

Energy Conservation Audit & Implementation of Energy-Saving Systems for a Manufacturer of Vegetable and Fruit Food Products

The Project.

A vegetable and fruit food products manufacturing facility uses vast amounts of energy in its industrial processes. In an effort to improve efficient energy use and reduce expenses, the plant called on Conversion Technology, Inc. (CTI) to perform a comprehensive energy conservation audit. CTI helped the facility realize its energy goals, designing and implementing a series of solutions that led to striking reductions in energy consumption at the facility – an investment by the facility that paid for itself in less than one year through energy savings.

The Analysis.

CTI began by conducting a thorough evaluation of all energy-consuming processes at the plant, focusing on points at which energy losses were occurring. Through this comprehensive analysis, CTI's engineers were able to determine that:

- The total steam demand for the plant was 75,400 tons per year
- No. 6 fuel oil was the primary fuel source for the facility boilers, with the plant consuming 5,015 metric tons per year.
- The existing system discharged excess heat to the atmosphere to enable the cooling of discharged boiler blowdown water.
- Non-insulated pipes and valves in the water and steam lines were leading to significant energy losses.

The Solution.

Based on the analysis performed, CTI's engineers were able to propose a number of improvements for the manufacturing facility to minimize energy loss and create cost savings. CTI's design solution for the plant included:

- Adding a heat exchanger to the system, allowing the excess heat of the boiler blowdown water to preheat the feedwater, thereby reducing the use of conventional fuels to heat the water (see Figure 1 below).
- Implementing a more efficient economizer to improve heat recovery from the condensation water.
- Adding insulation on all pipes and valves in the steam system, reducing heat loss throughout the manufacturing processes.
- Installing a new pump that is able to pump high-temperature condensation directly to the boiler without the release of excess heat to the atmosphere, thereby conserving heat energy in the system (see Figure 2 below).
- Adjusting steam pressures in the lines of the system to reduce the discharge of pressurized steam to the atmosphere.
- Employing a control system to regulate electricity demand.

The Results.

The improvements made by CTI to the steam system at the manufacturer led to impressive progress with regard to energy consumption and expenses:

- The investment cost for the changes to the system totaled \$230,000.

CASE STUDY

- Through the cost savings associated with a reduced need for No. 6 fuel oil due to the decrease in system heat loss, the upgrades designed by CTI led to an annual energy savings of \$250,000.
- Overall, the facility was able to pay for the costs of these improvements in less than one year.

The Final Word.

The energy savings realized at this manufacturing facility display the great benefits that a facility can obtain through the performance of an energy conservation audit. Experienced engineers are able to determine methods for streamlining processes and eliminating energy losses. Through this venture and numerous other projects with a wide variety of industrial clients, CTI concentrates its efforts on assisting plants to minimize energy costs in order to maximize earning potential.

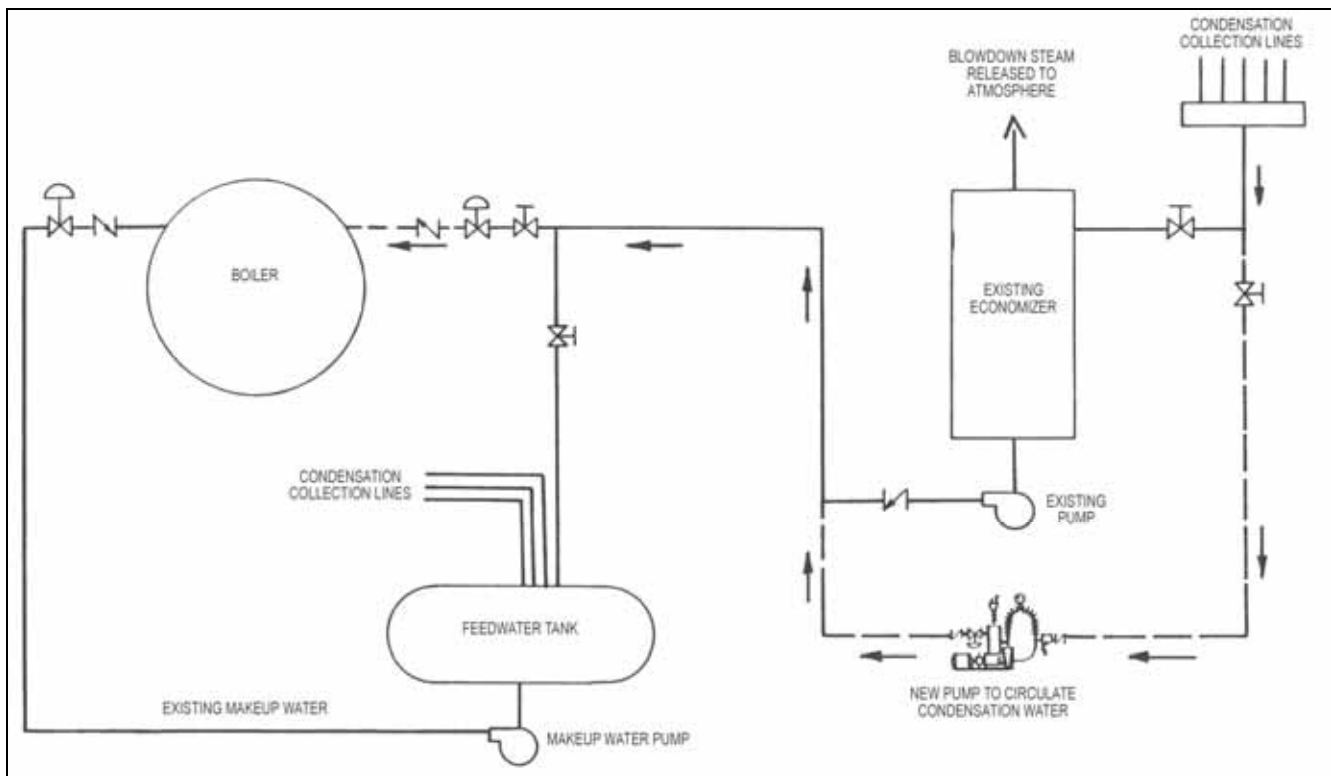


Figure 1: The addition of a heat exchanger to the system, allowing the feedwater to be preheated by the excess heat of the discharged boiler blowdown water.

CASE STUDY

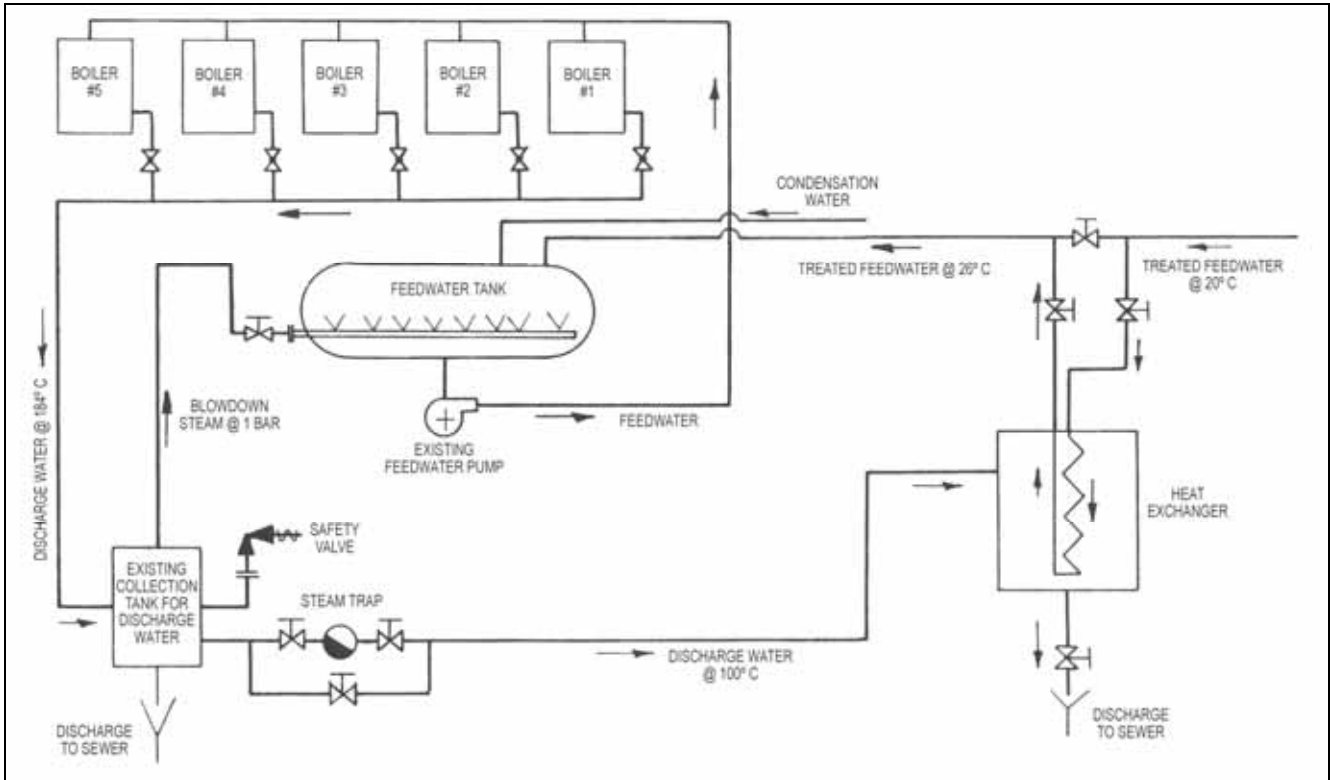


Figure 2: Incorporating a new pump into the existing steam system, eliminating the discharge of excess heat to the atmosphere.