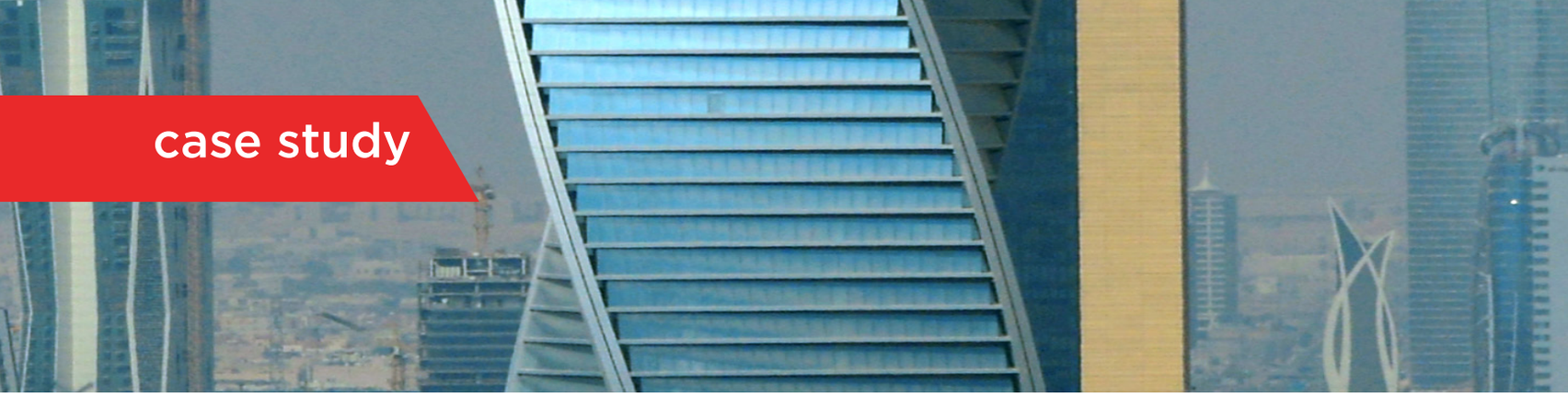


case study

Niagara Deployed at the World's Twelfth-Tallest Twisting Tower

CHALLENGE

Majdoul Tower is a spectacular 801-foot structure located on King Fahad Road of Riyadh, Kingdom of Saudi Arabia (KSA). It has 54 floors above ground, four parking levels below, and a helipad located on the rooftop. Due to its size and the demanding desert climate of Riyadh, the tower's infrastructure services are among the most sophisticated in the world. To fulfill the demand for cooling and heating of occupants, the HVAC system involves over 1500 locally controlled fan-coil units, 300 VAVs and 10 AHUs There are almost 230 different lighting fixture groupings that need to be controlled. Elevators and people-moving services are dispersed throughout the tower from basement-4 to rooftop. Also, 170 water meters and 250 electricity meters are installed for getting awareness about energy consumption to tenants and to bill them for their usage. Other essential services include smoke and fire alarm systems, access control, central battery system, water treatment plants, power units, a parking guidance system, a pumping system and more.

The wide range of tower systems meant that the controls and integration firm on the project team, Saudi Electronic Trading and Contracting Company (SETRA), needed a way to manage myriad dissimilar protocols i.e. BACnet, Modbus, LONWORKS, EIB, MBus and others. Before the building could be opened to occupants, the project team designers needed to consider all the tools the Majdoul Tower Operations & Maintenance team would need to ensure that building services continued to perform as designed —graphical interfaces, alarms, trends and reports. It was up to SETRA to provide an integrated, centralized and user-friendly control environment that would work across all these systems and provide data interoperability among them.

SOLUTION

KSA-based SETRA deployed Tridium's Niagara Framework® as the core integration and data normalization platform for Majdoul Tower. Niagara enabled SETRA to quickly and successfully connect a wide range of tower systems and sub-systems and to integrate data streams from various equipment, regardless of its brand and manufacturer and without installing additional gateways. Niagara has made it possible to integrate the vast amount of multi-vendor systems installed on the project. The resulting Niagara network consists of a total of over 25,000 control points. Over 1500 LG FCUs are being controlled by their BACnet supported thermostats, and 120 JCI field controllers connect various hardwires of HVAC and Electrical systems. Niagara oversees

EXECUTIVE SUMMARY

Project Type: Office & Residential

Client: Awtad-al-Akaria Company

Niagara Partner:

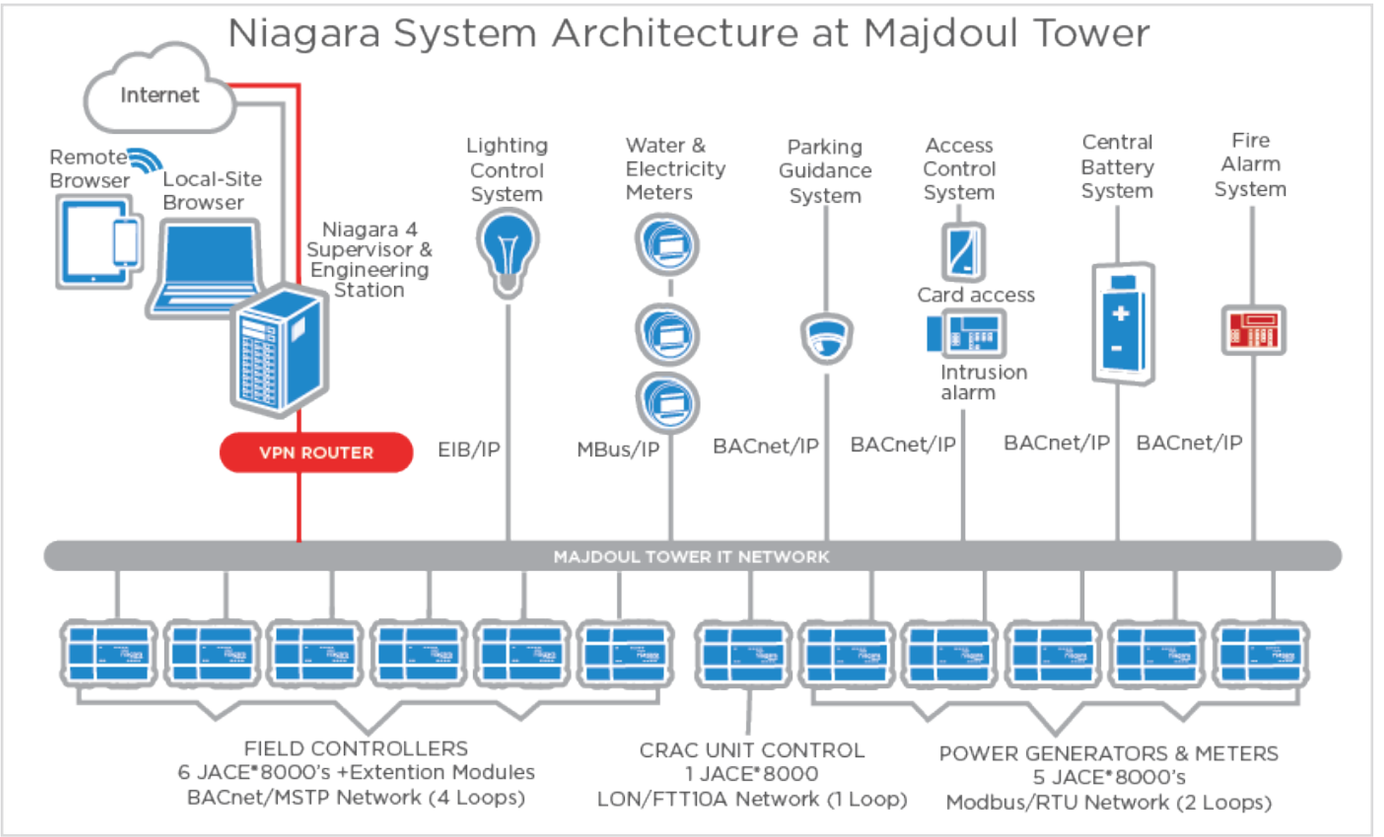
SETRA
الشركة السعودية الإلكترونية للتجارة والمقاولات المحدودة
SAUDI ELECTRONIC TRADING & CONTRACTING COMPANY LIMITED

Dates: Completed 2020

Property: Majdoul Tower is a new skyscraper with total area for rental of 75,565 Sqm, 1,344 Sqm for restaurants and a 1,344 Sqm viewing lounge.

Key Technologies:

- Niagara 4 system architecture
- 12 JACE 8000 controllers providing 25,800 points.
- Supervisory/ IP based integration



almost 150 DALI and 80 KNX buses for control over occupancy sensors, actuators, IP routers and DALI gateways for lighting systems from ABB and Siemens. Niagara control also extends to CRAC units operating on LONWORKS protocol, and Schneider Electric power meters and Cummins generators that support Modbus protocol. Regarding water and electricity meters from SPIRE, all meters have been looped to different metering gateways supporting MBus/IP. Also, the Simplex Fire alarm system, the Teknoware Central Battery system, the Honeywell ACS and the Parking Guidance System are integrated by Niagara via BACnet protocol. All mentioned systems are being connected to different JACE controllers located at different points of the tower either through serial or Ethernet cable. Systems integrated through IP have been connected to the tower IT network. Operators can interface with Niagara using a PC or tablet, viewing dynamic graphics to check alarms of different priority levels, to find abnormalities in systems, and to adjust setpoints,

RESULTS

With the Niagara platform, building engineers have a single centralized supervisory console to control and monitor each parameter of the Majdoul Tower operations. Data interoperability among building systems has enabled some impressive innovations. For example, a light level sensor connected to a BACnet device is programmed to control the lights on a KNX bus. Also, when fire is detected various pre-defined units are programmed to shutdown automatically. The Tridium Niagara framework has certainly delivered to meet the specifications and requirements of this project.

"One operator can oversee the entirety of our tower systems through a user-friendly graphical interface. Commendation goes to Tridium's Niagara Framework as it made possible the gathering of our many unalike systems under one umbrella."

Mohammad Al-Saloul
Senior Automation Expert
AWTAD

ABOUT TRIDIUM

Tridium is a global company with established key strategic alliances with leading corporations in the energy services, building automation and data management sectors. It markets its products to a wide range of control manufacturers, HVAC equipment manufacturers, and a network of Tridium system integrators.

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