Energy Conservation Initiative (ECI) Project Summary
Mann Library and Mann Library Addition, Facility 1027,1027A

What We Did:
Mann Library
We updated the sequences of operations to incorporate demand controlled ventilation allowing a reduction in minimum outdoor air setpoints in the air handling systems. Pumps were added to the preheat coils on the air handlers allowing better temperature control while reducing nuisance trips in cold weather. Adjustable speed drives were installed on multiple make up units and exhaust fans.

Mann Library Addition
Outdated controls were replaced throughout the space and central mechanical systems. Airflow stations were added to allow accurate control of outdoor air entering the building. Updated variable air volume (VAV) box controls enable improved temperature control throughout the building, occupancy sensor based unoccupied mode, and adaptive fan static pressure setpoint reset.

What It Cost: $840,000
How Long It Took: 12 months. Completed May 2014.
What We Saved: $150,000 and 198 tons/per year carbon equivalent annually.

Benefits:
The new controls allow the fan, pump and temperature control systems to be adaptive to user occupancy and significantly reduce energy usage. They also improve comfort and make maintenance much faster due to enhanced graphics, trends, and summary data.

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Peter D. Paradise
Sr Director Facilities

Mann Library and Mann Library Addition: ECI Savings Table

<table>
<thead>
<tr>
<th>Utility</th>
<th>Historical Energy Use (MMBtu)</th>
<th>*FY 2015 Energy Use (MMBtu)</th>
<th>Energy Savings (MMBtu)</th>
<th>% REDUCTION</th>
<th>Historical Cost (billed rates)</th>
<th>* FY 2015 Cost (billed)</th>
<th>Annual Savings $</th>
<th>Equivalent # Homes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>14,500</td>
<td>14,000</td>
<td>500</td>
<td>3%</td>
<td>297,000</td>
<td>290,000</td>
<td>7,000</td>
<td>13</td>
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<tr>
<td>Steam</td>
<td>31,500</td>
<td>28,000</td>
<td>3,500</td>
<td>11%</td>
<td>710,000</td>
<td>630,000</td>
<td>80,000</td>
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<tr>
<td>Chilled Water</td>
<td>24,000</td>
<td>21,000</td>
<td>3,000</td>
<td>13%</td>
<td>440,000</td>
<td>380,000</td>
<td>60,000</td>
<td>60</td>
</tr>
<tr>
<td>Totals</td>
<td>70,000</td>
<td>63,000</td>
<td>7,000</td>
<td>10%</td>
<td>1,450,000</td>
<td>1,300,000</td>
<td>150,000</td>
<td>111</td>
</tr>
</tbody>
</table>

*Based on energy study

Map
Utilities Costs and Use

Mann Library and Mann Library Addition, Total Energy Use - Pre & Post ECI

Updating the controls in Mann Addition along with the coordination of the building management systems between Mann and Mann Addition has resulted in a dramatic reduction of energy use at our facility. FY2014 is over 30% less than 2012!

Peter D. Paradise
Sr Director Facilities

Energy use based on project scope
Equivalent # Homes Savings based on average home use: 40 MMBtu Electric • 90 MMBtu Heat • 50 MMBtu Cooling