

PIPELINE MONITORING SYSTEMS (PMS)

Features of Pipeline Monitoring

CST offers a family of products which can be combined to deliver advanced awareness solutions for a broad range of physical monitoring applications.

CST's PMS is the optimum system that solves many critical pipeline issues facing stakeholders today.

Today's physical security, surveillance and monitoring applications require systems which:

- Increase "awareness zones" and coverage
- Integrate security and integrity
- Remote communication capability
- Dual power/long-life battery option
- Remote reading to alert threats
- Eliminate false alarms and minimize nuisance alarms
- Can be scaled to monitor particularly long linear distances while traversing varying terrain
- Are concealable, with minimal vulnerability to discovery, evasion, or compromise
- Integrate seamlessly with existing systems to improve overall effectiveness
- Are easy to install, need minimal maintenance, and are easily software-upgradable
- Integrate with GIS systems
- Reduce manpower costs
- Provide 24/7 coverage

Our PMS consists of several forms of the most advanced technology including sensors for detection of seismic and vibration activity related to intrusion and conditions initiated by an attempt to tap. The sensors trigger a series of integrated alerts for remote communication. This system identifies and communicates the exact location of the intrusion for deployment of a response. The synergy of the sensors results in a reduction in costs of the systems and increased data available from the alarms. Pipeline integrity, pipeline leak detection and corrosion monitoring are additional features of the system.

Our system, based on advanced, intelligent algorithms and sensor technology, will detect and report potential threats to the user automatically and in real-time, all the time.

Configuring a System

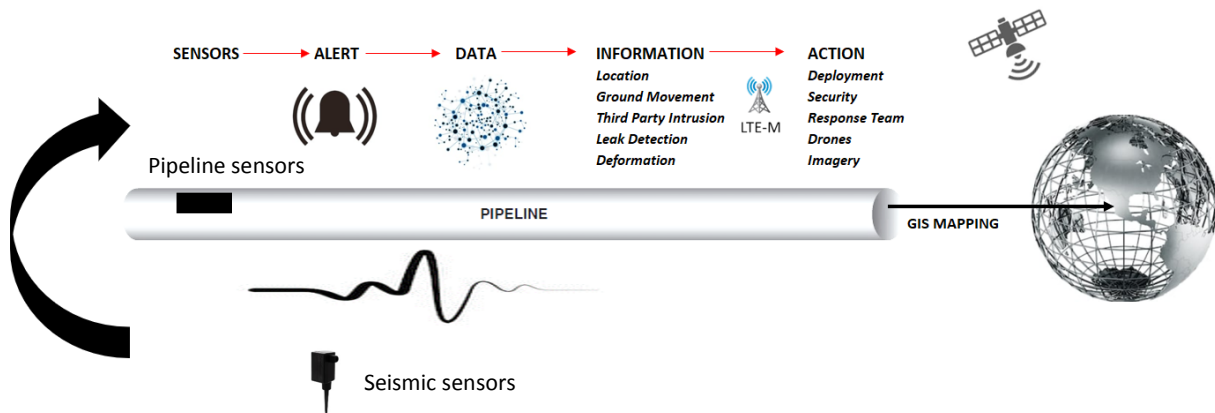
Every pipeline monitoring project is tailored to provide the most efficient and effective system for that application's requirements. Building-blocks for the monitoring system will be configured to the pipeline characteristics and environmental conditions.

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Main system components:

- Pipeline & Seismic Sensors
- Integrity System
- Monitoring
- Communication Interface
- LTE-M or Satellite
- GIS Mapping Interface



Project Process:

- Analysis of the pipeline specifications, physical and operating parameters.
- Define scenarios for the development of solutions specific to the requirements.
- Project simulation of all the proposed solutions allowing assessment of the system's performance.

System Installation

Sensors are installed below or above ground depending on the requirements of the deployment. Sensor location is important but not critical. In general, sensors are spaced for overlapping coverage of the faintest signals of interest.

Certain system elements must be deployed on or above the ground such as GPS, and communications as necessary. The remainder of the deployed system can be completely out of sight if desired.

The standard wireless communications link is LTE-M or Iridium satellite.

GIS mapping integration to client systems or surveillance systems.