



## Case Study

*We were amazed when the BATS system scanned the horizon for its friendly and locked onto the connection by reflecting the signal off of a 30-foot high oil storage tank. It continues to work flawlessly.*

*Tony Todora  
Motorola Engineering Manager  
Emerging Technologies*

*Our technology enabled the wireless broadband connection but Motorola's point-to-point 5.4 GHz radios really pulled it off.*

*Steven Bensen  
BATS senior project manager*

**Customer Situation:** An oil refinery seeking a temporary (1-2 month) secure communications network to its command center during a turnaround (shut down) period during which maintenance, overhaul and repair as well as inspections, tests and replacement of materials and equipment occur over one portion of the refinery.

**Customer Challenges:** The refinery is situated in a populated coastal area with a lot of maritime operations resulting in a very difficult RF environment. Because secure access is an inherent process at the refinery, it can be time consuming and difficult to arrange for skilled engineering services to align and optimize a traditional microwave link. Additionally, numerous oil storage tanks dot the landscape making line-of-sight deployments difficult.

**BATS Solution:** Integrated with a 5.4 GHz point-to-point (PTP600) wireless broadband radio from Motorola, the Broadband Antenna Tracking System's BTS-3300 uniquely located, locked and tracked the wireless broadband connection by reflecting the radio frequency off a storage tank.

### **Background**

Refineries periodically shut down portions of their plants to perform maintenance. These shut downs are called turnarounds and typically involve hundreds of contractors and associated projects throughout the plant. Turnarounds are run under rigorous schedules, operations and safety for which it is important to have network connectivity for employees and contractors at the work site turnaround temporary central office or trailer. Because turnarounds are typically one-to-two months long, it is not cost effective or efficient for the refinery to lay fiber or copper wire for network connectivity so wireless broadband is an ideal solution for a quick deployment. The turnkey solution consisted of Motorola 5.4GHz PTP600 wireless links with BATS' Rack Mount Control Unit (RMCU) and Hardened Control Units (HCU) and associated 360 degree continuous positioning units. The solution was provided as an integrated rapid deploy kit complete with hardened storage cases.



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**BROADBAND ANTENNA TRACKING SYSTEMS ARE IDEAL SOLUTIONS FOR:**

*-- Rapid deployment of wireless network communications*

*-- Systems with unknown or little information associated with the direction to friendly access points*

*-- Situations where it is difficult to manually align antennas for acquisition and optimal signal strength (both near and distant)*

*-- Service providers that have limited skilled resources in deploying wireless broadband communication systems*

*-- Systems that require frequent antenna re-alignment due to natural causes or equipment movement*

*-- Automatic repositioning of directional antennas to secondary (backup) communication points is required if a communication point is moved and/or no longer available*

*-- Mobile to mobile broadband communications over long distances utilizing directional antennas*

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### **Hitting a Bank Shot**

Two radios were installed on a refinery radio tower and were connected to two turnaround trailer sites. One site was line of site so connectivity was easily established. The second trailer site was behind a 30-foot oil storage tank. When the radios were turned on, the BATS control units began searching for their friendly and both units pointed to a location on a nearby storage tank. “The link calculation said it was possible, but theory and the real world are two different things,” said Steven Bensen, BATS senior project manager. “The radios were reflecting the RF off of the tank. It was a perfect bank shot.”

The network connection has proven flawlessly throughout the turnaround period offering data speeds up to 127 megabits per second (Mbps) with an aggregate of 80Mbps per link.

### **The Technology Behind BATS**

The BATS technology is **agnostic** as to frequency and broadband vendor radio equipment. The technology can automatically reposition the directional broadband antenna mounted on a vessel to maintain a wireless broadband network session. This unique **tracking capability** is an industry-first feature that allows moving vehicles to obtain real-time access to resources inherent to broadband communications. The BATS system allows for **rapid deployment** of wireless networks as well as the **geographic extension** of a current network for customers who have limited broadband access or rely on expensive, low-bandwidth satellite communications.

### **About Broadband Antenna Tracking Systems**

Broadband Antenna Tracking Systems (BATS) provides a proprietary software and hardware platform that locates, locks and tracks wireless broadband communication access points. Our products are designed for quick deploy communications centers and mobile to fixed and mobile to mobile vehicle communications. BATS was founded by three information technology professors and researchers from Purdue University in West Lafayette, Indiana. For more information, please visit [www.batswireless.com](http://www.batswireless.com).

