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India SMART UTILITY Week 2024

Supporting Ministries



Session: Vision for the Indian Power System

ABT Meters Installation for Efficient Energy Accounting and Real Time Power Forecasting

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The existing interface energy meters were not capable of providing the real time demand data, an integral requirement to the effective management of power scheduling and load forecasting in the DSM regime

ABT meters Installation at all the 197nos. Exchange points in TPDDL Grid Substations for Real time accounting and avoiding DSM penalty.

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Robust and Real time Data Availability on Dual network on LAN and OFC based network with fail safe Network Architecture. Data availability on single platform so system strengthen according to SAMAST regulations.

It were found that 50% of DSM penalty is on account of Data Mismatch between existing ADMS(SCADA) Real Time data scheduling and final billing data from DTL based on non ABT meters installed on Exchange points. The Non ABT meters data were not available in Real Time and billing were done only at the end of the month and hence the error and causes DSM Penalty. Including these we were also facial below crucial issues-

1. ***15 mins Periodicity: Existing IEMs (Interface Energy Meters) have 15 mins intergration period active, reactive and auto-time synchronisation.***
2. ***Time synchronisation Issue: The Time stamped data recorded by IEMs shows a diffrence from the time displyed in GPS. It is the time drift issue. The Audit by DERC has recognised, Time drift as a significant issue affecting the Energy Accounting. In exsiting meters, the time synchronization is done manually once a month.***
3. ***Compatibility issues due to Non-DLMS meters: The existing IEMs are non-dlms and thus the data can only be accessed through Proprietry OEM softwares. As a result replacement of these meters with another make meters will also create compatibility issues.***
4. ***Delay in detection of Meter Failure: The existing energy accounting is based on monthly data reading and thus create delay in case of failure.***
5. **Reactive Energy Pricing:** The existing meters provides only cumulative reactive energy exchange on daily basis. For effective monitoring and control of the exchange of reactive energy, the flow in each integration period is required.

- In light of these facts, it were proposed that TPDDL should make transition towards real time energy accounting by replacing the existing fleet of interface energy meters with new ABT interface meters having 5Min/15Min integration period and data transfer through a robust communication infrastructure and with necessary IT application for storage and analysis of data.
- With detailed technical discussion with different stakeholders and team in TPDDL we have decided selected the best in-class ABT Metering technology with DLMS compliance. Some of the major features of the selected technology are as follows:
 - In built configurable RS232/RS485 and Ethernet ports in a single product & capability of simultaneous communication through all these ports to different master clients with refresh rate of alternative second .
 - Simultaneous DLMS and MODBUS over Ethernet port.
 - RS232 port compatible with meter-powered modem.
 - Metering for availability-based tariffs (ABT) and open access systems.
 - 0.2S accuracy for active and reactive measurement.
 - On-line monitoring of energy exchange at various interface points.
 - Energy accounting, automation, and system integration
 - 5 minutes Integration period.

PRESENTATION ON THE TOPIC (1/2 slides) (1 Mins each slide)



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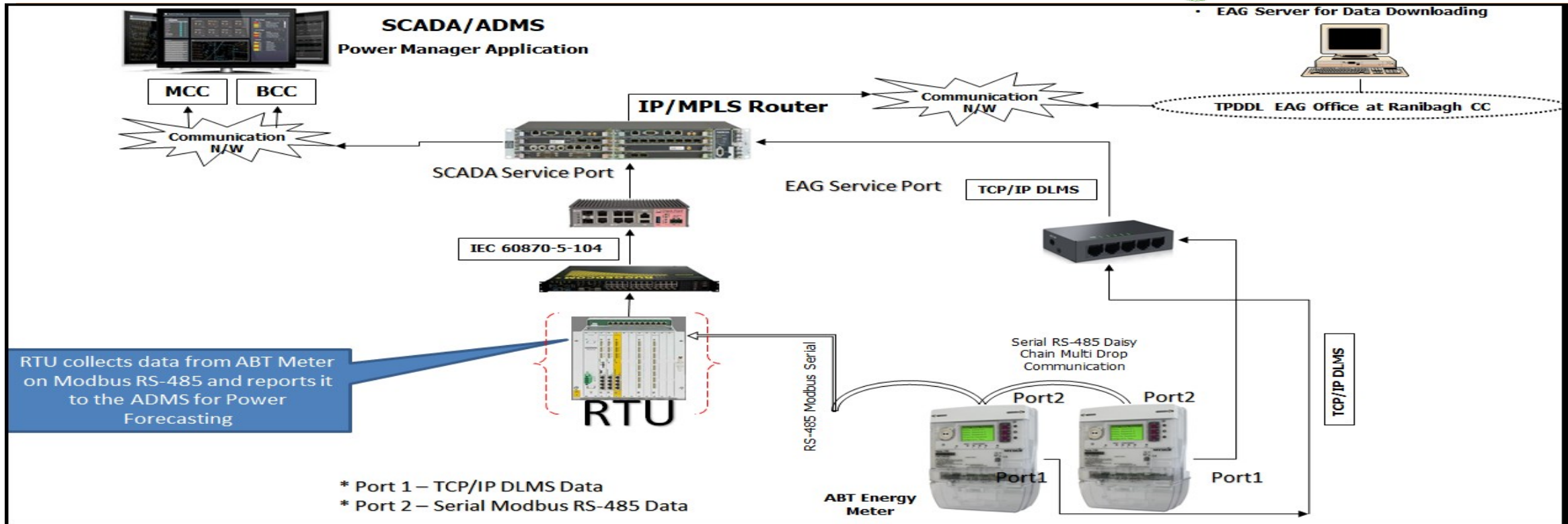


Exhibit 1: ABT Meter Communication System Architecture

Highlights of the Project:-

- Dual Communication System Architecture for Energy Auditing and Power Forecasting.
- Utilization of existing Grid RTU/ Automation system for reporting of energy data to Power Manager Portal for real time power forecasting.
- Utilizing the advanced TCP/IP DLMS protocol for downloading meter data at the Energy Auditing Server, thereby ensuring quicker and more responsive data retrieval.

PRESENTATION ON THE TOPIC (2/2 slides) (1 Mins each slide)



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Efficient and easy in real time data that helps in real time power forecasting

Active / Reactive power management.

Encourages Peak Load Management

Facilitate Incentive for Renewable Energy Integration

Contribute to Improved Grid Stability

Accurate data driven decision-Improve accuracy in billing and reduce revenue losses due to inefficiencies.

■ **Pilot Phase (6 months):**

- Identified the interface exchange point for the initial installation of ABT meters.
- Conducted feasibility studies, including infrastructure assessment and communication network readiness.
- Installed 5 no. of ABT meters to test functionality, data transmission, and real time forecasting and billing accuracy.

■ **Expansion Phase (12 months):**

- Expanded the installation of ABT meters for the remaining grid locations.
- Robust Meter data integration for energy accounting and load forecasting.
- Real time Meter Monitoring Page developed for early alerting and restoration in case of meter communication non-availability.

• **Optimization Phase (Ongoing):**

- Creating meter communication availability dashboard for ensuring reliable data availability.
- Utilized data analytics to identify consumption patterns and optimize load distribution.
- Conducted regular maintenance and updates to ensure the reliability and accuracy of ABT meters.
- Ensuring N-1 networking for uninterrupted data availability.



Advance Data analytics to identify the abnormalities in ABT meter SCADA data for accurate power forecasting

Robotic Process Automation of Exchange Data Reports

- Real Time Alerts for Communication offline cases and deviations
- Auto generated reports for abnormalities in data integrity

Advance Data Analytics

- QC Tools analysis for ABT meter data to identify problematic exchange points
- High Data Accuracy by proactive comparing **SCADA** v/s **DTL & EAG** Meter Data. Target to minimize deviations and removal of “Correction Factor” by PSC

Data (N-3) Redundancy and Auto Switch over mechanism

- Developing (N-3) data redundancy (ABT Meter, BCPU data and Calculated data)
- Auto switch over mechanism with priorities algorithms (1st – ABT meter 2nd – BCPU data and 3rd Calculated of ABT and 4th Calculated of BCPU)

THANK YOU