PROCTER & GAMBLE

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COMPANY BACKGROUND

Procter & Gamble started in 1837 as a small soap and candle company based in Cincinnati, Ohio. It has since grown to a multi-billion dollar Fortune 500 company with facilities worldwide and products ranging from beauty and grooming to household care. The Procter & Gamble facility in Iowa City, Iowa, began operation in 1956 and manufactures shampoos and conditioners, oral rinse products, and body wash. The brands produced are Pantene®, Head & Shoulders®, Herbal Essences®, Aussie®, Gillette®, Scope®, Crest Pro Health®, Olay®, Old Spice®, and Ivory®. The plant employs approximately 630 people in its manufacturing facility.

PROJECT BACKGROUND

The Procter & Gamble Hair Care site in Iowa City has waste heat sources spread throughout the facility. The purpose of the 24-week intern project at Procter & Gamble is to assess and research technologies to recapture, transfer and store heat energy, identify inefficiencies in the steam trap program and optimize boiler efficiency. The intern will continue to collect data and research recovery options in the coming weeks.

INCENTIVES TO CHANGE

In an effort to improve the environmental profile of its operations, Procter & Gamble's goal is to reduce production of energy, waste, CO_2, and water usage by 20 percent in 2012, as compared to 2007 data. While the company has achieved a reduction per unit of production of 57 percent in waste and 22 percent in water usage, energy and CO_2 have only been reduced by 16 percent and 12 percent respectively.

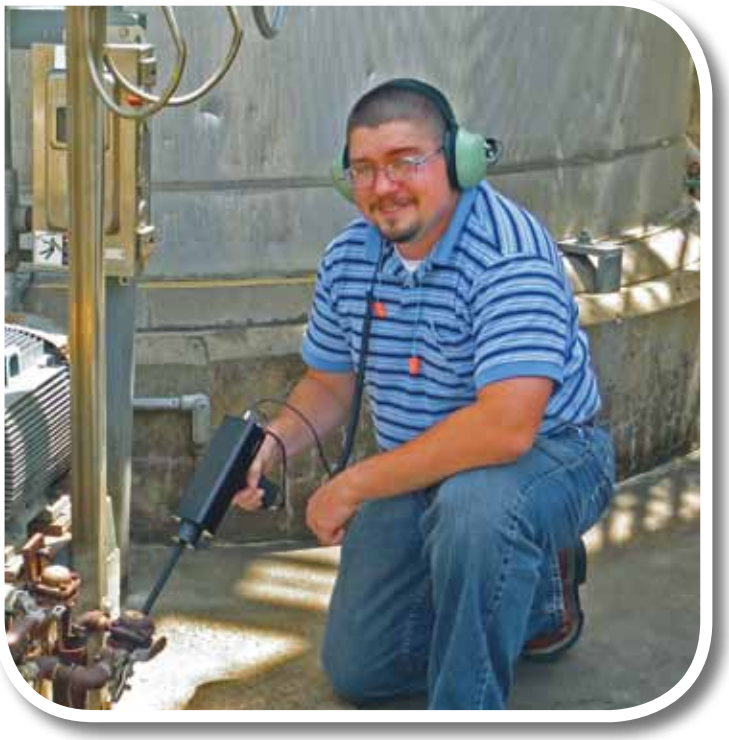
Therefore, the goal of the Procter & Gamble Iowa City site is to reduce electricity and natural gas usage by 20 percent. Accomplishing this goal will not only support Procter & Gamble as a whole, but will also reduce utilities costs and emissions.

RESULTS

Waste Heat Recovery: The available waste heat energy has been quantified at several locations, but many more locations remain to be investigated. Preliminary results show that collecting energy, augmenting the quality with a heat pump or similar device, and delivering to processes is possible. This project may be divided into two subprojects focusing on different locations in the facility. Financial feasibility will be determined during the next 12 weeks.

Replace Failed Steam Traps: It is estimated that each failed steam trap at the facility costs $626 - $1,343 per year in wasted steam. Surveys have been conducted for 250 of the 600 traps at the facility and several failed traps were identified. Surveys will continue and recommendations for replacement will be made during the next 12 weeks.

Implement Steam Trap Maintenance Program: Steam energy is currently being lost to leaks, failed traps, and lack of insulation. To address this, the intern is working with



utilities personnel to implement a comprehensive steam trap maintenance program including a rotating schedule for trap surveys, established protocols for trap replacement, standards for trap installation, equipment training, and resource materials creation. As a part of this effort, the intern has promoted the creation of steam trap maps to facilitate future trap surveys and has organized training for ultrasonic measurement.

Steam System Insulation and Heat Recovery: Currently, most steam traps and some lengths of condensate return lines are not insulated. The intern is investigating savings from using removable steam trap insulation and condensate return line insulation. Additionally, some condensate from the steam lines is sent to the sewer and is not recovered for boiler feed water. Condensate recovery options are also being investigated.

Boiler Efficiency: As boiler efficiency increases, the cost of producing steam will decrease. The intern is investigating opportunities for increasing efficiency through automated controls for O_2 and CO, upgrading the burners, and installing economizers.