



HENNINGSEN COLD STORAGE CO. INVESTS IN THEIR ENGINEERS TO IMPROVE ENERGY PERFORMANCE

HENNINGSEN & CRES: A COMMITMENT TO OPERATIONAL EXCELLENCE

Henningsen is committed to building and operating the most energy-efficient refrigerated warehouses, and has 6 CRES Certified engineers among all their facilities. By achieving the CRES certification, these engineers have demonstrated that they know how to safely and efficiently operate industrial refrigeration systems, while uncovering projects that reduce energy waste at their already efficient facilities.

A common metric used to assess how efficiently a facility operates is their annual energy use (kWh) per cubic foot (ft³) of storage space. Last year, Henningsen's portfolio of refrigerated warehouses operated at 0.52 kWh/ft³, which is 58% more efficient than the industry average¹.

The impressive energy performance of Henningsen's facilities can be attributed not only to the ingenuity of their engineers, but also to the culture of efficiency that extends throughout the ranks at Henningsen. To this end, CRES is not just another bolt-on certification for Henningsen engineers, it is an embodiment of the existing culture of energy efficiency and waste reduction.

¹ <http://www.gcca.org/resources/publications/white-papers-reports/benchmarking/>

CRES CERTIFIED HENNINGSEN ENGINEERS IMPLEMENT ENERGY UPGRADES FOR BIG PAYBACK

Receiving, storing, and shipping out over a million pounds of frozen food every day with 100% accuracy is no simple task. However, in 2014 Henningsen Cold Storage Co. (Henningsen) built a state-of-the-art refrigerated warehouse in Salem, Oregon to do just that.

Henningsen is one of the largest public refrigerated warehousing companies in the U.S. They deliver award-winning refrigerated logistics through a national warehouse network totaling more than 60 million cubic feet of multi-temperature controlled storage (ranging from -20°F to +70°F). Henningsen's Salem facility (S1) boasts more than 7.5 million cubic feet of -5°F freezer storage, more than 0.5 million cubic feet of refrigerated dock, and 28 unload/loading spots. The facility is the primary production support and distribution point for a local food processor.

This state-of-the-art facility was built utilizing low-charge and high-efficiency components and design practices. However, even in this already-extremely energy efficient facility, the CRES certified Henningsen engineering team has been able to identify several more energy saving activities. These additional energy activities were championed by the site's engineering team: Jenson Storm, Jason Propes, and Chris Hutchinson – all of whom are CRES certified. They completed seven activities at the site resulting in 395,583 kWh of annual energy savings, which equates to approximately \$25,000 per year in energy cost savings.



ESTIMATED SAVINGS

Dock Heater Upgrade:

70,745 kWh annual energy savings
\$4,641 annual energy cost savings
\$19,467 project cost (not including utility incentives)

Freezer Coil Replacement:

255,945 kWh annual energy savings
\$16,790 annual energy cost savings
\$0 project cost

“*The CRES certification reinforces Henningsen Cold Storage’s commitment to operating our facilities at industry leading levels of efficiency,”* said Henningsen Engineering Manager, Pete Lepschat. *“The awareness and expertise of our people allowed them to identify an issue that would likely have gone unnoticed at many facilities, which would have resulted in a sizeable energy penalty over time.”*”

DETERMINED HENNINGSEN ENGINEERING TEAM UNCOVERS MORE SAVINGS

Henningsen’s S1 facility was brought online in 2014 and operated efficiently from start-up. However, the Henningsen Engineering team identified performance issues with their new facility and set out to correct them. Over the last two years, their CRES certified engineers have been busy working on system diagnostics and developing clever solutions to improve the facility’s energy performance. These include:

Dock Heater Upgrade: The facility’s dock must be kept above freezing at all times because it contains a wet fire suppression system. Additionally, the dock was built so air-tight that infiltration from traffic through their freezer doors was causing the dock temperatures to drop to near freezing during the winter. Therefore, during the first two winters Henningsen had to operate large electric resistance heaters to keep their dock from freezing. Operating the dock this way for two winters was long enough for the Henningsen Engineering Team to figure out and implement a better way to keep their dock from freezing. They plumbed an old glycol air unit with heated glycol from their underfloor heat system and hung it in the dock. This approach allows them to use waste compressor oil heat instead of electricity to keep the dock from freezing. In fact, the new system works so well they use it as a re-heat coil to drive down humidity in the dock during much of the year. This minimizes the latent load on their freezer coils, which reduces the need for freezer coil defrosts and saves even more energy.

Freezer Coil Replacement: The freezer was designed to have 7 coils, each providing 52 tons of refrigeration at a 10°F temperature difference. However, upon start-up of the facility the Henningsen Engineers needed to operate the compressors at lower than expected suction pressures to maintain the freezer temperature requirements. While many engineers may chalk this up to an unforeseen energy need for the facility, the Henningsen Engineering Team was committed to figuring out why their actual energy performance differed so much from the initial design. After extensive testing, the team demonstrated they had defective coils that provided only a fraction of their rated capacity. To diagnose and remedy the issue, Henningsen worked with their refrigeration design vendor and coil manufacturer: the manufacturer warrantied the coils and Henningsen now has the full design evaporator capacity in the freezer. The final result? The refrigeration system is even more efficient because it now operates at higher suction pressures and lower average fan speeds while still maintaining freezer temperatures.

HENNINGSEN ENGINEERING TRIO FINDS LOW- AND NO-COST UPGRADES TO OPTIMIZE EXISTING EQUIPMENT

In addition to capital upgrades, the Henningsen Engineering trio of Storm, Propes, and Hutchinson implemented several low- and no-cost CRES activities. Two of these low-cost activities focused on optimizing the freezer doors to ensure the opening size was appropriate for the application. First, they adjusted the door opening width on their bi-parting doors to open only 7 feet wide instead of 8 feet wide, which reduced the amount of warm-air infiltrating the freezer space. Additionally, they added an insulated metal panel to block part of an unused doorway on their high-speed roll-up doors, also reducing infiltration. Both activities were low-cost and saved the company thousands of dollars per year.

Additionally, Chief Engineer Jenson Storm noticed that while working in the engine room, his control system was running the engine room exhaust fan because the space temperature exceeded the space temperature setpoint. However, Jenson observed that it was even warmer outside than it was in the engine room, so the fan was actually bringing in hot air while simultaneously using extra energy. Jenson set out to change this: now the control system ensures that it is cooler outside than in the engine room before turning on the exhaust fan for cooling. The result? Another no-cost activity that further reduces energy waste.

The success of these three Henningsen Engineers demonstrates that creativity and having a watchful eye for efficiency opportunities can yield impressive energy savings, even in already-efficient facilities. Additionally, the CRES certification has proven to be an excellent complement to Henningsen's culture of efficiency as it has empowered their engineers to find more energy savings and provides a path to track performance and recognize excellence.

A HELPFUL TIP

The CRES (Certified Refrigeration Energy Specialist) Certification has two aspects; an exam and energy saving activities. To become CRES certified, all applicants must pass the exam and complete three energy saving activities. The scope of these activities can vary, and they can be shared among other CRES certified individuals, but they must save energy or support good energy performance and they must be implemented at the applicant's facility or a partner facility.

Check out RETA's website www.reta.com/cres, or resources from your local utility, to learn more information about CRES and figure out next steps to becoming CRES certified.



ESTIMATED SAVINGS

Freezer Door O&M:

42,758 kWh annual energy savings
\$2,805 annual energy cost savings
\$540 project cost (not including utility incentives)

Tunnel Door Upgrades:

24,862 kWh annual energy savings
\$1,631 annual energy cost savings
\$1,086 project cost (not including utility incentives)

Exhaust Fan O&M:

1,270 kWh annual energy savings
\$83 annual energy cost savings
\$500 project cost

“The project portion of the CRES certification brought several of our energy efficiency projects from consideration to completion,” said Jenson Storm. “We took it as a challenge to make our energy saving ideas a reality.”

