

# LOCKHEED MARTIN HEAVY INDUSTRY PROGRAM



*WE NEVER FORGET WHO WE'RE WORKING FOR*

**Goals: Reduce the energy consumption of the Boiler System**

**Strategies: Install a Boiler Economizer to preheat the water entering the boiler**

**Benefits:**

- **Natural Gas Savings: 13,588 therms annually**

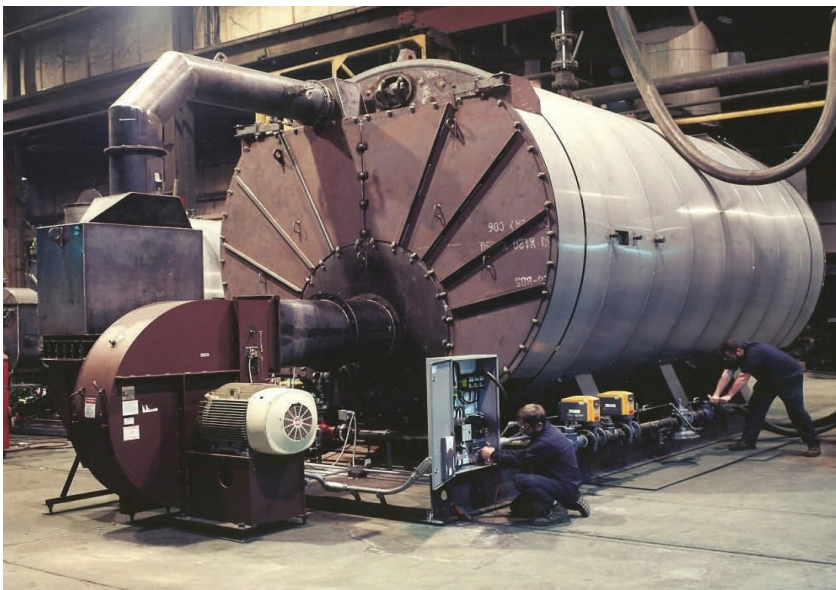
**Equipment Installed:**

- (1) Cleaver Brooks/Cannon Feedwater Heater

**Financial Analysis:**

- **Total Project Cost: \$70,983**
- **LM Paid Incentive: \$13,588**
- **Energy Cost Savings: \$10,191**
- **Simple Payback In: 5.6 years**

## Boiler Economizer



The facility involved in this study manufactures biopharmaceutical feed stocks in a batch fermentation process. The Plant operates a Cleaver Brooks model fire tube boiler that produces steam at 100 PSIG. Steam is utilized for sterilization and heating of the fermentation reactors and product holding tanks. A small Ajax hot water boiler provides domestic hot water for the campus and building heating. The boiler was installed without a feedwater economizer. An economizer is a device that is fitted to a boiler which saves energy by using the exhaust gases from the boiler to preheat the cold feedwater.

Energy Engineers audited the facility and recommended that a method of preheating the water that enters the boiler would save sufficient energy. The plant purchased and installed

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a Cleaver Brooks/Canon Feedwater Heater model. Boiler feedwater is piped through a gas-to-water heat exchanger installed in the boiler exhaust stack. Waste heat in the boiler flue gases preheat the feedwater, thereby reducing the overall boiler fuel demand. This is a typical energy savings measure on a boiler.

The total project cost was \$70,983, however Lockheed Martin paid an incentive of \$13,588. Implementation of this installation provided a natural gas savings of 13,588 therms annually, corresponding to an energy cost savings of \$10,191 per year. These savings make the simple payback period only 5.6 years!

#### **Project Team:**

- **Pacific Gas and Electric Company**
- **Lockheed Martin Energy Services Inc, Heavy Industry Program**

#### **For Further Information About Our Services, Contact:**

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**Or visit our website:**

**Www.lmsi-pge.com**

It is our objective to assist PG&E heavy industry customers in:

- Improving their competitive position
- Identifying process-focused energy improvements and other opportunities (e.g. demand response)
- Facilitating electricity and natural-gas energy efficiency equipment and demand reduction upgrades
- Reducing Operating costs per unit of product
- Improving product quality and production rate
- Reducing waste, pollutants, and Green House Gas emissions

**Remember that increased production efficiency = lower production costs  
= increased profits**

The Heavy Industry Efficiency Program is managed and facilitated by Lockheed Martin Services Inc.(LMSI), and is funded by California utility ratepayers, under the auspices of the California Public Utilities Commission. The program objective is to identify and facilitate the implementation of major process-orientated and other energy-efficiency upgrades for PG&E's heavy industry customers. Customers that install energy efficiency systems receive incentives based on the annual kWh or therm saving achieved.

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