOMMENDATIONS

Over the course of the workshop, participants were able to meet with their African peers and discuss the varying technologies, strategies and best practices presented. Upon workshop completion, participants laid out their recommendations, which included:

- The participants from **Botswana Power Company (BPC)**, **NORED**, **CENORED**, **Eskom**, **City of Tshwane**, and **Zambia Electric Supply Company Limited (ZESCO)** will make use of pilot programs to test future adoptions of new technologies and metering, metrics for analyzing system performance and identifying necessary improvements before full-scale implementation.
- **NamPower** and the Regional Electricity Distributors in Namibia (**NORED**, **CENORED**, and **ErongoRED**) will work with Eskom to develop a meter tampering training program in Namibia.
- The participants from **Botswana Power Company (BPC)** will recommend improvements to their customer service and community engagement programs based on the best practices presented by the **Visayan Electric Company’s (VECO)** Noel Modesto.

WORKSHOP PARTICIPANTS

- Botswana Power Corporation (BPC)
- CENORED
- CENTLEC
- City of Johannesburg
- City of Tshwane
- Electric Power Research Institute (EPRI)
- Erongo RED
- Eskom
- GE Energy Management
- Itron
- Landis + Gyr
- Large Public Power Council
- Lesedi Municipality

- Lesotho Electricity Company (LEC)
- Los Angeles Department of Water and Power (LADWP)
- NamPower
- National Energy Regulator of South Africa (NERSA)
- NoRED
- SALGA
- Siemens Energy
- Swaziland Electricity Company (SEC)
- Visayan Electric Company (VECO)
- Zambia Electricity Supply Company Limited (ZESCO)

WORKSHOP SPEAKERS

- **Doug Bashford**, Revenue Control Assurance manager, Eskom
- **Gert Booysen**, Software Solutions Leader, Africa, GE Energy Management
- **Jeff Carivau**, Electric System Manager, Los Angeles Department of Water and Power (LADWP)
- **John Di Stasio**, President, Large Public Power Council
- **Noel Modesto**, Engineer, Visayan Electric Company (VECO)
- **Imraan Mohamed**, Marketing Manager, Sub Saharan Africa, Itron
- **Martin Sanne**, Head of Smart Grid Africa, Siemens
- **Brian Seal**, Technical Executive, Electric Power Research Institute (EPRI)
- **Brian Secholtlho**, Head of Electricity Pricing and Tariffs Department, National Energy Regulator (NERSA)
- **Dave Tarr**, Product Manager, Landis + Gyr

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