Energy Company Secures Physical Sites and Substation Network

First Wind implemented IP-based video surveillance, physical access controls, and connected grid solutions.

EXECUTIVE SUMMARY

First Wind

- Energy
- Boston, Massachusetts

BUSINESS CHALLENGE

- Protect people and property at remote locations
- Simplify IT management
- Minimize operational costs

NETWORK SOLUTION

- Centralized management of physical security systems using Cisco Video Surveillance and Cisco Physical Access Control
- Unified network for all substation voice, video, and data applications, with Cisco Connected Grid Switches and Routers

BUSINESS RESULTS

- Accelerated incident detection through centralized monitoring
- Paid for investment through travel avoidance
- Standardized on single network platform for offices and substations

Business Challenge

First Wind is an independent wind energy company exclusively focused on the development, financing, construction, ownership, and operation of utility-scale wind projects in the United States. Based in Boston, Massachusetts, First Wind operates wind projects in the Northeast, the West, and Hawaii, with the capacity to generate up to 534 megawatts of power. Projects under construction will bring the total to 736 megawatts.

Physical security and substation automation are traditional challenges at wind farms, which are often located in remote areas. “We depend on physical security systems to help prevent theft and vandalism and to restrict access to offices and substations,” says Keske Toyofuku, vice president and chief information officer for First Wind.

First Wind already used a variety of physical access control systems for existing facilities. But an IT staff member had to travel to each site to make changes such as adding and removing employees’ access privileges. As the company grew to six locations, the lack of centralized management became impractical and expensive. A large wind farm in Utah, for example, is a four-hour drive from the nearest airports.

The company also wanted to centralize monitoring of video surveillance cameras, with the goal to accelerate incident detection. The goal was for security officers in the company's two data access control centers to monitor real-time video from all sites, notifying local staff if they saw something suspicious. "We liked the idea of IP-based physical security systems, especially the potential for integrating video surveillance with physical access controls," says Toyofuku.

Bringing the network to remote substations represented another challenge because of extreme environmental conditions requiring ruggedized devices. Therefore, First Wind preferred the efficiencies of a unified network as compared to separate networks for voice, enterprise applications, and information sharing with utility companies. Ideally, the company's network administrators would not have to learn a new management interface and tools for the substation automation network.

> "Cisco Video Surveillance and Cisco Physical Access Manager have both simplified and improved physical security at our wind farms."
> **— Keske Toyofuku, Vice President and Chief Information Officer, First Wind**

Solution

First Wind met its goals with Cisco® Physical Access Controls, Cisco Video Surveillance, and Cisco Connected Grid solutions.

ADT Security Services, Inc., a Cisco partner, implemented the Cisco Physical Security solution at First Wind's headquarters, sales offices, and wind farms. First Wind uses the Cisco Physical Access Control solution to control access to exterior doors, substation doors, and laboratories where engineers and technicians work late at night. Doors remain locked at all times unless an authorized employee passes a card in front of a proximity reader. Video surveillance cameras from Cisco and other vendors are mounted near doors and in warehouse areas, so the company can monitor compliance with safety guidelines. In addition, cameras with pan-tilt-zoom (PTZ) controls monitor the exterior of all buildings. ADT even mounted PTZ cameras on the turbines themselves in remote areas, to capture incidents such as vandalism attempts. "At one wind farm, two video surveillance cameras with PTZ controls monitor the property from the top of a 250-feet television broadcast tower," says Chris Schwegel, with ADT Security Services. A Cisco 881 Integrated Services Router connects the cameras to the network so that operators can control them from any location with browser. "We would not have the confidence to do that with a non-IP-based solution," Schwegel adds.

With Cisco Video Surveillance Manager and Cisco Physical Access Manager software, First Wind employees can centrally control cameras and manage physical access controls at any location, from any location. “We especially liked that Cisco Video Surveillance and Cisco Physical Access Control products work together,” says Toyofuku. For example, the company can quickly correlate building access logs with video to confirm that a person who enters at a given time is not using someone else’s card.

To bring the network to substations, First Wind engaged Cisco partner LookingPoint to implement Cisco Connected Grid Switches and Cisco Connected Grid Routers. “Using Cisco Connected Grid Routers and Switches saved network administrators from having to learn a new interface and tools for substation networks because we had already standardized on Cisco switches and routers in our offices,” says Toyofuku. The first wind farm to begin using the Cisco Connected Grid solution is in Kahuku, located on the island of Oahu. The Cisco Connected Grid Switch provides power over Ethernet (PoE) to the Cisco IP Video Surveillance Cameras and physical access control gateway.

A Cisco Unified Wireless Network provides wireless access from anywhere in or around company offices. “We authenticate against Cisco Secure Access Control Server whether employees connect from wireless devices like smartphones and laptops, or from wired devices,” says Toyofuku.

In addition to Cisco Physical Security solutions, First Wind uses Cisco Unified Computing System™ C-Series for its business applications, and desktop Cisco TelePresence® systems for face-to-face interoffice collaboration without travel.

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Results

Simplified Physical Security

Now First Wind security personnel at the company’s data access control centers can view real-time and archived video from any location, using Cisco Video Surveillance Manager. Video plays on a 52-inch screen display that shows video from eight locations. Personnel can also centrally manage the Cisco Physical Access Control systems in each location. “Cisco Video Surveillance and Cisco Physical Access Manager have both simplified and improved physical security at our wind farms,” says Toyofuku.

Lower Costs Through Network Consolidation

Cisco Connected Grid Switches and Routers extend the corporate IP network to substations, which now need only one network for physical security applications, substation automation applications, and voice. First Wind uses Cisco Unified Communications for voice, and provides Cisco Unified IP Phones at remote substations to make it as easy to reach these remote personnel as if they were headquarters.

Reduced Operational Expense

The Cisco Physical Security solution is paying for itself in travel avoidance for monitoring and managing the systems, including airfare and the staff engineers' time. In addition, the ability to quickly troubleshoot and reconfigure equipment over the network minimizes downtime, helping to prevent interruptions in First Wind's revenue stream.

The Cisco Connected Grid solution also minimized upfront costs for substation automation. "We are able to support operations with just two Cisco Connected Grid Switches and two Connected Grid Routers, and yet we have higher levels of redundancy than we did before," Toyofuku says. "Management is also simpler, because the switches and routers use the Cisco IOS® Software, eliminating the time and costs of learning a new interface and tools."

PRODUCT LIST

Physical Security
- Cisco Video Surveillance Manager
- Cisco Video Surveillance IP Cameras
- Cisco Physical Access Control

Connected Grid
- Cisco 2520 Connected Grid Switches
- Cisco 2010 Connected Grid Routers

Security
- Cisco ASA 5510 Adaptive Security Appliances
- Cisco IPS 4240 Sensor Appliance
- Cisco Security Monitoring, Analysis, and Response System
- Cisco Access Control System

Wireless
- Cisco Wireless WAN Controller
- Cisco Wireless Control System
- Cisco Aironet® Wireless Access Points

Technical Implementation

First Wind uses Cisco ASA 5500 Series Adaptive Security Appliances in conjunction with Cisco Connected Grid Switches and Connected Grid Routers to securely partition the corporate network and substation network. "The Cisco ASA also isolates traffic from different vendors that access the network," says Sean Barr, principal network architect, LookingPoint. The Cisco ASA Adaptive Security Appliance and Cisco IPS 4240 Sensor Appliance report anomalous behavior to the Cisco Security Monitoring, Analysis, and Response System for event correlation.

For More Information

To learn more about Cisco Physical Security Systems, visit: http://www.cisco.com/go/physec.

To learn more about Cisco Connected Grid Systems, visit: http://www.cisco.com/go/smartgrid.

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