

Entivity Facilities Management Success Story #503

GRAND CANYON NATIONAL PARK

Customer Profile

Grand Canyon National Park operates utilities including potable water, wastewater, telecommunications and fire protection serving 5,000 residents and millions of park visitors.

Application

- Wireless communication to network controllers

Industry

- Utilities: drinking water, wastewater, telecommunications and fire protection

Location and Web Site

- North and South Rims and throughout Grand Canyon National Park
- www.nps.gov/grca

Key Benefits

- Saved money. Projected costs were \$2 million. Actual cost: \$500,000
- Saved time and provided easy-to-use system
- Provided Wide-area network (WAN) capabilities

Mission-Critical Capability

- Upgrade old SCADA systems over a vast area without rewriting application programs and operator interface.

Grand Canyon Uses Wireless Communication to Link Controllers Over Tough Terrain

What began as a Y2K initiative to update older SCADA systems expanded into a replacement of the entire control network with PC-based control systems. An upgrade of the distributed SCADA systems was ruled out because of the huge amount of time it would take to do an extensive rewrite of application programs and operator interfaces.

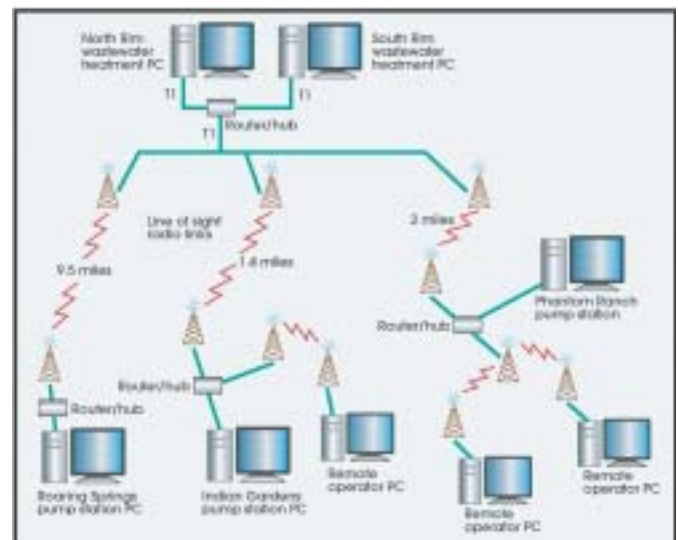
The project included three wastewater treatment facilities, two potable water stations, one tank farm and pumping stations located on the North Rim, South Rim and throughout the canyon. The vastness of this area made it difficult to install, operate and communicate with the distributed SCADA systems.

The solution was to replace the entire control network with Entivity Live! PC-based control systems using inter-PC-connectivity centering on wireless communications-based control.

“Our decision criteria included ease of use, wide area network capability and the exclusive use of open protocols,” explained Michael Martin, Grand Canyon controls engineer.



Spanning the Grand Canyon National Park was a challenge that only a wireless communication system could meet to handle a waste-water



Simplified schematic of the Grand Canyon wireless system.



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Customer Satisfaction

“We are very pleased with the results! Using open protocols and off-the-shelf technology, we greatly simplified installation and commissioning. We have also increased our telecommunications capacity. The project has been a resounding success!”

*Michael Martin
Grand Canyon
Controls Engineer*

Simplified Installation and Increased Capacity

Nine PC-based control stations were installed at remote sites across the Canyon each with 100-250 points of Ethernet-based I/O. The PCs and control stations often span distances of more than nine miles. An additional six PCs perform remote monitoring and facilities operations. To network the control PCs and the remote view node PCs for supervisory monitoring and control they used some wired configurations but

mostly a combination of T1 leased lines, fiber optic, high-data rate digital subscriber lines (HDSL) and wireless communications via spread spectrum radio.

“Many of our operators live only a short distance from the pumping stations and are on-call to acknowledge and handle alarm conditions. But traveling even half a mile to acknowledge an alarm is quite annoying when it’s the equivalent of climbing a 40-story building,” explains Martin.

“We were able to use off-the-shelf PCs, control software, Ethernet I/O and readily available wireless and telecommunications products to network the controllers. Control software came from Entivity and provides:

- logic and process control
- all operator interface functions
- wide area networking capabilities and trending
- unlimited expansion capabilities

Martin concluded, “We are very pleased with the results! Using open protocols and off-the-shelf technology, we greatly simplified installation and commissioning. We have also increased our telecommunications capacity. The project has been a resounding success.”



Typical panel at Grand Canyon handles between 100 and 250 Ethernet-based I/O.



At the Grand Canyon site, interconnecting technologies spread spectrum radio communications to connect the control.