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AJINOMOTO HEALTH & NUTRITION NORTH AMERICA, INC.

2023 28-WEEK CO-OP PROJECT

COMPANY PROFILE:

Ajinomoto Health & Nutrition North America, Inc. (Ajinomoto), founded in 1909, is a Japanese-based food and amino acid producer with more than 34,000 employees worldwide and annual sales exceeding ten billion dollars. Dedicated to its mission to improve the health of humankind, Ajinomoto produces high quality products to resolve food and health issues globally. Ajinomoto is the world's largest producer of monosodium glutamate (MSG), a flavor enhancer that is naturally present in many foods. The location in Eddyville, Iowa, focuses on the production of MSG as well as amino acids for farm animal consumption, including lysine, threonine, and tryptophan.

PROJECT BACKGROUND

The focus of this project was to improve data collection on Ajinomoto's emission points and utilities. The intern was tasked with creating a program to organize and analyze information from emission point control equipment and with establishing a baseline for electrical and water usage. The intern analyzed this data to develop recommendations to reduce electrical and water usage and to reduce emissions of particulate matter.

INCENTIVES TO CHANGE

With a mission to improve global wellness, Ajinomoto is committed to improving human health through better nutrition and promoting environmental stewardship. Locally, the company strives to be a productive and responsible neighbor, contributing to a healthy community. Ajinomoto places a large emphasis on environmental initiatives and has pledged to reduce its companywide environmental impact 50 percent by 2030.

RESULTS

Emission Point Monitoring and Maintenance Plan
After compiling a large amount of data, the intern created a tool that collects and organizes data electronically from the emission point control equipment and analyzes the data for issues and abnormalities. This information can then be used to quickly detect and locate the source of an issue. This data collection and analysis tool has been implemented and is currently being used by the environmental team. Emission point control parameters, such as pressure drop and flow rate, occasionally fall outside of optimal range, which can cause an increase in particulate matter emissions. A Preventative Main-
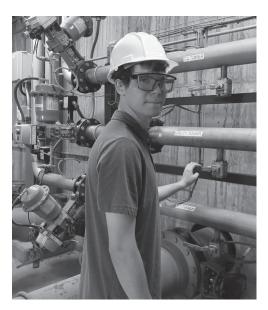
tenance Plan was recommended to reduce the occurrence of these events and prolong the lifespan of the equipment. At the end of the internship, the preventative maintenance plan was being reviewed for approval and implementation.

Cold Lime Water Softening
Ajinomoto has two options for water, onsite wells or sourcing it from a third party. The hard well water has a high concentration of total dissolved solids, leading to a buildup of scale within systems where it is used, such as the cooling towers and chillers. Scale buildup has reduced heat transfer efficiency, requiring these systems to use additional electricity. To decrease scale build up, treated water has been sourced from a third party.

A cold lime water softening system could provide a viable on-site water source for the cooling towers at the plant. Softening lowers the amount of total dissolved solids, and in turn, reduces scale buildup in the equipment and systems. Using well water to reduce scaling improves both the flow and efficiency of the heat transfer, reducing maintenance of the operations and costs associated with water usage. Using water with a lower amount of total dissolved solids allows the cooling towers to cycle water more times, leading to less overall water usage. This recommendation provides a financially and environmentally responsible method to achieve water independence. Additional research is needed to further explore the operational impacts of integrating cold lime softening at the plant.

Air Compressor Efficiency Optimization
An air compressor's efficiency increases the closer it operates to its maximum capacity. For this reason, it is more efficient to run fewer compressors close to maximum capacity rather than many air compressors at a lower rate. Currently, Ajinomoto runs more air compressors than necessary to meet the facility's demand for compressed air. Creating a new program on the programmable logic controller that controls the compressed air system will allow for more efficient operation by running fewer compressors, significantly reducing the energy usage of the compressed air system.

ENVIRONMENTAL AND ECONOMIC SAVINGS TABLE

PROJECT	ANNUAL COST SAVINGS	ANNUAL ENVIRONMENTAL RESULTS	STATUS
EMISSION POINT MONITORING	$30,000 (ONE-TIME)	–	IMPLEMENTED (Monitoring)
MAINTENANCE PLAN	–	1.29 tons PM	RECOMMENDED
COLD LIME WATER SOFTENING	$984,054	130,705,600 gallons 6,997,171 kWh	FURTHER RESEARCH NEEDED
AIR COMPRESSOR EFFICIENCY OPTIMIZATION	$372,524	5,138,266 kWh	RECOMMENDED