

# HANSEN CASE STORIES

## THE CHALLENGE

A typical industrial refrigeration system has hundreds of valves, each with an important role to play in the safe and efficient operation of a modern cold storage facility. However, a staggering number of these valves (over 17%) are non-functional or have varying degrees of limited functionality, leading to energy waste in the form of parasitic loads, as well as latent safety risks and unplanned maintenance or downtime. Reducing these hidden energy costs depends on early detection of valve performance anomalies before valves fail completely, as well as reducing mechanical integrity-associated risks. The good news is that most of these challenges can be mitigated through rigorous and continuous monitoring. With new IoT systems, like Hansen's Sentinel, progressive managers can push past traditional constraints to address these challenges. Using Sentinel's continuous feedback and monitoring, the US Cold Storage facility in Minooka, IL, mapped the individual behavior of 100 valves – monitored continuously at a rate of once per second – to identify over 31 different business-impacting site anomalies so far.

## 522,000 KWH AND \$52K SAVED TO DATE

US Cold Storage used Sentinel to look for opportunities to identify and eliminate parasitic loads, avoiding costs by avoiding energy waste. So far, more than 522,000 kilowatts of energy waste, or the equivalent of 365 Metric Tons of CO<sub>2</sub> emissions, have been avoided in just 6 months. At US Cold's Minooka facility, the current monthly blended electrical rate is approximately \$0.10 per kilowatt hour, which amounts to total savings/cost avoidance to date of ~\$52,000. This represents nearly 1% of the facility's total energy expenditure. By all indications, industrial electrical rates will continue to increase. Rates have already increased 34% since 2020 and over 7% in 2025 alone according to the US Energy Administration. By identifying non-optimally performing valves, the facility eliminated excess heat load in the system, which translated into a substantial cost recovery. "Sentinel is what cost avoidance looks like," said Brian Smith, US Cold's Regional Engineering Manager. "If valves are leaking hot gas in any amount back to the compressor, the compressor is working harder, and you're using more electricity. That's a cost that's often not quantified, but Sentinel makes it easy to do. It's really that simple: when you can see leaky valves, you can reduce heat to the compressor, and you're saving money. Sentinel is projected to deliver a payback period of under two years and generate a strong return on investment."

## ENGINEERS

Brian Smith, Jim Duffy, Roberto Pinzon – US Cold Storage

## FACILITY

US Cold Storage, Minooka, IL: 22.1 million cubic foot cold storage facility for food storage and distribution.

## TECHNICAL SPECS

55 evaporator groups supporting 4,500 tons of refrigeration.

## DETAILS

Charge: 59,000 pounds of ammonia.

## CHALLENGE

Eliminate heat accumulation, parasitic load, energy expense, and unseen maintenance risks.



IT'S LIKE HAVING A **24/7 TECHNICIAN** IN YOUR PIPING SYSTEMS WATCHING TO MAKE SURE YOUR COIL STATIONS ARE **WORKING PROPERLY.**

- Roberto Pinzon,  
Chief Engineer for US Cold

## TIMELY AND ACTIONABLE DATA

Reliability and remote monitoring are big advantages for large facilities, where manually inspecting valves can only give partial visibility into flow and leak rates. Because every valve is different, the variation introduced by partially seated or fully malfunctioning valves represents a vast individual range of behavior. Sentinel solves this problem by building individual profiles on each valve, monitoring not only individual flow, but a constellation of data that can be analyzed to predict failure before it happens – or act as a first warning sign for more complex problems. "Sentinel's data is very helpful in real time," said Roberto Pinzon, Chief Engineer for US Cold. "It's like having a 24/7 technician in your piping systems watching to make sure your coil stations are working properly."

## 100% MAINTENANCE VISIBILITY

Predictive maintenance has become a top priority for US Cold Storage, where prevention as a strategy is guiding maintenance decisions that mean the difference between exceptionally low and high-cost repairs. At the same time, the company is using Sentinel's real-time feedback to help train new technicians in the field. "We're looking at Sentinel as a mechanical integrity tool," said Jim Duffy, Senior Manager of Engineering for US Cold. "It acts as an insurance policy against unexpected failures and downtime because it can alert us to potential problems we might not pick up on for months or years. It's the difference between a 2am wakeup call and scheduling maintenance on our own time."

## SOLUTION

US Cold installed Sentinel in its 22.1 million cubic foot facility in Minooka, IL, to develop customized data on valve performance across 100 valves in real-time. Improvements noted in these key areas:

- **Savings/Cost Avoidance:** By identifying non-optimally performing valves, US Cold has already saved/avoided over 522,000 kwh, representing nearly 1% of the facility's 6-month energy spend.
- **Predictive Maintenance:** US Cold used Sentinel to build individual profiles on each valve, monitoring not only individual flow, but providing a constellation of data to predict failure before it happens and act as a first warning sign for more complex problems.
- **Training:** US Cold uses Sentinel's real-time feedback to help train new technicians in the field and support maintenance decisions for more experienced managers.

