

The Siemens logo is displayed in a white rectangular box in the top left corner of the image. The background of the entire page is a photograph of a manufacturing facility where large, white, circular foam tableware pieces are being produced and moved by machinery.

SIEMENS



Success Story

Monitoring and data collection boost manufacturer's efficiency by 8 percent, so far

usa.siemens.com/3VA

It's difficult to keep a production line going when the manufacturing machinery requires downtime for ongoing updates. It's even harder when replacement parts are no longer being produced, which makes eBay and other secondary markets the only source for parts.

That was the situation Republic Plastics was facing on a regular basis. Republic Plastics runs four manufacturing facilities across the country – one in Texas, two in Tennessee and another in Arizona – to manufacture foam tableware. Since 1999, Republic Plastics has provided customers in the North American institutional food service and consumer markets with private label disposable plates, bowls, trays and containers.

To make those products, Republic Plastics uses custom-made production machines assembled in house and provided by an original equipment manufacturer (OEM). But sourcing the necessary components to keep production lines open had

become nearly impossible. Electronic parts provided by the OEM such as control system components were reaching obsolescence quickly. According to Luis Castro, Project Manager at Republic Plastics, "Parts were failing, and we were having difficulty replacing those components. For us to find a component, we'd be looking for parts on eBay. That doesn't make any sense at all. So that was the trigger to find a solution and start investing and upgrading the machines."

The answer to Republic Plastics' problems came in the form of an integrated solution from Siemens comprising of modular 3VA6 circuit breakers, a SIMOTION control platform and SIMATIC ET 200 automation system, S120 drives and SIMATIC HMI Comfort Panels. The solution, in place for only 12 months has already shown an increase in these machine's efficiency by 8%, and more gains are expected as the company parlays data collected by the 3VA6 circuit breakers into a predictive maintenance schedule for the production equipment.



Extruding foam into rolls

Efficiency Boost

Republic Plastics operates in a hyper-competitive market. "To be competitive, we need to be able to achieve high machine efficiencies with ultimate reliability. We need to be able to run, on demand, machines better and faster than anybody else," says Castro.

The company needs every advantage it can find to be faster to market, and the 3VA6 circuit breakers are delivering a significant advantage. In addition to protecting production machines, the circuit breakers monitor them to regulate energy consumption and improve equipment reliability.

Republic Plastics have deployed 3VA6 circuit breakers in two of their plants so far, starting with Texas and then in Tennessee. Modular S120 drives and automation controls with SIMOTION and SIMATIC also were deployed to resolve issues related to the frequent breakdowns and difficulty in sourcing components.

Castro was anticipating the solution would deliver an 8% efficiency increase, so it is already meeting expectations. In addition, the ability to reduce additional costs through power efficiency adds to the payback for the project. As he puts it, an 8% efficiency gain translates to "a lot of money."

The 3VA6 units monitor machine performance and energy consumption, sending data through the company's PROFINET system to a SQL database, from which data is pulled into the SIMATIC HMI Comfort control panel for analysis. Without the integrated Siemens solution, data collection would have required a hodgepodge of components, including transformers, wiring and analog input cards – and the information still wouldn't deliver the needed accuracy.

That's why the 3VA6 circuit breaker gets an enthusiastic review from Castro. "It is fantastic," he says. "I know of nothing else like it in the market. I fell in love with that circuit

breaker the minute I saw it. There are times a circuit breaker is a circuit breaker doing what it's supposed to do – overload protection. But when you look at the technology behind the 3VA breaker, it's what sets it apart from everything else."

Operational Improvements

What makes the 3VA6 so different is its communications and integrated measuring capabilities, which Republic Plastics is leveraging to streamline its manufacturing by reducing waste, increasing efficiencies and cutting costs. For instance, the company now can closely monitor power consumption by the production machines and by electric heaters attached to the machines. When the equipment isn't running, operators often forget to turn off the power and the heaters, wasting energy. The 3VA6 units eliminated this issue.

The 3VA6s also spot anomalies in amperage used by the machines, which are tuned to a certain volume of amps. If the amperage goes up or down, it needs attention. "You might be facing a maintenance issue and that machine needs to be shut down and reviewed before you have a major failure that brings the machine down for an unplanned number of hours," says Castro. "These machines previously would need to be down two or three hours every 24 hours because of control issues. Now that is completely gone. Now we have no unscheduled downtime."

To review data collected from the machines, Republic Plastics installed SIMATIC HMI Comfort control panels. The panels are connected through Ethernet to a SQL database that stores the data. Republic Plastics chose the Comfort Panel because it's an industrial HMI-enabled display. If it needs to be replaced, there's no need to go through a rebooting procedure as you would with a computer. Instead, a technician turns it off, removes the SD card and pops it into the replacement unit to quickly resume operations.

To hone production, Republic Plastics is leveraging Siemens SIMOTION control platform and SIMATIC automation. SIMOTION delivers coordinated motion control and SIMATIC software automates production processes based on the equipment's specific operating parameters and control requirements. "Everything is very easy in terms of communication and configuration, and very reliable," Castro says.

Training and Support

Castro says he enjoys working with Siemens not just for the technology, but also for the people. There is no bureaucracy, communication is great, and company representatives are knowledgeable and easily accessible. "When I work with Siemens I get a feeling of a small company – but it's a huge company, which is great. Technical support is outstanding and free. I've called for technical questions, and I get a phone call back within 24 hours from very knowledgeable people."

Castro also has high praise for the Siemens Cooperates with Education training program, which promotes automation, advanced manufacturing and mechatronics in schools. Having attended various training sessions, he asserts the curriculum is unmatched in the industry for its professionalism and comprehensive reach. "It's amazing how much information is available to educate people and train students in technical schools, colleges and universities in Siemens products. Siemens commitment to close the skilled workers gap in manufacturing through training and educational support is what will make a difference in the end."

Looking Ahead

The efficiency boost from the Siemens integrated solution is only the beginning. Data collected by the 3VA6 units will create the basis for a predictive maintenance schedule that Republic Plastics plans to implement in the near future. Predictive maintenance relies on historical data patterns that show when a machine will need attention or replacement part. Instead of relying on the calendar to service the equipment, technicians schedule maintenance based on what the data tells them.

"We are still in the collecting data stage," Castro says. Before launching predictive maintenance, his team first needs to build statistics models that define a machine's normal operation and what constitutes a need for service. This data is now available to them from the 3VA6 Electronic Trip Unit and its communication capabilities.

In the meantime, Republic Plastics is increasing its investment in Siemens technology. Pleased with the results from Texas and Tennessee, company management has approved the purchase of 3VA6 circuit breakers for machines in all its facilities. Soon the days of scavenging for replacement parts will be completely a thing of the past. Instead, Castro will be looking to further increasing efficiencies and reducing waste and power consumption – outcomes he says would not have been readily achievable without the Siemens solution. "I am very happy that I chose Siemens to work with on the development of this plan."



Republic Plastics creates foam tableware

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