

Future Strategy for the Implementation of Smart Metering with Ripple Control

by Reinhard Dettmar, Elster Messtechnik,
Germany

Ian Robinson, Robmet Meters,
Johannesburg



elster

Leading the World
in Metering Technology

- Notice R.773 stipulates:

“A licensee should install a facility to remotely control the supply of electricity to any electric geyser that does not incorporate a solar water heating facility.... by 1st January 2012”

GOVERNMENT LEGISLATION



- Notice R.773 also stipulates:

“an end user or customer with a monthly consumption of 1000kWh and above must have a smart system and be on a time of use tariff not later than 1st January 2012”

STATISTICS (1)



- According to latest NERSA statistics, there are approximately 7,5 million domestic customers
- Approximately 3,6 million of these are ESKOM customers
- Average consumption per customer = 205kWh per month
- Unlikely that many of these have electric geysers, therefore not affected by R.773

STATISTICS (2)



- Approximately 3,9 million of these customers are Municipal customers
- Average consumption per customer = 603kWh per month
- Likely that most of these have electric geysers, but average consumption below 1000kWh per month

STATISTICS (3)



- Statistics difficult to obtain, but probably only 30% of these customers consume over 1000kWh per month
- This means only around 1,2 million customers need to be fitted with a smart meter
- However, this leaves 2,7 million customers who need to be fitted with a remote control device for their geyser

SMART METERS - COST



- Current cost around R 5 000 per installation including support systems and radio links for control of geysers
- Cost of fitting 1,2 million customers with smart meters = R 6 billion
- Who pays for smart meters?
- No money in ESKOM's DSM fund

SMART METERS - TECHNOLOGY (1)



- New technology
- No standardisation on communication technology
- No standardisation on communication protocols
- Many competing technologies

SMART METERS - TECHNOLOGY (2)



- Slow response time – OK for meter reading but not for dynamic load control
- Reliant on 3rd party suppliers
- Still need to carry out product evaluation and field trials, so extended delivery period

MODERN RIPPLE CONTROL SYSTEMS (1)

- Use HV injection (up to 150kV) so can cover larger areas from only one injection point
- Based on proven technology and reliability
- Large number of receiver addressing capabilities so can split load into smaller groups for better control

MODERN RIPPLE CONTROL SYSTEMS (2)



- Designed for dynamic load control
- Emergency shed capability of less than 10 seconds
- Open protocols
- Receivers microprocessor-based so fully programmable
- Suitable for controlling TOU meters

MODERN RIPPLE CONTROL SYSTEMS (3)



- Fully under the control of the Municipality - no 3rd parties involved
- Low capital and running costs
- Small receiver size - can be mounted in DB board
- Well-known technology in South Africa
- Fast delivery: receivers within 2 months

PROPOSED SOLUTION



- Hybrid system using ripple control for direct control of geysers, and TOU smart meters
- Meters provided with space for future plug-in communication module (GPRS, PLC, RF)
- Read meters initially using existing meter readers with Hand Held Units (HHUs) fitted with optical probes

ADVANTAGES OF HYBRID SOLUTION (1)



- Uses proven technology
- Low cost solution for geyser control
- Low cost solution for control of smart meters
- Same functionality as for an AMI smart meter
- Makes use of existing ripple control systems

ADVANTAGES OF HYBRID SOLUTION (2)



- Allows time for communication methods and protocols to mature
- Avoids stranded assets
- Complies fully with R.773 for control of geysers
- Complies fully with R.773 for smart meters when communication module added in future

DB - BOARD MOUNTING



AS2XX SMART METER FOR HYBRID COMMUNICATION



- Basic features of the meter
 - Advanced metering
 - Pluggable Comm. Modules
 - Integrated Disconnection Unit
 - Load Limitation
 - Consumer display with remote access
 - TOU Management
 - Tampering functions
 - Wired & Wireless M-bus Interface

Thank you

