

**HIGH-RISE  
OFFICE BUILDING**

**Company Name**  
The Times Company

**Location**  
620 8th Ave, New York, NY  
(Consolidated Edison)

**Installation Date**  
2007

**Operating Experience**  
Beginning 2007

**CHP Equipment**  
Two 700 kW Caterpillar G3516  
engine generators

**Generating Capacity**  
1,400 kW

**Heat Recovery Application**  
Space heating; absorption  
cooling

**Design CHP Efficiency**  
61% annual CHP efficiency

**Type of Fuel**  
Natural Gas

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"This system provided a cost-effective approach to provide highly-reliable, redundant power for our data center with the added benefit of hot water heat that reduced energy costs in the building."

- Patrick Whelan,  
Facilities Director  
The New York Times

# Grid Independent Generators Serve Data Center Loads

## BACKGROUND

The New York Times Building is located in midtown Manhattan. The 52-story commercial office building opened in 2007. The Times Company owns and occupies about half of the building's 1.5 million square feet. They needed a highly reliable, redundant source of power for their data center's uninterrupted power supply (UPS) and other critical loads.

## THE APPLICATION

WSP Flack & Kurtz designed a CHP system with two Caterpillar 700 kW natural-gas-driven engines as the primary source of power. Diesel engines and the utility grid provide backup and redundancy for this system. If generator power is lost, a series of automated transfer switches ensure that power flow can be maintained to these critical loads at all times. The generators run around the clock throughout the year to serve these loads. Therefore, hot water is continuously available from the engine jacket and exhaust silencers to meet space heating loads in the winter season and space cooling loads all other times (via a 200-ton hot-water-driven absorption chiller).



*The New York Times Building*

## CHP SYSTEM AND EQUIPMENT

Each engine is a Caterpillar G3516 natural-gas-driven engine generator capable of producing 700 kW of synchronous power. The rated electrical efficiency of the units is 31.8% based on lower heating value (LHV). As much as 4,675 MBtu/hr can be recovered from each engine using the jacket water and a VaporPhase™ exhaust heat recovery silencer (9,350 MBtu/hr maximum for both engines). If all the available heat is used, the system has a fuel conversion efficiency (FCE) of 94% LHV.

The Trane absorption chiller can provide about 200 tons of cooling at the maximum available hot water temperature of 195 °F. A dump radiator rejects excess heat to ambient when it cannot be used in the building.



# Combined Heat and Power for High Rise Office Building

## ECONOMICS AND ENVIRONMENTAL BENEFITS

The performance of the system was measured via gas meters, power meters, and Btu meters that were installed on the system to record the major energy flows. The Btu meters measured the useful thermal outputs from the CHP system as well as the hot water energy delivered to the chiller. Performance data were collected from July 2009 through October 2011. The measured results showed that the system consistently provided 900-1,100 kW. The thermal output from the CHP system reached as high as 6 million Btu/hr in the winter and the base-loaded absorption chiller consumed about 4 million Btu/hr in the summer. The average annual FCE for the system was 61% in 2011, which is very good for a high-rise commercial office building.



*Caterpillar Engine Generator*

## SUMMARY OF BENEFITS

- CHP system also provided reliable power for critical data center loads
- Continuously produced 900-1,100 kW throughout the year
- Annual average fuel conversion efficiency was 61% in 2011

## ADDITIONAL RESOURCES

- **Developer/Engineer:** WSP Flack & Kurtz [www.wspgroup.com](http://www.wspgroup.com)
- **Equipment Manufacturer:** Caterpillar [www.cat.com](http://www.cat.com)
- **DG Integrated Data System:** [chp.nyserda.ny.gov](http://chp.nyserda.ny.gov), [www.northeastchp.org](http://www.northeastchp.org)

[nyserda.ny.gov/chp](http://nyserda.ny.gov/chp)  
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