

Satcom Solutions Ensure Reliable SCADA Operations

By George V. Head

For the monitoring and control of oil & gas pipelines, oil & gas production facilities and utility infrastructure, satellite communications (satcom) is firmly positioned as a cost-effective, reliable solution for remote sites where terrestrial or cellular communications infrastructure is unavailable, unreliable or cost prohibitive.

Satellite-based SCADA (Supervisory Control and Data Acquisition) systems enable operators to monitor, control, optimize and start or shut down assets and processes anywhere in the world, from central sites.

With advancements in remote-site monitoring, SCADA-based services must constantly monitor the status and security of assets, and send commands to manage remote equipment such as video cameras or environmental controls. These services help improve maintenance scheduling, prevent disasters and reduce production costs – as well as provide current information to assist decision making.

Business Continuity is Key

Reliability of SCADA systems is critical. If an oil or gas production site goes down, the well cannot make up lost production – it is lost forever. If a pipeline loses communications – and thus the ability to monitor or control a segment of pipe carrying explosive content – pipeline operators are forced to shut down sections of the pipe until communications and safety can be guaranteed.

SCADA system operators have no tolerance for downtime. The deployment of redundant networks is the established method by which most companies avoid downtime. In some instances, SCADA systems based on Very Small Aperture Terminal (VSAT) satellite networks serve as the primary communications platform, with terrestrial lines serving as a backup.

At high-value onshore well sites, engineers depend upon fixed, private VSAT networks for real-time, well-pressure monitoring. High-speed VSAT networks also are deployed for video



surveillance applications at remote production sites. VSAT networks are designed to provide at least 99.5 percent network availability.

To ensure redundancy, automatic failover of communications circuits must be tested monthly to guarantee proper operation. Some companies run all communications over both VSAT and terrestrial networks simultaneously, to ensure 100 percent uptime. For many companies, the cost of such redundancy is not nearly as important as the end result.

VSAT Solutions Offer Specialized Communications

Leading satcom service providers understand SCADA system networks and the critical nature of the data being carried

across them. They also understand the importance of notifying customers of any outage, and keeping them informed until service has been restored.

An experienced satcom provider's Network Operations Center (NOC) is staffed 24x7x365 by dedicated professionals who provide proactive monitoring to keep customers informed of outages.

NOC professionals are aware that SCADA operators face a variety of challenges in setting up communications to their sites. Some sites need constant, real-time updates – with data being exchanged every few seconds. Other sites will communicate less frequently, perhaps daily.

A communication session might exchange only a few bytes of data, or it might involve 1kb, 2kb or even 1Mb of data. Likewise, some sites feature available power sources such as an AC or DC power source, while others must rely upon battery and solar power, or some type of local generation. Today's satellite-based SCADA services are designed to meet a wide range of individual application requirements.

Most leading satcom providers offer a flagship SCADA VSAT offering that is based on an IP-centric platform. These same offerings also feature serial interfaces on their satellite modems and can accommodate 1-7 serial interfaces on a single system. While most SCADA applications are not bandwidth intensive, higher-speed VSAT networks are becoming more and more common – to accommodate enhanced applications, such as video and voice.

Coupled with SCADA-specialized customer support and proactive monitoring, these Ku-band VSAT services are those chosen by most leading pipeline operators.

Lower-Cost VSAT Systems

Not all customers have sites with ample power or have the need to exchange data on a frequent basis. Many need status reports a few times a day, or perhaps as little as once per day. For these sites, less expensive VSAT solutions are available that provide the reliability of VSAT technology, with equipment that requires very little power.

These L-band, lower-cost SCADA terminals are very easy to install, making them very popular alternatives – even when compared to radio communications networks. Also, they are not susceptible to rain-fade. These systems cost-effectively meet applications requirements for exchanging 1-10 kb of data per day.

BGAN Systems Fill Important Need

Most SCADA operators still must make trips to remote sites for maintenance purposes and for general inspection. As a result, they employ significant field labor forces who need to stay in touch, both from a voice and network perspective. Inmarsat's BGAN (Broadband Global Area Network) service is ideally suited to meet this remote-communications requirement.

With high portability, this proven solution offers high-speed data rates up to 492 kbps, streaming data rates up to 384 kbps and voice connectivity anywhere in the world. These data rates represent a crossover to traditional broadband speeds, thus providing the communications manager with the assurance of full support for mission-critical applications.

Designed specifically with remote access in mind, BGAN provides users with quick access to email, corporate networks, Internet or voice. Its compact design, the size of a laptop computer, makes BGAN a valuable resource for system operators when they must venture out to their remote sites.



Value-Added Services Control Costs

Top satcom providers offer a number of value added services which, when combined with SCADA networks, provide a total remote data-gathering solution.

For BGAN, one example of these value-added services is the online Stratos Dashboard. It provides real-time information on the amount of BGAN traffic used for voice and data, and the associated costs. Stratos Dashboard is fully automated and enables customers to activate SIM cards in minutes and modify service configurations in real time, as well as manage the consumption per user or groups of users.

Stratos Dashboard is a multi-access-level system that is accessible by customers as well as by end-users in the field. It provides an overview of all traffic usage, including completed calls and calls in progress.

Global SCADA operators also appreciate how leading satcom providers offer elaborate network infrastructures, the likes of which were not available a decade ago. One example, StratosNexus, is an extensive terrestrial multi-service core network that seamlessly integrates traditional and IP-based transmission systems in one platform.

Regardless of the transmission interface standard (Frame Relay, ATM, etc.), Stratos can securely connect corporate and regional headquarters with remote sites anywhere in the world. The StratosNexus core network links a number of Stratos network facilities in Europe and the United States. Each facility is co-located and integrated with multiple Tier 1 Internet backbone carriers.

Finally, prominent satcom providers offer creative applications to meet SCADA-operator requirements for real-time availability of data from their sites. These remote-monitoring solutions provide the operator with a live, customized view of the entire field, distribution, and gathering assets. The applications offer access to monitor, report, and manage remote unmanned sites from anywhere. With access from the Internet, or from their wireless device, these programs allow customers to monitor their valuable assets, 24x7.

As SCADA operators go about their meticulous planning to ensure business continuity and maximize productivity, the latest satcom systems will continue to provide critical support and peace of mind. **OGN**

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