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ECONOMIZADOR

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ABSTRACT

This paper presents an economizer project. First, an economizer recovers heat energy that would normally be lost in the stack exhaust. In addition, to effectively utilize this wasted heat a fluid must be found that can utilize the amount of heat. However, the fluid that uses the heat must also be at a lower temperature than the flue gas. Finally, the economizer was made to reduce fuel costs and take advantage of the equipment's efficiency, since a certain amount of fuel is wasted in the food industry.

1. INTRODUCTION

The economizer can be installed during the application of a new boiler or retrofit of an existing system. The coil is sized for one boiler application, so one size fits all. In addition, the size of this unit has good handling at the time of installation.

The economizer recovers heat energy that would normally be lost in the stack exhaust and in order to use this wasted heat effectively there must be a fluid that can use that amount of heat. The fluid that uses the heat must also be at a lower temperature than the flue gas.

- 1 It reduces fuel consumption for a given steam demand, also reduces thermal stress on the boiler and adds heat transfer surface area to the boiler system.
- 2.One of the main factors for the optimal operation of a boiler is to have a water supply system which is adequate to maintain a constant water level inside the boiler so that an effective water supply failure does not occur.
- 6.The stack temperatures of the high-pressure steam boiler often range between 400° F and 650° F. That high temperature exhaust is wasting energy. That's where a boiler economizer comes in to reduce that heat loss.

Execute identified system improvements, including the application of flow regulation adjustments, the introduction of advanced control technologies and the implementation of corrective measures to resolve operational inefficiencies.

JUSTIFICATION

The economizer was designed to reduce fuel costs and take advantage of the efficiency of the equipment, since a certain amount of fuel is wasted in the food industry. Inefficiency in the water supply system can manifest itself in various ways, from the quality of the water used to inadequate regulation of the flow. These deficiencies not only result in higher water consumption, with its consequent direct costs, but can also lead to performance issues in the boiler, increasing the costs associated with maintenance and unplanned repairs.

➢ 3.Having a minimum water reserve (feed tank). Minimum reserve

➢ 4.The amount of water that is fed to a boiler is practically the amount of steam that is produced, therefore, the necessary water reserve is in proportion to the capacity of the boiler. A recommended criterion to obtain the amount of reserve water and tank capacity is to store a minimum amount of water sufficient to sustain evaporation in the boiler for at least 20 minutes.

➢ 5.To satisfy the water demand of a boiler horse for one minute, 0.261 liters (0.690 gallons) are required. According to the above a 100 horsepower boiler evaporates.

Objectives

Develop specific strategies to optimize the water supply system, considering precise flow regulation, watequality improvements and the implementation of preventive maintenance practices.

Explicative

- **8.1 Project to be carried out**

Our project starts with a 5kg capacity tank with a ¼ copper tube coil with 5 turns inside with inlet and outlet valves with thermometers to verify temperatures in order to optimize fuel costs in the short term, to take advantage of wasted temperatures and use them in other processes.

- **7.1 Results**

The storage tank should not be choked at any time, therefore, the total volume of the storage tank should be:

The purpose of this is to leave 30% of the tank volume free. In most cases, in order to comply with an adequate water storage, a container is used, which in addition to maintaining the minimum water reserve, serves as a tank.

The boiler feed water must be at the highest temperature available to avoid expansion problems, contractions and thermal shocks inside the boiler, hence the convenience of using the same tank to store the minimum reserve and to receive the condensate returns, thus raising the temperature of the necessary replacement water.

In certain cases where the available feed water and the required feed water conditions make deaeration necessary (discussed in the water treatment section) then the common condensate tank is replaced by a desander.

We know that a desander is part of an equipment designed primarily for the removal of air and corrosive gases (oxygen and carbon dioxide) present in the feed water and for the preheating of the feed water before delivering it into the boiler. Thus leaving ample

HOW DOES IT WORK?

When the water enters, it begins to “pressurize” the contained air and when it reaches 50 PSI of pressure, the pump stops since the tank pressure is also 50 PSI. When a faucet is opened, air pressure forces water out of the tank.

How we see it in the figure 1.3

Tenemos 60 grados en el tanque principal

- The result of the cerpentin gives us 50 degrees Celsius at the exit, taking advantage of 90% of the temperature.

Results

Figure 1.3

We have 60 degrees in the main tank

Figure 1.3

As we can see, this would be the prototype that was made. in the figure 1.3

CONCLUSION

Economizers reduce fuel consumption for a given steam demand, also reduce thermal stress on the boiler and add heat transfer surface area to the boiler system.

REFERENCES

Prototipo SELIMEC Sociedad Electromecanicos, SA de CV.