



FIRE & GAS DETECTION CONSULTANCY & SERVICES



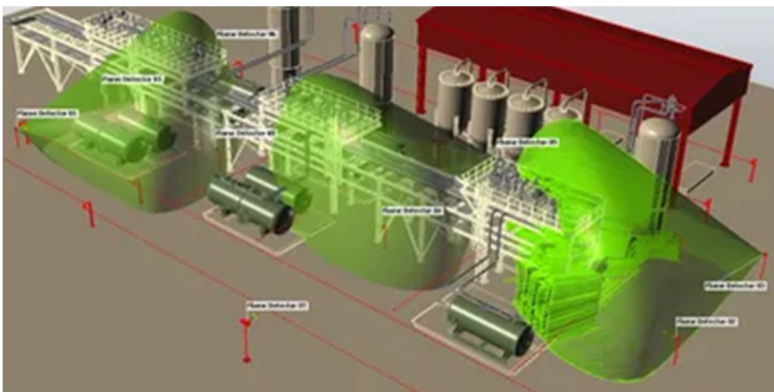
Fire & Gas Detection Consultancy

Industrial plants often involve the processing of highly flammable/toxic gases and liquids, should there be an escape of flammable/toxic gas or liquid then the plant, plant operatives and the local population can be put at risk, this can lead to injury, loss of life, loss of expensive process plant, litigation, reputational damage, and damage to the environment.

It is therefore important these hazards are minimised, leaks detected quickly, and executive action of the safety system is prompt and effective. Fire & Gas Detection Systems are an important element of the overall plant safety system.

FGDS can assist in the design and engineering of these systems, ensuring compliance with National, Local, and site-specific Standards, Codes and Regulations, to provide an effective system at a reasonable cost.

It is often the case that a plant owner is confused by the breadth of detection technologies and manufacturers available, leading to project delays and cost overruns, and an ineffective Safety System design. With our experience of system design over many years FGDS can cut through this "fog of confusion" and design and document a system to detect gas hazards, provide suitable alarm philosophy and possibly shutdown/mitigation steps.



Fire & Gas Detector Mapping Studies

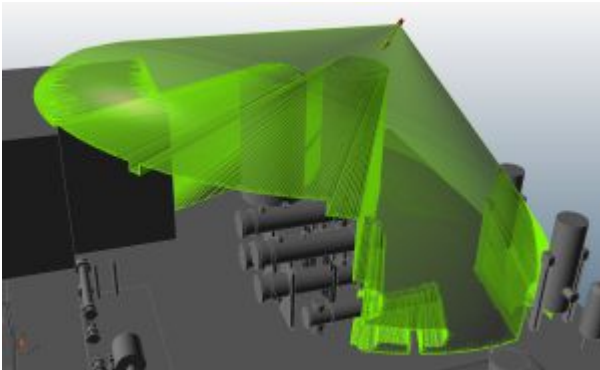
FGDS computer modelling of Fire & Gas Detector selection, and placement, can optimise the number and position of detectors to increase plant safety, and provide enhanced detection coverage in both Onshore and Offshore Installations. We can provide detailed indications of potential gas dispersion and movements over time from identified leakage points.

The mapping study commences by assessing the risk and definition of the "detection target", gas leak points are identified, and dispersion patterns plotted, fire zones are detailed and then the detector type and quantity evaluated to ensure suitable detector coverage throughout the area under review.

The "Detection Target" depends on the type of facility, Local and National Standards, Codes and Practices, Company Standards, and the results from Hazard Identification.

Using the most accurate Fire & Gas Mapping software, for the design and assessment of detector layouts, flame detectors and point and open-path gas detectors can be interactively positioned and oriented within any geometry.

The deliverables from 3-D Fire & Gas mapping include drawings in AutoCAD (DWG), PDF and JPEG files and a detailed report.



Fire Mapping & Flame Detection

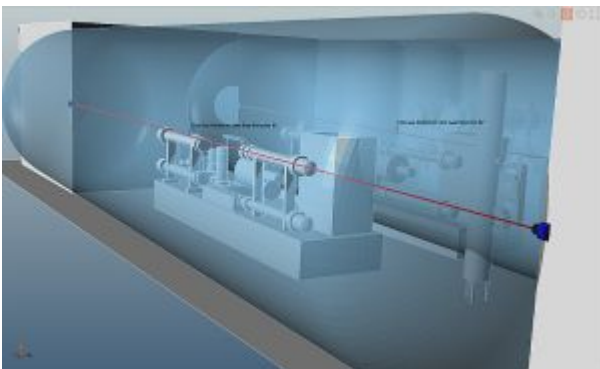
Utilising Fire & Gas Mapping software incorporating powerful ray-casting algorithms to accurately determine the obstructed field of view of flame detectors, a full 3D representation of coverage areas is built, which can be visualized using contours or isovolumes, this provides engineers with unique insight into flame detector layouts.

The resulting “obstructed” FOV is highly accurate. The coverage is calculated by combining multiple detector FOVs in a volume.

The resulting 100N, 200N are calculated on a volumetric basis utilising the client performance targets, specified detector FOV, range and sensitivity data. Coverage is reported on tables (exportable to Excel) contours, and isovolumes, Three-dimensional surfaces (isovolumes) are also shown. These are particularly useful to highlight “blind spots” or zero-coverage areas.

Any manufacturer and model of flame detector can be used with the mapping software. The coverage for multiple fire sizes can be calculated by applying FOV multipliers to risk grades. There is no need for separate projects for different fire sizes – it can all be managed in the same simulation.

Once we have completed the fire mapping project, the detector locations and orientations can be exported to Excel. For even greater CAD integration, the detectors can also be exported to CAD files (DGN and DWG), ready to be imported into your own CAD software.



Gas Mapping & Gas Detection

The coverage of the gas detector layout is calculated using the “Design Gas Cloud” method popularized by BP and Shell. In this method, a spherical gas cloud is chosen to be used as a design basis for the detector layouts. Although gas clouds are never spherical, the complexities involved in characterizing gas clouds more accurately are so great that a sensible approach is to represent the statistical average of the gas clouds as a sphere.

The advantage of this approach is that it is clear, easy to understand, and can be justified by considering maximum overpressures. It is also widely accepted in industry, and guidance on cloud diameters is readily available in most cases.

Point, Ultrasonic and Open-Path Gas Detectors can be added into the design for the assessment of gas detector coverage, and layouts. As gas detectors are either ‘point’ or ‘open path’ devices we assume that that gas is detected if the accumulation envelopes a detector or intersects the beam of an open path detector. Ultrasonic detectors have their own unique mapping based on background sound levels.

Once we have completed the fire mapping project, the detector locations and orientations can be exported to Excel. For even greater CAD integration, the detectors can also be exported to CAD files (DGN and DWG), ready to be imported into your own CAD software.



Gas Detection Training

Gas Detection Basics

This course focuses on the principles of gas/vapour behaviour, the effects of gas build up, flammable and toxic detection levels, specific detectable gasses, and the detection techniques used. This provides a detailed understanding of gas detection.

Gas Detection Principles

This course covers the principles used in gas detection. You will learn which gas sensors are available, detector placement, how they work and what they can be used for and cannot. You will learn how to specify gas detection equipment and how to design a safety protocol for detecting different common gases.

Gas Detection Applications

Why would someone need to detect sulphur dioxide? Where in industry would I find perchloroethylene, why is ozone dangerous? All these questions and more are answered by this course, covering the commonly found gases in industry, where they occur and why, detection levels and methods, and what they are used for.

Gas Awareness Training

Easy to digest training which covers the things you need to know; What is the gas I am dealing with in my line of work? Where will I find it? How can it harm me? What can I do to protect myself?

Nitrogen awareness

Nitrogen makes up most of the air around us and is commonly used for inerting and purging applications in industry. It is also used in freezing, cryogenics, and storage applications. You will learn how nitrogen is dangerous, how it displaces the oxygen in the air, and how to protect yourself.

Carbon Dioxide awareness

Carbon dioxide is the most common gas used in the world. It is found in every food factory, brewery, distillery, every bar, and restaurant and now commonly in coffee shops. You will learn how carbon dioxide is dangerous, what it does to the body, and how to protect yourself.

Ammonia awareness

Used commonly as a low-cost refrigerant gas, ammonia can be found in frozen food factories, breweries, ice rinks and supermarkets. It is the most reported leaking gas in industry. You will learn how ammonia is dangerous, how it is lethal, how it is explosive, and how to protect yourself.

Hydrogen Sulphide awareness

Hydrogen sulphide is a common byproduct of oil exploration and production, but also found in sewage treatment and processing. A common hazard in confined space entry into sealed underground areas you will learn just how dangerous and toxic hydrogen sulphide is, where it can be found, and how to protect yourself.



Flame Detection Training

Flame Detection Basics

This course covers the properties of flammable materials, principles of flame behaviour, different types of fuels and classes of fire, specific detectable fuels and the detection techniques used, providing an understanding of flame detection.

Flame Detection Principles

This course covers the principles used in flame detection. You will learn which flame sensors are available, how they work and what they can and cannot be used for. You will learn how to specify flame detection equipment and how to design a safety protocol for detecting different common fires.

Flame Detection Selection and Location

This course covers selection of the optimum detector type (UVIR/IR3/HD) for the application, taking into consideration fuel to be detected, environmental situation, and specification requirements for coverage. It looks at detector placement and some of the common site conditions which can influence a detectors performance, including containments, inhibitors, and physical barriers. We also discuss detector cone of vision, detector range, sensitivity, and configuration to provide an optimum flame detector solution.

Flame Detection Applications

Why would someone need to detect flames? Where in industry would I need to detect flames, why is flame detection necessary to protect process plant? All these questions and more are answered by this course, covering the commonly found applications in industry, where flames occur and why, and what equipment to use to detect them.



Specification of Fire & Gas Devices

FGDS has the experience and competence to recommend the most suitable equipment from a variety of manufacturers, to meet requirements of the system design and to produce a compliant system.

With expert knowledge of the fire & gas hazard, how to protect against such hazard and mitigate the risk, we can select the most appropriate

detection methodology and manufacturer, giving you the peace of mind that you have protected your plant and people, and we provide the documentation to support the decisions you will need to make in creating your safety case.

We can provide reassurance that the risk has been taken seriously and suitable prevention steps taken to meet your duty of care to your people.

This includes establishing detector type, set points, system cause and effect, and any executive control action.

We can compile the System Design Requirement and associated datasheets for the field devices to create a design document for the fire and gas system, detailing the detector type, quantity, and placement from a mapping study.



Identification of Fire & Gas Hazards

FGDS engineers are experienced in Fire & Gas Safety Engineering and Hazard Identification, they can help identify potential gas and fire hazards and verify the risk assessment created for those hazards by those with a knowledge of the plant and/or process.

To provide an effective detection system, the extent of the hazards must first be detailed, the

type of hazard, location and occurrence of a hazardous situation must be assessed and documented, this will be documented in a Hazard Assessment based on site surveys, plot plans and an understanding of the process under review.

FGDS can survey a site, a process or an area and provide advice on the likely source and dispersion of gas hazards and provide recommendations on the placement of detectors and the type of detection technology used.

FGDS can recommend suitable fixed fire & gas detection technology and design and document a system to detect fire & gas hazards in an area and provide suitable alarm and possible shutdown/mitigation steps.



Installation, Commissioning & Service

A team of highly experienced installers with decades of experience in fire and gas detection system installation ensures your system is installed and available in the shortest possible time.

Our engineers have experience in all applications and in every possible environment including COMPLEX compliant.

For customers with resident experienced installers or trusted contractors, FGDS can still ensure your investment is installed correctly. We can supply an installation supervisor for the duration of the project, or if preferred, at the start and end of the project and at agreed milestones.

For those customers with the engineering resource or who prefer to use trusted contractors, it is still of vital importance to know that your fire and gas detection system has been installed correctly. Whether self-installed or installed by FGDS, our commissioning engineers will check all connections and test the full system ensuring the system is installed to specification and customer expectations.

All FGDS service packages are tailored to the client's needs and compliant with legislative requirements, we offer straight forward pricing and even extended warranty on certain packages, customers are able to choose the level of service that best suits their needs, application and budget.

All work is carried out by experienced engineers who undergo continuous training at our principles headquarters, and who hold a variety of accreditations including:

- CSCS Competence Cards
- CCNSG Safety Passports
- Offshore Survival and Medical Certificates
- Safe Contractor Approval



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