Quaker Oats

COMPANY BACKGROUND

Quaker Oats Company, a division of PepsiCo, operates the world's largest cereal mill, located in downtown Cedar Rapids. The production facility was built in 1873 and employs more than 1,000 people. There are 1.9 million square feet of building under roof. Quaker Oats produces many well-known brands, including Life cereal, Captain Crunch cereal and Quaker Oatmeal.

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PROJECT BACKGROUND

Quaker Oats Company is continuously improving its environmental awareness and sustainability. Quaker's Cedar Rapids plant has begun to map utility usage throughout its various production lines for use in resource conservation projects. As part of a growing resource conservation initiative, the utility modeling is a long-term project that will identify opportunities to eliminate wasted energy.

INCENTIVES TO CHANGE

The size and age of the plant, as well as the complexity of numerous lines and operations, create many opportunities to reduce resource consumption and decrease energy costs. Additional demands being placed on current equipment increase the need to fully understand consumption inside the plant. Effects of the 2008 flood have presented additional needs and opportunities for improvement. Major production components use multiple sources of energy, and as prices continue to rise, sustainable practices will become increasingly vital.

RESULTS

Utility Model: Manufacturing departments were analyzed to determine utility usage rates. Natural gas, water, steam, and electricity were estimated at the specific process level such as ovens, mixing, and extruding. Internal energy sources of compressed air and vacuum air were considered as well. Particular attention was given to flow parameters, in order to identify opportunities for pollution prevention strategies and cost savings.

Flash Furnaces: Flash furnaces are used to heat air to approximately 500° F for cereal food processing. Currently, this air is exhausted through the roof. It is recommended that the hot air be routed back to the respective flash furnaces to recover heat energy, which would reduce natural gas use for this system. A fresh-air intake damping system should be included for airflow adjustment as process demands continue to change in the future.

Flash Steam: The main use of steam throughout the plant is in oat milling processes. One building in particular presents an excellent opportunity to implement a condensate flashing vessel in order to regenerate low-pressure steam. This will not only recover heat and provide additional steam, but also provide a control for condensate flow.

Compressed Air: A compressed air audit assessed the plant-wide distribution system and its more than 300 dust collectors. Dust collection is an essential function throughout the plant. Fans and airlocks are used to remove and control unwanted light material from main product feeds. Plant compressed air is used to clean filters within the dust collection units in order to maintain airflow.

Leaks and equipment malfunctions have become an increasing problem in terms of production and energy costs. Repairing current problems would provide quick payback through energy savings in compressed air conservation. Likewise, instituting a rigorous compressed air program to identify and repair leaks and maintain dust collectors would ensure continued savings in the future.

Steam Traps: Steam use accounts for roughly 40 percent of the plant's utility costs. Steam trap audits conducted plant-wide found significant energy and cost savings could be realized by repairing or replacing failing steam traps. Further, steam load shortages have been detrimental to production in certain departments.

Instituting a continual steam trap program to maintain the more than 1,000 steam traps would reduce steam loss and improve the plant's condensate recovery system. An active steam trap database for reporting failures would benefit the company.

Lighting: A proposal for plant-wide lighting upgrades has been formulated to conserve energy and lower maintenance costs. Utility rebates and tax credits would augment electrical and maintenance savings.

AIR POLLUTANTS DIVERTED IN TONS

Total for all sectors	
SO2	13.22
CO	2.95
NOx	6.63
VOC	3.05
PM	0.40

GREEN HOUSE GASES DIVERTED IN TONS
(CO2 Equivalent)

Total for all sectors	
CO2	2777.13
CH4	3325.09
N2O	1660.00
CFC	32.92

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
UTILITY MODELING	-	-	IN PROGRESS
FLASH FURNACES: WASTE HEAT RECOVERY	$47,695	95,389 THERMS	RECOMMENDED
FLASH STEAM	$22,025	9,471 THERMS (957,600 POUNDS OF STEAM)	RECOMMENDED
COMPRESSED AIR REPAIRS AND MAINTENANCE	$195,595	3,957,780 KWH	IN PROGRESS
STEAM TRAP REPAIRS AND MAINTENANCE	$529,600	397,200 THERMS (33,100,000 POUNDS OF STEAM)	RECOMMENDED
LIGHTING UPGRADE	$130,145	1,451,236 KWH	RECOMMENDED