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Designing Retail LNG/LCNG stations

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Retail Fuel Stations



Q: Why are we here?

A: Discuss how to integrate conventions fuels into existing retail fuel stations













Steps for Station Design and Installation



- I. Define Fleet and Its Fueling Requirements
- 2. Define Station Location and layout
- 3. Define Existing Site Conditions
- 4. Permitting
- 5. Installation Process

Define Fleet and Its Fueling Requirements



- I. What is the size of the fleet(HD trucks, pickups, cars)
- 2. Desired type of fuel to be used(LNG, CNG, Diesel, propane)
- 3. Define daily fuel consumption and growth projections
- 4. Fueling behavior of the fleet(once a day, continuous, overnight)
- 5. Desired amount of fuel storage(reserve fuel)
- 6. Desired number of pumps(based on vehicles fueling at same time)
- 7. Desired amount of redundancy(electric, pumps)
- 8. Desired Fueling window

LNG dispensing:

Typical dispensing rates 30-50 LNG gpm

CNG dispensing:

Fast or slow fill

Typical rates 5-8 gge per minute

Define Station Location/Layout



- I. New or existing location
- 2. Site convenient to fleet operations
- 3. Retail or behind the fence operation
- 4. Vehicle traffic flow, vehicle staging
- 5. Security gates/secure access
- 6. Software integrates with existing fuel mgmt software
- 7. LNG/CNG/LCNG footprint fits property
- 8. Dispenser options Island vs Wall mounted unit

Define Existing Site Conditions



- I. Determine proper power supply to property (480v 3 phase for LNG)
- 2. Phone service- 3 lines required(alarm, fire, fuel management system)
- 3. Natural Gas pipeline needed for dedicated CNG(100 psi desired)
- 4. Concrete driveways for proper traffic flow
- 5. Some stations may conflict with local codes for height of LNG tanks and noise restriction codes

Permitting and construction



- I. Planning Committee (Landscaping, height restrictions)
- 2. Local city/county ordinance
- 3. Authority having Jurisdiction (usually local fire department)
- 4. Seismic and soil evaluations are required
- 5. Construction of the station should take no more than 3 months if all permits and equipment is received in a timely manner

Retail LNG/LCNG Fuel Stations



Governing Codes

- Local Building / Electrical / Plumbing / Mechanical Codes
- Local Fire Codes
- NFPA 52 (CNG/LNG)
- NFPA 30A (gasoline/diesel)

General Issues

- 480VAC power availability
- LNG storage setbacks and equipment footprint
- Gasoline/diesel dispenser vs. LNG/LCNG dispenser electrical classifications
- Traffic flow patterns
- Public barriers vs. safety for maintenance personnel
- Interface with existing point of sale system
- Capex vs. capacity
- Customer fleet requirments

Retail LNG/LCNG Fuel Stations



Kwik Trip Fuel Station

Kwik Trip Way, La Crosse, WI

Equipment

- Six fuel lanes with CNG, LNG, E85, B20, B5, DEF, propane, off-road diesel
- 15,000 gallon LNG tank
- Two submerged LNG pumps for redundancy
- 60 hp LCNG pump

General Issues

Separations between fuels



GP Strategies Solutions



LNG

- Mobile stations
- Pumpless station for small fleet
- Various storage sizes to meet needs
- Dispensers
 - Demand based cold-saturated fuel
 - Integrated card reader
 - Wall mounted dispenser
 - Dual hose
- Standard designs for most configurations
- Own-Operate-Maintain

LCNG Options

- LCNG pump capacity to meet CNG dispensing needs
 - Eliminate waiting between dispensing operations
 - Eliminate short fills when 2nd vehicle starts fill
- Cold climate options
- Dispensing
 - Low flow / high flow nozzles



Thank You

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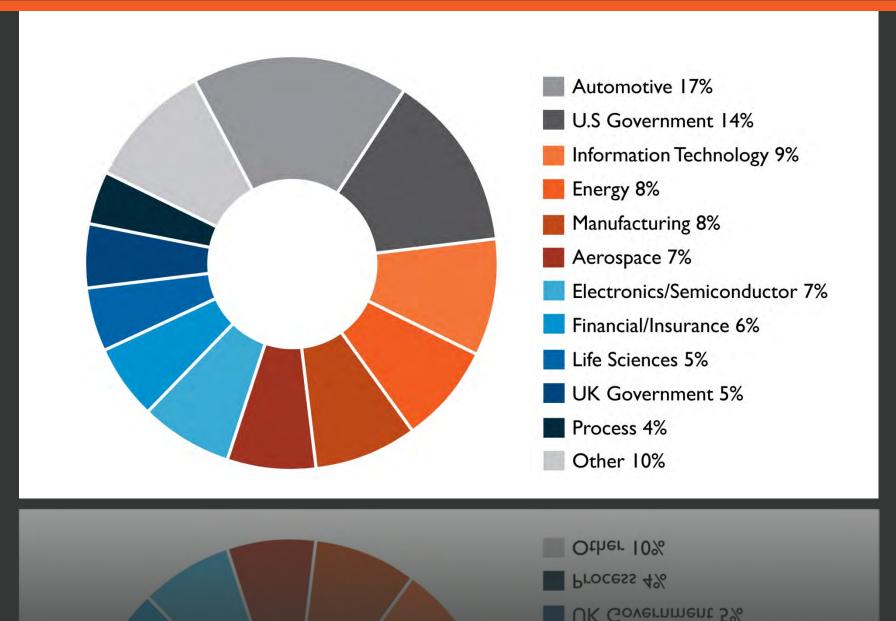
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