

VESDA

OIL & GAS APPLICATIONS

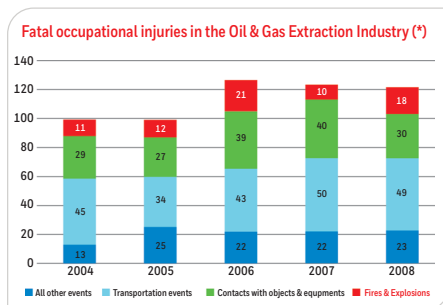


VESDA PROVIDES
DEPENDABLE SMOKE
DETECTION IN
PETROCHEMICAL, OIL
& GAS FACILITIES

- OFFSHORE PLATFORMS
- OIL & GAS REFINERIES
- PROCESSORS
- PETROCHEMICAL REFINERIES
- DRILLSHIPS
- GAS WELLS
- DISTRIBUTION STATIONS

The heavy investment in the Oil and Gas industry, the highly volatile nature of products and a number of offshore petrochemical disasters around the globe have created a strong need for very early warning smoke detection.

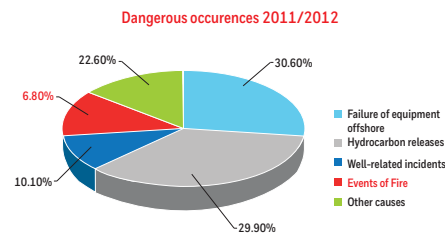
A disaster in this industry would not only threaten lives and facilities but, also adversely affect national and international economies, as well as potentially having significant environmental consequences. For decades, Xtralis' powerful, very early warning smoke detection solutions have delivered unparalleled protection and situational awareness for oil and gas facilities around the world, including companies such as: ESSO, Suncore, Woodside, Shell, BP and Caltex.



In 2008, 18 staff fatalities were caused by Fire / Explosion

(*) Oil and gas extraction industries include oil and gas extraction, drilling oil and gas wells, and support activities for oil and gas operations

Source: U.S. Bureau of Labour Statistics, U.S. Department of Labour, 2010



According to HSE, 425 dangerous occurrences (including well incidents) were reported of which 30 were fire-related

Source: UK Health and Safety Executive (HSE) - Offshore Safety Statistics Bulletin 2011/12

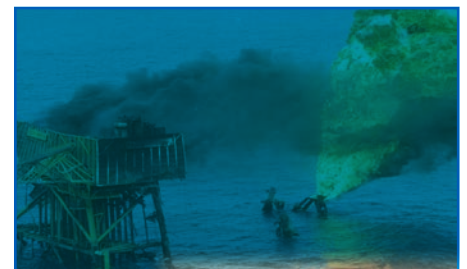
There are many effective variables during the drilling process, and even equipment failure can lead an offshore platform to disaster. With heavy equipment being operated in the middle of harsh ocean waters it is critical that Codes & Standards requirements are being met by industries willing to go above-and-beyond for the safety of their workers.

The possible causes of offshore platform fires and explosions include liquid spills of hazardous materials, defective equipment leading to malfunctions and failures, or poorly trained equipment operators. At times safety regulations and rules are simply not followed.

A FIRE DISASTER CAN OCCUR AT ANY TIME

The Piper Alpha disaster in the North Sea, UK, which killed 167 people in July 1988, is the deadliest offshore oil rig accident in history. The Piper Alpha disaster occurred due to gas leakage from one of the condensate pipes.

Communication errors however, led the night crew staff at the platform to turn on the pump after the other pump tripped. This resulted in leakage of gas condensate from the two blind flanges causing gas ignition and serial explosions on the platform. Only 61 out of the 226 workers survived the disaster and it took close to three weeks to control the fire.



CONSEQUENCES OF SMOKE OR FIRE ON AN OIL & GAS FACILITY

Maintaining high service levels and protecting staff and property in a cost-effective manner is a critical challenge for Oil & Gas facilities when it comes to designing a safety system. Fires in particular can compromise life safety, asset protection and operational continuity with severe and sometimes tragic consequences. It may:

- **Endanger the lives** of staff
- **Cause severe damage to equipment** including smoke contamination within electrical equipment
- **Create large environmental pollution** caused by the release of oil or gas leakage
- **Generate down-times** that suspend or delay energy supply
- **Destroy** the entire facility
- Lead to service penalties for breaking contracted service agreements
- **Create negative publicity** that may affect sales and profits and lead to potential litigation
- **Lead to long and costly prosecutions** when it comes to staff injuries or fatalities, and even more in case of environmental pollution

RISKS AND CHALLENGES

As it has been dramatically demonstrated offshore oil rigs activities entail the hazard of a major accident with potentially severe consequences to the life and health of workers, pollution of the environment, direct and indirect economic losses, and deterioration of the security of energy supply.

The main hazards include:

- **Fire** after ignition of released hydrocarbons, **explosion** after gas release, formation and

ignition of an explosive cloud, or **oil release into the sea**

- Petrochemicals are notoriously volatile and the highly flammable nature of these facilities means an undetected fire could spread rapidly with potentially catastrophic results. In oil and gas facilities there are a number of smoke detection challenges faced in an emergency situation, particularly in an offshore environment, where there is no fire service in close proximity. The delay in detection of smoke can lead to a number of significant consequences including; the ability to evacuate personnel safely, environmental impacts, protection of assets and possible disruption to both domestic and international supply.

WHY USE A VESDA ASPIRATING SMOKE DETECTION SYSTEM?

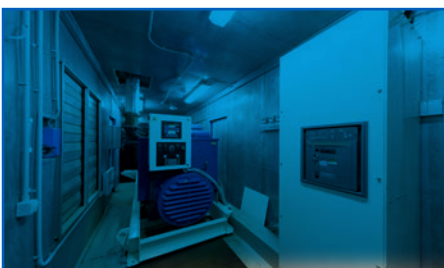
There are a number of factors to consider when designing and installing a smoke detection system for the protection of petrochemicals facilities, such as:

- **Smoke dilution** in large volumetric areas, **high airflow** interfering with normal dispersion of smoke, or **smoke** originating within concealed electrical or mechanical equipment create problems for point type smoke detectors. **High levels of dust, oil mists, corrosive or high humidity environments or other airborne particulates** result in malfunctions or unwanted alarms makes detection difficult. The inability to safely and cost effectively access detectors to perform **maintenance** are common problems routinely encountered with spot type detectors.

Since pioneering aspirating smoke detection (ASD) technology over 30 years ago, VESDA has been recognized as the best in the world by providing the earliest possible warning of a potential fire hazard. It provides flexibility in where you sample for smoke and detectors have multiple configurable alarm thresholds which are field adjustable within a wide sensitivity range that allows you to establish a fire escalation protection scheme. In practical terms you can define the smoke event you want to detect or ignore.

Aspirating smoke detection system features provide the designer flexibility by meeting the design requirements of prescriptive codes as well as facilitating the use of today's performance-based fire engineering methodologies. VESDA detectors buy "TIME", time to respond to a fire threat, minimizing damage and business downtime. They provide:

- Detection of **both small incipient smouldering fires and large flaming fires**
- Superior **performance in harsh environments** and a **high resistance to contamination** through the use of our clean air barrier technology that protects the detection chamber
- **Flexibility to design** on ceiling, underfloor voids, in cable ducts across return air intakes, or enables targeted sampling within targeted equipment such as electrical cabinets
- **Multiple configurable settings** to provide, for example, very early warning for investigation, and sub-sequent warnings to initiate a fire response plan, evacuation and suppression
- **Simply access to the detector and sampling pipework** ensuring a quick and effective maintenance



APPLICATIONS THAT OFFER A PARTICULAR STRONG SOLUTION-FIT

Oil & Gas and petrochemical applications are wide and varied and present a wide variety of challenges to effective and reliable smoke detection and on-going maintenance.

| Applications | Causes | Consequences | Detection Challenges |
|---|--|--|--|
| Control rooms | Large amount of equipment and cabling installed in very compact spaces and concealed areas | Injury and loss of life from smoke exposure | Incipient slow-growth fires, low smoke levels diluted at source by high airflow HVAC systems. A fire may also rapidly spread due to the presence of large amounts of combustible materials |
| Telecommunication & Instrument & Computer rooms | Electronic equipment, electrical and electronic switching devices, underfloor cabling | Injury and loss of life from smoke exposure, loss of high value assets, long time to replacement | High air movement, caused by air-conditioning dilutes and disperses the smoke. In-cabinet fires that have long incipient smouldering stages |
| Switch rooms | Electrical arcing and the build-up of static electrical charge within equipment, overheating of electrical control equipment, switchgear and cabling | Injury and loss of life from smoke exposure, loss of high value assets, long time to replacement | Incipient slow-growth fires, low smoke levels diluted at source by high airflow HVAC systems, open fires. In-cabinet fires that have long incipient smouldering stages |
| Substations | Electrical arcing and the build-up of static electrical charge within equipment, overheating of electrical control equipment, switchgear and cabling | Injury and loss of life from smoke exposure. Fire can spread to other critical installations. Loss of high value assets, long time to replacement | Incipient slow-growth fires, low smoke levels diluted at source by high airflow HVAC systems. High levels of background pollution present in these areas especially in cable trenches |
| Pumping stations | Large amount of equipment and cabling, high pressure equipment. Large open spaces | Injury, impact on critical operational functions. Fire can spread to other critical installations | Highly condensing environment, harsh temperature for electronics |
| Battery rooms | Uninterrupted power supply areas may become explosive from the build-up of high concentrations of hydrogen gas | Injury and loss of life from smoke/gas exposure, explosion due to high concentration of gas, Impact on operational function given that chain events might occur | Potential explosive atmosphere due to hydrogen |
| Generator halls | High-current electrical equipment and faults, arsons, frictions due to mechanical failures in case of diesel engines | Injury and loss of life from smoke exposure. Loss of high value assets, long time to replacement. Critical impact on operational functions that may lead to chain events | High level background fumes and vapours, humidity and high airflows, reliability, temperature, high maintenance |
| Air handling & Filtering systems | Filter fires, general area fires | Injury and loss of life from smoke exposure | Changing airflow conditions across the return air vents that cause high dilution and potential flow faults |

ABOUT XTRALIS



Xtralis is a leading global provider of powerful solutions for the very early & reliable detection of smoke, fire, and gas threats. Our technologies prevent disasters by giving users time to respond before life, critical infrastructure or business continuity is compromised.

We protect highly-valued and irreplaceable assets and infrastructure belonging to the world's top governments and businesses.

To learn more, please visit us at www.xtralis.com