

MONOGRAM PREPARED MEATS



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COMPANY PROFILE

Monogram Prepared Meats (MPM) is a division of Monogram Food Solutions LLC; which was founded in 2004 by CEO Karl Schledwitz and President Wes Jackson. Monogram Food Solutions is headquartered in Tennessee and employs 3,000 people across the Midwest and Eastern United States. The Monogram plant in Harlan, Iowa, was acquired in 2013 and employs 250 people. MPM produces microwaveable bacon and jerky for various clients and the plant processes 800,000 pounds of pork bellies weekly.

PROJECT BACKGROUND

MPM operates several large industrial microwaves to cook bacon and jerky. Power quality issues at the plant have resulted in excessive transformer tube breakdowns and replacements which are expensive and time-consuming. Addressing power quality concerns has been a priority for MPM. Some improvement was seen in 2016 after the installation of line reactors, but tube lifetimes are still below acceptable levels based on manufacturer specifications. To reduce waste and operating expenses, MPM was seeking further opportunities to extend tube lifetimes by improving power quality at the plant.

INCENTIVES TO CHANGE

The high rate of tube replacement is both a financial and material drain on MPM. The tubes are costly and outages require maintenance labor and result in downtime on production lines leading to reduced product output. There are also safety concerns regarding the potential of arc flashes from the transmitter systems. MPM requested an intern from the DNR's Pollution Prevention Intern Program to investigate power quality issues and the potential for system redesign to reduce the impact of power quality and the number of tube replacements.

RESULTS

Surge Suppression: In meeting with another local consultant engineer, the need for plant-wide surge suppression was addressed. Surges are defined as spikes in voltage delivered to a device and are known to cause premature equipment failure. Transmitters are also affected by such events, as these sensitive electronics require a near constant amount of current to flow through them to prevent failures. Surge suppression in depth is considered an industry best practice, and has been recommended to MPM as such. This protective measure operates through the application of several surge protective

devices (SPD) placed at critical points along the transmission line; one by the main service entrance, another in several microwave control panels, and the last directly prior to every transmitter. While these SPD's do not prevent surges from occurring, they prevent the negative effect any such surges would cause. Surges can be prevented to some degree and this is the aim of future projects, however a surge suppression system is still considered a best practice as it reduces the effects of any unexpected surges. Furthermore, SPD's prevent the damage caused by lightning during thunderstorms. Next steps for implementation include collecting outstanding vendor quotes and internal project approval.



Improved Pause Feature: During normal plant operation, it often becomes necessary to temporarily halt production. This is usually due to a backlog in packing. Several production lines have implemented a pause feature for their operators to use, but all lines have emergency stop features as is required for safe operation. Emergency stops are frequently used when simply pausing the line would be the more appropriate choice because emergency stops are more convenient to the line workers. Designed for safety, emergency stops shut off power in the span of only a few milliseconds, during which time power is disconnected from transmitters, opening the circuit. Huge quantities of energy are released instantaneously, and a multitude of effects can occur including arc flashes, short circuiting, and power absorption into transmitter supporting structure which can be harmful to people and equipment. Use of line pauses instead of emergency stops should be encouraged in non-emergency situations. Ease of access to pause capabilities can be enhanced through a push button system redesign. Emergency stops should not be made harder to access or use due to safety and ethical concerns. However, inappropriate use could be discouraged through the use of required follow-up reports and mandatory maintenance re-starts. To move forward, control system re-design will need to be contracted following discussions with the control system vendor.

Continued Monitoring/Measurement The work done through this project is the beginning of MPM's effort to continuously improve their transmitter setup. Continued monitoring through two avenues; power quality surveys and infrared thermography surveys will help MPM to understand the cause and effect of power quality at the plant and identify inconsistencies earlier.

Power Logger Survey: The aim for the power quality survey will be to use information gathered from this project as a baseline and over time, a database of example waveforms could be created. Monitoring sensitive loads for concerning waveforms and evaluating waveforms currently not understood will provide indications as to whether various instrumentation is working properly. Priority areas for monitoring have been identified.



Infrared Survey: An infrared survey, could be completed in-house, using tools and personnel supplied by MPM. Here infrared snapshots of sensitive equipment, control panels and circuitry, and power connections would be taken. With data collected from the infrared survey, maintenance staff would be able to pinpoint troubling locations and perform preventative maintenance, and work to correct failing parts or redesign the setup to avoid systemic failures.

MPM possesses the power logger and infrared monitoring equipment needed for conducting these surveys. While maintenance staff is trained and currently uses this equipment, additional training on the capabilities of the equipment for these specific applications would help the staff become proficient in using the equipment and logging and analyzing the data, and proactively effect change.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
SURGE SUPPRESSION	\$46,330	0.0334 tons source reduction	RECOMMENDED
IMPROVED PAUSE FEATURE	\$100,601	0.072 tons source reduction	RECOMMENDED
CONTINUED MONITORING/MEASUREMENT	\$24,390	0.0176 tons source reduction	IN PROGRESS
INFRARED SURVEY	\$18,290	0.0176 tons source reduction	RECOMMENDED

