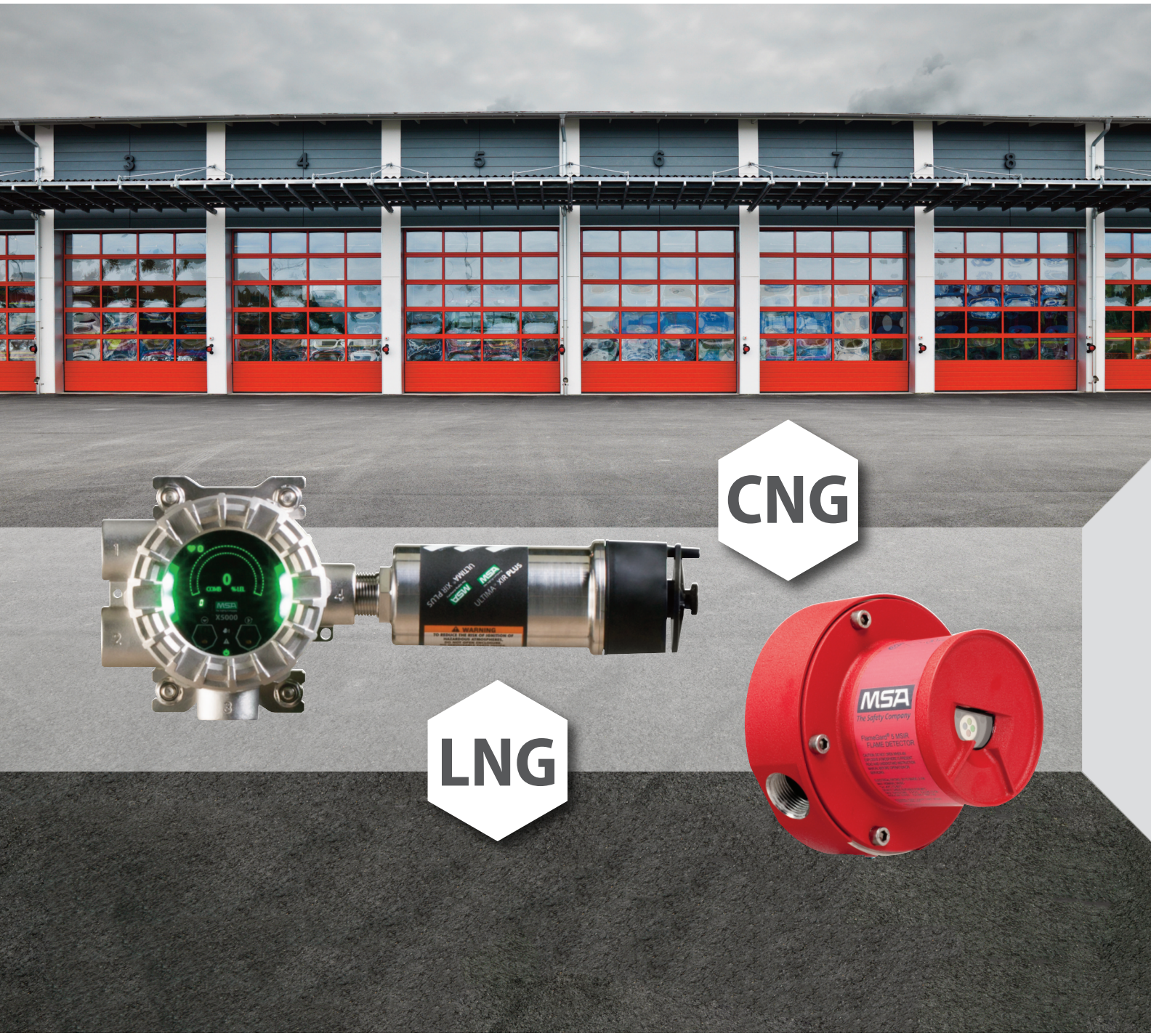
Application Note:

Natural Gas Fleet Maintenance Facilities

MSA
The Safety Company



WE KNOW WHAT'S AT STAKE.

Application

LNG (liquefied natural gas) and CNG (compressed natural gas) are common methane fuels used by long haul trucking firms as well as municipal fleet vehicles, also known as NGVs (natural gas vehicles). As private companies and municipalities convert their fleets from diesel to LNG -or CNG-fueled vehicles to reduce fuel costs and emissions, NGV maintenance and storage facilities must be constructed, overhauled or renovated to include safety products to manage leaks of LNG/CNG fuels. Such facilities are generally large buildings (four to 10 or more bay doors) with roll-up doors for each bay.

CNG vehicles can be subject to leaks due to premature natural gas cylinder release, typically caused by use of defective or incorrect pressure relief valves. LNG vehicle tanks that are stored within warming conditions can also be subject to pressure relief valve gas leaks, as well as liquid leaks.* If NGVs are stored within enclosed maintenance facilities, potentially hazardous gas and vapor buildup may occur. Natural gas leaks with an ignition source present can result in explosions and fire.

NGV facilities management personnel must meet safety and building code monitoring requirements specific to natural gas fuels to help ensure safe environments within these sites. In addition, such facilities may be located in public areas, an obvious concern for those working and living nearby.

Trade associations the National Fire Protection Association (NFPA) and the International Code Council (ICC) provide voluntary national code guidelines for gas detection instrumentation installation within NGV fleet storage and maintenance facilities.

Specifically, NFPA 72: National Fire Alarm and Signaling Code 2013 Edition includes "the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment and emergency communications systems (ECS), and their components. " **

However, local public safety requirements may stipulate the installation of both gas and flame detectors to address safety concerns via the Auhority Having Jurisdiction (AHJ). According to the NFPA, "the AHJ may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority." **

When a fleet maintenance/storage facility natural gas detection system activates, bay doors open, heaters are powered off, ventilation fans and louvers activate, and in most cases the fire department is notified. Heating systems may deactivate. Automated controllers are needed to activate doors, fans and heaters. Accuracy, timing, precision of tie-ins with ventilation systems, and avoidance of false alarms are key to the benefits of gas detection flame and gas detection systems for natural gas.



* *Guideline for Determining the Modifications Required for Adding Compressed Natural Gas and Liquefied Natural Gas Vehicles To Existing Maintenance Facilities, Douglas B. Horne, P.E., www.cleanvehicle.org*

***www.nfpa.org*

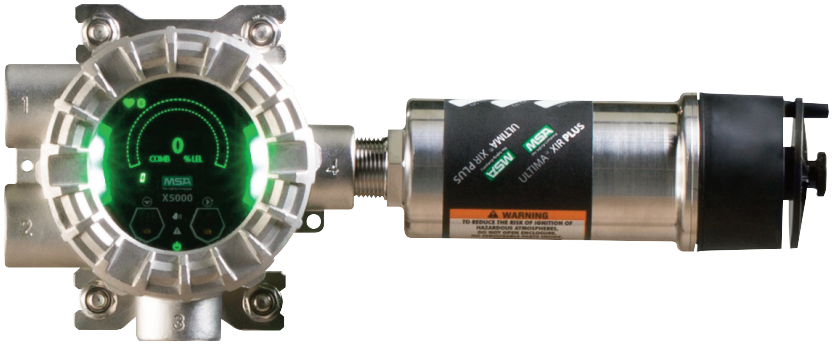
Solutions

MSA Ultima® X5000 XIR Plus Gas Monitors and FlameGard® 5 MSIR Flame Detectors

meet stringent requirements for LNG fueling station applications.

The **ULTIMA® X5000 Gas Monitor** features a breakthrough design with touch-button interface, dual sensing technology, and Bluetooth technology providing real-time data at your fingertips. The XIR Plus detector uses infrared technology to sense for combustible gases and vapors to quickly and reliably detect LNG gas leaks. DuraSource Technology uses dual-wavelength, heated-optics technology to compensate for temperature, humidity and aging effects. These monitors eliminate the need for gas calibration via simple zero adjustment. Ultima X5000 XIR Plus Gas Monitors provide rapid response times and are immune to sensor poisoning.

Stainless steel explosion-proof design and infrared source backed by a 10-year warranty and SIL 2 certification meet requirements for robust design. Ease of maintenance is built into these units through single board design, easy, intuitive calibration process and field-swappable smart sensors.



- HART port provides easy output access.
- Optional mounting bracket enables detectors to be easily mounted within containment areas.
- Patented sensor design offers sensor replacement without declassifying hazardous areas.
- Zero adjustment provides full calibration.
- Optional carbon dioxide detection is provided.

FlameGard 5 MSIR Detectors using four multi-spectrum infrared sensors and Neural Network Technology (NNT) enable these detectors to distinguish between fire and non-fire events from distances of up to 230 feet, providing superior false alarm rejection. Continuous Optical Path Monitoring (COPM) checks optical path integrity and detector's electronic circuitry. Dependability is enhanced by the ability to function at temperatures between -40° F and 185° F.



Longer range, wider of field view means that fewer detectors can cover more territory, reducing the cost of protection. Detectors are housed within rugged stainless steel explosive-proof enclosures. FlameGard 5 MSIR Flame Detectors can be installed at strategic points above LNG storage tanks via optional mounting brackets, potentially covering entire areas around tanks.

- FlameGard 5 MSIR Detectors are SIL 3-certified.
- FlameGard 5 MSIR Detectors can see through dense smoke produced by diesel, rubber, plastics, lube oil and crude oil fires.
- Multiple communication outputs provide versatility for use in a variety of applications.
- Serial communication port allows 128 units (247 using repeaters) to be linked to a host computer using Modbus RTU protocol.
- FlameGard 5 Test Lamp with high-energy broadband radiation source tests FlameGard 5 MSIR Detector operation.

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MSA controllers *provide intelligent, high performance data acquisition and data logging control for fixed gas and flame detection systems. Web-based open Ethernet connectivity and data monitoring functions allow for a wide range of monitoring and historical logging functions. Integrated measurement, interface to PLC and display and recording platforms, that when equipped with MSA's extensive line of transmitters and sensors, form comprehensive gas detection solutions. Other features include analog and Modbus field device communication, customized layout configuration and more. Controller solutions are offered for facilities large and small. MSA offers controllers to help users meet SIL 2 certification as well as compliance with NFPA 72 and NFPA 59A standards. Controller selection is determined by user communication needs and functionality preferences.*

FlameGard 5 UV/IR Flame Detectors *monitor for both ultraviolet and infrared (UV and IR) spectral ranges and are highly immune to false alarms caused by radiation sources. Continuous Optical Path Monitoring (COPM) checks both optical path integrity and electronic circuitry once per minute; wide field of view enables greater fire detection coverage.*

HazardWatch Integrated Fire and Gas Systems *are modular, scalable and employ Allen-Bradley ControlLogix™ programmable technology for gas and flame detection. Link up to 13 local gas and fire alarm panels over a network up to 25 km long. Systems easily integrate with third-party auxiliary devices and are ideal for many applications.*

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. Specifications subject to change without notice.

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