NATURAL GAS VEHICLE MAINTENANCE FACILITIES

NOVEMBER 09, 2017
WISCONSIN CLEAN CITIES - ROUNDTABLE

NGV MAINTENANCE FACILITIES

Code Related Modifications For NGVs In Existing Maintenance Facilities

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888-937-3832
TODAY'S AGENDA

- NGV specific requirements and compliance strategies
- Q&A
ET ENVIRONMENTAL

- National Design Build Firm specializing in solid waste and natural gas infrastructure
- RNG and Biogas processing
- First CNG project completed in 2004
- Over 130 fueling projects completed
Reference Guideline Documents

- Wisconsin SEO Guidelines Document
  - Code compliance for NGV maintenance garages
  - Developed in coordination with SEO, DSPS, Fire Officials, and Fleet Owners
- GTI – Online and in person workshops coming soon
  - Online resources will be available Q2 2018
  - Workshops and Training
  - www.AltFuelGarage.org
Applicable Codes

Partial list of codes and standards:

- 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
- I-Codes – IBC, IMC, IFC, IEBC
- Municipal / Local requirements and amendments
MAINTENANCE FACILITIES

GARAGE RETROFITS FOR NGVs

- Every shop is unique
- Consult a professional
- Code compliance is only one component
  - Operations
  - Training

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NGV MAINTENANCE FACILITY EVALUATION

1) Electrical Systems and Components
2) Ventilation
3) Gas Detection
4) Heating Systems

- Existing Conditions and Code Triggers
- Other items that may be applicable
  (for now, assume “Major Repair Garage”)

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NGV MAINTENANCE FACILITY
ELECTRICAL

Classified Zone
“the area with 18” of the ceiling shall be designated a Class 1, Division 2 hazardous location .........

Except in Wisconsin
Ref SPS 316.511
effective Dec 1, 2013
NGV MAINTENANCE FACILITY
ELECTRICAL

Typ Compliance Strategies

- Relocate electrical

- Use equipment and wiring permitted in classified zone

- Conduit Seal fittings

- Continuous Ventilation
WISCONSIN AMENDMENTS

- SPS section 316.511 modifies the 2011 NEC

- “Unclassified where … ventilation conforms to chapters SPS 361 to 366”

- Note – SPS adoption of the IMC where compliant ventilation is defined

- Ventilation fans must be safe for Hazardous Areas
NGV MAINTENANCE FACILITY VENTILATION

TWO DISTINCT VENTING CRITERIA

1) PURGE VENTING
   • Only required for NGV’s, not Diesel or Gasoline Vehicles

2) AIR QUALITY FOR OCCUPIED SPACES
   • Same for Natural Gas, Diesel, and Gasoline.
   • WI revision SPS 364 (0.5 cfm/sf)
NGV MAINTENANCE FACILITY VENTILATION

NGV Compliance Requirements:

- Airflow - low to high
- 5 air changes per hour (ACH)
- 3 ways to operate

Compliance Strategies:

- Roof mounted fans
- Makeup air
- Hazardous environment rating
- # and location of fans
NGV MAINTENANCE FACILITY DETECTION

- Detector heads – where and how many?
- Tied to a fire alarm system or monitoring?
- Calibration
- Relay Panel
NGV MAINTENANCE FACILITY
HEAT & FLAMES

- Areas of ignitable concentrations
- Non-compliant heaters
- Other non-compliant appliances
- Compliant heat
  - Floor Radiant
  - Low Intensity Radiant
  - Air handler*
  - Steam
NGV MAINTENANCE FACILITY
ADJACENT OCCUPANCIES

“Enclosed rooms for [NGVs] ... should prohibit the transmission of gases to other areas of the building.”

Compliance Strategies:
- Positive pressure in adjacent occupancy
- Separation wall sealed to prevent transmission of gas
Existing Building & Conditions

- WI has adopted the 2009 IEBC
- Identify “triggers” for current code compliance
- Alteration Level and Change in Occupancy
Existing Buildings & Conditions

- Building Alteration Level 2 is common
- Change of Occupancy is applicable. = change in level of activity that involves a change in the application of the code
- Must comply with new code provisions specifically for NGVs
- Energy Conservation – amended by SPS 366.0607….unaltered portions not required to comply with energy codes
- Structural – 5% rule
- Fire Protection – Automatic Sprinkler “Triggers”
NGV MAINTENANCE FACILITY

HEAT
< 750 °F and no open flames

VENTILATION
Required at 5 ACH

- Interlocked to Lighting
  CNG Only (NA tot LNG)

- Continuous

- Interlocked to Gas Detection

Gas Detection required for LNG

Electrical classified areas must be addressed for projects outside of Wisconsin
MINOR REPAIR GARAGES

MINOR REPAIR GARAGE = lubrication, inspection, tune-ups, replacement of parts, fluid changes, brakes, tires, and similar routine maintenance

- NGV Minor Repair Garages are exempt from many but not all of the code provisions.
MINOR REPAIR GARAGES

- Electrical – Ceiling Classified Areas
  - *Exempt, ceiling is “unclassified”*
- Heating and Sources of Ignition
  - *Exempt from 750 °F and open flame requirement*
- Ventilation
  - *5 ACH is not required by 2018 International Mechanical Code*
- Gas Detection
  - *Required for LNG*
MINOR REPAIR GARAGES

- Electrical - Ceiling Unclassified

- Heat
  - No 750 °F and open flame requirements

- Ventilation - 5 ACH Not Required by 2018 IMC
  (petition for a variance may be required)

- Gas Detection required for LNG
Cost Saving Strategies

- Use a sealed partition wall to separate NGV repair areas
- Hire experienced design professionals and contractors
- Select HVAC system considering operational costs
- Seek out financial incentives (WI Focus on Energy program, grants, etc.)
- + more ideas in the SEO guidelines document
NGV MAINTENANCE TRAINING & OPERATIONS

- Training
  - Understanding of gas properties & hazards
  - O&M of systems
  - Respect the pressure

- Develop standard operating procedures (SOPs)
  - Preparation of vehicle for service
  - Hot work in NGV shop- Prohibit torches, welding and grinding near fuel system
  - Run LNG vehicles prior to entering the shop (** hold time**)
  - Fuel Tank Inspections
  - Gas Detector Calibration
Contact Information

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More information - SEO Guidelines Document: