



# 24/7 Automatic Detection and Alarm Hazardous, Lethal & Explosive Fugitive Emissions

## FEVDS

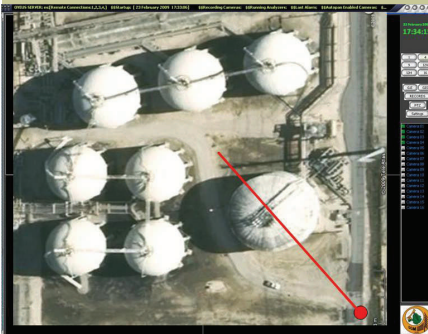
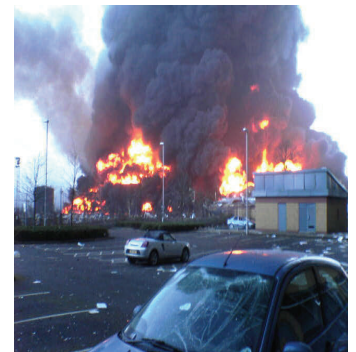
### Petroleum, Gas and Chemical Facilities Optical, Software Centric Unattended Emission Detection

The DDS systems are applied when death, injury, explosions or loss of costly materials and assets can occur if a vapor/aerosol emission is not detected immediately.

- Hydrogen Sulfide
- Methyl Isocyanate
- Health Hazard Greenhouse Gases
- Volatile Hydrocarbons
- Pumping and Transfer Stations
- Refineries and Chemical Plants

The technology is designed to prevent catastrophic incidents by automatically recognizing the gas emission in the first few seconds allowing the control center to resolve the problem quickly. Examples of incidents that the DDS system can prevent:

- June 12, 2008: Six people died. Hydrogen Sulfide leak
- Dec 2/3, 1984 – A methyl isocyanate leak in Bhopal India killed an estimated 20,000 people over time with 120,000 suffering long term ailments.
- August 9, 2008: Propane storage facility in Toronto exploded
- Dec 11, 2005: Bruncefield oil storage facility, Hertfordshire UK. Vapor cloud undetected for 30 minutes: 20 storage tanks exploded, 43 injuries, damaged over 5 mile radius, 3 days to control fire



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# Fugitive Emission Detection System Technology

DDS systems (patents pending) represent non-invasive, field-proven, first-to-market innovation, in terms of providing continuous 24-hr detection of lethal, toxic, explosive, gas, vapor, particulate and greenhouse emission plumes. Depending on the specific nature of molecular targets, Delacom's *ERMT* technology detects quarter-diameter emission plumes at 20m, 1m sq. plumes at 250m, and 10m sq. plumes at 15km – which amounts to an unprecedented versatility of detection range.



The FEVDS system is several orders of magnitude forward in technology and performance over existing systems. It will replace current oil/gas/and chemical facility monitoring devices that are fixed position ionization monitors. Existing ionization monitors are not applied if the potential vapor is lighter than air, can miss the detection based on their position and environmental conditions, do not identify the exact position of the leak, and cannot follow the hazardous gas cloud as it migrates through the facility.

## **FEVDS Detection Optodynamics**

- Delacom Detection System *ERMT* technology utilizes a novel fractal wavelet transform-driven video analysis technique that processes and de-convolutes the image received from an optical sensor that monitors UV, Visible wavelength, SWIR, MWIR, and LWIR reflection spectra, thereby revealing hidden vapor emissions;
- The system continuously compares the present frame with the previous frames from the sensor, providing a time-driven snapshot evolution in the emission geometry formation of an evolving vapor plume;
- The transparent vapor causes edges in the image to soften (mathematically reducing the energy of the image);
- This in turn unmasks a temperature (and light wave) absorption frequency-coupled differential between the transparent/semitransparent vapor plume and the

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# Fugitive Emission Detection System Control Center

The control center consists of a windows based processor , LCD screens and I/O interface. Each computer can monitor up to 16 remote sensor locations. For facility wide applications, each of the 16 sensor units are connected to an independent server or integrated with the facility master security system

The remote sensor transmits the video stream to the control center where the images are processed and algorithms determine the presence of leak or a fugitive emission. The system will identify the precise location of the emission and can follow the emission as it migrates through the facility. The system provides

- An audible and visual alert
- Zooms to the location
- Specific location information
- Manual control of the sensor to examine the alert
- Sends event notification to Master Control Center
- Sends SMS to pre-selected mobile phones
- Sends email with image to pre-selected addresses
- Records the event
- Event history is compressed, maintained and searchable



Sensors are mounted in drives that provide both horizontal and vertical movement and are programmed to scan the target area.

Depending on the application, the sensor, drive and I/O device are available in weatherproof standard IP-68 protection grade, non-explosive class 1 Div. 1 and Class 1 Div.2, Zone 1 and Zone 2, Group B and Group C enclosures.

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# Fugitive Emission Detection System Summary

## FEATURE

## BENEFIT

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Automatic Detection and Alarm</li> <li>• Tracks Propagation of Fugitive Gas</li> <li>• Locates and Provides Visual of Event</li> <li>• Worldwide Remote Access</li> <li>• Adaptive Learning</li> <li>• Video Analysis Technique</li> <li>• Integration with Security Programs</li> <li>• 150,000 hours commercial operation</li> </ul> | <ul style="list-style-type: none"> <li>• 24/7/365 Unattended Monitoring</li> <li>• Safety of First Responders and Facility Personnel</li> <li>• Immediate Identification of Source and Compound</li> <li>• Centralized Oversight</li> <li>• False Positive Reduction</li> <li>• Detects in UV, Visible, SWIR, MWIR and LWIR Spectrum</li> <li>• Single Monitoring Point</li> <li>• Proven Technology</li> </ul> |
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## APPLICATIONS

### Greenhouse

- Methane
- Nitrous Oxide
- Sulfur Hexafluoride
- HFC's
- PFC's

### Explosive

- Gasoline
- Propane
- Butane
- Ethylene
- Volatile Hydrocarbons

### Lethal/Toxic

- Methyl Isocyanate
- Hydrogen Sulfide
- Hydrogen Fluoride
- VCM
- Chlorine
- Ammonia

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