Northeast GAS ASSOCIATION
NYSEARCH

Technology Brief

Automatic - Geographic Alert System (A-GAS)
Smart Video Imaging to Prevent Third Party Damage

Description: To evaluate and adapt smart video imaging applications to prevent pipeline damage caused by third party excavators.

Status: Technical and economic feasibility evaluation initiated.

BENEFITS

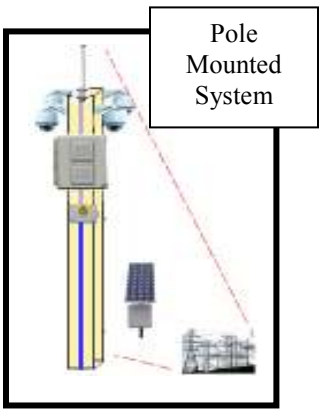
In many situations, excavations by third party excavators are not under the direct control of utility operators yet are the main cause of pipeline damage. These damages may result in customer downtime or can cause significant loss of property and/or jeopardize public safety. This is a great concern to gas utilities that need new technologies/methods that can reduce or eliminate these third party excavating threats. Today, smart camera/video imaging systems have the ability to send video images and alarms wirelessly to a remote location or control center. These technologies can be applied to remotely monitor activities or provide an early warning of intrusion or activity near pipelines.

BACKGROUND

P&LE-Communications LLC (PLE) has worked with U.S. Military Force Protection professionals to develop AVT234© Target Motion Cueing (TMC™) Smart Camera System. It uses state-of-the-art change detection and automatic object discovery which was originally developed by scientists at the University of Rochester and then commercialized by engineers at PLE.

The objective of this effort is to evaluate portable and stationary systems for unattended and continuing surveillance, to prevent third party damage to transmission and distribution pipes and right-of-way encroachments at typical utility company facilities.


Camera Kit & Tripod


Pole Mounted System

The NYSEARCH project work will build on previous work performed for military concerns, which uses an area of 10m by 100m for base perimeters.

TECHNCIAL APPROACH

PLE plans to perform experiments and analysis to adapt the AVT234© Smart Camera System to provide unattended monitoring of gas transmission and distribution pipelines. In addition to experimentation and analysis, NYSEARCH will provide two field test sites, one rural and the other suburban/city, where tests will be conducted with excavating equipment typically used by third party contractors. The systems will be installed using existing infrastructure, such as poles, buildings, etc. or by using portable surveillance kit that can be quickly deployed in the vicinity of selected sections of the pipe. The camera systems will provide continuous third party surveillance to prevent potential damages caused by backhoes, drilling machines and other types of

excavating equipment. The systems will be powered by standard 110 volt supply, power converter, generator, or solar panel.

PLE's analytical software solution uses an adaptive classification scheme that raises an alarm only when there is a high degree of confidence that there is an intrusion or third party event caused by a third party activity. Nuisance alarms and/or false alarms which are benign (such as nearby traffic, blowing leaves, sun glints, clouds, illumination changes, shadows, rodents, etc.) are intended to be discounted and eliminated or minimized. The utility operator will have the ability to identify and exclude certain areas or zones.

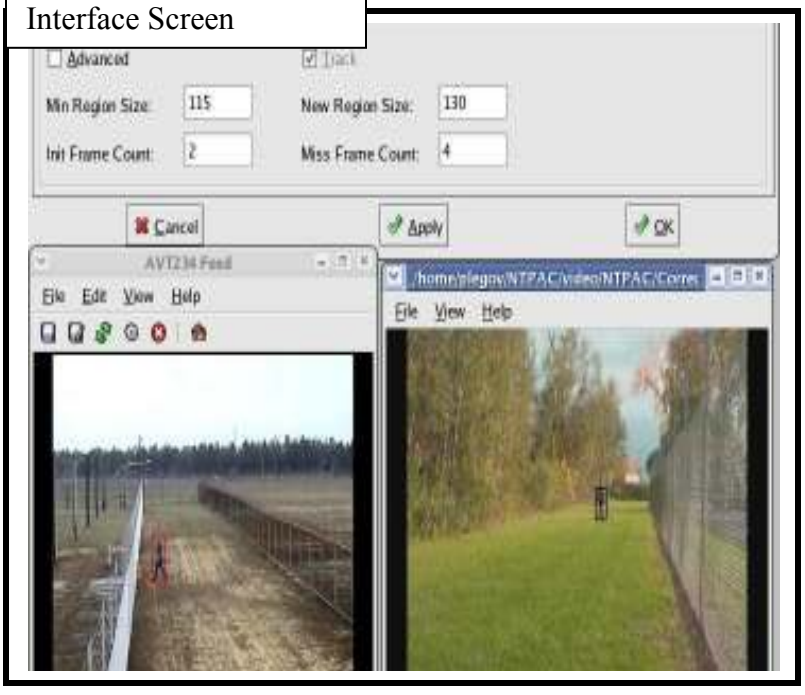
Stationary Solution

The AVT234© TMC™ is an automatic intruder detection system designed to operate with permanently pole-mounted stationary cameras. The system eliminates or significantly reduces false alarms while it analyzes live video feeds to detect human or vehicle activity within designated camera views and sectors and alerts when such activity is a true intrusion worth noting.

Mobile Solution

Portable AVT234© kits are easy to setup to create a "virtual fence" with PLE's intelligent video surveillance software that provides unattended monitoring of video for unwanted intrusions. Kits can be quickly deployed for full motion video analysis of areas of interest and can be transported via truck in carry bags and cases. The kit is equipped with a series of cameras that can be quickly installed on pole mounts or special camera tripods.

Typical Video/Alarm Interface Screen



PROJECT STATUS

The project is in progress and PLE is working with NYSEARCH member utilities to obtain video images of excavating equipment used by third party contractors. This data will be used to provide the detection algorithms needed to adapt the smart camera system. Field tests are also being planned.

Highlights

- Project intends to evaluate use of state-of the-art video imaging systems to prevent TP damages
- Proactive alarm and warning system
  - -Must be able to detect event of concern with 99% reliability
  - -Must keep nuisance and false alarms to less than 1%

FOR ADDITIONAL INFORMATION

Angelo Fabiano
Technology Manager,
NYSEARCH
Northeast Gas Association
1515 Broadway, 43rd Floor
New York, NY 10036-5701
212-354-4790
Fax: 212-764-7014
afabiano@northeastgas.org

Paul Simpson
P&L E-Communications, LLC
1900 Ridge Road East
Rochester, NY 14622
Phone 585-340-5435
Fax 585-654-7999
Email: paul@plegov.com