MIDWEST

U.S. DOE

CHP TECHNICAL ASSISTANCE PARTNERSHIPS

PROJECT PROFILE

Brandonview Building

4.3 MW CHP System

Project Overview

The Brandonview Building (formerly the Laclede Gas Building) in St. Louis was constructed in 1969. At the outset the 31 story office building was designed to operate completely off the grid with a combined heat and power (CHP) plant providing 100% of the building's energy requirements.

The plant serves the heating, hot water, electric, and cooling loads of the 500,000 square feet building. The plant operates in stand-alone mode, which means it is not interconnected to the local electricity provider, Ameren UE. The power plant is fueled by natural gas, which is purchased from CenterPoint Energy Gas Marketing and distributed to the building by Laclede Gas Company.

The CHP Plant consists of four 800 kW Waukesha engines and two 550 kW Waukesha engines all operating on natural gas. For thermal energy, the plant heat recovery system is capable of generating up to 25,000 lbs/hr of low pressure steam. For summer cooling, the system includes an absorption chiller rated at 1,050 tons of refrigeration. Supplemental or backup steam is provided by two 200 hp boilers.

Operational Reliability

Through the years the CHP plant has had a remarkable history of successful operation. During weekdays, the plant usually operates four engines with nighttime and weekends normally requiring only three engines. This operating schedule has allowed the building to cycle units into service on an as-needed basis allowing for routine and major maintenance without interruption of energy service to the building tenants. The operational history has been so successful that the building has not seen an unscheduled outage since 1980.

Quick Facts

LOCATION: Saint Louis, Missouri

MARKET SECTOR: Office Building

FACILITY SIZE: 31 Floors and 500,000 Square Feet

ELECTRIC GENERATING CAPACITY: 4.3 Megawatts

CHP PRIME MOVER EQUIPMENT:

- (4) 800 kW Waukesha Engines
- (2) 550 kW Waukesha Engines
- (1) 1050 Ton York Absorption Chiller

FUEL TYPE: Natural Gas

HEAT RECOVERY RATE: 25,200 lbs/hr Low Pressure Steam

CURRENT ANNUAL ENERGY SAVINGS: $14,000/yr

BEGAN OPERATION: 1969

SYSTEM OPERATION: Grid independent operation (islanding mode) with no unplanned outages since 1980

Laclede Gas Tower, Saint Louis, Missouri

System Efficiency

By providing 100% of the building electrical load and recovering 650,000 therms of thermal energy annually, the overall system efficiency is 68%. In winter months the system is capable of generating steam in excess of that needed for the building. This has prompted the building management to seek neighborhood customers for the excess steam. If the building is able to provide steam to an existing or future neighbor, the system efficiency will increase further and provide an additional revenue stream to the owner.

System Upgrades

With over 45 years of operation it is only natural that the plant will incorporate upgrades. Recently the plant completed the installation of engine exhaust catalysts to place the plant in compliance with the current EPA NESHAP requirements. This has resulted in a 30% reduction in hydrocarbon emissions. In addition, the plant has improved their lubricating oil management resulting in an increase in time between oil changes from 800 hours to over 1,100 hours. Engine ignition modules have also been upgraded.

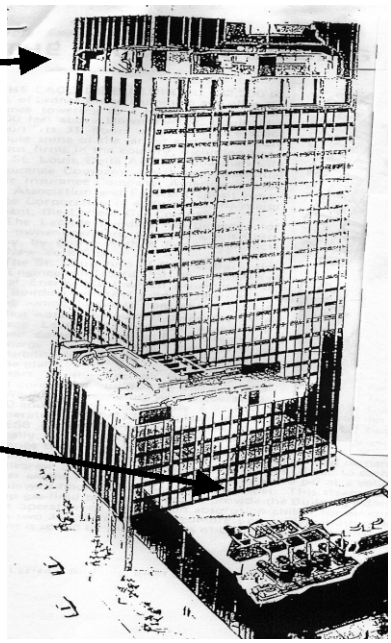
These and other plant upgrades have allowed the plant to maintain scheduled top overhauls at 20,000 hours and full overhauls at 40,000 hours.

This facility, for over 45 years has been a symbol of energy efficiency through the use of CHP systems and equipment. As prices in the electric power market are expected to continue to rise and the prices of natural gas are continued to reduce (or at least remain low) it is expected that this facility will continue to provide low cost, reliable energy to the building.

Laclede Gas Building

Roof
Cooling Towers

31st Floor
1 - 1050 Ton Absorption Chiller
2 - 350 Ton Engine Chillers
2 - 200 hp boilers
Heat exchangers, pumps, and fans



3rd Floor
4 - 800kW, 1200 rpm engine generators
2 - 550 kW, 900 rpm engine generators
4 - 4700 lb/h heat recovery boilers
2 - 3200 lb/h heat recovery boilers
Control room and Spare parts

Waukesha Engines at Laclede Gas Building

For More Information

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The Midwest CHP TAP is a U.S. DOE sponsored program managed by the Energy Resources Center located at the University of Illinois of Chicago.

Version 0315