PHMSA

Petroleum Gas Systems

MISSION

PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives. To do this, the agency establishes national policy, sets and enforces standards, educates, and conducts research to prevent incidents. We also prepare the public and first responders to reduce consequences if an incident does occur

PHMSA's goal is to improve the overall integrity of pipeline systems and reduce risks.

OBJECTIVES

- Revisit LPG regulations
- Discuss threats to small LP Gas systems
- Discuss precursors to reportable incidents
- Determine if NFPA contains sections less stringent than 192
- Determine if LP Gas system incident reporting requirements are sufficient

REGULATIONS AND GUIDANCE FOR LPG SYSTEMS

• Part 192	117 pages
• Part 191	8 pages
• NFPA 58, 2004	134 pages
• OQ guide for Small LPG operators	226 pages
• DIMP Guide for Small LPG operators	7 pages
• Guidance manual for LPG operators	172 pages
• 73 different IBR standards	?
• Total	664 + pages

FEDERAL REGISTER/ VOL. 35, NO. 161 / WEDNESDAY, AUGUST 19, 1970

Section 192.11 contains requirements applicable to petroleum gas pipeline systems. The authority of this Department to regulate certain petroleum gas pipeline systems under the Natural Gas Pipeline Safety Act, has been questioned. While there may be some question as to jurisdiction over a pipeline carrying petroleum gas from a tank (where it is stored in liquid form), to one or two single-family houses, there is no question as to authority over petroleum gas systems that serve a significant number of customers

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In these cases, there is certainly a sufficient affect on interstate commerce to sustain a Congressional grant of authority and the language of the Natural Gas Pipeline Safety Act is broad enough to cover such cases. Section 192.11 applies only to petroleum gas systems that serve more than 10 customers from a common source or in which a pipeline crosses a public place, such as a highway.

The word liquefied has been deleted to avoid any implication that these sections apply to petroleum gas when it is in liquid form.

08/19/1970 - §192.11 PETROLEUM GAS SYSTEMS.

(a) No operator may transport petroleum gas in a system that serves 10 or more customers, or in a system, any portion of which is located in a public place (such as a highway), unless that system meets the requirements of this part and of NFPA Standards No. 58 and No. 59. In the event of a conflict, the requirements of this part prevail.

JULY 28, 1976
INTERPRETATION 192.11 21

"A 'system' normally consists of a tank storing petroleum gas in liquid form and the appurtenant pipelines and other facilities used by the operator of the system to deliver gas to one or more customers."

§192.1 WHAT IS THE SCOPE OF THIS PART?

(a) This part prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities and the transportation of gas within the limits of the outer continental shelf as that term is defined in the Outer Continental Shelf Lands Act (43 U.S.C. 1331).

§192.1 WHAT IS THE SCOPE OF THIS PART?

(B) THIS PART DOES NOT APPLY TO—

- (5) Any pipeline system that transports only petroleum gas or petroleum gas/air mixtures to—
- (i) Fewer than 10 customers, if no portion of the system is located in a public place; or
- (ii) A single customer, if the system is located entirely on the customer's premises (no matter if a portion of the system is located in a public place).

§192.3 DEFINITIONS.

Transportation of gas means the gathering, transmission, or distribution of gas by pipeline or the storage of gas, in or affecting interstate or foreign commerce.

Pipeline facility means new and existing pipelines, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.

§192.3 DEFINITIONS.

Service line means a distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter.

§192.11 PETROLEUM GAS SYSTEMS

(a) Each plant that supplies petroleum gas by pipeline to a natural gas distribution system must meet the requirements of this part and NFPA 58 and NFPA 59 (incorporated by reference, *see* §192.7).

(b) Each pipeline system subject to this part that transports only petroleum gas or petroleum gas/air mixtures must meet the requirements of this part and of ANSI/NFPA 58 and 59.

(c) In the event of a conflict between this part and NFPA 58 and NFPA 59 (incorporated by reference, *see* §192.7), NFPA 58 and NFPA 59 prevail.

WHICH THREATS POSE THE GREATEST HAZARD

- **Excavation *(normally not a problem on small systems)***
- **Lack of enforcement due to prioritizing by number/risk**
- **Threats that are unique to propane,**
  - **Vapor Gravity**
  - **Running out of gas (not unique to propane)**
  - **Temperature/pressure change**
  - **Storage is normally above ground**
  - **Tank could be owned or leased by the customer**

WHICH THREATS POSE THE GREATEST HAZARD

ASME B 31.8S Gas Integrity Management Threats

- External Corrosion
- Internal Corrosion
- Stress Corrosion Cracking
- Manufacturing
- Construction
- Equipment
- Third-Party Damage
- Incorrect Operations
- Weather Related or Outside Forces

WHICH THREATS POSE THE GREATEST HAZARD

- Operator Qualifications
- No or Inadequate Cathodic Protection
- Vandalism or Terrorism Target
- Venting Tanks to Test Relief Valves (per NFPA59)
- Lack of Procedures to Provide Sufficient Odorant to New Lines or Tanks
- Hot tapping

WHICH THREATS POSE THE GREATEST HAZARD

Odorization

- CPSC has issued 3 recalls since 03/09 for under odorized propane.
- 118,000,000 gallons
- 700 Rail Cars (18,500,000 gallons)
- 919,000 Barrels (38,600,000 gallons)
- https://www.cpsc.gov/recalls?combine=propane
- ? Gallons that were not part of a CPSC Recall

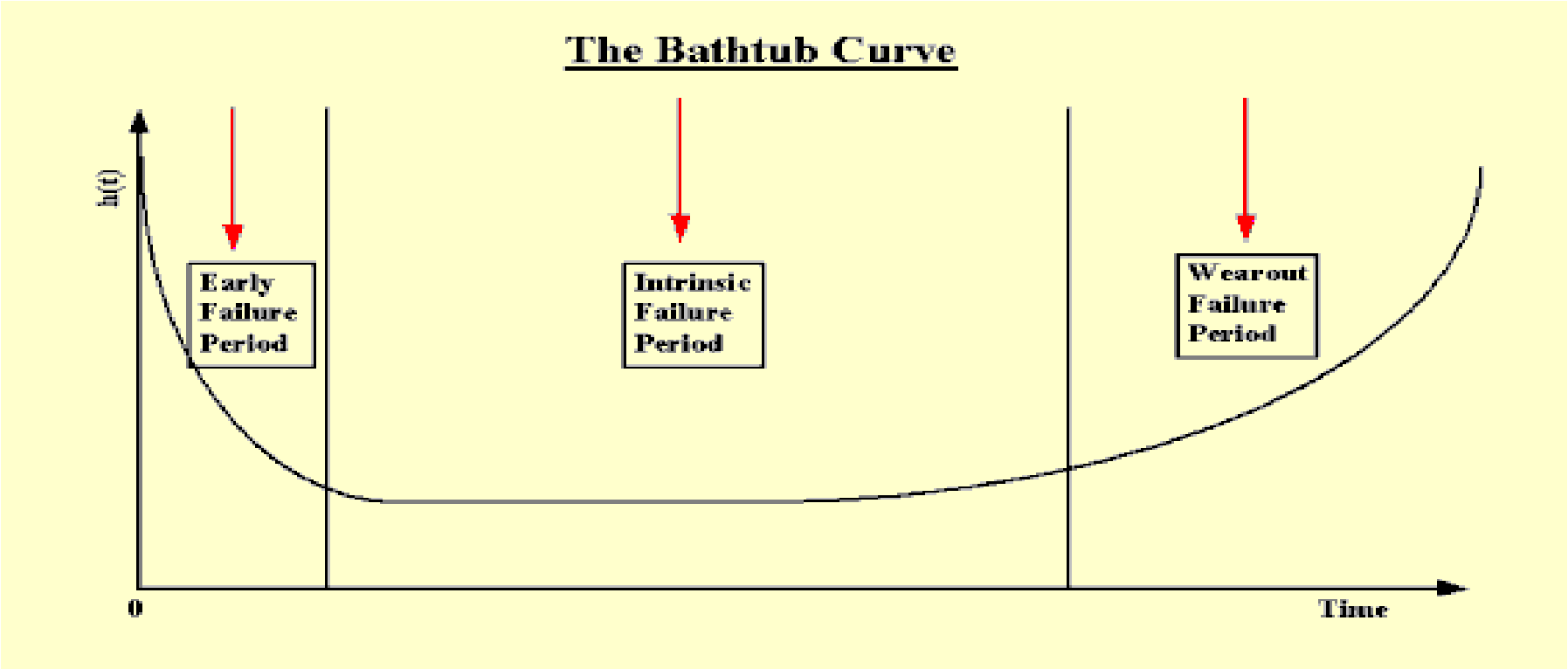
ADDITIONAL THREATS WHICH POSE A HAZARD

- Misunderstanding of Regulations
- Definitions that are missing or incomplete
- Failure of AHJ to Identify Jurisdictional Systems
- No clear line of demarcation
- Emergency Response personnel that may not be trained to respond to LP Gas Incidents
- BLEVE
- Unconfined vapor cloud explosion

ARE THERE IDENTIFIABLE PRECURSOR EVENTS OR BEHAVIORS WITH A STRONG CORRELATION TO INCIDENTS?

- Excavation
- Age of the system
- Size of the system

AGE OF THE SYSTEM



ARE THERE SPECIFIC PROVISIONS OF NFPA THAT PHMSA VIEWS AS DETRIMENTAL TO SAFETY

§192.11 Petroleum gas systems.

(c) In the event of a conflict between this part and NFPA 58 and NFPA 59 (incorporated by reference, *see* §192.7), NFPA 58 and NFPA 59 prevail.

ARE THERE SPECIFIC PROVISIONS OF NFPA THAT PHMSA VIEWS AS DETRIMENTAL TO SAFETY

Yes, and it was addressed, but not in a rule change.

08/11/2010, 75 FR 48595

When a requirement exists in part 192 that does not exist in NFPA 58 or 59, operators are required to comply with it. A conflict only exists when an operator cannot comply with a requirement in NFPA 58 and 59 because it conflicts with a requirement in part 192. When a conflict exists, NFPA 58 or 59 continue to prevail

ARE THERE SPECIFIC PROVISIONS OF NFPA THAT PHMSA VIEWS AS DETRIMENTAL TO SAFETY

- **Odorization testing 192.625**
- **Operations 192.601 – 192.631**
- **Maintenance 192.701 – 192.755**
- **Operator Qualification 192.801 – 192.809**

Note, the O&M and OQ sections have been updated in later editions of NFPA. The later editions are currently being reviewed and under consideration for IBR.

There is also a better understanding of the Primacy provision.

ARE THERE WAYS THAT PETROLEUM GAS SYSTEMS GET OUT OF REPORTING INCIDENTS?

§191.3 Definitions.

Incident means any of the following events:

(1) An event that involves a release of gas from a pipeline, gas from an underground natural gas storage facility, liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:

(i) A death, or personal injury necessitating in-patient hospitalization;

ARE THERE WAYS THAT PETROLEUM GAS SYSTEMS GET OUT OF REPORTING INCIDENTS?

(ii) Estimated property damage of $50,000 or more, including loss to the operator and others, or both, but excluding cost of gas lost; or

(iii) Unintentional estimated gas loss of three million cubic feet or more.

(2) An event that results in an emergency shutdown of an LNG facility or an underground natural gas storage facility. Activation of an emergency shutdown system for reasons other than an actual emergency does not constitute an incident.

(3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraph (1) or (2) of this definition.

ARE THERE WAYS THAT PETROLEUM GAS SYSTEMS GET OUT OF REPORTING INCIDENTS?

- There is 36.38 Cu ft. of vapor per gallon of propane.
- 3,000,000 cu ft of gas is equal to 82,463 gallons of liquid propane.

The majority of Petroleum Gas systems would never meet this meet this criteria for a reportable incident.

PETROLEUM GAS REPORTED INCIDENTS FROM 2010 TO PRESENT

- 10 reported incidents
- 3 were excavation by third party
- 2 were vandalism
- 1 construction crew drove a stake through a line
- 1 damage from attempted theft
- 1 tree root
- 2 improper operations

PETROLEUM GAS REPORTED INCIDENTS FROM 2010 TO PRESENT

- 0 class 1 locations (10 or less buildings for human occupancy)
- 2 class 2 locations (more than 10 but less than 46)
- 6 class 3 locations (more than 46 or well defined outside place of public assembly)
- 2 class 4 locations (buildings with 4 or more stories are prevalent)
- 7 ignitions
- 20 evacuations

PETROLEUM GAS REPORTED INCIDENTS FROM 2010 TO PRESENT

- No reported fatalities
- 5 locations reported injuries
- 7 total persons injured
- At least 1 was a peak shaving facility
- Mcf Gas released, from .24 to 354, (56 loss average)
- Residences affected; 0, 0, 2, 5, 25, 95, 118, 434, 750, 936

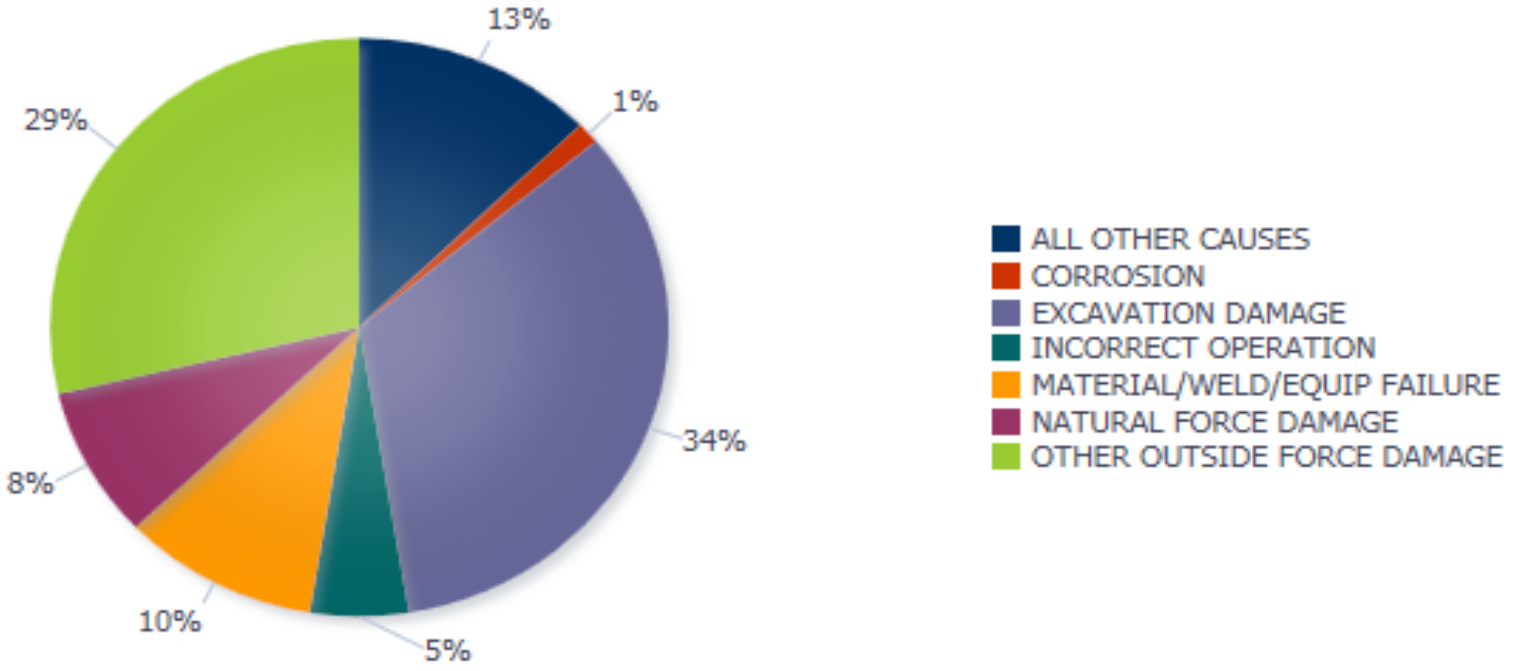
Note, the highest residence numbers come from Class 2 and 3 locations

ALL GAS DISTRIBUTION INCIDENTS, 3 YEAR AVERAGE PHMSA 11/16/2017

Cause of Incident	number	%	Fatalities	Injuries
Corrosion	4	1.2	0	2
Excavation	111	33.5	2	31
Incorrect Operation	17	5.1	1	9
Material Failure	34	10.3	0	12
Natural Force	28	8.5	10	55
Outside Force	95	28.7	9	43
All Other	42	12.7	11	52

ALL GAS DISTRIBUTION INCIDENTS, 3 YEAR AVERAGE PHMSA 11/16/2017

All Reported Incident Cause Breakdown: 3 Year Average (2014-2016)
System Type: GAS DISTRIBUTION **State:** ALL



ANNUAL REPORT USED BY SOME STATES

- **Leaks are classified as:**
- **EXCAVATION:** leak resulting from damage caused by earth moving or other equipment, tools, or vehicles. Include leaks from damage by operator's personnel or contractor or people not associated with the operator.
- **OTHER OUTSIDE FORCE DAMAGE:** Include leaks caused by fire or explosion and deliberate or willful acts, such as vandalism.

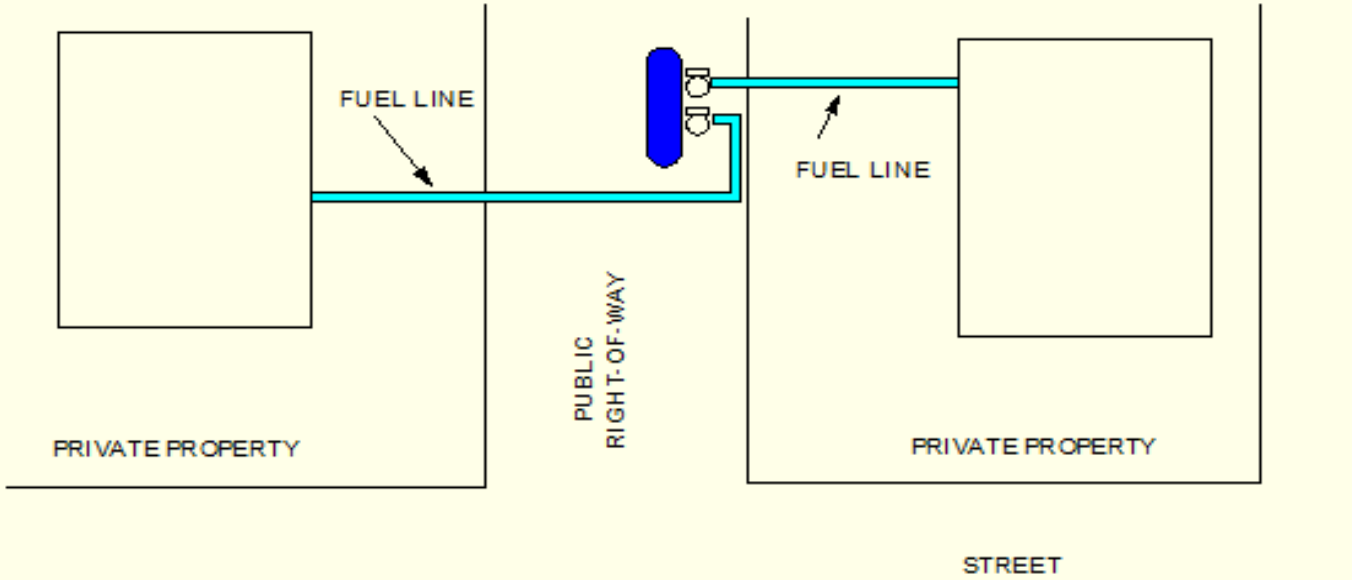
CONSIDERATIONS

- Later editions of NFPA 58 and 59 are under review for IBR
- Referencing only specific sections of NFPA 58 or 59
- Excavation incidents are less likely on small systems
- Small systems with a tank capacity of less than 500 gallons are more likely to run out of gas, however the jurisdictional designation would not have any effect.
- There are no customer limits for a master meter
- A propane system could also be a master meter system.

CONSIDERATIONS

- Small systems with no underground piping or jurisdictional piping of less than _____ feet
- Aboveground systems are readily visible for inspection, maintenance or replacement
- Systems with less than ___ Customers
- Small systems that are totally owned by the customer *(note, what if jurisdiction ends at customer piping and the customer owns the tank)*

Jurisdictional Drawing 12



DEALER OWNED LINESAND TANK ARE
NON-JURISDICTIONAL

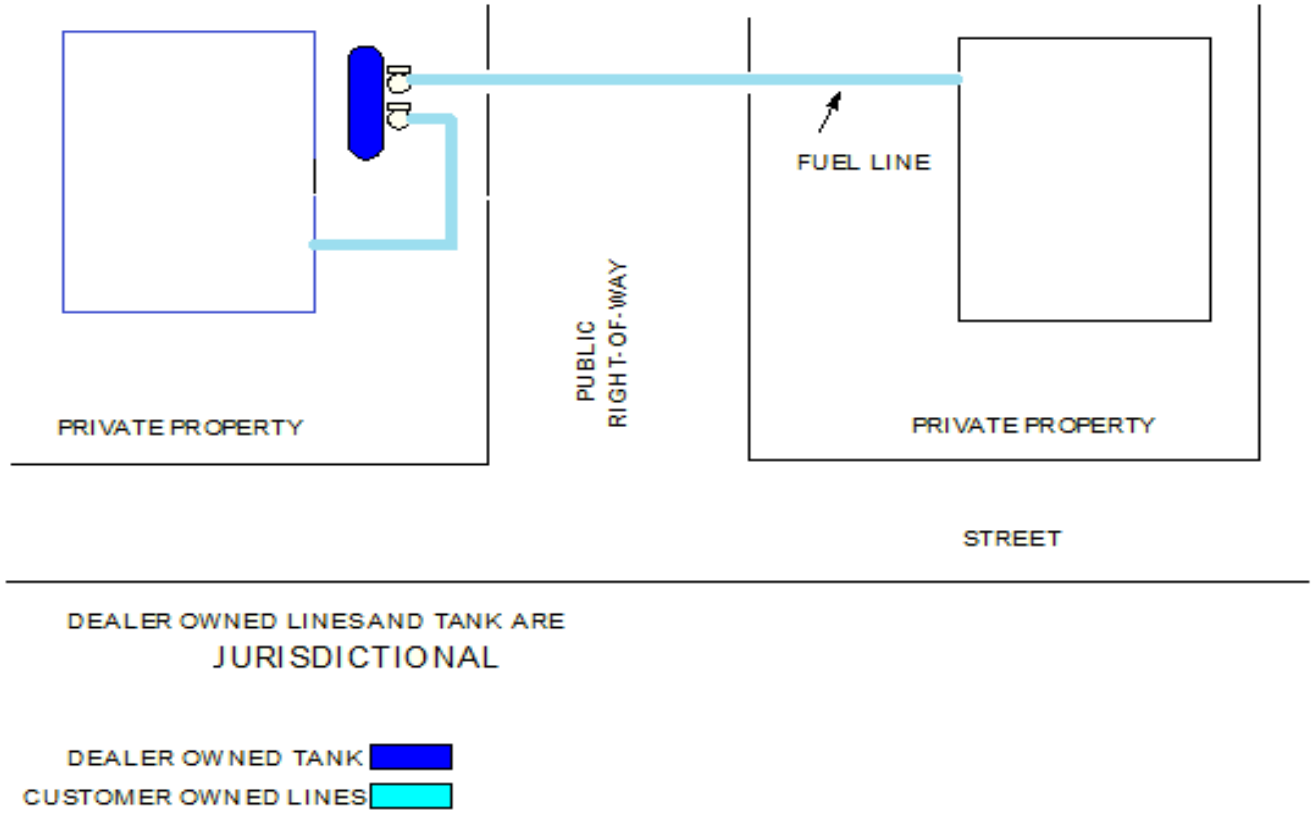
REASON FOR NON - JURISDICTION - METER LOCATION

DEALER OWNED TANK
CUSTOMER OWNED LINES

LPG12-2/11/94

Jurisdictional Drawing 12

Jurisdictional System



DEALER OWNED LINESAND TANK ARE
JURISDICTIONAL

DEALER OWNED TANK
CUSTOMER OWNED LINES

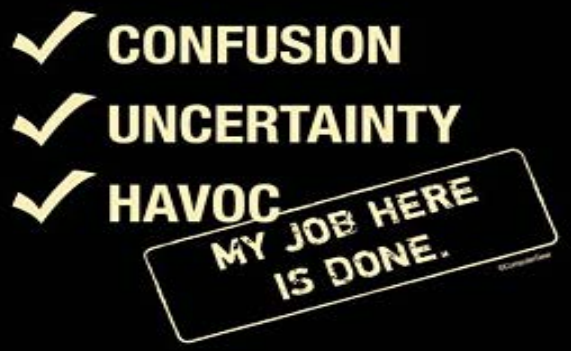
ARE SYSTEMS WITH LESS THAN 100 CUSTOMERS LESS OF A RISK?

- a residential system with 57 customers, 10,800 feet of mains, and 14 x 1,000-gallon UG storage containers
- a residential system with 84 customers, 7,000 feet of mains, and 10 x 1,000-gallon UG storage containers
- a residential system with 115 customers, 6,258 feet of mains, and 8 x 1,000-gallon UG storage containers

- *Note, these systems are in Florida.*

ARE SYSTEMS WITH LESS THAN 100 CUSTOMERS LESS OF A RISK?

- A system at a strip mall with 2 stores is jurisdictional
- Many churches and schools with a potential for high consequences are not jurisdictional under 192


CONFUSION
UNCERTAINTY
HAVOC
MY JOB HERE IS DONE.

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