

Fish processing plant streamlines production with upgraded refrigeration system

Result

- 450 tons of ammonia refrigeration
- Integrated control algorithms
- Streamlined fish processing production
- Dual slide single screw design allows the compressor to start unloaded
- VFDs allow compressors to start using less than 60% FLA
- Optimum efficiency even at part load conditions

Application

A state-of-the-art, high-production plant that processes 400,000 pounds of fish per day, with on-site storage capacity of one million pounds. The plant includes a continuous moving tunnel freezer that is capable of freezing over 250,000 pounds of fish per day.

Customer

Coast Tsimshian Fish Plant is located on the remote northwest coast of British Columbia and is wholly owned by the Lax Kw'alaams First Nation. The plant produces a variety of locally-sourced fish products from the cold waters of the Northern Pacific Ocean, including wild salmon, wild salmon caviar, flounder, sole, and pacific cod. This plant is the only major fish processing and freezing plant on the north coast of British Columbia capable of shipping large quantities internationally.

Challenge

This project required a complete renovation and remodeling of an outdated and poorly performing refrigeration system that was originally installed in 1974.



“From start to finish, Vilter and Wyatt teamed up to create a state-of-the-art versatile fish freezing system. I was proud to be given the opportunity to work with the Lax Kw’alaams First Nation. It was the opportunity of a lifetime to work with such great people.”

— Scott Wyatt
President of Wyatt Refrigeration



The high-production processing plant wanted to streamline production of its ten processing lines: eight mechanized and two by hand, with four mechanized lines dedicated to salmon and four to ground fish. Maximum flexibility to freeze a wide variety of different species in different packages was required to afford the ability to run the plant year round. And the entire plant must run utilizing less than 1100A due to power limitations of the site.

Solution

In 2012 a \$7.8 million dollar major renovation and upgrade of the plant facility was completed. The renovation included a continuous moving freezing tunnel, four modern efficient blast freezers, eight contact plate freezers and specialized automated fish butchering equipment.

Wyatt Refrigeration, located in Everett, Washington, designed and supervised the installation of the Vilter refrigeration system components. Four Vilter screw compressors, along with pressure vessels, air units, condensers, and variable frequency drive panels, power the refrigeration system.

Three Vilter VSS-1201 ammonia single screw compressor units and one Vilter VSM-501 were installed to provide the refrigeration capacity. Each VSS unit is rated at 125.3 tons when operating at -35° F suction temperature. Each compressor is powered by a VFD suitable 350 HP high efficiency motor with 95.8% nominal efficiency. The VFD limited the in-rush current during starting to less than 60% to allow starting of the multiple 350 horsepower motors within the 1100 Amp plant limit.

All four units are equipped with Vilter Vision 20/20 microprocessors. This versatile control panel allows for independent operation as well as centralized control via communications. A centralized control was used allowing for integration of the compressors with the entire refrigeration plant.

The dual slide design on the Vilter single screw compressor offers the highest level of flexibility and performance optimization for screw compressors. The two slides are commonly referred to as the capacity slide and the volume slide. The capacity slide is infinitely adjustable from 20% to 100% allowing the compressor to match the system requirements. The volume valve is infinitely adjustable from 1.2 to 7.0 Vi, and operates in parallel with the capacity valve. This unique design allows for optimum efficiency at all load conditions. It also allows optimum efficiency when the discharge pressure is allowed to float down. Another unique feature of the dual slide design is that it allows the compressor to start completely unloaded.



By using ammonia, Emerson's compressor technology solution offered Coast Tsimshian Seafood a refrigerant that has a good environmental profile (non-ozone depleting and zero global warming impact) and provides superior performance benefits. In addition, the balanced radial and axial force design of the single screw compressor reduces stress on the unit's bearings, resulting in very low operating and maintenance costs while delivering a performance unachievable with any other type of compressor.

The total freezing capacity of the plant averages 400,000 pounds a day and makes this the second largest freezing facility on the North Coast. The plant employs 100 people for up to eleven months of the year, with peak employment reaching 170 during the busy salmon fishing season.



Resources

Learn more about the Vilter VSS single screw compressors at: EmersonClimate.com/Vilter

EmersonClimate.com

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