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Introduction

1.1 PURPOSE

The primary driver behind the development of early gas detectors was the mining industry, which was experiencing notoriously high mortality rates related to the presence of oxygen deficient, explosive and toxic atmospheres. In response to this problem, the first gas detectors were developed in the mid-1920.

Since then, the use of gas detectors has extended to other industries, technologies have advanced and our knowledge concerning the behavior of released vapors and gases has expanded. However, older gas detection systems that are not as reliable as the newer ones are still in use.

This guideline was developed with the intention of helping today's facility to get the most out of their gas detection systems. It includes guidance on:

- Available gas sensors, including basic descriptions of how each type works, their capabilities and their limitations.
- Establishing objectives for the use of gas detection systems and incorporating them into the facility's operating and emergency procedures.
- Placing gas detectors to maximize the potential for detection success during a release.
- Managing gas detection system design, alarm, and operating parameters.

1.2 SCOPE

This text is intended to assist the user to detect and respond to accidental release of hazardous materials. It is not intended to address:

- Integrated exposure sampling to assess employee exposure against documented standards i.e. 15 min STEL (Short Term Exposure Limit), or 8 hour threshold Limit Value (TLV) time weighted average etc.
- Background or continuous monitoring required for environmental regulatory purposes.

1.3 WHO WILL BENEFIT FROM THIS GUIDELINE?

Because gas detection may be utilized to meet a wide range of objectives, this Guideline will benefit many different people within an organization.

1. Corporate Leadership – Senior executives define the basis for the development of personnel and asset protection philosophies. Their commitment and recognition of the value of gas detection is vital to the implementation personnel and asset protection strategies.
2. Site Managers – Site managers are responsible for developing and maintaining the facility's gas detection philosophy and strategies. They are also responsible for developing emergency response and site evaluation policies.
3. Line Management – Line managers are responsible for maintaining gas detection systems and for ensuring personnel are trained on their use and limitations. They ensure that policies and procedures, including gas detection, are integrated and implemented. This includes testing and maintenance of the gas detection systems.
4. Project Managers – Project managers are responsible for executing projects, usually from design through startup and commissioning. A Project manager is responsible for determining the basic system design concepts to apply in the execution of a project. The Project manager is responsible for implementing the decisions and abiding by the project procedures associated with amending and adding to the gas detection system.
5. Engineers – Engineers are responsible for specifying and designing gas detection systems that meet their company's personnel and asset protection requirements. There is a lot of room for decision making when designing gas detection systems, making knowledge about their capabilities, limitations and modern design practices critical.
6. HSE Professionals – Health, safety, and environmental (HSE) professionals provide technical guidance to engineers and typically are in an assurance role for gas detection systems.
7. Emergency Response Personnel – Emergency response personnel provide guidance on how gas detection system should be integrated in the overall emergency response protocols.