

Lessons From a Low-Charge Ammonia Installation

The world's first deployment of the Evapcold packaged low-charge system was an opportunity to invest in the future that has paid dividends for Western Gateway Storage

– By David W. Bornemeier

After purchasing Western Gateway Cold Storage, located in Ogden, Utah, in 2011, my wife Becky and I found ourselves needing additional freezer space to meet more demand from existing customers as well as the growing regional demand in the Western U.S. Turning down business due to capacity constraints was downright depressing.

But we were faced with a critical decision – whom to entrust as our refrigeration equipment supplier – that would literally make or break our company.

Here are two key lessons we learned in making that decision.

Lesson 1: Educate the End-User Design Team

During the design and estimating process, we assumed big general contractors that have food/distribution construction divisions would have their finger on the pulse of the latest freezer technology. However, during the design phase, our experience was that even large general contractors and their lead estimators needed “a crash course in refrigeration design.”

It is NOT unreasonable to assume that these division-specific general contractors have up-to-date knowledge. Isn't this why they claim to have specific construction specialties and why they can charge for this expertise? But this assumption cost us both time and money.

End-users should instead rely more on a famed Ronald Reagan approach, “Trust, But Verify.” Without this verification process, end-users are all too often left to simply do as their contractors

have done in the past – and contractors have LESS motivation to change from systems that have worked. Change is hard, but necessary, and end users should demand it. But they first need to educate themselves about the latest technology.

Lesson 2: Verification and Self-Education Pays Off

Rapid technology advances are not isolated now to just the latest smartphone release; new technology and design innovations in many fields often hold much potential. However, early adopters have been known to get burned. So our task was to find the latest refrigeration technology that had the best chance for decades of trouble-free service.

It's our responsibility as end-users to ask the tough questions that can sometimes make you feel foolish when asking them. Nonetheless, I believe that you can't ask “Why?” too frequently. In the long run, our verification process led us to the best solution for our refrigeration system.

In particular, it was the following two questions – born of curiosity – that led us to our refrigeration solution: “Why isn't there a compact industrial refrigeration system that can be located up and out of the way?” and “If HFCs are to be phased out, why is my general contractor offering it as a viable long-term solution for us?”

That was in March of 2015. In this article, I will give the results from our use of “Trust, but Verify” and “Why?” questions.

We had these expectations for our new freezer system: Maintain 1.2 million cu ft of storage space at a minimum of -20°F while at the same time drastically reducing our potential environmental regulatory burden through use of natural refrigerants, all without sacrificing energy efficiency or safety, or increasing our maintenance requirement.

To accomplish this, we decided to entrust our freezer expansion to the new Evapcold low-charge ammonia package from equipment manufacturer Evapco.

Before I provide the results we have seen from the Evapcold system, please realize that I have not been compensated by the Evapco folks. No discounts were given for being the world's first installation of their new flagship product. Anyway, we had a good reason not to take them even if they had been offered: No excuses for failure. Again, we needed our refrigeration system simply to work, period. Both of our reputations were (and still are) on the line. And the results are in: the Evapcold low-charge units just plain work. Our bet paid off spectacularly and specifically in these ways:

IMMEDIATE BENEFITS

- ▶ We experienced a massive reduction in installation time and associated cost, though the savings in field labor were offset, in part, by the Evapcold unit cost.
- ▶ Due to the much reduced system layout, our energy costs were reduced relative to a traditional system, and we qualified for local utility incentives of nearly \$60,000.
- ▶ Our risk of cost overruns from poor contractor estimation, poor project management, design errors/omissions or other unforeseen conditions was fully contained by aligning with a well-established company.
- ▶ Our pollution insurance cost was reduced by over 50% when compared to a traditional system using 10 times the ammonia profile.

LONG-TERM BENEFITS

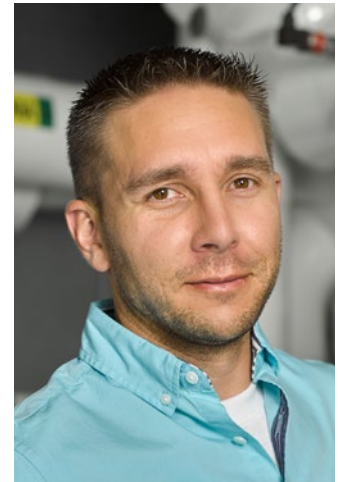
- ▶ Our system has a ZERO GWP (global warming potential) and ZERO ODP (ozone depletion potential), which is the best “insurance” to withstand current and future U.S. Environmental Protection Agency regulations.
- ▶ Evapco offers one-stop responsibility for all system components (compressor, valves, pipe fittings, controls, etc.) The blunt reality is that your building, and most refrigeration system components, will last longer than most contractors will be in business.
- ▶ One-stop responsibility has already translated to a lower annual maintenance bill and future peace of mind for our company. Having the manufacturer oversee design AND construction of the our refrigeration system eliminated the communication risk and the ensuing finger pointing that can happen when one entity is in charge of design and another only in charge of install. I have built using both methods and, given the option to decide, will never separate responsibility for design and installation of a refrigeration system. Our Evapcold units have been refreshingly low-charge/low-maintenance/low-drama.
- ▶ Safety will be a lasting legacy of our new building. ALL refrigerant is contained outside active areas of our freezer, eliminating accidental contact with people, product and product-handling equipment in the refrigerated space.

UNINTENDED BENEFITS

- ▶ The design of the Evapcold units unlocked space in our machine room that has been used for an additional building tenant, which has increased revenue.
- ▶ The ability to resell a used compressor, evaporator, etc., is common. But the secondary market for an entire refrigeration system is less common. However, the Evapcold units we purchased have resell potential. Imagine, many decades from now, swapping out your entire refrigeration system with the same relative ease that you change out your home washer and dryer – unplug, remove, install, plug in. Our building design allows us this very valuable future option that would otherwise require a major retrofit to provide the same benefit.

Because of the immediate and long-term benefits – with no significant net-cost difference over traditional stick-built system design – we see no reason why low-charge package units should not be the new standard for industrial refrigeration. Further, while HFC/HCFC refrigerant systems can, in some cases, be less expensive up front, their regulatory profile and environmental impacts put purchasers of these systems in the same category as the kid who pees in the pool: Only one sees the benefit while everyone else suffers the consequence.

Western Gateway bet on its future, and we believe the future is bright, with even more room for innovation. But if the only thing we were left with is knowing we pulled our weight in modernizing our state’s cold storage logistics chain and utilized a powerful, yet sustainable, refrigerant that helps my family and our entire state literally breathe easier – I would be cool with that, too. ■ DB



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