Natural Gas Vehicle Maintenance Facilities
Objective

Create a Safe, Code Compliant Environment

- Understand the hazards
- Evaluate the functions needed
- Determine the number of bays needed
- Consult a Professional
- Check the applicable Codes
Applicable Codes

- National Fire Protection Association (NFPA)
  - *NFPA 30A Code for Motor Fuel Dispensing Facilities and Repair Garages*
  - *NFPA 70 National Electric Code (NEC)*
  - *NFPA 52 Vehicular Gaseous Fuel Systems Code*

- Texas Railroad Commission
  - *TX Admin Code (TAC), Title 16, Chapter 13 – Regulations for Compressed Natural Gas*
Applicable Codes

- International Codes
  - International Building Code
  - International Mechanical Code
  - International Fire Code
  - International Existing Building Code

- Municipal / Local requirements and amendments
  - Local Building Codes
  - Local Fire Inspector
MAJOR versus MINOR REPAIR GARAGE

- MAJOR REPAIR GARAGE: engine overhauls, painting, body and fender work, and repairs that require draining of the motor vehicle fuel tank. Defined in NFPA 30A.

- MINOR REPAIR GARAGE: lubrication, inspection, and minor maintenance work, such as engine tune-ups, replacement of parts, fluid changes, brake system repairs, tire rotation, and similar maintenance. Defined in NFPA 30A.

- IFC - informal Minor definition: work is not performed on the fuel system and is limited to exchange of parts and maintenance requiring no open flame or welding.
MAJOR REPAIR GARAGE ISSUES

• 1) Ventilation
• 2) Gas Detection
• 3) Heating Systems
• 4) Electrical Systems and Components
• 5) Other Considerations
  – *Migration of Gas*
  – *Existing Conditions and Code Triggers*
  – *LNG Venting and Spill Mitigation*
• Systems Approved Include:
  – 5 Air Changes per hour
  – Continuous operation or interlocked to gas detection
    • Interlocked systems reduce energy costs
  – Ventilation interlocked to lights is also compliant
  – Airflow from inlets at floor level - exhaust at high point
• IMC 502.16 - Venting
• “Repair garages for the repair of vehicles which use CNG, LNG or other lighter-than-air motor fuels shall be provided with an approved mechanical ventilation system.”
Gas Detection

- Required for non-odorized gases such as LNG NFPA 30A-7.4.7
- Required for pits and below grade work areas
- Must be calibrated and activate at 25% of LEL (Lower Explosive Level)
- Operation:
  - Distinct audible and visual alarm signals
  - Deactivation of all heating systems
  - Activation of mechanical ventilation system
Heating Systems

• “Where major repairs are conducted on NGVs, open flame heaters or heating equipment with surface temperatures in excess of 750° F shall not be permitted in areas subject to ignitable concentrations of gas.” NFPA 30-A 7.6.6

  – Remove appliances with pilot or open flames
  – Remove other ignition sources – pressure washers, oil burners, and other heat producing appliances
  – Replace with forced air HVAC
Electrical Systems

- “In major repair garages where NGVs are repaired or stored, the area with 18” of the ceiling shall be designated a Class 1, Division 2 hazardous location NFPA 30-A 8.2.1

- “Electrical wiring and electrical utilization equipment shall be of a type specified by and shall be installed in accordance with NFPA 70, National Electrical Code.”
Modified Bay
RIDE RIDE RIDE RIDE
WITH US. WITH US. WITH US. WITH US.
Adjacent Facilities

- Classification of Adjacent Areas.
- “Areas adjacent to classified locations aren’t classified if mechanically ventilated at a rate of four or more air changes per hour, or when walls or partitions effectively cut off the adjacent area” NFPA 70 – 511.3 (E)
Either

1. Defuel the vehicle and render it inert with Nitrogen prior to shop entry
2. Issue a Shop entry Permit
3. Identify the vehicle as inert
4. Complete the repairs
5. Remove the unit from shop
6. Fuel and return to service

No Shop Modifications Required
1. Pull vehicle into work bay
2. Complete work
3. Remove from shop and return to service

**Required Shop Modifications**

- Methane Detection
- Changed Heating Source and Ventilation System
- Both are Latched to Methane Detection
- Lowered Garage Door Opener
- Lowered/Changed Lighting
Results in a Compliant Garage

Thank You for Your Attention
Dennis Foose
972-742-1214
Locations:

- Houston, Texas
- San Antonio, Texas
- Shreveport, Louisiana

888-925-6284