

case study

Dubai Park Place Tower Pivots to Open BMS with a Niagara Retrofit

CHALLENGE

Park Place is a 56-floor mixed-use tower that offers 15 floors of luxury residences with floor-to-ceiling windows overlooking the Arabian Gulf and the central business district of Dubai. It also houses a hotel, two restaurants and 18 floors of commercial offices. It is one of the many tall towers that give Sheikh Zayed Road its futuristic skyline. Recognizing that the cooling of buildings represents about 70 percent of regional peak electricity load, the United Arab Emirates (UAE) along with other countries in the Gulf Cooperation Council (GCC) have issued aggressive building energy efficiency goals for such towers.* These are being studied around the world as climate change causes spikes in the use of air conditioning in many other metropolitan regions. Likewise, Park Place's sophisticated HVAC operations offer lessons in how to comply with energy saving mandates and report on usage for the rest of the globe.

Park Place Tower completed construction and welcomed its first occupants in 2007. The original MEP infrastructure plan included a central Building Management System (BMS) to control HVAC, electrical, water and elevator systems. When it was time for a controls upgrade in 2021, the project team had several new objectives not considered during original construction:

- ▶ An **open-protocol building operating system** for centralization, normalization and integration of the data streams from equipment and system-level building services. The open-protocol approach would give Park Place managers more options when adding new technology in the future, and it would save them money by enabling more competitive bidding for HVAC replacement parts and services.
- ▶ Better ability to **leverage the latest advancements in IT** and data management such that the tower's IT team could keep compute costs in check and cyber defenses at the highest levels. Operating Park Place Tower in a manner that delivers a modern, luxury user experience and that can meet regional mandates for precise control and visibility of energy use requires a sophisticated data strategy as well as MEP strategy.

To achieve these goals the retrofit project team looked to a Tridium Niagara partner, Green Optima Airconditioning LLC. Green Optima proposed an open Niagara-based BMS, as well as a Niagara-at-the-Edge approach. Its winning bid specified the IP-based field equipment controller powered by the Niagara Framework®, the Niagara Edge™ 10.

"To retrofit the BMS system in an operating building is always a challenge and requires the close cooperation of the FM team with equipment providers and contractor. We can confirm that Tridium and Green Optima have exceeded our expectations. The new BMS system has been in use for six months and it provides us excellent tools to monitor MEP systems, react in time to identified issues, optimize energy saving features and deal more efficiently with any HVAC complaints received from tenants."

Edin Mahic
Head - Facilities Management
Park Place Tower

FAST FACTS

Project Type: BMS Retrofit of a Multi-Use Building Commercial/Hotel/Residential

Niagara Partner:



Property: Landmark skyscraper with total structural height of 234.1 m (768 ft). Original construction completed in 2007.

Retrofit Date: 2021

HVAC Equipment: AHUs (9); FAHUs (5); VAV Boxes (450); FCUs (55); District Cooling Connection (Tabreed) - Max 1800 RT

Key Technologies: Niagara Supervisor, Tridium JACE 8000, Niagara Edge 10 Plus IO Modules

Project Area: 7.2 million square meters

Number of Control Points: 15,000

* <https://www.strategyand.pwc.com/m1/en/reports/energy-efficiency-in-the-uae.pdf>

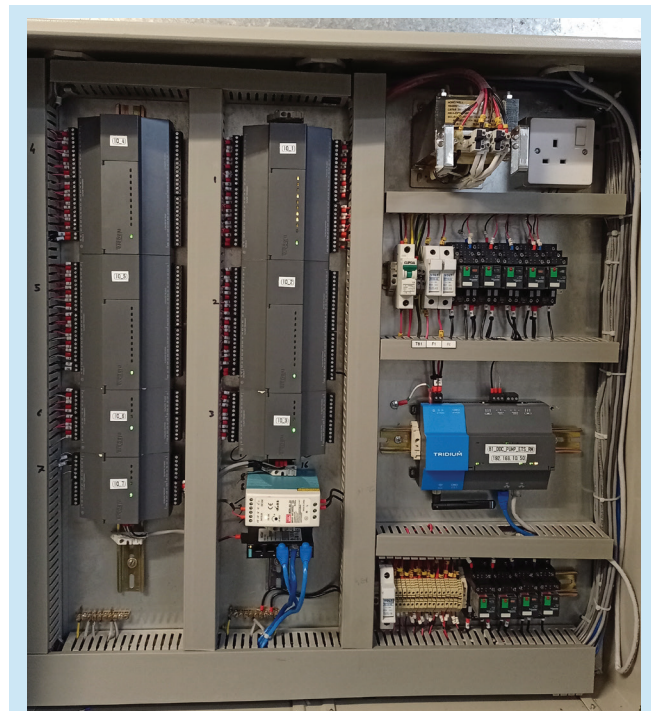


The customized user interface built for the Park Place Tower features a graphical navigation system that allows the facilities management team to easily visualize the status of building services in the tower at the whole-building, floor, equipment and VAV levels. This makes the root cause of alarms easy to trace, and it speeds response time. The facility team is empowered to monitor trends and address issues before comfort and energy use is impacted.

SOLUTION

Niagara Edge 10 controllers offer superior price-performance when driving applications such as zone temperature control and the operation of fan coil units, single-stage air handling units, elevators and more. Niagara Edge 10 controllers run the full Niagara stack, with 10 points of on-board IO and IO-R expansion capability. They have the microprocessing capability to run some analytics locally, communicating with central supervisory control on an exception basis, thus conserving data network bandwidth. With this design, the Park Place Tower operations team would be able to oversee, control and gain insight from many more data points, while still having only one operating system to learn.

To complete the BMS retrofit, existing DDC Panels, field devices and wiring were reused, replacing only the controllers inside existing DDC panels with Tridium JACE and Niagara Edge™10 Controllers and IO modules. Also the existing front-end supervisory control unit was replaced with Tridium's Niagara Supervisor and a custom Niagara user interface was built. The Niagara network for the whole tower encompasses 8 JACE 8000s, 17 Edge 10 controllers and lots of IO modules installed in 21 DDC panels. Also, 366 room controllers were integrated to the Niagara Supervisor using LON protocol. The customized graphical UI now offers histories and alarms that make any issues easy to detect, root causes easy to identify and resolution fast to happen.



DDC PANEL AFTER RETROFIT

One of 21 DDC panels that were retrofit with Tridium JACE and Niagara Edge 10 controllers and IO modules. The Niagara Edge 10 provides scheduling capability at the FCU and VAV levels to save energy.



ENERGY SAVINGS VIA FRESH AIR HANDLING

The climate and regulatory environment inside the UAE necessitates the use of certain energy-conserving HVAC design and data collection and reporting approaches. For example, the Fresh Air Handling Unit (FAHU) visualized here makes it possible to control the supply/exhaust air quantities, monitor heat recovery, and adjust and schedule operation based on ambient temperature and time of the day. It also provides “Trends” that allow review of operation across different periods of time.

RESULTS

Park Place Tower was provided with an open and refreshed BMS with low operating and maintenance cost. Close monitoring and optimizing of operations through Niagara Framework has proven to assist in energy savings at no negative effect to comfort level. Early detection of equipment failures or reduced efficiency reduces energy consumption and also maintenance costs.

ABOUT GREEN OPTIMA

Green Optima is a well-known Tridium Partner in the UAE and an experienced system integrator delivering innovative, high quality, economical integrated building management solutions. Founded in 2006, its team of experienced professional engineers deliver customized solutions with top-of-the-range control, monitoring, energy and cost-saving objectives as a priority. Green Optima is actively involved in successfully implementing

integrated automation solutions in the government and private sectors for retrofit and ESCO companies. It has proven ability to deliver BMS solutions with speed, tech-savvy flexibility and cost-efficiency as evidenced by its impressive project portfolio.

ABOUT TRIDIUM

For over 20 years, Tridium has led the world in business application frameworks — advancing truly open environments that harness the power of the Internet of Things. Our products allow diverse monitoring, control and automation systems to communicate and collaborate in buildings, data centers, manufacturing systems, smart cities and more. We create smarter, safer and more efficient enterprises and communities — bringing intelligence and connectivity to the network edge and back. Additional information about Tridium is available at www.tridium.com