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CASE STUDY - SUMMARY

August 2016

WESTERN GATEWAY STORAGE COMPANY FIRST TO SAVE WITH EVAPCOLD

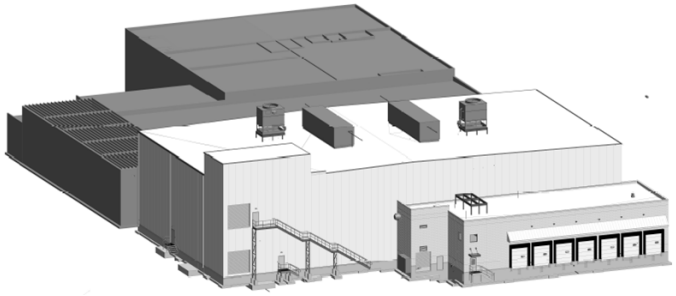
The best solution for freezer and cooler applications

Western Gateway Project Specifications	
Equipment	(2) LCR-060P-L20-2H-W Evapcold Units (2) ATWB 9-7K12 Fluid Coolers
Capacity	70 TR per LCR Unit x (2) = 140 TR max capacity
Charge	290 lbs. NH_3 per LCR Unit x (2) = 580 lbs. NH_3 vs. 3500 lbs. NH_3 for comparable stick-built system

Western Gateway Storage Company is the top cold storage company in northern Utah and has been in business for a century. They have always used state of the art ammonia refrigeration technologies to keep their clients' product cold, and now they've chosen Evapcold Low Charge Ammonia packages for their new 30,000 square foot freezer facility in Ogden, Utah. The small 580 pound ammonia charge is a great benefit to Western Gateway because it significantly reduces their regulatory compliance costs, particularly because of the comprehensive product and system documentation provided by Evapco.

One of two Evapcold LCR units, fully installed at Western Gateway.

Western Gateway's two Evapcold LCR-060P-L20-2H-W units provide a combined rated capacity of 120 tons of refrigeration (TR) at a room temperature of -10°F. Each unit's compressor can be sped up to provide 70 TR in case one unit needs to be taken offline. The water-cooled units at Western Gateway are designed for maximum energy efficiency with variable frequency drives (VFDs) on all motors. The cold climate in northern Utah also requires freeze protection, so each Evapco fluid cooler feeds 40% propylene glycol to its LCR unit and maintains efficiency through advanced wet cooler design and VFDs on all fans.



Two Evapcold units and adjoining fluid coolers on the new Western Gateway facility in Ogden, Utah.

Designed to maximize energy efficiency

Western Gateway's Evapcold LCR units provide substantial energy savings compared to a traditional system. Additionally, because the Evapcold system is entirely self-contained, end users can measure energy consumption at one point - the Evapcold main power feed.

The local utility awarded Western Gateway an electrical rebate of $60,000 for installing Evapcold. Additionally, the Evapcold units also save 20% annually on kWh consumption compared to a baseline stick-built installation of a single stage economized recirculated liquid ammonia system as shown below.

Western Gateway Annual Energy Savings		
Equipment	**Annual kWh Savings**	**Annual Cost Savings**
Evapcold LCR Units	141,304	$20,722
Fluid Cooler Fan VFDs	59,280	$2,613
Evaporator Fan VFDs	79,419	$5,408
Total Annual Savings	**280,003**	**$28,743**

Every component of the Evapcold system is designed to maximize efficiency and improve performance. The dual evaporators, rated in accordance with AHRI Standard 420, operate at a low recirculation rate of 1.2:1.0 and include optional VFDs on the evaporator fans to improve part-load efficiency. Each unit's screw compressor also utilizes a VFD to provide superior part-load efficiency and is economized to improve overall system efficiency.

The Evapcold LCR machine room.

Cost effective installation and operation

Western Gateway initially developed a budget for a complete traditional stick-built system. The Evapcold solution fit within this budget and also allowed for a small stick-built system to be added to service the 20 TR dock. Evapcold units helped Western Gateway save on overall installation cost. The fully wired and piped units alleviate the need for contractors to perform a variety of site installation tasks.

Installing Evapcold units is straightforward and reduces the amount of work performed by the refrigeration and electrical contractors.

By choosing Evapcold, Western Gateway eliminated the need to build a large central stick-built machine room. However, instead of getting rid of the machine room entirely, Western Gateway chose to use this space to house refrigeration equipment for a separate building and manufacturing process. Today, the extra space created by Evapcold supports an additional manufacturing revenue stream for Western Gateway.

Startup

Successful startup of both Evapcold units occurred on June 17th, 2016. Both units performed well under 100°F hot ambient startup conditions. The units were then turned off and the Evapco ATWB fluid coolers ran with no load in passivation mode for several weeks while building work was completed. The Evapcold units were turned back on on July 7th and ran in high temperature mode at 45°F until July 21st while the storage racking was completed. Final building temperature pull-down began on July 22nd. The warehouse successfully pulled down to a -10°F design temperature over a 10 day period with no problems. The units continue to run successfully at -10°F room temperature.

Lessons learned

Evapcold LCR units require some different considerations than stick-built systems in the facility design. It is important to coordinate with the general contractor, architect and structural engineer during the initial building design to maximize project savings with Evapcold. Evapcold units may eliminate the need to construct a central machine room, or at least reduce its size. The electrical contractor will also need to perform less work because Evapcold systems come pre-wired and need only be connected to a 460V power feed. Building designers need to account for the weight of Evapcold systems when designing the roof structure. With all factors carefully considered, choosing Evapcold units can reduce the overall installation cost compared to a comparable stick-built system.

It is also important to consider that one size or configuration does not fit all. Evapcold units can effectively cover spaces from 5,000 to 35,000 square feet per unit. Different Evapcold models can be optimized to provide the best overall solution for the unique layouts and cooling requirements of each refrigerated facility.

Breaking down the barriers

New technologies are disruptive to any industry, and refrigeration is no different. Packaged low charge ammonia systems have many benefits, but engineers, contractors and end users are accustomed to traditional stick-built systems. The pace at which the industry will adopt packaged low charge systems is dependent upon the success of those first to market. This is why Evapco has invested heavily in research & development, testing & validation and manufacturing infrastructure for the Evapcold product. This large investment also explains why the startup of the Western Gateway units occurred flawlessly and the first Evapcold installation is a complete success.