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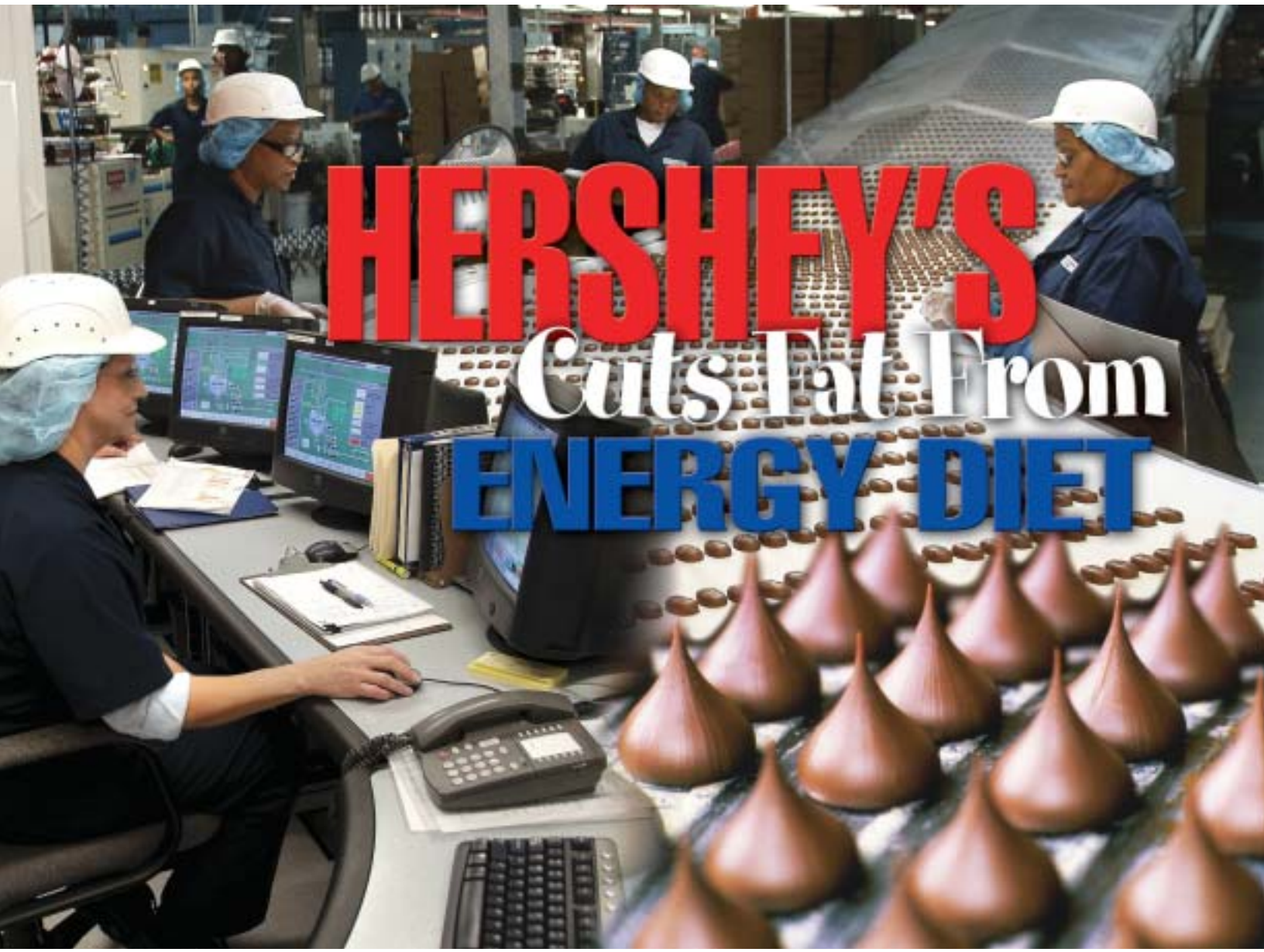

HERSHEY'S Cuts Fat From ENERGY DIET

INSIDE

POWER SYSTEM Sweetens Efficiency OF HERSHEY'S FACILITY

CANDY MANUFACTURER WATCHES OUTAGES

Just like every other industrial enterprise, the Hershey Company's candy manufacturing plant in Stuarts Draft, VA, needs electrical power. Unlike many other enterprises, plant management has taken a proactive approach to its power usage.

In the late 1990s, due to a plant expansion, Hershey's corporate engineering arm decided to bring on a power monitoring and control system. Since then, the benefits of that decision, utilizing Square D Powerlogic products from Schneider Electric, have gone far beyond analysis of power usage and quality and a better understanding of how the electrical distribution system is functioning at any given time. It has been invaluable in troubleshooting problems, which translates to significant cost savings and a stronger relationship with the plant's local power utility. Most importantly, it validates the growth of the more than 500,000-square-foot facility, which hosts a 24-7 manufacturing operation.

"We add processes annually and we have ever since the plant opened in 1981," says Lorin Droppa, plant senior designer. "With growing facilities, it's critical that you prove or disprove whether you have the infrastructure to support your plans. We use the information from the Powerlogic system to make informed judgments."

Growth Facility

Stuarts Draft is located in the foothills of the Appalachians, halfway between Charlottesville, VA, and the West Virginia border. Hershey's built the plant in 1981, and it was originally configured as a growth facility.

"We had a lot of steam capacity, a lot of compressed air capacity, and a lot of electrical capacity when the plant was built," says Droppa, who was hired in 1990 after a short stint as a plant contractor. "Over the course of t he next 20 years, we ate into that capacity."

In 1997, when the plant was expanded, Droppa said it was difficult to gauge how much the electrical infrastructure should be upgraded. "So we added based on code," he recalls, "which is everything running at 100% and then you add 125% of your biggest load, and there you are."

The situation prompted Hershey's corporate engineering to work with Stuarts Draft plant management and Droppa to get a better handle on power usage. That same year, six Square D CM-2350 circuit monitors were purchased and stationed at each main and all four feeders entering the facility.

It was a good start, Droppa says, "because it allowed us to get a better understanding of the facility's total electrical load." While that information was useful, it only went so far–the circuit monitors weren't connected to a centralized database that would allow for accumulation and subsequent analysis of data.

In 1999, that situation was finally resolved with the purchase of Square D System Manager software, which was integrated by Square D personnel. Additional hardware was installed by a local electrical contractor, including more CM2350 circuit monitors and several PM620 power meters.

Accruing Data

Willie Wonka and Charlie would certainly be at home in this chocolate factory. The

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Stuarts Draft facility manufactures roughly 30 different Hershey products. Quite literally, workers at the facility take raw ingredients, like cocoa, sugar, and flour; combine them; put that mixture through a production line; and form it into various products. From there, the candies are cut, wrapped, put into a case, and shipped.

With multiple product lines, there is a fair amount of intricacy when it comes to the plant's electrical distribution infrastructure. Droppa says there are essentially two feeder breakers per production line, with one typically feeding the kitchen end of a line and another feeding the packaging end of the same line.

"These feeders are segregated per production type," he says. "In other words, for a Reese's Pieces production line, the power system comes from two feeder breakers out of a substation. We don't intermix those feeders, because when it comes down to maintenance or an electrical problem, I can't have a situation where I have one breaker that has a problem and then lose multiple production lines."

When the Powerlogic System Manager software was purchased in 1999, it ran on a laptop computer that sat on Droppa's desk. Since then, he says, the software has become more robust and these days, it runs on a dedicated Dell desktop server in his office that constantly displays system status, including each device type and its current condition, provided by the various circuit monitors and power meters stationed throughout the plant. Through this interface, he is also able to monitor power amperage and usage, along with power quality issues like total harmonic distortion and any effect it has on the electrical distribution system. He also has a CM4000T mobile circuit monitor with an Ethernet port that allows him to gather data from virtually anywhere, even down to a wall receptacle.

Because there is so much data that could be accumulated by the Powerlogic system, Droppa says that over the years, he's prioritized the information he chooses to monitor.

"I gradually started to reduce the amount of data I kept in my history, because they are not data that I personally would use," he says. "What I've found is, there are certain things that I don't need to record, for instance any total harmonic distortion alarm less than 10% does not affect my production. Therefore, I stopped logging those particular instances.

"Conversely, there are other things that I have added and started to build a history on, and now when I need to know over the course of the last five years, what has this product line done--has it grown in energy usage? Has it contracted? Is it about the same? Does it use more power in the summer than the winter? I can just start trending. The graphing function is what I use the most."

It also doesn't take Droppa long to document system performance. For example, he says it "would take me probably in the neighborhood of four minutes" to produce a report that shows the electrical usage for the last month on one product line, from kitchen to packaging.

Another inherent value is the alarms the system provides, or rather the variety of alarms. Parameters can be set to trigger an alarm for a virtually infinite amount of possibilities, but the system can alert Droppa a variety of ways, from a noise to a printed report to even a broadcast page across the facility. Droppa chooses a pop-up window on the server monitor.

Determining Workload

The historical data that Droppa has at his fingertips helps plant and corporate management directly determine the facility's workload."Installing a new electrical service to our facility from a utility is a multiple-year operation," Droppa says. "If we suddenly want to make a new product at our facility and we don't have the electrical service to do it, we are going to miss that market. We have used the power monitoring system to begin planning for that utility expansion sooner, so that as our load grows, we will be able to immediately act and get that two-year time frame below one year, which is in the realm

POWER SYSTEM

Sweetens Efficiency

OF HERSHEY FACILITY

of what it takes to put processes in place. In other words, it wouldn't be the utility or electrical service holding it up."

Droppa says the Powerlogic system played an influential role in acquiring three production lines. However, it also helped determine that the plant didn't have the necessary electrical distribution to take on a new line.

"We evaluated that our existing electrical infrastructure couldn't support this particular process, and therefore we had to build into that project how much money it would take to improve that service so we could add that production line," he recalls. "It turned out the company had another facility that had existing electrical infrastructure to support that line and they got it."

Cost Savings

The Powerlogic system has contributed to major cost savings for the facility, but Droppa is quick to point out that the savings can't be calculated in the conventional sense, such as quantifying an annual amount. Instead, the savings are situational. For example, manufacturers of packaging equipment recommend a certain amperage of service for each individual piece of equipment. Add up several pieces of such equipment, though, and you can end up with a faulty picture.

"We had a situation on a recent line where we provided 2,400 amps (A) of service total to run the whole production line," Droppa says. "A year later, I logged those three feeders, summed them up and found out I could run that whole line on less than 500 A. So the next project comes along and I have no breaker space on my substation now, and I have these three feeders that are supplying 2,400 A, but I only need 500 A. I can take all three of those and put them on one circuit breaker, and now I've freed up two spaces."

The bottom line? For the next new production line, Droppa didn't have to buy a new substation. "In just that one instance, I avoided a hefty expense that I would have had to incur had I not had that information," he says. "As it turns out, we eventually did fill up that substation and we had to buy one, but it was three years later."

Another good example: A neighboring production facility was getting a new service. When the utility installed it, it found that the company's secondary feed was too high, so their immediate solution was to lower the primary. Problem was, that was also Droppa's primary.

"I experienced a reduction in my voltage, which I immediately recognized with my power monitoring system," Droppa said. "So I got on the phone with my utility, asking, 'What happened to my primary service? I'm browning out here.' Within 90 minutes, we were back where should be on the primary. The utility also put a voltage regulator on my neighbor's secondary to correct their problem."

Without a power monitoring system, he would have had no idea that situation had occurred and would have been paying for reduced voltage without knowing it. In that case, the cost also would have been the time and the allocation of resources to identify the problem–all of which could be dedicated to other projects.

That's why Droppa says that while his relationship with his power utility has always been good, it's improved since adding his power monitoring system, because of his ability (and willingness) to share data on power-related issues. "When I have a power disturbance, whether or not it affects my production, I can determine whether it is on the utility side or my side, and if it's on the utility side, I send an e-mail to my representative at the utility with the time and date stamp and usually a picture of the sine wave, and I say, 'Here is what I captured. Can you give me a reason why this happened?'" he says, adding he will also do that for neighboring companies that don't have a power monitoring system. "And usually within a couple of hours, I get an e-mail back from the utility that says, 'We recorded this particular thing, and here is why that happened to you.'"

Because Virginia's electrical rates are regulated, Droppa can't use the information provided by the Powerlogic system to get a better deal. However, historical data have helped him work with his utility to plan for the future. "What we have done recently with our utility is taken a look at our total plant load and found that as our plant continues to grow, we are outgrowing our utility service," he says. "So we have entered into an agreement with our utility to do some engineering work for us to plan what we are going to do to get electrical service to our facility in the long term."

Better Prepared

Droppa plans to integrate power monitoring equipment with the plant's entire power distribution system by the end of this year. As of this writing, for example, he was in the final stages of adding monitoring to an older substation with Square D Powerlogic Multi-Circuit Metering. This application allows monitoring of multiple distribution points fed by one substation.

To his thinking, a fully integrated system will only make his plant better prepared for whatever new manufacturing processes it will inevitably take on. But the information he provides to plant and corporate management on the front end, based on the data he collects via his Powerlogic system, helps paint a picture of what the plant can conceivably take on … and what it can't.

"There is always something new and exciting happening here," he says. "My job is to basically know the entire electrical picture and feed that information to both my plant managers and corporate management." *e&pm*