Recommendation

Adjust refrigeration suction pressure set points from 24.0 psig (10.2°F) to 34.0 psig (20.5°F). This will increase system efficiency, decreasing compressor energy consumption by 20%.

Annual Savings Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>Quantity</th>
<th>Units</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Consumption</td>
<td>251,010</td>
<td>kWh (site)</td>
<td>$12,550</td>
</tr>
<tr>
<td>Electrical Demand</td>
<td>344</td>
<td>kW Months / yr</td>
<td>$1,719</td>
</tr>
<tr>
<td>Total</td>
<td>856.7</td>
<td>MMBtu</td>
<td><strong>$14,270</strong></td>
</tr>
</tbody>
</table>

Implementation Cost Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Cost</td>
<td>$0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Facility Background

The facility currently uses (insert compressor information here). During the site assessment, facility personnel explained (compressor operating conditions). (Talk about current set points). Motor information was collected for each system and is summarized in the following Motor Analysis Tool page.

Technology Background

Refrigerant evaporation temperature is directly related to compressor suction pressure. Compressors require less power and energy to operate if the pressure differential between suction and discharge pressure (lift) is reduced. Raising suction pressure increases refrigeration efficiency by decreasing this lift and the compression ratio (discharge pressure divided by suction pressure). Typically, 2% to 3% of refrigeration compressor energy can be saved for each degree Fahrenheit increase in suction temperature and associated suction pressure.

Proposal

Change the suction pressure setpoints on the refrigeration system's controllers. Completing this procedure can be done in regular working hours by maintenance personnel so that there are no implementation costs. These actions will decrease the compression ratio, reducing associated annual energy consumption by 251,010 kWh, resulting in an annual cost savings of $14,270.

Notes

Put any additional notes or references at the end. Things like alternative proposals, considerations, and potentials
problems or side-effects should all be noted.
**Data Collected**

**Refrigeration System Data**

- Refrigerant Type: Ammonia
- Cooled Medium Target Temperature: 35.0 °F

**Current Conditions**

- Current Suction Pressure Set Point: 24.0 psig (N. 1)
- Current Suction Temperature Set Point: 10.2 °F (N. 2)
- Current Temperature Differential: 24.8 °F (Eq. 1)

**Proposed Conditions**

- Proposed Suction Pressure: 34.0 psig (N. 1)
- Proposed Suction Temperature: 20.5 °F (N. 2)
- Proposed Temperature Differential: 14.5 °F (Eq. 1)

**Incremental Cost Data**

- Incremental Electricity Cost: $0.05000/kWh (Rf. 1)
- Incremental Demand Cost: $5.00/kW·mo. (Rf. 1)

**Compressor Analysis**

**Savings**

- Savings Factor: 2.0%/°F (N. 3)
- Suction Temperature Increase: 10.2 °F (Eq. 2)

**Energy Savings**

- Current Energy: 1,226,400 kWh/yr. (Rf. 2)
- Energy Savings: 251,010 kWh/yr. (Rf. 2)
- Energy Cost Savings: $12,550 /yr. (Eq. 3)

**Demand Savings**

- Current Demand: 1,680.0 kW·mo. (Rf. 2)
- Demand Savings: 343.8 kW·mo. (Rf. 2)
- Demand Cost Savings: $1,719 /yr. (Eq. 4)

**Economic Results**

- Cost Savings: $14,270 /yr. (Eq. 5)
- Implementation Cost: $0 (Rf. 3)
- Payback: 0.0 yrs. (Rf. 3)

**Notes**

N. 1) Data collected on-site during the assessment. See analyst site report for details.
N. 2) Saturated refrigerant temperature at corresponding pressure.
N. 3) An industry accepted value to determine compressor energy. (2% of compressor energy saved for each degree Fahrenheit that suction temperature increases.)
## Compressor Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Rated Power</th>
<th>Operation Hours</th>
<th>Operation Months</th>
<th>Input Power</th>
<th>Current Demand</th>
<th>Current Energy</th>
<th>Demand Savings</th>
<th>Energy Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(hp)</td>
<td>(hrs./yr.)</td>
<td>(mo./yr.)</td>
<td>(kW)</td>
<td>(kW-mo.)</td>
<td>(kWh)</td>
<td>(kW-mo.)</td>
<td>(kWh/yr.)</td>
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<tr>
<td>Compressor No. 1</td>
<td>100</td>
<td>8,760</td>
<td>12</td>
<td>70.0</td>
<td>840.0</td>
<td>613,200</td>
<td>171.9</td>
<td>125,505</td>
</tr>
<tr>
<td>Compressor No. 2</td>
<td>100</td>
<td>8,760</td>
<td>12</td>
<td>70.0</td>
<td>840.0</td>
<td>613,200</td>
<td>171.9</td>
<td>125,505</td>
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<tr>
<td>Totals</td>
<td>200</td>
<td>140.0</td>
<td>1,680.0</td>
<td>1,226,400</td>
<td>343.8</td>
<td>251,010</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes

N. 4) Motor power obtained from the Motor Analysis Tool (MAT) on the previous pages.