The only time a Tata Indicom Phone won’t be accessible.
Please switch off your mobile phones during the presentation.
Agenda

• Challenges & Expectation of DISCOMs in India
• Erstwhile AMR solution using CSD
• Limitations in erstwhile AMR Solution
• Smart Metering solution using CDMA 1X/ EVDO
• Benefits of TTSL Smart Metering Solution
• Building Blocks of Smart Metering
Abbreviations

- DISCOM- Power Distribution companies
- SMR- Smart meter reading
- AMR- Automatic meter reading
- CSD- Circuit switched data call
- IPVPN- IP Virtual Private Network
- DT- Distribution Transformer
Challenges & Expectations of DISCOMs in India

**Challenges**
- Identification of cause of distribution losses and plug them
- Remove manual processes and record keeping
- Removing “human factor” and error in meter readings
- Online Load monitoring and remote re-routing of power in case of outage
- Managing even supply of power vis-a-vis revenue collection

**Expectations & things in pipeline**
- Time of day tariff to make even usage of power during day
- Intelligent power load shedding & supply management to meet peak demand
- Limit revenue exposure from customers
- Prepaid metering to check frauds & theft
- Real time SMS alert and notification to subscriber incase of over drawl of power during peak hour.
Erstwhile AMR Set up at DISCOM using GSM CSD connectivity

1) Modem at server end would dial modems at Meter end to establish CSD connection
2) Modem at meter end would connect to Meter to establish Server Meter CSD connection
3) Server would then pull the data from Meter over a CSD connection established
**Limitation of GSM CSD solution for AMR**

- This GSM solution is a centralised solution wherein server pulls the data from each meter in sequential manner.

- Meter data was not available on real time basis to DISCOM as data acquisition happened in round robin manner.

- High dial-in costs due to low data throughputs & frequent disconnections and redials.

- Solution was becoming complex and administratively difficult to handle as number of energy meters were increasing.

Also existing solution cannot meet DISCOM future expectation

Shift happened from circuit switched architecture to packet switch architecture
TTSL’s Smart Metering Solution - Store and Forward IP based

1) Modem would talk to Meter through optical port
2) Meter will send the data to Modem who will store into its memory
3) Modem will then push the data to Centralised Data Centre (Head end)
4) Head end would process the data in readable format and forward to billing engine
<table>
<thead>
<tr>
<th><strong>TTSL Smart metering Solution</strong></th>
<th><strong>GSM – CSD Solution</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Parallel Communication and takes 6-8 hours for download and data availability (XML + RAW)</td>
<td>• Serial Communication and takes 4-5 days for complete data download availability.</td>
</tr>
<tr>
<td>• Proactive approach</td>
<td>• Reactive approach</td>
</tr>
<tr>
<td>• Bi directional Communication and gives online tamper/alert/reports</td>
<td>• One Way Communication and Off line. Tamper alert and report available after data analysis.</td>
</tr>
<tr>
<td>• Easy to operate as only 2-3 operational resources required irrespective of no of modems</td>
<td>• Complex and expensive as no of meters/frequency increases.</td>
</tr>
</tbody>
</table>

First of its kind solution deployed in India with one of the technologically advanced DISCOM
Key building blocks for NEW smart metering solution

**Modem**
1) Modem with intelligence to collect and forward data
2) Modem with real time tamper alerts
3) Flash Memory to store the Meter data for minimum 6 months

**Connectivity Network**
1) Fast communication using CDMA 1X/ EVDO connectivity
2) Data on VPN internal IP private network only

**Backend Server Solution (Head end)**
1) Collects the meter data in raw format and processes the format
2) Data collection point for billing engine
3) Generates real time alerts / alarms
4) Shows real time status reports and data
5) Presents on demand data/ scheduled data captures
Key building blocks

– **Intelligent Modem**
  • Flash memory to store 4 MB of Data
  • Auto collection of energy meter data
  • Auto Generation of tamper alerts through SMS
  • Network alarms/ alerts
  • Auto push of data to server on regular Intervals as desired
  • Remote customization of business logics on modems
  • Modem compatible with all available energy meter
  • Modem compatible with GPRS and CDMA

– **Connectivity Network**
  • Seamless pan India CDMA Network.
  • Dedicated data speeds over a private VPN network
  • Online real time health checkup
  • 24X7 data centre to have 99.7% of uptime for modems and network
Key building blocks

– **Backend Solution (Server End)**
  • Raw and XML files on demand any time
  • Raw and XML Files – scheduled data
  • Online Web portal access and management
  • Online Meter Billing Data (XML)
  • Tamper events alarms/ report
  • Group data download requests
  • Near real time parameters update
  • Real time meter / Modem health check
  • Real Time Tamper Detection
  • Customized SMS Alerts/ Notification
  • Instantaneous and energy data Values
  • Load Survey Data/ Instantaneous /Billing data
**Email notification**

**From:** camralertservice@analogcgroup.com  
**Date:** Thursday, May 06, 2010 11:45 PM  
**To:** s.sananta@ndpl.com; subrata.das@ndpl.com; prasannabni@analogcgroup.com; santadyuti@yahoo.co.uk  
**Subject:** BR Phase Event 22 Occurance For 52004002

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**Analogic Alert Service**

**Meter Details**

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<tr>
<th>Meter Number</th>
<th>52004002</th>
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<tr>
<td>Modern Date and Time</td>
<td>06-05-2010 19:58:07</td>
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**Voltages:**

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<tr>
<td>R-Phase Voltage</td>
<td>0235.420</td>
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<td>B-Phase Voltage</td>
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**Currents:**

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<th>Current Type</th>
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<tr>
<td>Y-Phase Current</td>
<td>0.81</td>
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<tr>
<td>B-Phase Current</td>
<td>1.4</td>
</tr>
</tbody>
</table>

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**Power Factors:**
GUI Reports – Current & Voltage for DT

Curves shows whether Load, Current are within normal limits.

Useful for profiling of DTs, Optimizing power distribution to maximize revenues.
Benefits of New Solution from TTSL

1. To Regulators:
   - Utility performance on distribution networks can be monitored real time
   - Generation of MIS at desired frequency for each DISCOM for range of parameters defined by regulators
   - Demand and supply management of energy
   - Optimum planning of generation/distribution networks.

2. To End-Consumers of Energy:
   - Quick turn around time for outage correction in sub distribution network
   - Complaint management and resolution- notification to consumers, and field staff of Discom
   - Bill due date reminders and payment alerts
   - Complaint logging using sms
   - Multiple billing cycle can be provided to optimise printing resources.
Benefits of New Solution from TTSL

3. To Discoms;

• Instant information on black out/ sub distribution outage, thereby improving revenue realization.
• Boundary/ check / DT/ Distribution Pole/ Consumer end metering information and audit can be performed on real time basis.
• Optimal load balancing on sub distribution grid. Provide real time status of distribution system (Transformer/Pole) health status and raise proactive alarm incase of likely failure.
• Peak time demand side monitoring by identifying errant/overdrawing consumers and advising them to cut down demand (Auto/manual)
• Tamper/events are proactively detected hence direct saving on theft of power.
• Timely billing / online bill generation/report and hence prevent unnecessary revenue exposure.
• Time of Day billing / Multiple billing cycle …improved cash flows.
• Complaint management.
• Prepaid billing model can be adopted.
THANK YOU