



Latest Generation of Satellite for Advanced Communications & Remote Monitoring

Introduction

Historically, basic SCADA and monitoring could be done with terrestrial wireless technologies. Now, these networks have greater requirements including voice and video in many cases. Traditional network solutions are not sufficient to meet the more demanding requirements, and extending terrestrial networks is not a practical solution. Fortunately, these changing requirements coincide with developments in satellite technology.

Over the years, satellite networks have undergone a number of transformations. Today's satellite has improved in price and capabilities and provides numerous advantages over competing technologies. The latest generation of satellite communications solutions provides a more reliable, secure and cost-effective network solution, and offers faster speeds, advanced functionality and support for new applications compared with past satellite services. In addition, satellite is comparable to terrestrial alternatives in performance and user experience. Energy companies can leverage the latest advantages of satellite to significantly improve their networking capabilities for both their current and expanding requirements.

Remote Communications Requirements and Satellite Advantages

Companies today need higher bandwidth and faster speeds to support a wider range of advanced applications including IP, voice and video. Satellite technology, unlike its terrestrial alternatives, is equipped to support these more demanding requirements for the energy market, and provide more value added features that terrestrial technology can't. For instance, satellite provides a single platform solution to support a wide range of advanced applications including data, voice, video and SCADA. In addition, it can provide built-in network redundancy for high availability networks, has quick network deployment times with transportable options available, provides faster data transmission and quick response times with real-time control, and is a scaleable network platform that can be integrated with wireless technologies.

Today's satellite services offer energy companies a reliable, secure and cost-effective network solution – with near 100% availability to support all locations. The latest generation of satellite services support converged voice, video and data applications; can deliver sub 1 second response times; and offers built in network redundancy for high availability. Satellite networks support advanced communication systems for Automated Metering Infrastructures, SCADA, and IP or serial networks. There are many new opportunities to improve efficiencies with today's satellite technology, including faster transmission times, increased uptime and reduced telecommunications costs.

- **Coverage and Geographic Reach:** One of the most obvious benefits of satellite is the huge geographic footprint which cover multiple countries. In addition, satellite is unique in its ability to quickly establish a broadband network virtually anywhere and isn't susceptible to damage of physical lines or cables like terrestrial options are. The ability to deliver communications capabilities virtually anywhere makes satellite a key component of connectivity in remote areas and an ideal solution for the energy market. Satellite networks are fully integrated IP networks able to support critical applications anywhere users require them.
- **Network Efficiency and Support for Advanced Applications:** Today's generation of satellite technology is much more efficient than in the past, especially in regards to bandwidth usage. Increased bandwidth efficiencies enable users to support a wider range of advanced applications more cost effectively. The dominance of IP and new bidirectional services make VSAT services more



appealing to a wider audience, and the increase in usage has lowered the price, making it a more affordable alternative than in the past.

In order to support the wide range of applications that energy companies are using, today's VSATs can integrate a wide range of solutions on a single hub system and VSAT terminal. A single system supports broadband Internet access, VoIP, video and IP multicast. As energy companies deploy these higher bit-rate applications, including video and VoIP, there is a critical need for higher bandwidth and faster speeds. Although in the past VSAT speeds were limited, the latest generation of VSATs can provide higher and more efficient speeds that meet these requirements.

- **Technology Advancements – Mesh and Acceleration:** An important feature of today's satellite technology that was not available previously is mesh, and it is especially important for energy companies that have multiple sites with backup networks. Mesh network topology enables improved real-time applications, ultimately helping energy companies stay connected with reliable and clear communications via phone and video. Mesh technology enables remote satellite modems to communicate directly with another remote satellite modem, rather than traversing from the modem to the hub and from the hub to the second modem. This topology improves response times for real-time applications like voice and data and improves bandwidth efficiency, ultimately providing a more cost-effective and reliable solution.

At the same time, new acceleration technologies have significantly improved the satellite user experience, especially when it comes to latency. Latency is the time it takes for a packet of data to get from one point to another. In older satellite generations, latency caused long delays. In new-generation satellite, advanced packet acceleration technologies help diminish the effects of latency.

- **Network Backup Enables 100% Availability and Security:** The cost of network downtime can be significant for energy companies, and it also poses risks including security concerns. As a result, energy companies need high availability and always-on communications. With satellite, energy companies can leverage private dedicated networks for extra security. Many satellite solutions also offer built-in network redundancy that provides a reliable backup solution to ensure constant access to communications despite unforeseen events.

In addition to full-time satellite services, many satellite providers offer more flexible VSAT service models, including usage-based and part-time services. These services enable cost-effective backup connectivity for mission-critical communications. Users pay a reduced flat-rate monthly usage fee lower than full-time services with the option to purchase additional usage on a site-by-site basis. Backup can be tracked by daily usage hours, and the megabytes transferred can track multicast distribution.

Conclusion

Overall, companies face many unique challenges and network requirements. Maintaining a sophisticated and high-performance communication system is critical for maximizing data accuracy and reducing operating costs. Organizations that require remote monitoring must have suitable equipment which can withstand extreme weather conditions while providing high network availability and secure information transfer. Today's satellite offerings can provide a complete end-to-end and seamless solution that support a wide range of advanced applications for remote monitoring. It is important to understand these benefits in order to bridge the gap between the past perceptions of satellite and its current capabilities.