



BRYCE NEUMAN
MECHANICAL ENGINEERING
UNIVERSITY OF WISCONSIN PLATTEVILLE

COMPANY BACKGROUND

Zoetis discovers, develops, manufactures and commercializes a diverse portfolio of animal health medicines and vaccines designed to meet the real-world needs of veterinarians and the livestock farmers and companion animal owners they support. The Zoetis manufacturing site in Charles City, Iowa, produces vaccines for cattle, swine, poultry, and companion animals. Production of animal vaccines at this facility began more than 90 years ago under the lead of Dr. Joseph Salisbury. Ownership and names have changed a few times since then but the facility in Charles City, Iowa, has always been a producer of animal health products. The current facility includes 600,000 square feet of buildings located on 256 acres and employs approximately 440 people.

PROJECT BACKGROUND

Zoetis uses domestic water for a large portion of their process cooling throughout the facility. Zoetis' current water use is more than 60 million gallons per year. Many processes currently utilize one-pass cooling. This provides one area of opportunity to meet the goal of 5 percent reduction in water consumption.

INCENTIVES FOR CHANGE

Zoetis supports the reduction of waste and efficient utilization of resources. The water and sewer charge is projected to increase 3.5 percent annually, making this an important utility to consider conserving and reusing where feasible.

RESULTS

Clean Steam Generator: One of the clean steam generators had a continuous blow down of purified hot water. This blow down amounted to 0.75 gallons per minute (gpm) of 85° Celsius water. The hot blow down water is now being captured and mixed with plant steam condensate and returned back to the boilers. This project will save the company approximately 547,000 gallons in Reverse Osmosis water and more than 3,900 therms in natural gas annually.

Blend Vessels: The blend vessels have a standard operating procedure using city water that permits the operator to choose a cooling temperature between 16° and 20° Celsius. This range of temperature is problematic as the city water temperature may be warmer, leading to excessive water use. Training the operators to always use a set point of 20° Celsius could save an estimated 279,000 gallons per year.



Autoclave Condensate Cooling: An autoclave in the isolation building is run once per day on average. Currently the flow rate for the condensate cooling is 1.75 gpm, running continuously 24 hours per day, 7 days per week. A switch that connects the control panel to an on-line valve would allow it to open and close only through the operation of a program. This modification could reduce water usage by 2,200 gallons per day.

Decorative Fountain: The Research and Administration building on the Zoetis campus utilizes a decorative fountain. This fountain is operated from 7 am to 5 pm Monday through Friday approximately 7 months per year. Approximately 1,500 gallons of water are added to the fountain per day indicating a leak in the system. Repair of the leak could save more than 335,000 gallons per year.

Freeze Dryers: Five of the Hull freeze dryers use high temperatures for sanitation requiring a shelf fluid temperature of 121° Celsius. After the temperature is obtained, it must be cooled to between 20° and 25° Celsius which is accomplished by using city water in one-pass cooling. One cool down of this system can use more than 5,000 gallons. However, during operation these Hulls have closed-loop cooling systems for the compressors. It is recommended to tie into these loops for the initial shelf cooling to avoid city water use and save more than 1.3 million gallons of water per year.

CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN METRIC TONS

TOTAL FOR ALL SECTORS							
CO ₂	SO ₂	CH ₄	N ₂ O	CFC	NO _x	VOC	PM ₁₀
35.87	0.19	6.03	0.02	0.44	0.09	0.02	0.01

PROJECT	ENVIRONMENTAL RESULTS	STATUS
CLEAN STEAM GENERATOR	547,500 GALLONS OF WATER 3,990 THERMS	IN PROGRESS
BLEND VESSELS	279,000 GALLONS OF WATER	RECOMMENDED
AUTOCLAVE CONDENSATE COOLING	804,825 GALLONS OF WATER	RECOMMENDED
DECORATIVE FOUNTAIN	335,343 GALLONS OF WATER	RECOMMENDED
FREEZE DRYERS	1,395,556 GALLONS OF WATER	IN PROGRESS

