ZOETIS

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COMPANY PROFILE

Zoetis is a world renowned leader in the animal health industry. With over 60 years of experience, Zoetis discovers, develops, and manufactures many different types of animal health vaccines and medicines for more than 100 counties. Eight species of livestock and companion animals are supported under the wide umbrella of animal health products. The Charles City, Iowa, site has grown over the years to become the lead producer of Zoetis' products in the world.

PROJECT BACKGROUND

The primary goal of this project was to identify potential areas for water conservation and formulate alternatives without compromising Zoetis' drive for efficiency and maintaining a bio-secure process. Zoetis uses a great majority of their water in cooling systems, and also purifies a significant amount to be used for heating systems, cleaning equipment, and manufacturing products. The intern analyzed these processes, gathered and interpreted data, and researched and evaluated solutions for reducing water usage. A secondary goal for this project was to improve the efficiency of the chilled water system used for cooling in the main production building.

INCENTIVES TO CHANGE

Zoetis strives to be a leader in environmental responsibility and stresses the importance of meeting the needs of the present without compromising the ability of future generations to meet their own needs. Water conservation is one of the corporate environmental priorities for Zoetis. With utility costs constantly rising, the need to assess how water is used in the facility becomes increasingly important. The company could save a significant amount of water and associated treatment costs and make strides toward meeting their environmental goals.

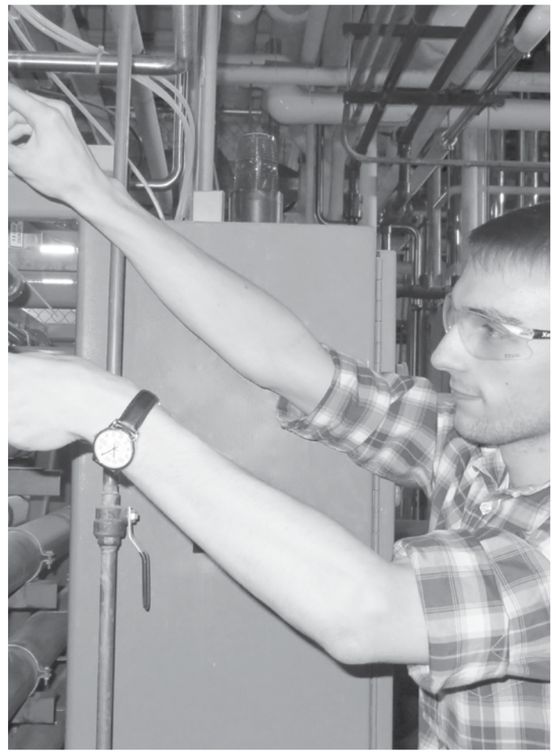
RESULTS

Concentrate Recovery RO System: Zoetis currently uses two reverse osmosis (RO) systems to produce purified water used in production for cleaning, making product and making pure steam. Reverse osmosis is the process of applying pressure to impure water, forcing clean water to pass through a semi-permeable membrane. These systems, by design, have a constant stream of water concentrated with the leftover impurities that is sent directly to the drain. The purity of this reject water was analyzed and determined to be mainly unusable as-is. Running the reject stream through a concentrate recovery RO system would filter the impurities and leave filtered water of a pure enough quality to be fed back through the original RO system. Up to 75 percent, or approximately 4.5 million gallons, of the original reject water could be recovered through this additional concentrate recovery RO system to be reused elsewhere in the plant.

WFI Production: Water for Injection (WFI) is extremely pure water that is suitable for use in pharmaceutical production. Currently, Zoetis produces their WFI through a distillation process. Distillation is one of the most effective methods of purifying water, though the heating and cooling steps of the process can be extremely energy intensive. Zoetis is currently evaluating the effectiveness of an ultrafiltration system for WFI production. An ultrafiltration process could meet the rigorous water purity standards without the heating and cooling demands that the current distillation process requires. Eliminating these demands could reduce the overall operational costs of WFI production and save energy in the process.

Actuator Replacement: Room temperatures at Zoetis are controlled by actuators that adjust the flow of hot water through heating coils that increase the temperature of the delivered air. Currently, Zoetis' Research and Administration building uses pneumatic, air controlled actuators. However, compressed air can very easily leak without being noticed, leading to overworked compressors. Additionally, the room temperatures are currently being manually controlled directly in the individual rooms which can lead to accidental wastes of heating. Electric actuators could allow Zoetis to more easily adjust the room temperatures through remote control. Decommissioning the compressor and switching to electric actuators could reduce energy usage and decrease maintenance costs of the compressed air system.

Chilled Water System Improvements: Zoetis uses two water-cooled, centrifugal chillers to produce enough chilled water for the cooling demand in their main production building. Each chiller uses an individual cooling tower unit for cooling its refrigerant. Adding a cooling tower cell could decrease the condenser water temperature and increase chiller efficiency. In addition to decreasing the energy needed to operate the chillers, this project could generate additional cost savings by lowering the company's peak electrical demand. It could also provide redundancy and improve the chilled water system's ability to meet the cooling load requirements on the hottest days of the year.



PROJECT	ANNUAL COST SAVINGS	ANNUAL ENVIRONMENTAL RESULTS	STATUS
CONCENTRATE RECOVERY RO SYSTEM	$15,380	3,088,600 gallons	RECOMMENDED
WFI PRODUCTION	$4,630	38,160 therms	FURTHER RESEARCH NEEDED
ACTUATOR REPLACEMENT	$2,510	51,870 kWh	IN PROGRESS
CHILLED WATER SYSTEM IMPROVEMENTS	$14,970	276,530 kWh	IN PROGRESS