United States Tower Operator Deploys Kentrox for Intelligent Site Management

The popularity of cellular devices in the United States (U.S.) is extremely high. Between June 2002 and 2012, there was an increase of 139% in the number of wireless subscriber connections (up to 321.7 million) and a 117% increase in the number of cell sites (with more than 285,000 in 2012)[1]. With continued competition and the market reaching saturation, tower operators and service providers are forced to provide differentiated services, whether from improved service quality, better performance, or less expensive services.

A Tier 1 tower operator in the U.S. has chosen Kentrox to provide intelligent site management for thousands of cell sites being managed nationwide. The goal was to minimize operating costs, comply with federal regulatory requirements, and reduce physical site visits with the future potential of implementing video surveillance and improving site security.

The Kentrox applications currently being utilized by this Tier 1 operator include:

- Aircraft warning light management
- Distributed antenna systems (DAS) management
- Generator management

The network

The Optima management system has been deployed in the data center, and the Remote RMM-1400s are being deployed at thousands of tower sites in the network. Optima centralizes and monitors all measurement, alarm, and fault data from the RMM-1400s at each remote site. The Kentrox solution trends site data and provides detailed Key Performance Indicator (KPI) and Key Quality Indicator (KQI) reports relating to site performance. The data obtained from the remote sites is transferred to the centralized Optima management system over secure wireless or conventional network connections.

The RMM-1400s are housed in a NEMA 4X enclosure with an International Protection rating 68 (IP68) which provides environmental protection from dust and water. The RMM-1400 enables site alarm monitoring, protocol conversion, and equipment connectivity, and acts as an intelligent extension of the Optima management system.

Generators are utilized at most sites for backup power. The Kentrox generator management application monitors the status of the generator (legacy and newer models utilizing smart controllers) including performance and fuel levels. If an issue arises, such as an unexpected stop, an increase in generator temperature, or if the generator fails to start, an alarm notification is sent to the Network Operations Center (NOC) for review and determination of next steps. If additional troubleshooting is required, operations personnel can remotely perform diagnostics. If the issue then needs to be escalated to the generator manufacturer, a remote connection can be provided directly to the manufacturer's support staff. The Kentrox solution is also used as part of a weekly maintenance plan by providing automated remote start and stop of the generator and performing load transfers as needed.

Aircraft warning light status view in Optima

Aircraft warning lights (AWLs) are required on most cell towers by the Federal Communications Commission (FCC) according to the code of federal regulations (47 CFR Part 17 – Construction, Marking, and Lighting of Antenna Structures). The Tier 1 operator is using the Kentrox AWL management application to remotely monitor the tower light's operation and perform diagnostic testing of many light types. When a light failure does occur, NOC personnel are automatically notified via an alarm so that a determination can be made whether to file a Notice to Airmen (NOTAM) with the Federal Aviation Administration (FAA).

Distributed antenna systems (DAS) are used throughout the tower operator's network at locations such as stadiums, casinos, shopping malls, and airports. The Kentrox DAS management application is being used to monitor and control DAS systems through both proprietary and intelligent interfaces. The environment, such as temperature and humidity, of the equipment room is monitored. Alarms are sent when an issue arises, such as when the DAS health degrades or a failure occurs. Optima communicates with the DAS to provide detailed and specific alarms beyond standard dry contact management. The DAS application also monitors the backup generators including their fuel level when needed.

DAS management alarms

The benefits

The Tier 1 U.S. tower operator has experienced many benefits from implementing the Kentrox intelligent site management solution. Remote monitoring, management, and control of the generators reduce operating costs by eliminating unnecessary site visits and enabling preventive maintenance activities before an outage occurs. This is extremely beneficial when sites are in hard-to-reach locations. Fuel costs are reduced by providing alarms when fuel is running low, and the reports provided by Optima help prioritize refueling, especially helpful during emergency situations. The automated alarms and reports also provide details to help maximize technician efficiency.

Because the Tier 1 tower operator has implemented the Kentrox AWL management application, they are only required to make a site visit once every three months and review Optima daily to ensure no issues have arisen. Without Optima, a visual inspection is required every 24 hours to confirm the lights are functioning properly (47 CFR 17.47). Having the AWL controller being monitored by Kentrox allows for alarming and report details to be provided at any time and can detail the duration of power failures or bulb outages over any designated time period.

The Kentrox DAS application is being used to filter and organize alarms from different DASs into common event categories. This helps reduce the amount of alarms seen by the NOC. A real-time view of site status including the DAS, uninterruptible power supply (UPS), doors, and generators enables the Tier 1 operator to determine the health, availability, and potential issues of any DAS in their network at any time.

Future plans

The operator is in the process of expanding the use of the Kentrox intelligent site management solution. IP cameras are being installed to obtain information about the tower and DAS sites. For example, cameras will be used during bad weather such as wind and ice storms to understand what damage has been caused and if the site is even accessible. Many tower sites often experience bird nesting, and the cameras will help the operator determine if the nest is interfering with site operations. Multiple maintenance personnel are often visiting DAS sites, and cameras will be used to see who is accessing the site and obtain views of the site equipment.

The tower operator is installing door sensors onto generator cabinets to obtain information such as if the door has been opened and remains open. An alarm will notify the relevant personnel to ensure that an unapproved open door is resolved to minimize theft and weather-related damages.

The current implementation and future expansion of the intelligent site management solution from Kentrox is helping the U.S. tower operator reduce operational costs, improve energy efficiencies, ensure regulatory compliance, increase network availability and reliability, and provide security – without the expensive cost of a site visit.

For more information, visit www.kentrox.com, email info@kentrox.com or call 800-733-5511 or +1 614 798 2000.

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