![SMARTCOVER SYSTEMS® — TURNING YOUR DATA INTO DECISIONS™]

SmartVault™

SmartVault Water Intrusion Monitoring System

SmartVault monitoring system located at a nuclear plant in Pottstown, PA

SmartVault is designed to provide ongoing monitoring of cable vaults in nuclear power plants to detect water intrusion. These vaults can become flooded causing the power cables in the vaults to degrade over time. In turn, cable failures can lead to subsequent reliability issues or regulatory actions.

Vault Access and the SmartVault Installation

Access to enable inspection of cable vaults is difficult and expensive. Excessive lid weight and structural requirements to withstand tornadoes and other environmental extremes require planning and coordination.

The SmartVault System

SmartVault is a monitoring system that eliminates the necessity for time consuming visual vault inspection by providing users with desktop access to the water level conditions in the vault.

Monitoring is done by remote field units (RFU) located at each site. Each RFU takes a measurement every 60 minutes. Data is also stored every 60 minutes. This level data is transmitted once every six hours via the Iridium satellite system and transferred to the SmartVault server. Users access all site information through their dedicated website. The server is secure using 2048-bit encryption, compliant with federal standards.
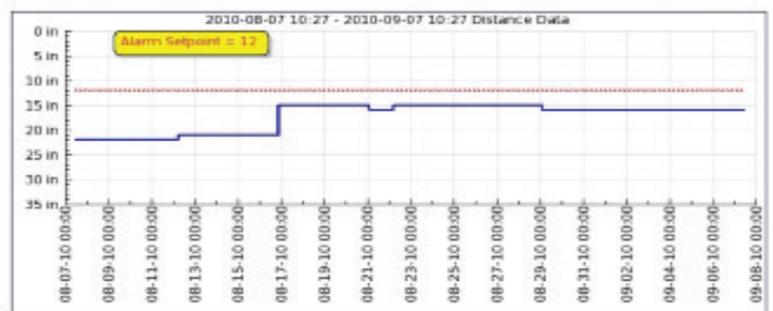

SmartVault pictured

With cloud-access, users can view locations graphically, download data in .CSV format, check the operational status of the system, view reports, configure system parameters and much more.

SmartVault provides several types of notifications via email, text message or paging:

- Alarms - indicate water has exceeded the maximum desired level.
- Maintenance Alerts - battery pack low voltage, sensor, or communications issues.

SmartVault - remote site graph showing water intrusion from a heavy rain event.

Y-axis is in inches from top-to-bottom. This can also be configured with zero at bottom.

X-axis shows dates and timer

SmartVault Operational Features

Robust Secure Communication

SmartVault communicates through the Iridium® Satellite System. This same system is used by the DOD for its security and high reliability. It is designed for redundancy with 66 satellites in Low Earth Orbit (LEO). Connectivity is assured, even during weather extremes. Alarm threshold can be set remotely.

SmartVault System Components

All remote field units contain components that are IP-68 rated (submersible). They are designed to be highly or extremely resistant to corrosion.

Installation

There are two standard approaches for installation. The lid mounting method installs to the underside using a bracket securing the E-Box, PowerPack™ and DSM. The DSM, connected to the E-Box, is positioned above the vault bottom. The antenna is attached to the top of the lid with its cable fed through a 3/8" drilled hole to the E-Box.

The second method houses the E-Box and PowerPack in a NEMA 4 enclosure (right) with the antenna mounted on top. The DSM is connected within the enclosure and installed at the desired monitoring location.

NEMA 4 enclosures pictured

SmartLevel	
Weight	4.5 lbs.
Size	5" x 6" x 6"
Power	3.6 VDC SmartCover® PowerPack™
Battery Life	24 months - nominal
Environmental	NEMA 6P, IP-68
Mounting	Mechanical Mount
Antenna	Low profile traffic rated reflector or round type
Level Sensor Range	3 inches to 81 inches with option to 20 feet
Level Sensor Resolution	0.1"
Intrusion Detection	3 - axis, continuous
Temperature Range	-40°C to 80°C

Local SmartCover Support Provided By

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