

Cisco Connected Pipelines



Prevent Pipeline Accidents, Sabotage, and Theft

A disturbance is occurring along a large, remote section of your pipeline. “Optical microphones,” the recording capabilities of your fiber network, detect movement. Is it an animal nearby, someone walking – or are laborers planning to dig, unaware of the pipeline? Or is it sabotage?

Video analytics software begins relaying images of earth-digging machines heading for the pipeline. Alerts are sent to the pipeline operator, who determines the activity is unauthorized and dispatches security. They arrive soon after and stop the digging before intruders damage the pipeline.

This is Cisco® Connected Pipelines for Oil and Gas in action. With it, pipeline operators are protecting their assets from accidents and cyber and physical attacks. They are reducing leaks and spills and the inevitable public outrage over environmental damage. And they are gaining greater control over longer stretches of their pipelines with existing expert resources.

Strong Growth, Dangerous Locations

It's a new era in oil and gas exploration. On the up side, worldwide demand for energy is projected to increase 41 percent by 2035 (2014 BP Energy Outlook 2035), and 95 percent will come almost entirely from emerging economies.

Exciting new technologies, such as hydraulic fracturing, are being used to drill in areas once considered too expensive. But operating in these areas requires unconventional approaches, often in remote, dangerous locations or in areas nearby residential communities.

This raises the specter of environmental accidents and public relations disasters. Twenty-four-hour news coverage across TV, the Internet, social channels, and mobile devices helps ensure that spills or leaks receive continuous coverage. Your bottom line and your brand's reputation suffer.

Imagine if:

A regulator valve on your remote pipeline could alert you of pressure drops before local communities complain of pipe leak smells. This is the power of [Cisco Connected Pipelines and the Internet of Things \(IoT\)](#)

Currently deployed pipeline technologies include sporadic telephone lines, and microwave or satellite links. But these are proving inadequate or too expensive for the new capabilities that are needed. They cannot provide online and real-time pipeline condition data, deliver simultaneous video feeds of a questionable area, or enable frequent measuring points for more precise flow measurement. The result: You can't react quickly to impending accidents or sabotage, or detect small leaks before they turn into large disasters.

Proactive, Intelligent Fiber-Based Pipeline Management

With Cisco Connected Pipelines, you get:

- Pipeline automation across a unified, end-to-end network
- Real-time management
- New pipeline protections that can prevent accidents and detect leaks much faster

When deployed over fiber, Cisco Connected Pipelines provide the bandwidth and latency to run the newest, state-of-the-art applications: third-party intrusion (TPI) prevention and leak-detection systems (LDS). These single unified networks also provide voice over IP (VoIP), video, and wireless support for bring-your-own-device (BYOD) applications up and down the pipeline.

TPI applications and LDS technology use the fiber's sound-detecting capabilities to transmit real-time signals about pipeline conditions to your central headquarters. Highly sensitive, they can detect pinhole-size leaks in the pipeline. You get alerts hours, days, or months before a leak becomes a flood – and a PR disaster. LDS technology also detects minute temperature changes in the surrounding soil, an invaluable secondary source of early leak detection.



TPI applications can also use the optical microphones to detect physical disturbances. Is it an animal nearby, a tremor, or a digging-machine operator oblivious to the pipeline? Or is it a group of mercenaries preparing to attack your pump station? Turn on the nearby video monitor for a visual scan, determine if it is a threat, and quickly dispatch security to protect the pipeline.

Cisco Connected Pipelines supports the requirements for supervisory control and data acquisition (SCADA) environments and provide a migration path to an infrastructure that meets your needs both now and in the future.

Wireless: From Traditional Uses to Advanced IP Networks

Fiber is the technology of choice for today's greenfield pipeline projects. But many existing pipelines still rely on wireless technology that was deployed years ago when only satellite or microwave communications reached remote areas. To support these wireless technologies as companies begin migrating to more advanced, IP-based networks, Cisco provides WiFi wireless connectivity along the pipeline. Both the ISA100.11a standard, and WirelessHART wireless sensor protocol standard are supported on a Cisco WiFi network.

Benefits Delivered

Benefit	Outcome
Take advantage of advanced LDS and TPI prevention.	Discover leaks proactively, avoiding disastrous and costly spills.
Remotely control valves, pump stations, and other pipeline facilities.	Centralize management to lower operations costs and scale limited professional resources across geographies.
Secure access across high-bandwidth, low-latency networks.	Securely control remote cameras, card readers, and other physical devices to enable real-time control and response to changing conditions.
Sell or lease extra fiber capacity to remote communities for services such as remote education or healthcare.	Increase revenue and support isolated communities.
Migrate existing OSI, SCADA, and PLC features to a robust, infrastructure that meets your needs both now and in the future.	Run the most advanced applications today including VoIP, video, and BYOD. Be prepared for quick deployment of tomorrow's applications.

Why Cisco?

A Cisco end-to-end network is secure, scalable, and unified. It offers the newest capabilities for pipeline automation and management. Cisco's strong market presence helps ensure that an extensive ecosystem of suppliers and third-party vendors continues to develop the newest TPI prevention, LDS and other applications for your network. You can also run voice and video services anywhere along your pipeline. Support for BYOD means it is easy to allow your personnel to securely access corporate resources from their mobile devices, ipads, and laptops.

To learn more about Cisco Connected Pipelines, visit <http://www.cisco.com/go/oilandgas>

Follow the latest thinking on how technology is transforming the energy industry on the Cisco Energy blog at <http://blogs.cisco.com/energy>.