Photo credit: www.nativewellness.com

The Hard Rock Tulsa property includes 600 hotel rooms and showcases more than $2 million in rock-inspired music memorabilia.

CASE STUDY

Entertainment/Hospitality

Name
Hard Rock Hotel & Casino

Location
Tulsa, OK USA

Facility size
308,974 ft²

Issue
Modular HVAC solution needed to support fast construction, revenue generation, and facility growth

Solution
Daikin Modular Central Plants with:
(2) 450-ton centrifugal chillers
(1) 800-ton centrifugal chiller
(2) 1000-ton centrifugal chillers (future)
Multiple boilers and cooling towers

Doubling Down on Daikin Modular Central Plants at Tulsa Hard Rock Hotel & Casino

Issues

Money is the name of the game in the casino business. And, to make it, casino owners have to keep people comfortable at the tables or in front of machines. Fast-track construction is the only way for them to expand and update while keeping the dollars flowing.

No one can attest to the need for speed in construction more than Cherokee Nation Entertainment, the operator of Hard Rock Hotel & Casino in Tulsa, OK. The gaming and hospitality company is in the midst of expanding its substantial Hard Rock property, which is a rich blend of Cherokee culture with Oklahoma's rich musical history and classic rock 'n' roll.

The company was looking for an HVAC solution and partner that could match new and retrofit requirements with a fast and economical installation. The vast project called on the need for a highly configurable design, fast track, and the benefit of single-source responsibility. A prime match was Daikin's modular central plant (MCP) offering, chosen to serve the facility's newest hotel tower and three casino areas.

The Hard Rock MCP combines multiple chillers, boilers, cooling towers, condensers, chilled water, and heating water piping in a convenient pre-engineered and pre-assembled module. "The MCP plant is built and disassembled at Daikin's manufacturing facility, shipped to the site, and reassembled by Daikin field personnel that saves on construction and lead times. Owners at the Cherokee Nation appreciate the single-source warranty for a clean line of responsibility," said Chad Smith, vice president at Airetech Corporation in Tulsa, a Daikin representative.

Solution

"The ability to scale the plants up to meet increasing capacity needs for chilled water and hot water lends itself to the MCP application. Originally, we designed the project to bring on the chillers in standardized sizes, but adapted the sizes to better accommodate the needs of the owners as they expand the Hard Rock," said Gary Niver, P.E., LEED AP, director of engineering for MCP at Daikin Applied.

The first phase of the project in 2010 retrofitted the existing HVAC system at area two of the casino to change it from DX cooling to chilled water cooling (with energy recovery) to allow for a 100 percent dedicated outdoor air system (DOAS). Two 450-ton Daikin centrifugal chillers were among the equipment supplied by Daikin in the first MCP, in addition to boilers and related equipment. "The plant is a variable

The plant and cooling towers accommodate capacities for Phase 1 and 2 of construction, with additional capacities slated for 2017 and 2019.

primary flow plant since the facility sees loads over a wide range due to the DOAS design," Smith said. Located outdoors, the MCPs can be easily expanded to coincide with the property growth, while saving profitable hospitality and entertainment space.

The second phase of the expansion at Tulsa Hard Rock added a 10-story tower featuring 100 suites and more than 55,000 ft^2 of entertainment, gaming, and convention space. "In 2012, we added another 800-ton capacity Daikin centrifugal chiller to the existing MCP to serve the new casino addition and hotel tower," Smith said.

Currently, the MCPs serve approximately 130,000 ft^2 of space across two casino areas and the 10-story hotel tower. "The older mechanical plants will continue to be used," said Robbie Jones, senior project manager with Las Vegas-based MSA Engineering Consultants and the mechanical engineer of record on the multi-year project.

"The MCP solution saves Cherokee Nation considerable cost and about four to eight weeks of construction time...with virtually no downtime."

Chad Smith
Vice President, Airetech Corporation

NWC Service, Airtech's sister company, functioned as turnkey service providers that helped the casino to begin generating income quickly.

Since 2010, Jones has managed the Tulsa Hard Rock project, which is among several for the Cherokee Nation, and cites sizing the HVAC equipment for future phases as one of the most critical aspects of the project. Another challenge was routing the piping from the new MCPs, located about 200 feet away from the buildings. "We did a lot of planning in order to route the heavy piping on top of the casino facilities and hired a structural engineer for an assessment," Jones said.

Smith estimates the MCP solution saves Cherokee Nation considerable cost and about four to eight weeks of construction time during each expansion with virtually no downtime. "Owners have the opportunity to source mechanical equipment directly. The general contractor is spared the coordination required with traditional HVAC systems among the plumbing, electrical, and other mechanical trades," Smith said. "To save time and provide a clear definition of warranty responsibility, Daikin provided a complete factory-mounted controls system with a BACnet front end."

Smith added: "As a turnkey solution for owners, Daikin provided coordination of installation services for everything inside the central plant, which included Airetech's sister company NWC Service providing all the rigging, assembly, and final connections."

Outcome

Since the first MCP came online in 2010, the HVAC system has been running 24/7 without any service disruptions. "The space temperature inside the Tulsa Hard Rock has never risen above 75 degrees Fahrenheit due to the fact we designed with multiple chillers to provide redundancy," Smith said.

In 2017, a 1000-ton chiller module will be added to the existing MCP. Adding another 1000-ton module in 2019 will complete the plant's master plan for a total 3,700 tons of capacity, (8) 2 MMBH boilers, and seven total modules making up the entire MCP.

Ultimately, the simplicity of the MCPs saved costs for the building owners by eliminating additional construction to achieve similar results with different HVAC equipment. Additionally, the MCPs minimized downtime, expedited operation, and allowed the casino to begin generating revenue sooner than any other HVAC solution provider could offer.