



Wireless broadband mesh network for oil tank farms and field offices

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Case study

Storage Tank Farm in Texas

Customer highlights

Challenges

- Reliable outdoor network capable of reliable operation in extreme heat and dust conditions
- Reliable communications in an environment with metal tanks that reflect radio signals
- Low-latency wireless communications to support real-time SCADA applications
- Support for mobile field worker Internet access

Solution

- High reliability wireless network nodes capable of operating under a range of harsh environmental conditions
- Capacity and security to support multiple concurrent applications
- Deployment flexibility – routers deployable as mesh nodes, Wi-Fi hot spot, PTP links

Results

- Reliable performance in extreme heat and high dust conditions
- Maintained performance even under highly reflective multipath conditions
- Achieved low latency required for SCADA applications
- Provides mobile field workers with Wi-Fi access around each CTB location
- Single network securely supports SCADA and mobile worker Wi-Fi

Systems and services

Hitachi Energy Wireless broadband wireless mesh network
Tropos 6320 mesh routers

Two new central tank battery (CTB) facilities were under construction in Texas, each with 15 storage tanks and an adjacent field office.

Challenges

Included in the plan for each of the CTB facilities, was a fully automated control system. The automated systems will provide remote monitoring of pressure and remote control of valves and solenoids on the tanks using a programmable logic controller (PLC) at each location. A communications network was needed to provide connectivity between the tanks and each office for remote monitoring and control. In addition, field workers required Wi-Fi access from mobile devices within the CTB sites.

The terrain is relatively flat and dusty with temperatures typically reaching 110-115°F during the summer months. For wireless communications, CTB facilities with their metal tanks represent a challenge for most wireless communications as they reflect radio signals, which can lead to signal distortion and significant reduction in capacity.





Solution

With the flat terrain between the two CTBs facilities, located approximately three miles apart, wireless connectivity is relatively easy. The customer decided that Tropos mesh routers would be used for both the access layer and for wireless backhaul, simplifying network installation, operations, and reducing costs.

During facility construction, a 200-foot tower was installed at Office A and a 30-foot mast was installed on the roof of office Office B. Tropos 6320 mesh routers were mounted on the Office B mast. One router is dedicated for supporting Wi-Fi access, PLC and SCADA applications; another is configured as a backhaul link for Office B. Additional Tropos 6320 routers were installed at locations between the two offices providing PTP connectivity between the two offices. The tower at Office A has Tropos 6320 mesh routers, one dedicated for support of Wi-Fi access, PLC and SCADA applications, and another to support the PTP link to Office B.

Results

The Tropos network provides a high capacity and reliable communications network for both the access layer and for wireless backhaul, simplifying network installation, operations, and reducing costs. Should additional coverage or capacity be desired, additional Tropos routers can be easily and seamlessly added.

Tropos mesh routers perform well in reflective, multipath environments, such as between storage tanks, because they feature a multi-antenna, maximal ratio combining system that reconstructs the original transmitted signal. Single antenna systems must rely on retransmission of the wireless signal, yet Tropos routers are able to combine signals from three antennas and then align them for up to 3dB of additional gain. By avoiding retransmissions and taking advantage of multipath reflections, Tropos networks perform better in areas where traditional wireless networks often fail.

Click the link to learn more about Hitachi Energy Wireless [communication networks for oil and gas](#).

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