

Initial Use of DE Packaged System Evaluated in Hospitality Sector

Ritz Carlton San Francisco Installs PureComfort™ 240M

Background

The power, heating, and cooling demands of large hotels are high year-round. The benefits of integrated energy system (IES) use in the hospitality industry are potentially great; however, the hotel industry has typically avoided the financial risk of introducing large-scale technology innovations which affect building design.

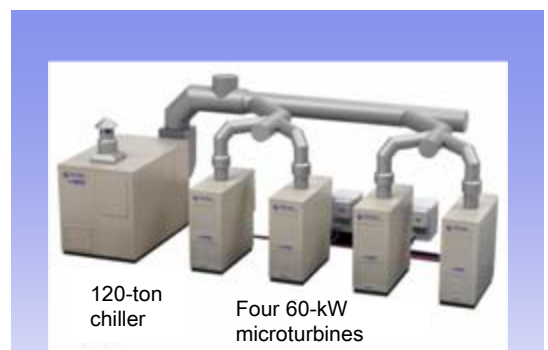


The Ritz Carlton San Francisco has become the first hotel in the world to install the PureComfort 240M – a combined cooling, heating, power system developed by UTC Power in partnership with the DE Program. It is anticipated that the IES will provide 240 kW of electricity and 120 tons of cooling to the 336-room hotel at better than 80% efficiency. In addition, nitrogen oxide emissions will be reduced by 90% in support of local and state environmental protection policies.

Technology

The PureComfort 240M is a modular system with four to six, 60-kW Capstone microturbines and a 120-ton Carrier absorption chiller/heater unit. It differs from traditional CHP installations in that the heat recovery unit is eliminated and the chiller/heater is directly connected to the microturbines. Recaptured waste heat is used to drive the chiller/heater with high efficiency, reduced utility costs, and no additional emissions.

PureComfort's modular design allows the flexibility required for installation and operation in diverse settings, and the Ritz system is customized to accommodate the facility's year-round air conditioning needs. Kitchen and restaurant heat can elevate cooling requirements to 300RT during summer months. Prior to the PureComfort installation, a 300-ton chiller ran continuously (even when demand would



PureComfort™ 240



drop to 100 RT) and accounted for 20% of the building's total electricity use. Now the PureComfort™ 240M provides 161RT of cooling year-round and the old chiller supplements its use only during the warmest four to five months of the year. San Francisco's fairly moderate climate makes it unnecessary to switch to the heating mode.

Benefits

- **Energy Efficiency and Reliability**– Combined power, heating, and cooling can significantly reduce energy spending in a large hotel. Microturbine exhaust drives the chiller/heating unit, reducing utility needs. Furthermore, on-site power generation reduces grid dependency.
- **Modularity** – PureComfort™ solutions are available with 4, 5, or 6 microturbines to generate 240kW, 300kW, or 360kW of power respectively. The Carrier chiller is a relatively small commercial unit that is specifically designed to recapture exhaust from these units. The system's modularity facilitates installation in urban areas and simplifies the retrofitting process. In addition, system operations can be more easily customized to meet each building's unique CHP requirements.
- **Environmental Protection** – No fluorocarbons are used and nitrogen oxide emissions are extremely low. The PureComfort™ system easily passed the especially stringent emissions regulations applied to the Ritz Carlton due to its close proximity to a school.
- **Low noise** – Hotel guests are not disturbed by the microturbines located next to the courtyard area.

Collaborators

Gas Technology Institute
United Technologies Research Center

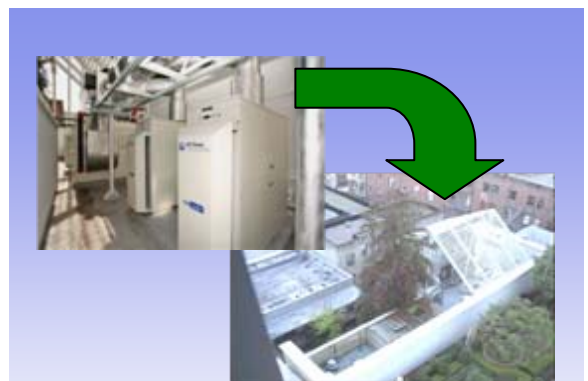


Future Work

Reductions in operating costs will be documented and used to encourage IES installation throughout the Host Marriott system as well as other hotel chains. Distributed energy use in other commercial settings such as grocery stores, hospitals, and schools will also be examined.

Point of Contact:

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The PureComfort™ 240M microturbines quietly operate adjacent to the Ritz Carlton courtyard. Pumps and tanks are located in the equipment room below.