

MSA Gas Detection: Liquefied Natural Gas (LNG) Applications



Application

LNG, or liquefied natural gas, has been processed to remove impurities and heavy hydrocarbons. It is then condensed into a liquid at atmospheric pressure by cooling it to -160°C . LNG is 1/640 the volume of natural gas at standard temperature and pressure (STP), so special designs are necessary for its transport and storage.

The very high demand for natural gas has spurred the construction of new LNG facilities in strategic locations along the United States coastline. These locations allow for very large and specially designed ships carrying LNG to unload the product, which is then stored in insulated tanks for future delivery to natural gas consumers. The cleanest-burning of all fuels, natural gas is widely used for heating homes and offices, as well as for fueling power plants.

A terminal that receives LNG from ships consists of an unloading dock area, piping, storage tanks, vaporizers, liquefiers, maintenance shops, offices, and control rooms.

Solutions

A typical LNG facility requires from 40 to 90 single-point infrared gas detectors, 30 to 60 triple infrared flame detectors, 10 to 15 open-path gas detectors, and CO and O₂ detectors. A controller is also required, and can be used to alarm, execute shutdown functions, and activate a foam or sprinkler fire suppression system.

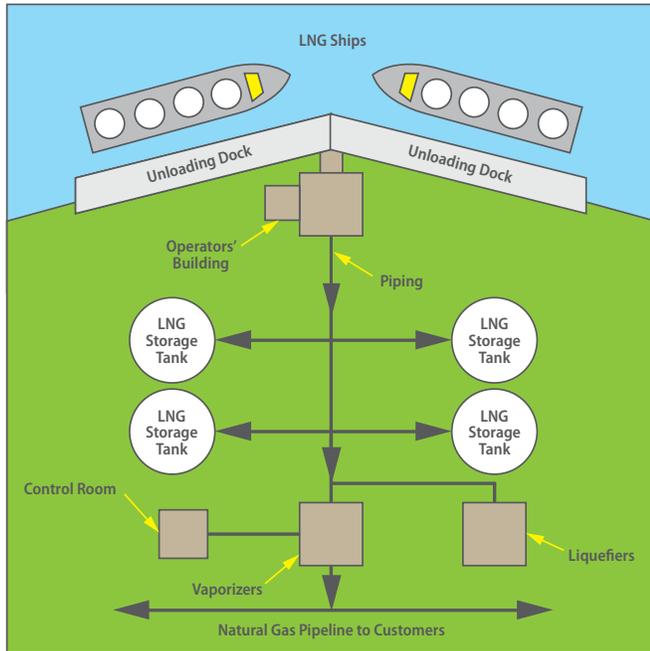


Monitoring recommendations:

- Dock unloading areas should be monitored for flame detection, single-point infrared gas detection, and possibly open-path gas detection.
- Storage tanks require flame detectors, single-point infrared combustible gas detectors, and open path gas detection for perimeter monitoring.
- Liquefiers used to re-liquefy boil-off gases require flame detection and single-point infrared gas detection.
- Vaporizers are used to heat up LNG to convert it back to natural gas before compressing it for the gas pipelines. Single-point infrared gas detection and flame detection are required around these units for protection.
- Air ducts into the control room call for single-point infrared gas detection.
- Office buildings and the maintenance shops also require single-point infrared gas detection as well as O₂ and CO monitoring.
- Many LNG facilities use distributed control systems (DCS) as their means of control and shutdown. A secondary fire and gas detection controller is also necessary to monitor the fire, gas, smoke, and thermal detectors. The Suprema Touch Control System is an excellent fit for this application.
- Many smaller LNG terminals exist throughout North America, located both near big cities and in more remote locations. When demand is high, these smaller terminals are used as peak loading units that ship gas to pipelines that supply local customers.

*Because every life has a **purpose...***

Typical LNG Terminal



For more information on these MSA products for terminal bay applications, go to www.MSAafety.com for bulletin #07-2078, *MSA Flame and Gas Detection for the Oil, Gas, and Petrochemical Industries*.

Product Descriptions

The **Flamegard® 5 MSIR Flame Detector** with neural network technology sets a new industry standard for performance, reliability and value. This is the industry's first MSIR/NNT flame detector designed to operate at a longer range with a wider field of view and at a higher level of accuracy for superior false alarm immunity.

Combining a precision multi-spectral IR sensing array with highly intelligent neural network processors, the FlameGard 5 MSIR Detector reliably discriminates between actual flames and nuisance false alarm sources (such as arc welding or hot objects). The unit detects virtually any hydrocarbon fire including liquefied natural gas (LNG) and liquefied petroleum gas (LPG).

The **Ultima® XIR Gas Monitor** provides a microprocessor-based, infrared single-point gas detector for continuous monitoring of combustible and carbon dioxide gases and vapors, and functions in both high-gas and low-oxygen environments. Dual-wavelength heated-optics technology offers definitive compensation for temperature, humidity, and aging effects. Infrared technology offers long-term stability, eliminating the need for frequent calibrations and reducing overall cost of ownership. The Ultima XIR Gas Monitor eliminates the need for gas calibration, using a simple zero adjustment. It operates over extended temperature ranges, has a rapid response time, and is immune to sensor poisoning.

The **Suprema® Touch Control System** offers the new standard in flame- and gas-detection technology through modular redundancy for the monitoring of 4-20mA output sensors, smoke detectors, heat sensors, and manual alarm call points. Offering signal processing for up to 256 inputs and 512 outputs per controller, this intelligent safety system is field config-urable and provides a distributed bus technology architecture to ensure failsafe internal data transfer. The unit has ATEX safety approvals and TUV approval for up to SIL3 systems.

MSA Recommended Equipment



*Ultima XIR
Combustible Gas Sensor*



*Ultima OPIR-5
Open Path Gas Detector*



*FlameGard 5 MSIR
Flame Detector*



Suprema Touch Controller

Note: This bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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