

BEST PRACTICES

ELECTRICAL DEVICES

Electrical wiring, lighting, and electrical appliances all present potential ignition sources in the event of a natural gas release within a maintenance facility. A spark could be a result of an abnormal condition such as a short circuit within a wire conduit or junction box or generated in normal operation of an unprotected electric motor. Either case can be a cause for ignition and must be addressed.

The area within 18 inches of the underside of the ceiling is of special interest for electrical devices. The applicable codes assume that a plume of gas will gather in this location after a leak has developed from a vehicle. All sources of ignition in this 18 inches zone must be addressed. NFPA 30A defines this area in a natural gas repair facility as a Class I, Division 2 zone. This means all devices located in this area must be Class I, Division 2 certified or must be removed from the area.

In general, it is less expensive to eliminate or relocate non-compliant electrical fixtures than to replace them with more costly certified material.

Additionally, unsealed electrical conduit may provide a means of gas migration from one portion of the facility to another. Before modifying a maintenance facility to service CNG fuel vehicles, the existing design must be taken into consideration so that gas migration patterns are taken into account.

An alternative option to address this issue is to de-classify the zone by providing ventilation at a rate of at least four air changes per hour across the zone. Continuous air circulation will prevent gas from accumulating in ignitable concentrations. This may be a less expensive option in temperate climates where heating isn't needed.



Conduit within 18 inches of the ceiling is acceptable if it is sealed against gas migration. If it is unsealed, it could be a path of migration and may need to be relocated.

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As part of a retrofit process, selected electrical circuits should be modified so that shunt trips are provided on all non-critical electrical circuitry. The control system minimizes potential ignition sources by turning off (shunt tripping) any potentially spark producing operations (welding plugs) or equipment and heating appliances within the maintenance facility. It is recommended that the shunt trips be activated only if the system detects a gas concentration of 40% LFL rather than the early-warning 20% LFL. Electric circuits that include the equipment listed below should not be shunt-tripped due to their function during an emergency scenario.



Examples of spark-producing equipment.

- Ventilation fans
- Emergency lighting
- Gas detection and alarm systems and controls
- Critical data collection or storage functions - computers, servers, etc.
- Any critical load which would cause damage or injury if electrical power was interrupted
- Electrical controls to the overhead doors that automatically open for the purpose of providing makeup air upon activation of the gas detection system

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