

Ste. Michelle Wine Estates embraces automated refrigeration controls



Customer Need

Chateau Ste. Michelle sought an automated temperature control system for its Woodinville winery. The winemakers wanted controls that would improve efficiency by automatically monitoring and adjusting the temperature of wine throughout the fermentation process. Flexibility was another top priority. The winery needed equipment that could be easily adapted to changing needs.

Logix Solution

Logix installed its system at Chateau Ste. Michelle in time for the 1996 crush. The system precisely controls tank temperatures, optimizes refrigeration machinery room operations, and reduces energy consumption.

Business Value Delivered

The Logix solution provided a user-programmable set of seven temperature modes that could be assigned to each fermentation tank, and equipped the system with "Automatic White Fermentation Mode" parameters. Within the first few months of using the Logix system, Chateau Ste. Michelle staff reported enhanced winery operations and big time savings from improved efficiency and record keeping. In addition, the Logix system's equipment optimization strategies have allowed the winery to frequently reduce the compressor horsepower requirements by 50%, resulting in substantial energy savings.

Big Time Savings and Improved Efficiency

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David Rosenthal
Chateau Ste. Michelle
enologist



Temperature Control Precision for Winemakers

Being able to fine-tune tank temperatures permits more precise control of the wine-making process.

The Story Behind the Logix Solution

More than 17 years ago, Chateau Ste. Michelle (one of four Ste. Michelle Estates wineries in Washington state) sought an automated temperature control system for its showcase Woodinville winery. The winemakers wanted controls that would improve efficiency by monitoring and adjusting the temperature of wine throughout the fermentation process. System flexibility was another top priority. The winery needed equipment that could be easily adapted to changing needs.

Chateau Ste. Michelle's management found the solution with Logix in nearby Kirkland, Washington. Logix installed its refrigeration controls system at Chateau Ste. Michelle in time for the 1996 crush. The system precisely controls tank temperatures, optimizes refrigeration machinery room operations, and reduces energy consumption. High expectations on the part of the Chateau Ste. Michelle management team gave Logix three interesting challenges.

First, the winemakers wanted to program temperature setpoints for each step of the fermentation process. The system had to monitor fermentation changes 24 hours/day and automatically change the tank temperature as needed. The Logix solution was to provide a user-programmable set of seven temperature modes that could be assigned to each fermentation tank. Each temperature mode could be scheduled sequentially and implemented without manual intervention.

Second, Chateau Ste. Michelle wanted to use the system to monitor fermentation activity and automatically change fermentation setpoints based on fermentation rate. To address this requirement, Logix equipped the system with "Automatic White Fermentation Mode" parameters. When yeast is added to a tank, fermenters are put on "Fermentation Start." This mode allows the tank to warm up to a specified setpoint that encourages yeast growth.

The system then monitors the rate of heat generated by the fermenting tank over a user-specified time interval. Once the fermentation is active and the heat generation rate hits the pre-determined value, the system automatically changes the mode to a cooler "White Fermentation Mode." The winemaker determines the mode setpoints based on the type of yeast used and the variety of grape juice being fermented.

Third, Chateau Ste. Michelle's staff requested safeguards to prevent overshooting of tank cooling setpoints and to prevent icing during cold stabilization. Logix addressed this requirement by establishing duty cycling setpoints that cycle the opening of the refrigerant feed solenoids when the tank temperature approaches icing conditions.

Realized Benefits

Logix president Jim Conant and engineering VP Mike Ghan identified these three core objectives by conducting a thorough "needs discovery process" with the winemakers. The Logix team then created a detailed system plan to address these needs; during installation, Ghan was on-site to ensure a smooth start-up. Within the first few months of using the Logix system, Chateau Ste. Michelle staff reported enhanced winery operations and big time savings from improved efficiency and record keeping. Because the Logix control system flags each problem as it's happening and sounds an alarm to make sure staff acknowledges and corrects the situation (even if they're off-site), it provides greater efficiency by reducing the time spent on manual temperature checks and precautionary troubleshooting activity on individual tanks.

"Temperature control is an absolutely critical component of quality winemaking, says David Rosenthal, Chateau Ste. Michelle enologist.



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Raymond McKee
Canoe Ridge Estate Winery
assistant winemaker



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The staff especially likes the Logix system's reporting flexibility. The information is detailed, presented clearly, and very helpful in analyzing trends. Chateau Ste. Michelle has complete records of the control strategies it used and the results it achieved dating back to the 1996 wine fermentation process. This information is invaluable in determining the best set-up for the fermentation tanks when producing different varieties of wine.

Logix's trend logging also provides the staff with temperature and setpoint graphs that can generate reports for periods of one day up to one year. If a particular fermentation curve was especially successful, the reports can be used to duplicate conditions for another batch. The system helps winemakers make quicker, better decisions by giving them a higher control level that enhances the wine quality and allows them to repeat their successes. Being able to fine-tune tank temperatures permits more precise control of the winemaking process. The Logix system allows for temperature controls within plus-or-minus 0.1 degrees F.



"In 1998 we bottled 480,000 cases," says Kara Koh, assistant winemaker and long-time member of the Ste. Michelle winemaking team. "In 2009, we are on target to bottle about 1.2 million cases. As we have expanded, Logix has been available and supportive, assisting us in implementing safeguards such as SO₂ and CO₂ monitoring in our barrel rooms." [Note: In 2013, Chateau Ste. Michelle produced 2 million cases.]

Ste. Michelle Estates chooses Logix for Canoe Ridge Estate Winery

Parent company Ste. Michelle Estates was so pleased with the initial results at Chateau Ste. Michelle that it immediately contracted with Logix to install a winery control system at the Chateau Ste. Michelle Canoe Ridge Estate Winery in Paterson, Washington. Logix commissioned that system in time for the 1997 crush. Says Raymond McKee, assistant winemaker at the Canoe Ridge Estate facility, "Logix is very important to our CSM red winemaking in that it helps us to very accurately control the fermentation temperature in a timely fashion, which is extremely important in developing our many different styles of red wines."

"Also, for me as a new winemaker to the team in 2008," McKee continues, "I was able to learn the Logix system very quickly because of its intuitive layout and user friendly options." Other Ste. Michelle Estates wineries that have implemented Logix's Winery Control System are Columbia Crest, also located in Paterson (1998), and Snoqualmie Winery in Prosser (2002).

The initial Logix installation at Chateau Ste. Michelle in Woodinville continues to save money with a variety of improved control strategies. For example, winery maintenance staff have reported that condenser pressure dropped and the tank cooling load regulated after the Logix system installation, allowing them to raise the suction temperature 10 - 12 degrees F.

Other horsepower reductions were achieved in evaporator fans cycling and outside air exchange

Trend Logs provide Setpoint and Temperature Graphs for Up to One Year

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Bob Berteau
Chateau Ste. Michelle head winemaker



Refrigeration System at Near Optimal Efficiency

The Logix system has made it possible to automatically operate the refrigeration system at near optimal efficiency without personal monitoring, freeing up time to concentrate on making wine – not on checking operational efficiencies.

ventilation. These strategies have allowed the winery to frequently reduce the compressor horsepower requirements by 50%, resulting in substantial energy savings. Without the Logix system's control and reporting functions, improvements such as these would be difficult because manual data collection would be impractical.

Another benefit: integration of the complex operations of the ammonia compressor engine room with tank temperature controls was straightforward, and the two winery areas now operate in harmony. Other custom features including barrel room temperature control, monitoring of wastewater pH levels to meet local sewage requirements, monitoring the nitrogen generator that fills the nitrogen reservoir for use on the bottling line and controlling temperatures in the case goods warehouse.

Ammonia compressor engine room staff and winemaking staff at Chateau Ste. Michelle appreciate the Logix alarm system, which automatically alerts them at home if there is a problem with tanks or the refrigeration engine room during the night. If alarms are triggered, the Logix system immediately notifies staff by calling a phone with a voice announcement, or sending an email message. Staff on call can restart important systems immediately from their personal computers at home running Clarity software.

Even during normal operations, the Logix system takes some of the workload off winery staffers, freeing them to perform other tasks. For example, prior to installation of the Logix Winery Control System, winemakers spent a lot of time during crush

in the ammonia compressor engine room monitoring pressures and temperatures. They needed to manually monitor this data in order to assess plant's capacity for providing the required cooling for fermentation.

The winery maintenance department reports that the Logix system has made it possible to automatically operate the refrigeration system at near optimal efficiency without personal monitoring, freeing up their time to concentrate on making wine – not on checking operational efficiencies.

The Chateau Ste. Michelle staff continues to work with Logix to discover other winery processes that can be linked into the system. "As we have grown and changed in focus and personnel, Logix has been there the entire time, monitoring our wines and safety in our Ste. Michelle facilities," says Bob Berteau, Chateau Ste. Michelle's head winemaker. "The Logix system has been an invaluable and flexible tool for the entire winemaking staff at Chateau Ste. Michelle."

In the 17+ years that Chateau Ste. Michelle has used Logix, the winery has expanded its winemaking capabilities from whites to reds to sparkling wines, and now its popular boutique wines. The winery may be best known in the broad market for its mass marketed red and white varietals, but Chateau Ste. Michelle has also made a name for itself with premium wines produced for the elite market year after year. The Logix system continues to work behind the scenes, helping to contribute to Chateau Ste. Michelle's growing success. And Logix is now performing the same service for several other members of the Chateau Ste. Michelle Estates winery family.