PROVIDING APPLICATION SOFTWARE FOR ABT METERING

Abstract
Kalkitech designed, developed and implemented the Availability Based Tariff (ABT) solution for State Load Dispatch Center (SLDC) of MPPTCL enabling the organization to carry out its responsibilities under section 32 of Electricity Act 2003 – ensuring integrated operation (operation, planning, monitoring and control) of the power system in the state effectively. The solution is the first of its kind in India – IT enabling implementation of ABT at Intra State level. The concept of Intra State ABT is in itself a complex subject in the wake of changing regulatory environment, inter and intra state open access, balancing and settlement (inter and intra), integration issues of proprietary protocol based meters among others. These critical issues were solved by utilizing Kalkitech’s rich energy domain expertise and integration experience in building the ABT solution. The solution is performing satisfactorily to and above the expectations of the customer.

Client Overview
The client MPPTCL is a Government of Madhya Pradesh undertaking and is one of the six (6) companies carved out of Madhya Pradesh State Electricity Board (MPSEB). MPPTCL is responsible for operating the transmission infrastructure within the state. MPPTCL has around 24000 km of High Tension transmission lines and around 230 High Voltage sub-station across the state. The end user of the system is SLDC.

The responsibilities of SLDC are:
• The State Load Despatch Centre shall be the apex body to ensure integrated operation of the power system in a State.
• The State Load Despatch Centre shall –
  – Be responsible for optimum scheduling and despatch of electricity within a State, in accordance with the contracts entered into with the licensees or the generating companies operating in that State;
  – Monitor grid operations;
  – Keep accounts of the quantity of electricity transmitted through the State grid;
  – Exercise supervision and control over the intra-state transmission system; and

Client
Madhya Pradesh Power Transmission Co. Ltd. (MPPTCL)

Website
http://www.mptransco.nic.in/

Region
Madhya Pradesh, India

Industry
Transmission Utility

Kalkitech Solutions
Energy Scheduling and Accounting

Kalkitech Products
ELTRIX DOPS – Availability Based Tariff software

Client
Madhya Pradesh Power Transmission Company Limited (MPPTCL) State Load Dispatch Centre

MPPTCL was in need of a solution that would facilitate scheduling, accounting, tariff calculation and reconciliation as per the ABT structure. The solution also had to provide the required interface between the SLDC and Open access customers to avail transmission facilities for power trading.
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- Be responsible for carrying out real time operations for grid control and despatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code.
- The State Load Despatch Centre may levy and collect such fee and charges from the generating companies and licensees engaged in Intra-State Transmission of electricity as may be specified by the State Commission.

Background
- With the notification of Intra State ABT by MPERC, MPPTCL SLDC started implementing Intra State ABT manually with in-house excel based first generation system.
- That system depended more hands on from Users, for even non-productive and repetitive instances. This resulted in inefficiency, both in terms of resources and accuracy of the work.
- The technical factors and challenges faced by SLDC manual operations were
  - Coordinating inputs from various stake holders – RLDC, State sector generating stations, distribution companies, Inter and Intra state Open access customers
  - Complying to the strict time frame of the scheduling regulations: processing the inputs with set guidelines and other factors within the time frame was virtually cumbersome, and many a times not possible manually
  - Meter Data Acquisition – offline and online:
  - Validation, editing and estimation of huge sets of meter data
  - Energy accounting, given the constraints of huge set of meter data, RLDC data, PPAs, Open access agreements, balancing and settlement mechanism, and regulations was taking months to calculate manually whereas regulation requires it in a week. This resulted in penalty from RLDC and financial activities among stake holders.
  - Accuracy of the results was a concern.
  - Resource allocation: SLDC was not able to allocate its expert resources in primary responsibilities and value adding activities.

Hence, SLDC was in need of an automated solution for Scheduling, Energy Accounting and Open Access in Intra State ABT regime.

Key Challenges
- Identify and understand the complex Intra State ABT structure.
- Changing/ evolving regulatory environment.
- Communication with legacy meters.
- Requirement of ABT meters.
- Computation of energy account within reasonable time.
- Gaming constraints.
- Implementation of Open access

Business Case
ABT is a system of rewards and penalties to enforce day ahead committed schedules.

MPPTCL was in need of a solution that would facilitate scheduling, accounting, tariff calculation and reconciliation as per the ABT structure. The solution shall also provide the required interface between the SLDC and Open access customers to avail transmission facilities for power trading.

Kalkitech’s intelligent ABT solution is a state of the art solution that enables power utility to monitor the power exported and imported from the grid in perspective of ABT maxims. It is a flexible solution with an extensive set of features that allows system operators to monitor different parameters within the ABT regime. The solution draws ideas and techniques from International standards and applies them to Indian regulatory framework.

Some of the solutions provided by Kalkitech are:
- Web based energy scheduling - DOPS
- Energy Accounting, and Balancing & Settlement - DOPS
- Transmission System Open Access Approval Management - STOA
- Plant Performance Monitoring - PPM
- Economic Load Dispatch (ELD)/ Merit Order Rating (MOR)
- Generation Management – Thermal
- Generation Management – Hydro
- Performance Analysis Diagnostics and Optimization - PADO

Kalkitech’s Solution
Kalkitech’s commitment towards supporting its customers in building an optimized grid has resulted in developing a number of energy optimization solutions, including a mix of products and services which combine power and energy domain expertise with optimization technology know how. Combined with its communication solutions, both solutions complement each other in terms of building a smart and intelligent grid.

Case Solution
ABT solution implemented in MPPTCL is for scheduling, accounting and billing of energy transactions among generation, distribution companies and open access customers over a transmission network.

MPPTCL SLDC supervises and controls the generation, distribution and open access of power spanning 31 state sector power

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plants, central sector power, 3 distribution companies and a number of inter and intra state open access customers. The ABT, energy scheduling module generates dispatch schedule for generating stations, drawl schedule for distribution companies, open access schedules based on declared capacity, beneficiary requirement, open access approvals, technical minimum, ramp rate, load forecasting, demand, machine availability, entitlement and transmission congestion.

- The billing and accounting sub module is based on IEGC, CERC and MPERC regulations on ABT regime.
- Provision of Hot bay server or the redundant server as a backup, has made the solution very powerful for MPPTCL.
- Data acquisition from majority of the meters in the market.
- Reporting tool for user to configure custom made reports in addition to standard reports.

Key Components

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Windows 2003 Server</th>
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<tbody>
<tr>
<td>Database</td>
<td>Oracle 10g</td>
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<tr>
<td>Programming language</td>
<td>VB6.0, Java</td>
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<td>Web Portal</td>
<td>RTIP</td>
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<tr>
<td>Reporting Tool</td>
<td>Inet Crystal Clear Reports</td>
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Key Achievement/Innovations

- Web based Scheduling Engine
- Tariff Modeling Engine
- MIOS Data Driver
- Extract Transform Load of WRLDC schedule from WRLDC website
- Database Redundancy
- Application Redundancy

Key Benefits

- Web Based Scheduling
- Tariff Modeling
- Efficient Energy accounting
- Monitoring critical parameters for efficient grid operation
- Reduction in process time
- Open architecture allows easy and quick integration with multiple devices
- Reduced cycle time, monotonous labor and manual error
- Ease of use and configuration allows minimal user training
- Reduction in IT expenditure for future enhancements