How AMIS can support an existing CIS

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Oncor Electric Delivery is powering Texas today and working on tomorrow.

- EFH (formally TXU Corp.), is a Dallas-based energy company, manages a portfolio of competitive and regulated energy businesses primarily in Texas. Oncor Electric Delivery, is an electric distribution and transmission business that uses superior asset management skills to provide reliable electricity delivery to consumers. Oncor Electric Delivery operates the largest distribution and transmission system in Texas, providing power to three million electric delivery points over more than 101,000 miles of distribution and 14,300 miles of transmission lines.
Oncor Electric Delivery

- Oncor Electric Delivery is the nation's sixth-largest U.S. transmission and distribution company, operating in a high-growth service area.
- Supplies electricity to over three million points of delivery, or about one third of the state's population.
- Operates in a 27,000 sq. mile service area in north central Texas with 402 incorporated municipalities and 92 counties.
Deregulation: Restructured Electric Industry

Competitive Generation

Transmission & Distribution

Competitive Retail Electric Providers (CRs)

Prohibited from selling electricity or other competitively available energy services

Regulated

Customer
TX Retail Market Systems & Transactions

- Oncor Electric Delivery processes 178 Million transactions each year

~ 70 Competitive Retailers
AMIS deployed as impetus for the Oncor SmartGrid

• Truly exciting times in Oncor Electric Delivery.
• We are aggressively moving forward on a number of technology initiatives that will – over time - transform our delivery system.
• Examples of these initiatives include:
  – Advanced Measurement Information Systems (AMIS - AMR and AMI), with broadband over power line (BPL), and Power Line Carrier (PLC) technologies
  – Enterprise Service Bus, Data Warehouses, and distribution device automation.
• These projects are one of the more significant systems development efforts undertaken in recent years. It truly touches every aspect of electric delivery operations and measurement services.
• It will truly lead a transformation of our business
## Oncor’s AMI Rollout

### Function

<table>
<thead>
<tr>
<th>Immediate</th>
<th>Near Term</th>
<th>Future</th>
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</thead>
<tbody>
<tr>
<td>Billing Reads</td>
<td>Outage Detection</td>
<td>System Operation</td>
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<td>Customer Response</td>
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<td></td>
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<td>Demand Management</td>
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### Solution

- Customer Response
- Demand Management

### Benefits

<table>
<thead>
<tr>
<th>Immediate</th>
<th>Near Term</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redeploy Operating Capital to Maintenance</td>
<td>Reduced Costs to Restore Service</td>
<td>System Monitoring</td>
</tr>
<tr>
<td>Reduced Risks</td>
<td>Reduced Time to Restore</td>
<td>Load Shifting</td>
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<tr>
<td>Improved Reliability (Eliminates SKIPS)</td>
<td>Improved SAIDI</td>
<td>Improved Asset Utilization</td>
</tr>
<tr>
<td>Customer Security</td>
<td>Improved Customer Satisfaction</td>
<td>Reduced Asset Costs</td>
</tr>
<tr>
<td>Tamper Detection</td>
<td>Problem Detection</td>
<td>Improved Reliability</td>
</tr>
</tbody>
</table>

- Automated Service Order Completion
- Quicker Response
- Appliance Control
- Demand Management
- Market Design
- Direct Customer Interaction
- Enables Market Innovation
Creating The 21st Century Smart Grid

Transforming TXU’s power distribution network into the nations first Smart Grid will allow a platform for a two way exchange of real time information.

Innovative technology such as automated meter reading and smart switches will enable Electric Delivery to move towards top decile in reliability.

What role will CIS systems play in the SMART GRID environment?
Portfolio: Present State Assessment

- Oncor has over 175 major and minor applications in its portfolio
- Many applications used by different internal departments cater to similar needs
  - Same Commercial Off the Shelf products are utilized in a different manner by different departments
  - Sub optimized processes developed by individual departments
  - Separate solution researches and implementations covering similar areas
- Complex network of interfaces due to the large number of applications in the portfolio
- Inconsistent & inaccessible reporting issues

**Major Integration Issues!**
Current Information Infrastructure is **Under Stress**

### Requirements

- Must align my technology to support the business
- Must reduce IT complexity
- Must provide more real time information
- Must enable cost effective changes to my IT environment
- Must be able to assimilate these technologies

### Initiatives

- AMIS Deployment
- BPL Network Communication Fabric
- Smart Grid Technology
  - Future initiatives with joint partners that provide other Capabilities and Intellectual Capital
Oncor’s business is undergoing many changes

Many changes are affecting our business

• Outsourcing 6 business lines in 2004 to Cap Gemini Energy (CgE) (Rev Mgmt, CCC, IT, HR, SC, F&A)
• Started rolling out AMR / AMI in 2005
• Continuous Texas Market Rule Changes (post 2001) have cause dramatic process and system changes. (Tx. Set 2.0, 2.1, 3.0, T&C’s, AMR rule)
• Mass Retailer Transition estimation
• New Market Metrics
• Old home grown systems are sagging under the load of required new functionality
• All would have cause massive changes to the home grown legacy CIS

Re-Missioned Strategy for Oncor

• Going to a Components Based Architecture using an ESB to link applications together
• Oncor’s strategy is to buy Vendor COTS with long term Vendor support
Commercial Products are Overkill for Oncor

Commercial CIS products are a culmination of the needs of traditional vertically-integrated utilities and retail companies. These products are functionally rich and highly-integrated. They contain substantially more functionality than that required by a TDSP doing business in Texas.
Market requirements on TDSP necessitate an MDMS/AMIS

Meter Data Management Systems provide isolation of the variability of AMI management and data from CIS business needs, flexible meter data processing as needed to produce billing data. MDMS also provides meter data processing and delivery for other utility systems.

New Functionality will be required in the Smart Grid environment that doesn’t exist today.
eMeter Overview

• **Company Background & Qualifications**
  – Founded in Silicon Valley in 1999 by original Cellnet executive group with nearly two decades experience in advanced meters
  – Leader in Advanced Metering Information Systems (AMIS)
    • Meter Data Management (MDM)
    • AMI-related Business Process Management (BPM)
    • Integration platform linking AMI systems to utility legacy systems
  – Vendor-neutral technology and business strategy

• **Business Focus on Software & Services supporting AMI**
  – EnergyIP™ software
    • License
    • Implementation services
    • Software support and maintenance services
    • Software commercially available and in production
  – Strategic consulting on AMI and mass market demand response
Where an AMIS fits
Integrating AMIS with Oncor Systems

- AMIS represents the AMI Services to the Enterprise
- AMIS delivers business functions and services – not just meter reads
- AMIS compliments other enterprise components to complete the function
Oncor’s MDMS Project Timeline

- **Sep - 05 - Nov - 05**: Requirements Phase
- **Nov - 05 - Apr - 06**: Construction Phase
- **Feb - 06 - Jun - 06**: Testing Phase

Dates:
- PIeGoLive Read Only: 5/15/06
- PIeGoLive SO Mgmt: 6/15/06
- PIeGoLive Billing: 7/14/06
CIS integration and impacts

• **Here’s what we accomplished:**
  – Move the meter data information and collection processes out of our CIS system into the MDMS
    – Reduce system maintenance cost
    – Allows better estimation and business rule control
    – Better control of AMI implementation processes
  – Move manual validation of meter reading/usage and exception handling into the MDMS
    – Reduce service order creation overhead and delays
    – Creates trust in the meter investigation orders for the field
    – Provides better controlled error handling
  – Allow business processes in our LCIS to be independent of the type of technology and functionality of AMR
    – Allows data to be seamlessly interfaced to any system that needs the data
  - Identify data and relationship discrepancies between CIS, GIS and AMI
Accommodating Market Changes

2007 Market rule changes requires tracking and reporting of consecutive estimated bills, estimation reasons and re-estimation after actual reads

- Significant changes to legacy CIS necessary to meet requirements
- Enhancements to MDMS to track and report meter reading details
- Focus CIS changes on market interface only
- Result – faster compliance at lower cost
A Component Based Architecture Will Use an Enterprise Service Bus [ESB] to Link the Various Components Together

Enterprise Bus Level Services
- OMS
- SCADA
- Financials
- Meter Management
- Security Service
- Workflow Service
- Network Billing
- Reconciliation
- Service Orders

High Level Illustration
- Consumption Data Repository
- Network Billing Data Repository
- Asset Repository
- Engineering Cleansing Engine
- PI Historian

Provided by EnergyIP

Component View of Major CIS Functionality
- Network Billing
- Service Orders
- Reconciliation
- Asset Management Library