Case Study

Private Cellular Powers Safer, Faster Inspections at Major Petroleum Producer

Client Overview:

Customer: Petroleum Refinery

Industry: Petroleum Products / Oil and Gas Refining

Location: Southeast US

Project Type: Private Cellular Network (4G)

Background

A major petroleum producer operating in southeastern US handling over thousands of barrels of petroleum products daily across a large operational footprint that includes more than 400 acres of land and river terminal operations. Constant communication with refinery personnel is critical to the safe operation of the plant.

Challenge

The refinery faced several critical mobility and connectivity challenges inherent to operating in a large, harsh industrial environment:

1. **Secure, Cost-Effective Connectivity:** A primary challenge was determining how to cost effectively provide secure, always-on wireless connectivity across the harsh expanse typical of oil and gas refining operations.

2. **Event/Peak Surges:** Reliable connectivity was necessary for essential Plant Safety checks. Furthermore, the company needed to support ROV (Remotely Operated Vehicle) operations into areas that are high-risk and unsafe for human inspections.

3. **Turnaround Inspection Requirements:** Critical plant "turnaround" inspections—which require taking a section of the plant offline—needed ubiquitous wireless coverage. During these sessions, large inspection teams use hardened iPads with Teams video for live inspection and certification of specific production units.

©2025 Highway9 Networks, Inc.

4. **Time Reduction in Inspections:** Lack of consistent connectivity would lengthen inspection processes. Having the ability to connect anywhere at any time was necessary to reduce the overall inspection time by several days and weeks.

5. **Mobility Handoff:** The network infrastructure required a seamless handoff between Cellular and indoor Wi-Fi.

Solution & Key Benefits

Highway 9 addressed all mobility challenges by deploying a 4G Private Cellular network. This solution was designed specifically to cost effectively cover the entire large plant area.

- **Cost-Effective Coverage:** Highway 9 deployed the solution using only 11 radios to cover the entire plant.
- **Deployment Efficiency:** Deployment time was dramatically reduced by utilizing existing IP and switching infrastructure.
- **Reliability and Security:** The solution successfully met and exceeded the challenges associated with providing secure, always-on wireless connectivity.
- **Ubiquitous Coverage:** Provided the necessary ubiquitous wireless coverage for critical activities like turnaround inspections.

In Customers' Words

"Highway 9's private cellular solution transformed how we operate. From improving inspection turnaround times to enabling safer remote inspections, we now have reliable connectivity across the entire refinery — something we struggled with for years."

– Director of IT

Business Outcomes

The deployment of the private cellular network resulted in significant operational and safety improvements:

- **Improved Inspection Speed:** The ability to achieve connectivity anywhere, anytime during "turnaround" inspections, which utilize live video conferencing (Teams) on hardened iPads, directly resulted in a reduction in the overall inspection time by several days and weeks.

©2025 Highway9 Networks, Inc.

- **Enhanced Safety Protocols:** The network facilitated crucial safety applications, including supporting ROV operations for inspecting high-risk areas and general Plant Safety checks.
- **Seamless Operation:** The 4G Private Cellular solution ensured consistent, always-on connectivity across the large, harsh environment of the refinery, supporting essential communication with refinery personnel and allowing for a seamless handoff between cellular and indoor Wi-Fi.

Looking Forward

Looking ahead, the customer plans to expand its private cellular network capabilities to support future 5G use cases. Potential enhancements include advanced IoT integration, predictive maintenance applications, and further automation of high-risk operations.

©2025 Highway9 Networks, Inc.