SESSION H3: STRATEGIC ENERGY MANAGEMENT

COSTS AND BENEFITS OF ENTERPRISE-WIDE IMPLEMENTATION OF SUPERIOR ENERGY PERFORMANCE AT SCHNEIDER ELECTRIC

1 OCTOBER, 2015

EDWIN WILLHITE, REGIONAL FACILITY LEADER
SCHNEIDER ELECTRIC
YANNICK TAMM, ENGINEER/SCIENTIST
ENERGETICS INCORPORATED
Schneider Electric’s Drivers for Joining SEP

- Energy Management System structure to help drive and sustain savings
- Reward system to motivate and reward sites that perform well
- Positive exposure for the company, important in our role as The Global Specialist in Energy Management
- Verification of the value of the energy program and its effects to the organization
Our Corporate Goals and Alignment with Enterprise SEP

- Schneider Electric has a goal as a part of our company program to reduce energy consumption by 10% in its largest sites worldwide.
- Enterprise SEP is a major driver of this reduction in North America.
  - Standardizes our approach to EnMS implementation.
  - Allows us to easily identify and share best practices of our significant energy users.
  - Aligns with our current efforts to aggregate, communicate, and share results internally.
  - Targeting 20 certified sites by the end of 2015.
Average SEP Implementation Cost Breakdown per Plant

- 8 SEP certified facilities
- Technical Assistance was only needed for the initial SEP implementation at Smyrna, TN. Schneider used this initial training to develop in-house expertise.
- Corporate energy team trained staff and implemented SEP at the remaining facilities.
INTERNAL STAFF TIME FOR ENERGY MANAGEMENT AND SEP AT SCHNEIDER ELECTRIC

Staff required to develop and implement EnMS and prepare for ISO 50001 and SEP audits
1.75 Person Year Equivalents per plant on average

Staff involved in energy management prior to SEP (Business As Usual)
1.18 Person Year Equivalents per plant on average

0.57 Person Year Equivalents of additional effort to meet the requirements of SEP
INTERNAL STAFF TIME FOR SAMPLING OF 13 SEP CERTIFIED FACILITIES – 2015 ACEEE PAPER

INTERNAL STAFF TIME COST FOR 8 FACILITIES

Internal Staff Cost over Time

EnMS Implementation Date

Jan-10      Feb-11      Apr-12      Oct-12      May-13      Nov-13      Jun-14      Dec-14      Jul-15      Jan-16

Internal Staff Cost (less sunk internal labor cost)

$0       $20,000      $40,000      $60,000      $80,000      $100,000      $120,000      $140,000      $160,000      $180,000
Cost reductions are primarily driven by reducing internal labor costs.
REASONS FOR COST DECREASES

- The enterprise program aligns with our efforts to integrate other standards (ISO 14001, OHSAS 18001) into a common set of enterprise procedures
  - Reduces time for writing procedures
  - Provides a framework that’s been used in several other facilities, increasing the knowledge base for support and decreasing time to create new solutions
  - Drives us towards common tools and processes across the enterprise, reducing licensing costs and startup time
  - Allows use to use expertise in other disciplines to improve our energy programs
  - Reuses procedures common among the standards (Document Control, Control of Records, Legal and Other Requirements, etc)
SEP AND ISO 50001 IMPLEMENTATIONS
HOW WE DO IT

● 6 Months from Start to Certification Audit

● Workforce Requirements
  o Internal Consulting Team
    ➢ Provide expertise in modeling
    ➢ 5 CP-EnMS’s
    ➢ 1 SEP Performance Verifier
  o Plant Resources
    ➢ Drive new procedures
    ➢ Host external auditors and performance verifiers
  o Implementation Costs
    ➢ First Site was twice the cost of each of the next 10
    ➢ Future Sites will be reduced by a further 50%
## Transition to Enterprise EnMS

<table>
<thead>
<tr>
<th>Target Date(s)</th>
<th>Event/Task</th>
<th>Personnel Involved</th>
<th>Sites Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 January 2015</td>
<td>Appoint Energy Management Designee</td>
<td>Plant Management</td>
<td>Group B</td>
</tr>
<tr>
<td>01 January 2015</td>
<td>Purchase Copy of ISO 50001 and MSE 50021</td>
<td>Energy Designee</td>
<td>Group B</td>
</tr>
<tr>
<td>01 February 2015</td>
<td>Communicate Energy Policy</td>
<td>All</td>
<td>Groups A and B</td>
</tr>
<tr>
<td>15 February 2015</td>
<td>Adopt New Procedures</td>
<td>Energy Designee</td>
<td>Groups A and B</td>
</tr>
<tr>
<td>31 March 2015</td>
<td>Complete Energy Review</td>
<td>ESS; Energy Designee</td>
<td>Group B</td>
</tr>
<tr>
<td>31 March 2015</td>
<td>Conduct Energy Basics Training</td>
<td>All</td>
<td>Groups A and B</td>
</tr>
<tr>
<td>17 April 2015</td>
<td>Conduct Internal Audits and Management Review</td>
<td>ESS; Energy Designee</td>
<td>Group A</td>
</tr>
<tr>
<td>15 May 2015</td>
<td>Conduct Internal Audits and Management Review</td>
<td>ESS; Energy Designee</td>
<td>Group B</td>
</tr>
<tr>
<td>15 May 2015</td>
<td>Complete Central Office Audit</td>
<td>Energy Team; Enterprise Team</td>
<td>Smyrna</td>
</tr>
<tr>
<td>31 May 2015</td>
<td>Complete Surveillance Audits</td>
<td>ESS; Energy Team</td>
<td>Group A</td>
</tr>
<tr>
<td>31 July 2015</td>
<td>Complete Certification Audits</td>
<td>ESS; Energy Team</td>
<td>Group B</td>
</tr>
</tbody>
</table>

*Group A - Sites already ISO 50001 certified*

*Group B - Sites without ISO 50001 certification*
**Qualitative Benefits**

- Improved our record keeping and process standardization
- Helped get the whole site structure involved
- Provides a framework for sustaining the program and ensuring that we don’t backslide on savings
- Took our M&V practices to a higher level
- Allowed us to focus on execution and implementation of the processes rather than procedure writing
- Allowed us to realize savings with facilities that are not in the SEP program through sharing of best practices.
  - Used DOE programs to double the efficiency of our paint ovens (typical significant energy use)
  - Using our M and V protocol to extend LED lighting savings from one facility to another reducing the lead time of implementation.
2014 SENA Energy Model for North America – 56 Sites

ENERGY PERFORMANCE INDICATORS

Year to Date Energy Performance

<table>
<thead>
<tr>
<th></th>
<th>Combined</th>
<th>Electric</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>-7%</td>
<td>-6%</td>
<td>-7%</td>
<td></td>
</tr>
</tbody>
</table>

Monthly Energy Performance

<table>
<thead>
<tr>
<th></th>
<th>Jan-14</th>
<th>Feb-14</th>
<th>Mar-14</th>
<th>Apr-14</th>
<th>May-14</th>
<th>Jun-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>-7%</td>
<td>-10%</td>
<td>-5%</td>
<td>-5%</td>
<td>-5%</td>
<td>-6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Jul-14</th>
<th>Aug-14</th>
<th>Sep-14</th>
<th>Oct-14</th>
<th>Nov-14</th>
<th>Dec-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>-5%</td>
<td>-6%</td>
<td>-7%</td>
<td>-6%</td>
<td>-11%</td>
<td>-3%</td>
</tr>
</tbody>
</table>

Monthly Energy Performance

Negative is a reduction in Energy Consumption
QUESTIONS?