LOS ANGELES COUNTY SHERIFF'S DEPARTMENT

Walk-In Freezer

June 11, 2012

Mr. Marcell Bernall, Jr.
Refrigeration / Steam Supervisor
Los Angeles County Sheriff's Department
11705 S. Alameda Street
Lynwood, CA 90262

Dear Marcell,

Thank you for the opportunity to conduct a Proof of Performance with the installation of IceCOLD® into the walk-in "veggie freezer" located at the Los Angeles County Sheriff's Department's Lynwood Women's Correctional Facility in Lynwood, California.

Using a defined protocol methodology, we conducted the Proof of Performance on this installation to illustrate the savings the LASD will garner as a result of introducing IceCOLD® in their refrigeration units. The data analysis was performed by Dina Wiltshire, IC Catalyst, LLC, Master Distributor IceCOLD®, who also approved the methodology, findings and conclusions in this report.

The following report outlines the methodology, results of the Proof of Performance, efficiency improvement and ultimate savings obtained:

METHODOLOGY

Purpose:
Establish a baseline for electricity cost, return and supply air temperatures, under normal operating conditions of a walk-in unit at Lynwood Women's Correctional Facility. Measure the difference between cost of operating unit before IceCOLD® and after IceCOLD® to determine efficiency improvement and expected energy savings.

Brands: Copeland
Use: Refrigeration
Refrigerant: R22
IceCOLD® Installed: 7 ounces

Tools Utilized:
2 U12 Data Logger (Onset Computer)
2 Temperature / Relative Humidity Sensors
1 AMP Probes

continued next page

LOS ANGELES COUNTY SHERIFF'S DEPARTMENT, cont.

Probe Placement:
Channel 1: AMP Probe (lower amp reading) placed on the line side voltage on the evaporator
Channel 2: Temp/RH probe (lower temp reading) placed on the supply air from the evaporator)
Channel 3: Temp/RH probe (higher temp reading) placed on the return air on the evaporator

Units Measured:
Amperage: Current draw on the L1 (overall amp draw) compressor unit
Temperature/Relative Humidity: On the return and supply air on the evaporator unit

Volume of IceCOLD® Installed:
Using a standard formula ratio of 1 ounce of IceCOLD® to 1 ton, 7 ounces were installed on April 25, 2012.

Units Measured:
AMP: Amount of electricity needed to operate system
Temperature/Relative Humidity: affecting performance of system

The data logger collected the following data:
As this is a refrigeration unit (walk-in freezer), no cooling degree days were used in the calculations. Improvement is based on reduced electricity consumption and improved cold air into the unit. To ensure a comparative analysis, three week days were chosen for the baseline period along with one weekend day (Saturday) for comparison to the exact same days in the post period. Three of those days were week days with Saturday representing weekend type activities which may be different from a week day. In this case, this proved to be true. Demand and consumption of power was much higher on Saturday. It is assumed by the writer that the increase in demand is due to increased load in the walk-in; the inclusion of warm/recently cooked foods needing to be cooled or deliveries that have added demand with doors perhaps being kept open for longer to allow for movement and/or increased content being placed inside the unit.

Baseline:
April 28, 30 and May 2, 4 were chosen to represent baseline
Total amps for the period = 18,330.61
Return Air average = 26.38 °F
Supply Air Average = -26.01 °F

Post Installation:
May 26, 26, 27, 28, 29, 30 and June 2 were chose to represent post installation
Total amps = 14,061.69
Return Air Average = -26.01 °F
Supply Air Average: -22.25 °F

continued next page

LOS ANGELES COUNTY SHERIFF'S DEPARTMENT, cont.

Change:
Amps: 4268.92 Less
Return Air Average: 0.37 °F Cooler
Supply Air Average: 2.9 °F Cooler

	Monday	Wednesday	Friday	Saturday	Total
Baseline	5077.84	5136.24	5271.61	2844.92	18330.61
Post	4333.53	4385.59	2638.05	2704.52	14061.69
Reduction	744.31	750.65	2633.56	140.40	4268.92

This decrease represents a reduction in use of 21.04% which is a very typical result for refrigeration improvement.

There was a total decrease in supply air of –2.9 °F and a decrease in return temperature of 0.37 °F.

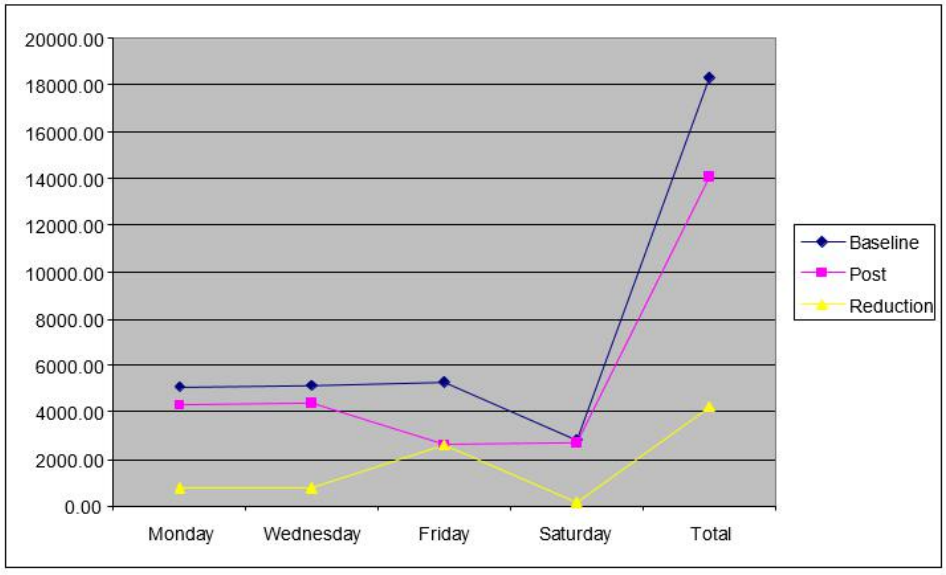
This decrease represents an 11.5% improvement in cooler air into the unit.

Reduction of 21.04% Electricity Use

Supply temperature improved by: -2.9 °F

The unit is now able to supply cooler air to the unit and as such not only cools the space faster; turns off the compressor more quickly but also is able to keep the space cooler longer with less fluctuation in temperature inside the unit.

21.04% Improvement



From the graph above it is clear to see that the change in consumption of amps has been reduced and a noticeable change day over day in consumption has occurred since the inclusion of IceCOLD®.

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LOS ANGELES COUNTY SHERIFF'S DEPARTMENT, cont.

The amperage use in baseline varies within a fairly consistent path and range of consumption except on Saturday which is clearly a very busy day for the unit as power needs have increased substantially. Despite this obvious increase in demand for power, after the inclusion of IceCOLD® the unit uses less in the post period. Refrigerant cycles are typically slower in refrigeration applications due to the narrower delta- T and as such the reaction will continue in this unit for some months to come improving the delta T. The actual energy consumption reduction is due to catalyst one removing the oil fouling and improving the heat exchangers.

PERFORMANCE IMPROVEMENT

Unit used 21.04% LESS power to keep the walk-in unit cooler by reducing the return and supply air by 2.9 degrees.

21.04% Less electricity was required for cooling of the space post installation of IceCOLD®