

# Consider a satellite-based communications backup system

**This refiner lost communications during a hurricane. Here's how it solved the problem**

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The Gulf Coast hurricanes of 2005 showed the importance of business continuity planning. For major oil companies in the region, the devastation of hurricanes Katrina and Rita highlighted the need to plan not just for transitory outages or network problems, but also for long-term communications failures. Those disasters also demonstrated that telco, cable and terrestrial cellular infrastructures are likely to be severely degraded in the aftermath of a major storm, creating a need for a truly independent and redundant means of communications.

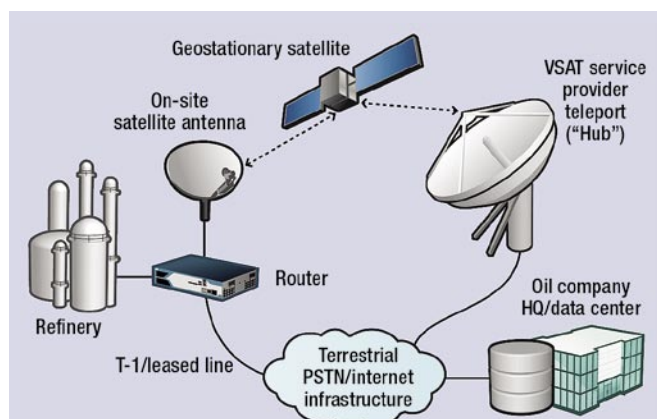
One of the nation's largest oil companies coped with these disasters and implemented a communications plan to ensure complete continuity of critical communications in the future.

**Refineries isolated after the storm.** In the aftermath of hurricane Katrina, the company lost voice and data communications with some of its 16 Gulf of Mexico (GoM) refineries. Wire-line circuits—frame relay, DSL and cable—were all out of service. Cellular communications were saturated and often unavailable. Voice and critical data communications of any kind were offline. The refineries were completely isolated.

The company quickly learned that, without voice and e-mail, refinery metrics could not be evaluated. Senior management was unable to make critical decisions. Employee and operational safety became a growing concern.

To deploy an interim, emergency connectivity solution, the company decided to use very small aperture terminal (VSAT) satellite networks. Within 24 hours, the service provider delivered satellite terminals to restore critical communications services between the headquarters and the affected refineries—avoiding costly and time-consuming refinery shutdowns.

Once terrestrial communications were restored, the oil company redesigned its disaster-recovery strategy to reduce its dependence on terrestrial communications links, and integrated a satellite backup solution into its ongoing communications and IT infrastructure.



**FIG. 1** The service supplier deployed a VSAT wide-area network backup solution.

**The solution: satellite data network backup.** In early 2006, the service provider deployed a VSAT wide-area network (WAN) backup solution that integrated a VSAT module into the world's most widely used enterprise routers (Fig. 1). This enables network managers to configure their networks to automatically "fail over" to a satellite broadband connection for voice and data if their primary links fail.

The VSAT WAN backup solution enables the oil company to minimize service disruptions during disasters and terrestrial WAN outages by switching high-value or mission-critical communications to the VSAT network. This enables the oil company to maintain data communications between its Texas headquarters and each of its 16 GoM refineries.

Now, the company's refinery routers can automatically route services during failover. This is made possible because the hot standby routing protocol (HSRP) is resident in the router. The on-demand satellite connection is configured on the router just

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like any other WAN interface, and routes are selected in the order specified by the network administrator. The entire switching process between terrestrial primary and satellite backup links requires less than two minutes.

With over 1 Mbps uplink and downlink capacity available on the VSAT network, the oil company can retain the most business-critical data and voice communications services, facilitating continuity and recovery.

### **VSAT's value as backup connectivity platform.**

VSAT-based satellite communication services are especially valuable as a backup connectivity platform because the technology completely bypasses the local terrestrial infrastructure. Even new emerging wireless technologies, like WiFi, WiMax and EVDO, are ultimately dependent on the cellular towers or local terrestrial telecom infrastructure and will be subject to disruption in even a local disaster. For example, an oil company's Texas headquarters can utilize one of several satellite earth station ("hub") facilities geographically distributed across the US, any one of which is "out of harm's way" and unaffected by the aftermath of the local storm.

More than 500,000 enterprise and government locations nationwide use VSAT networks to support some of the world's largest private WANs. These VSAT networks support a wide range of applications, including SCADA and monitoring for energy companies, point-of-sale and transaction authorizations for retailers, general broadband voice and data for rural locations, and mobile communications for disaster recovery and homeland security.

Satellite networks send and receive data via high-frequency radio signals relayed off a geosynchronous satellite in orbit, providing a single continent-wide wireless last-mile solution. VSAT systems comprise a small (0.75 to 1.2 meter) dish and transmitter that are installed outside (these can be fixed or "self-pointing") and a satellite modem installed indoors at the LAN access point. The outdoor dish/transmitter is connected to the indoor modem component with a pair of coaxial cables (one to send data and another to receive it).

VSAT networks are typically designed in a hub-and-spoke fashion, with customer locations connected over the air to a central teleport or hub facility. At the central hub facility, server equipment receives and transmits to the remote sites, and routes information to and from the Internet or private networks. From the hub, VSAT users can be connected to the public Internet, or from the hub facility directly and securely to a corporate data center.

VSAT networks may have anywhere from a single remote location to tens of thousands of remote VSATs communicating with a single hub. The satellite modem may be a small desktop box, or it may be a network module integrated with a router. The router-integrated VSAT WAN backup solution described is a complete system developed to provide VSAT network connectivity just as any other network module might provide a T1 or FDDI/GigE interface.

A very cost-effective medium for narrowband or broadband data communications, VSAT has particularly strong advantages in ubiquity (VSAT is available at any location with a view of the southern sky) and multicast support (sending the same data to tens or thousands of locations at once).

One key advantage of VSAT connections is that service availability is not limited by the reach of terrestrial telephone or cable infrastructure. A VSAT earth station can be placed anywhere—as long as it has an unobstructed view of the satellite. VSATs are capable of sending and receiving all sorts of video, data and audio content at the same high speed, regardless of their distance from terrestrial switching offices and infrastructure.

This also serves to make VSAT an ideal choice for WAN backup and disaster recovery. Because VSAT completely avoids the local-area wireline infrastructure, it is effectively able to avoid even large-scale local outages or disasters.

As this season's major storms lurk in the distance, it will be VSAT networks that help oil-company executives rest easier. **HP**



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