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Boiler Room Gas Detection

NATURAL GAS AND CARBON MONOXIDE GAS MONITORING AND DETECTION IN BOILER AND MECHANICAL ROOMS

Experts in **Boiler Room** Gas Detection

Industrial buildings and facilities commonly use natural gas for heating. In these facilities an undetected gas leak or incomplete combustion could present an explosive hazard or an influx of carbon monoxide resulting in loss of life, structural damage, or expensive waste of fuel. Since the boiler is not frequently occupied, leaks often remain undetected. Continuous gas monitoring and detection system will provide early warning of a gas release and prevent potentially catastrophic events.

Potential Combustible Gas Build-up in Boiler Rooms:

Natural gas is nearly half the weight of air and rises to the ceiling or roof space of a boiler room. Natural gas is composed mainly of Methane – a combustible gas with a rapid expansion rate.

In gas detection it is necessary to be aware of the potential hazard's LEL or LFL. LEL or LFL depending on your location stands for the Lower Explosion Level or Lower Flammable Limit. These values represent the minimum concentration required to generate an explosion when an ignition source is present. While there is a quantitative difference between flammability limits and explosive limits, in an explosive mixture the fuel

oxidizer mixture is closer to stoichiometric proportion. This difference has no practical application in facility safety engineering as the flammable vapor cloud is turbulent and the exact mixture of fuel and oxidizer varies greatly. Therefore, many references use the term flammability limit(LFL, UFL) and explosive limit (LEL, UEL) interchangeably.

Potential Carbon Monoxide Gas Build-up in Boiler Rooms:

Carbon Monoxide is a slow acting but deadly toxic gas produced by the incomplete combustion of hydrocarbon fuels such as Wood products, Natural Gas, Fuel Oils and Coal. There are about 500 deaths and 15,000 ER visits per year caused by excessive CO exposure. While poorly ventilated home furnaces and hot water heaters make up a large portion of this, larger buildings and certain occupancy classes require that safety measures be taken, by code. These include apartments, condominiums, adult care, nursing homes, hospitals, and so-called assembly occupancies. Heating appliances in larger structures are often package boilers designed to distribute heat via steam or hot water. Although they are vented to atmosphere, there is the potential for casing leaks and poorly ventilated devices to produce CO in the utility room. CO is the same density as air and easily migrates to other areas of the building through vents, ducts and openings in the building structure. The consensus building codes require smoke, CO and Natural Gas monitoring in multiple occupancy buildings when the "boiler room" is attached to or an integral part of the structure. The same is true for Propane fueled appliances.

Boiler Room Gas Detection Systems:

In boiler rooms, gas detection systems consist of strategically installed fixed sensors wired to a gas detection controller. When gas is detected, alarm relay contacts within the control panel activate audible and visual alarms. If the gas concentration continues to reach a higher level, additional relays should cut power to electrically operated solenoid valve connected to the gas supply.

Common Sensor Placement:

- Gas Burner Assembly
- Gas Shutoff Valve
- Gas Meter
- Gas Train Assembly
- Pressure Booster

The LEL for Methane is 4.4 - 5% by volume.

The LEL for Carbon Monoxide is 12.5 – 75%

50 PPM OSHA Permissible Exposure Level 8 Hours

In a boiler room, potential sources of ignition can include any uncertified electrical equipment from lights to control panel switches.

Fixed Point Gas Detectors for Boiler Room Gas Detection

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