Waukesha Co-Gen System Makes Brazilian Mall Cool, Bright

Location

Iguatemi Mall, Brazil

Engines

Three Waukesha 16V-AT27GL Enginator® units

Summary:

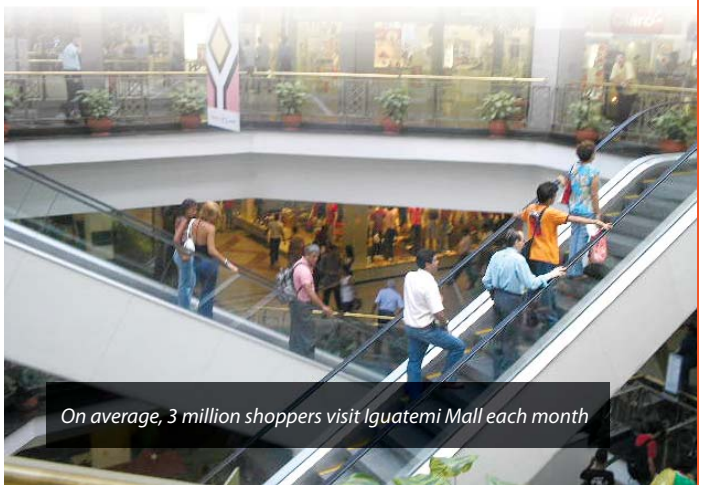
A Brazilian shopping mall's onsite electrical power co-generation system provides a cost-effective alternative to high-priced and less reliable grid power. Three Waukesha natural-gas fired ATGL generator sets provide all the electricity needed for the Iguatemi Mall and its 540-plus stores, while waste heat from the engines is used in the mall's air conditioning system.

SALVADOR, Bahia State, Brazil -- Follow Brazil's Atlantic coastline north from Rio de Janeiro a thousand miles to the sandy beaches of Salvador, capital of Bahia state. Salvador is a vibrant city that boasts colorful 17th and 18th century colonial-era homes, modern high rises, and thriving telecommunications and tourist industries. Visitors come to soak up the sun and experience the area's unique blend of Brazilian and African influences on culture, food, music, dance and folk art.

The city is home to 2.5 million inhabitants and the Iguatemi Mall, one of the largest indoor shopping malls in Brazil, an enormous complex with 540 stores.

Every day 130,000 people – or three million per month – visit the mall. They browse in brightly lit shops and linger over snacks in cool comfort in the food court, thanks to the three Waukesha engine-generator sets that are at the heart of the mall's co-generation system.

Shoppers aren't the only ones who benefit from the mall's onsite power generation system. Mall tenants, who own their shops in a condominium type arrangement, pay approximately eight percent less for electricity than if they were purchasing it from the local utility.



On average, 3 million shoppers visit Iguatemi Mall each month

Air conditioning is a necessity in Salvador, where, it is said, the sun shines almost every day. The climate is tropical and the temperatures are warm year-round with an average low of 70° F (21° C) in winter and an average summertime high of 90° F (32° C). However, in recent years, Brazil's fast growing economy and tight environmental controls on new power plants have created electrical power shortages, driving up costs and reducing dependability.

As a result, UTC, the corporation that operates of the 30-year old mall, saw the potential for cost-effectively generating its own power onsite by using a co-generation system that would maximize the plant's energy efficiency. The power plant was commissioned as a build, own, operate and transfer project (BOOT), which required no investment by the mall operators.

Instead, a company called Iguatemi Energia built and owns the plant and sells the power to the mall tenants. At the end of 15 years, ownership of the plant will be transferred to mall operator. According to plant manager Humberto Barra Neto, in that time Energia will have recouped its construction and start-up costs and turned a profit.

The power plant is tucked out of sight down and behind the mall, screened from the street by shrubs and a fence. From the street, the sounds of the plant's operation are barely audible over noise from traffic.

Case Study #1421, Brazilian Mall

In service since August of 2005, the three 16V AT gen-sets, rated at 2,885 kW each, together produce 7.5 to 8.2 MW of electricity each day between 7 a.m. and 11 p.m. During the day, the mall relies entirely upon the generator sets and consumes virtually all of their output. The units are paralleled to the grid, but only as a back-up in case of an emergency.

The plant gets its cost-competitive advantage from maximizing its energy efficiency by using waste heat from the engines for the mall's air conditioning system. The heat is drawn off through the engines' jacket water, which is further heated with exhaust air from the engines and then used in the three LG 450 ton absorption chillers, three centrifugal chillers that provide air conditioning for the 1.6 million square foot mall.

At 11 p.m. each night, the lights go out, the air conditioning is turned off and electricity use drops sharply to 1 MW – only what is required for nighttime and emergency lighting.

The plant is approaching its third anniversary of operation and the engines have logged nearly [number to come] hours with over 98 percent uptime during operating hours.

The food court is comfortably cool thanks to an air conditioning system powered by the Enginator gen-sets' waste heat.

Plant manager Barra expresses his satisfaction with the Waukesha units' performance. "This is robust equipment," he says with a smile. "And Stemac (Dresser Waukesha's distributor in Brazil who has the maintenance contract on the co-generation system) is doing an excellent job."

He believes that natural gas-fired co-generation installations like this one are a promising solution for his country's energy needs. However, he notes that both government regulation and the country's natural gas delivery infrastructure need to be further developed for such applications to become more widespread.

Government regulations for natural gas for co-gen installations need to be more clearly defined, to give potential users greater confidence about making the investment in a plant, he pointed out. And when Petrobras completes the interconnection between the Northwest and Southeast pipelines, gas will be more readily available.

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