



**Final Report**

**Actual Fuel Savings from Upgrade of Burner Systems for Caney  
Lake Heat Medium Heater Using Automatic Secondary Air  
Control System**

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A handwritten signature in blue ink, appearing to read "Lee Spivey", is written over a horizontal line.

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## Final Report

### **Actual Fuel Savings from Upgrade of Burner Systems for Caney Lake Heat Medium Burner System Using Automatic Secondary Air Control System**

The burner system employed in the Heat Medium Heater at the Caney Lake Station is comprised of three identical Zeeco GB-13 natural draft burners each rated for 10.5 MM BTU per hour (LHV) total input (8.5 MM BTU per hour usable heat). The fuel system for the plant supplies the heater and an incinerator designed to destroy tail gases from the amine process.

The original heater design employed manually adjustable intake air louvers and a stack damper to control the excess air in the combustion chamber. However, manual adjustment of the air using the equipment supplied is difficult and is adjusted for one setting only (assumed to be the highest firing rate).

The heater was retrofitted with Engineered Concepts Automatic Secondary Air Control System (ASAC). The ASAC automatically controls the secondary air in the combustion chamber across the full firing range of the burners to optimize burner efficiency at all firing rates. On the day that the ASAC system was commissioned, the plant DCS system was recording a steady fuel rate of 550 Mscfd with the burners operating at 7.5 psig.

A Bacharach PCA combustion analyzer was used to adjust the ASAC to its optimum set point. After adjustment, the analyzer showed that the heater was operating at an efficiency of 84.2% at 2.6% excess oxygen. After commissioning and adjustment of the ASAC system the fuel pressure to the burners was reduced to about 6 psig. According to the plant DCS system, the fuel consumption for the entire plant dropped by about 115 Mscfd.

Anadarko's plant operator, Eddie Perrin, stated that simply the installation of the ASAC system (before commissioning and adjustment by Engineered Concepts) reduced the heater fuel consumption by about 10 Mscfd. This reduction in fuel requirements can be attributed to the restriction of excess air in the combustion chamber by the ASAC even though the system was not fully adjusted and was not controlling the air flow into the combustion chamber.

After inclusion of the 10 Mscfd savings accrued from merely installing the ASAC, the total fuel savings attributed to the ASAC amount to about 125 Mscfd (125 MM BTU per day). At \$8.00 per MM BTU, the fuel savings amount to \$365,000 per year. Payback for the Automatic Secondary Air Control System is 4.5 months at current gas prices.