



Utah Division of  
Public Utilities

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## UTAH PIPELINE SAFETY

# Master Meter Systems

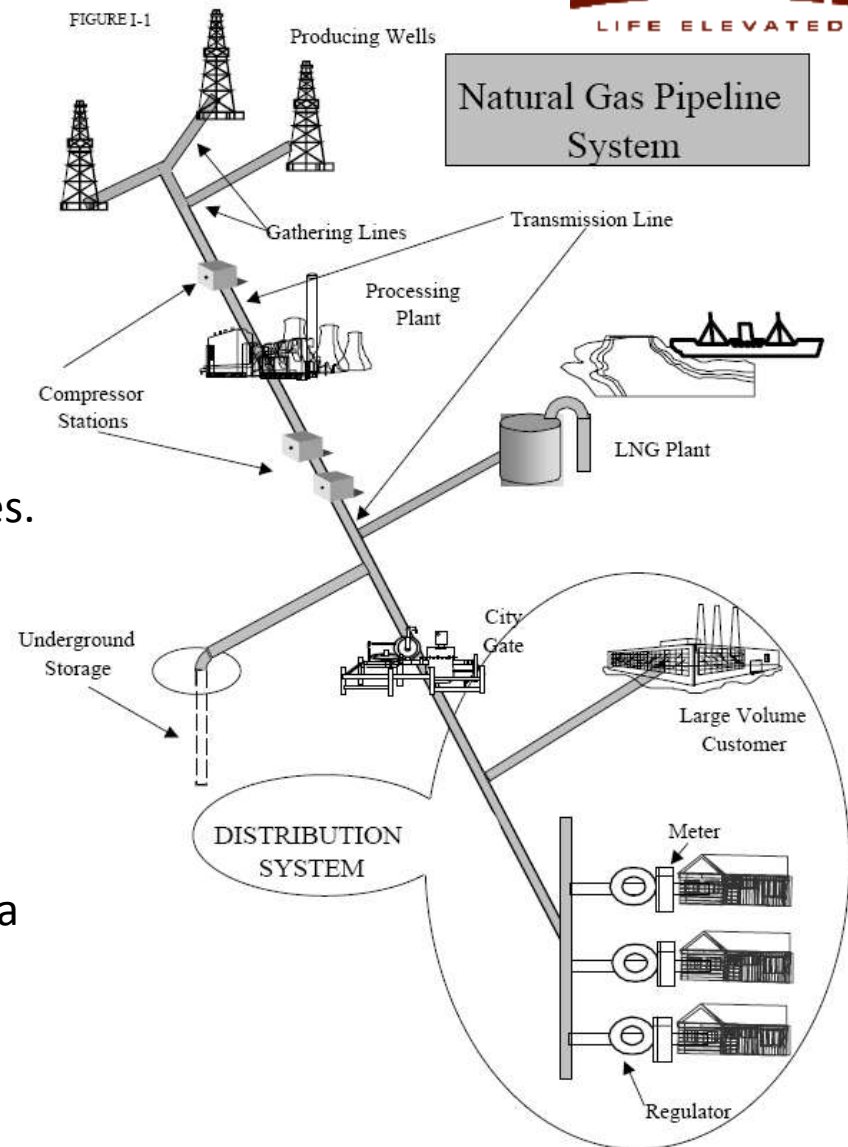
By: Jimmy Betham



# Overview

FIGURE I-1 represents one of the many possible configurations of natural gas transmission and distribution systems. The natural gas:

- Flows from the producing wells into gathering line(s).
- Through gathering lines and compressors or compressor stations.
- After the compressor(s), through transmission lines.
- To a processing plant where the heavy ends, such as propane, butane, ethane or natural gasoline, which are initially components of the gas stream, are removed.
- Through the transmission line and additional compressors.
- From the compressors to underground storage or a liquefied natural gas (LNG) plant (where natural gas is liquefied by reducing its temperature to - 260 F), or directly to a city gate station or master meter system.

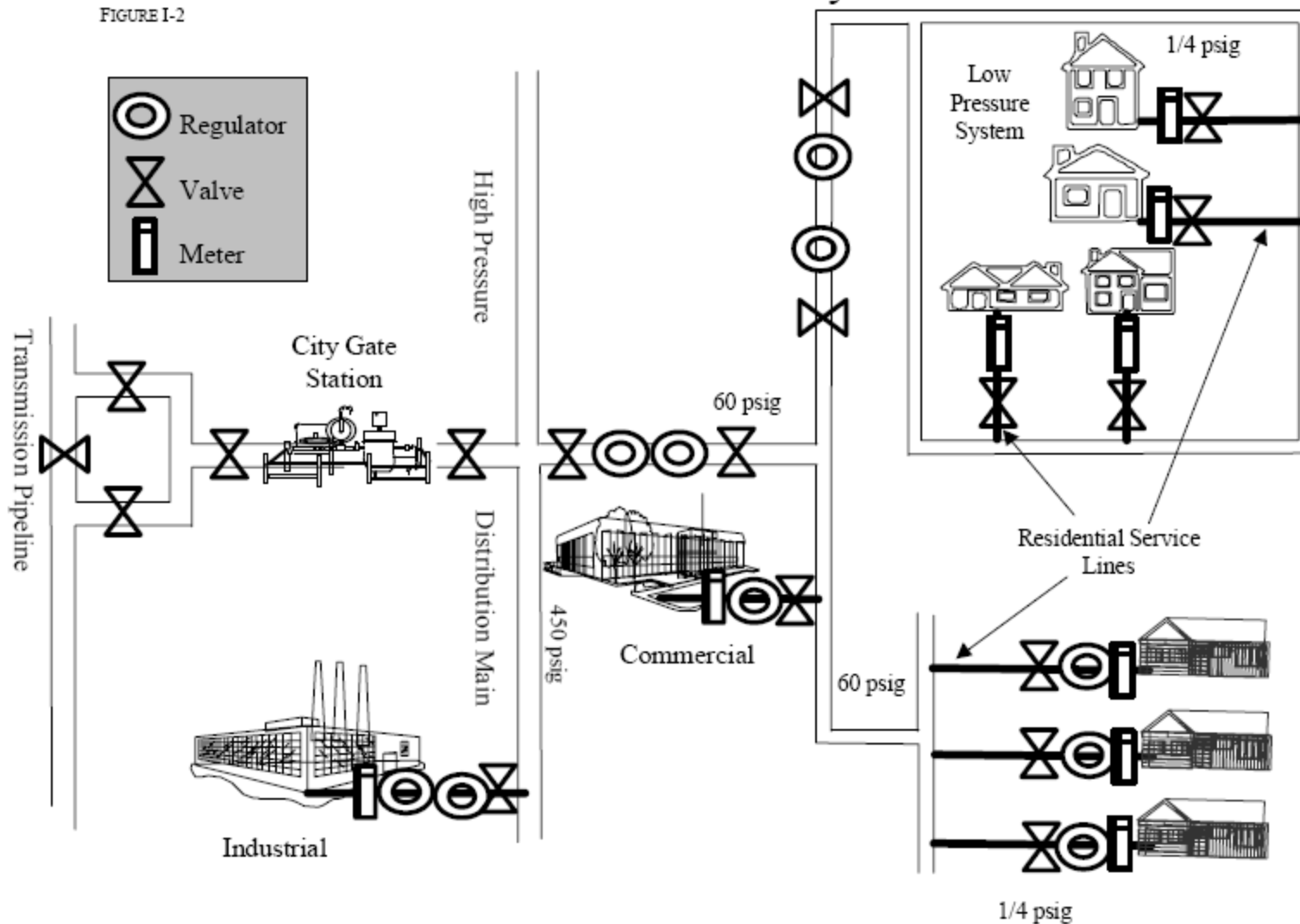




# Overview

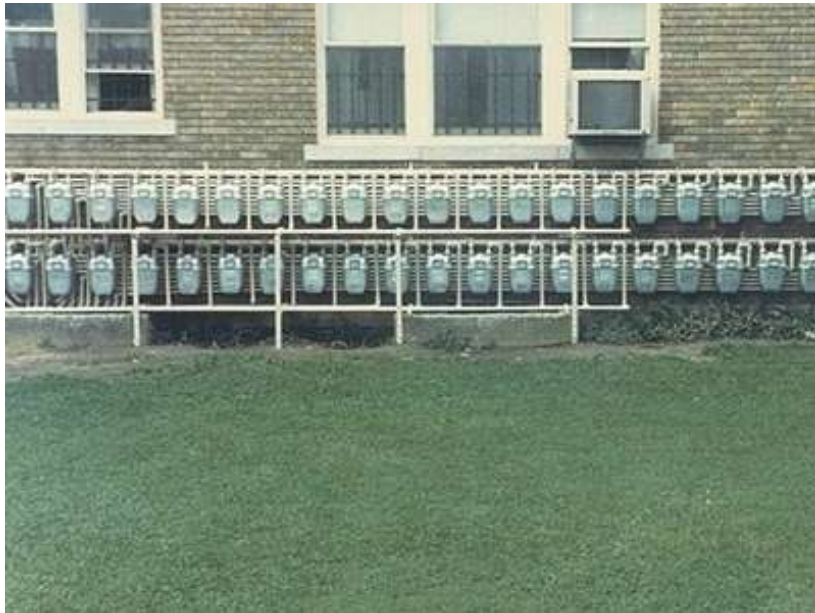
## Natural Gas Distribution System

FIGURE I-2





Section 192.3 states that a **"main is a distribution line that serves as a common source of supply for more than one service line."** These lines typically run up and down every street in a development where gas is served. Along the street at each house there is another line that runs to the house to deliver gas. These lines are called service lines.



Section 192.3 states that a "**service line** is a distribution line that transports gas from a common source of supply (which is a main) 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." A service line is the final section of pipe that transports gas to the end user or customer.



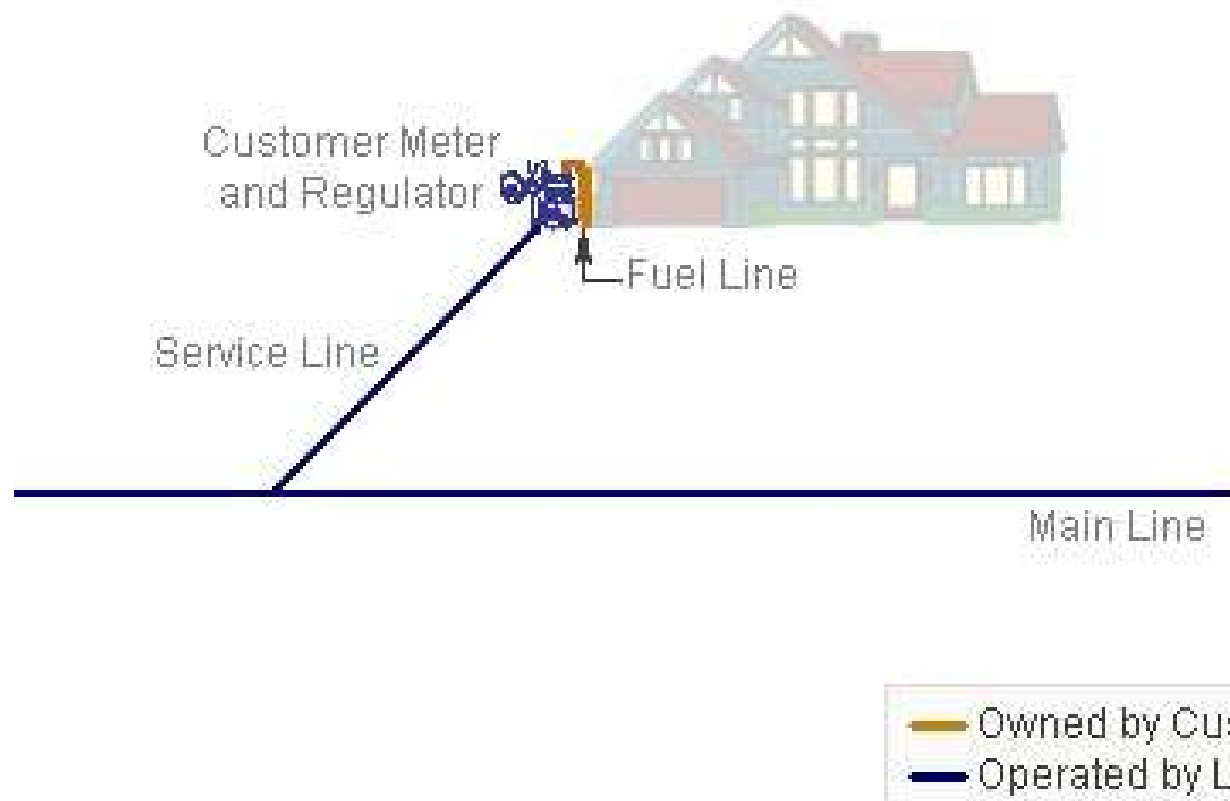
**Service regulator** is the device on a service line that controls the pressure of gas delivered from a higher pressure to the pressure provided to the customer. A service regulator may serve one customer or multiple customers through a meter header or manifold.

**Customer meter** is the meter that measures the transfer of gas from an operator to a consumer.





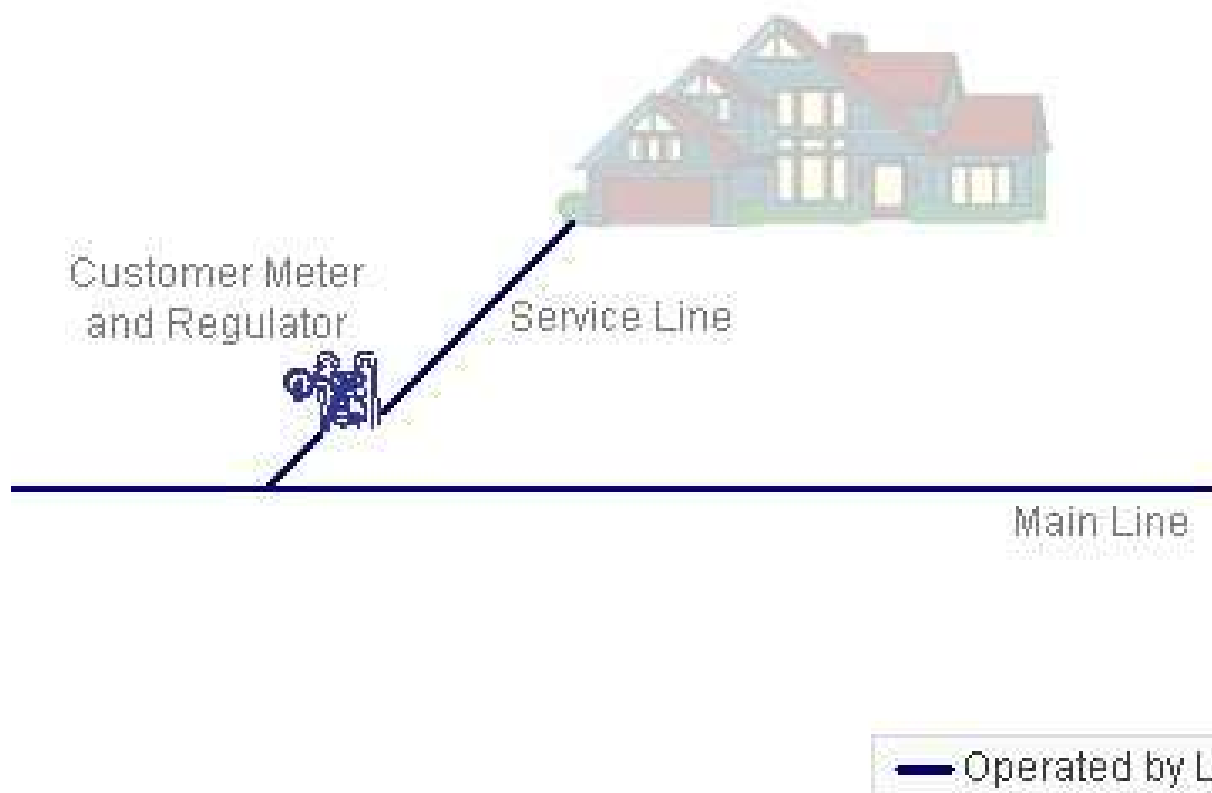
## Service Line Determination



**Service Lines: Scenario 1** Typically, the customer meter and service regulator are placed next to and outside the building. In this case, the service line ends at the outlet of the meter. The piping on the downstream side of the meter is the customer piping and referred to as a fuel line.



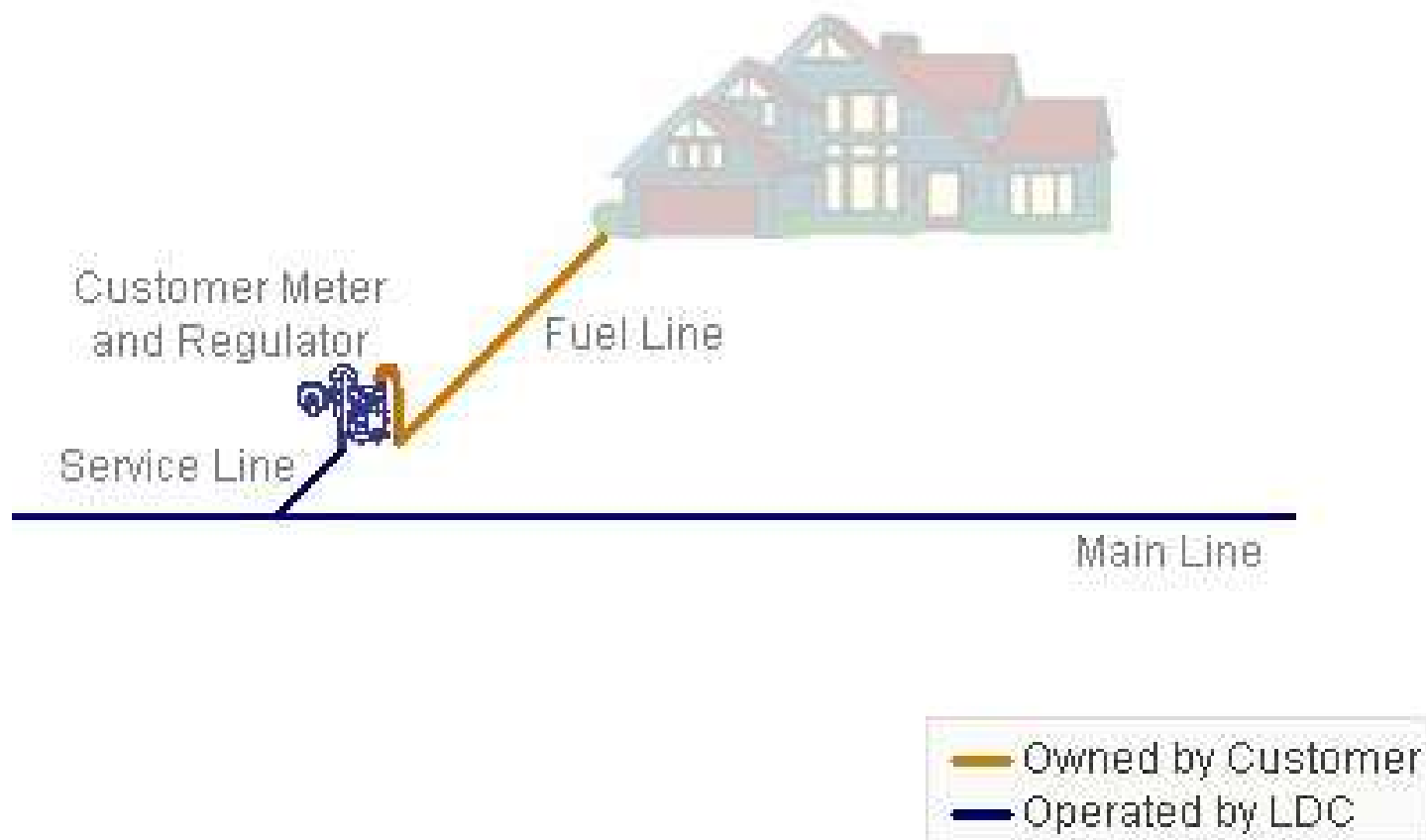
## Service Line Determination



**Service Lines: Scenario 2** In some cases, the LDC may place the meter at the tap off of the main located by the street. In this case, if the piping downstream of the meter that runs to the house is operated by the LDC, the service line ends at the building wall where the connection to customer piping is located.



## Service Line Determination

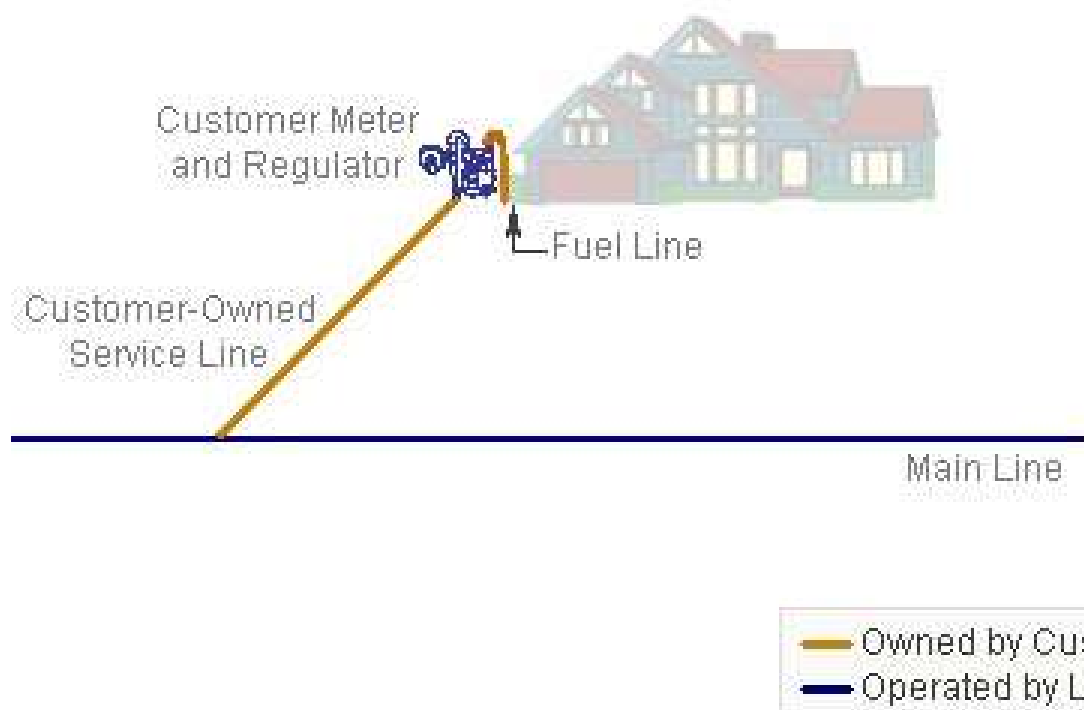


### Service Lines: Scenario 3

In the same scenario, if the line on the downstream side of the meter is owned by the customer, the service line ends at the outlet of the meter.



## Service Line Determination

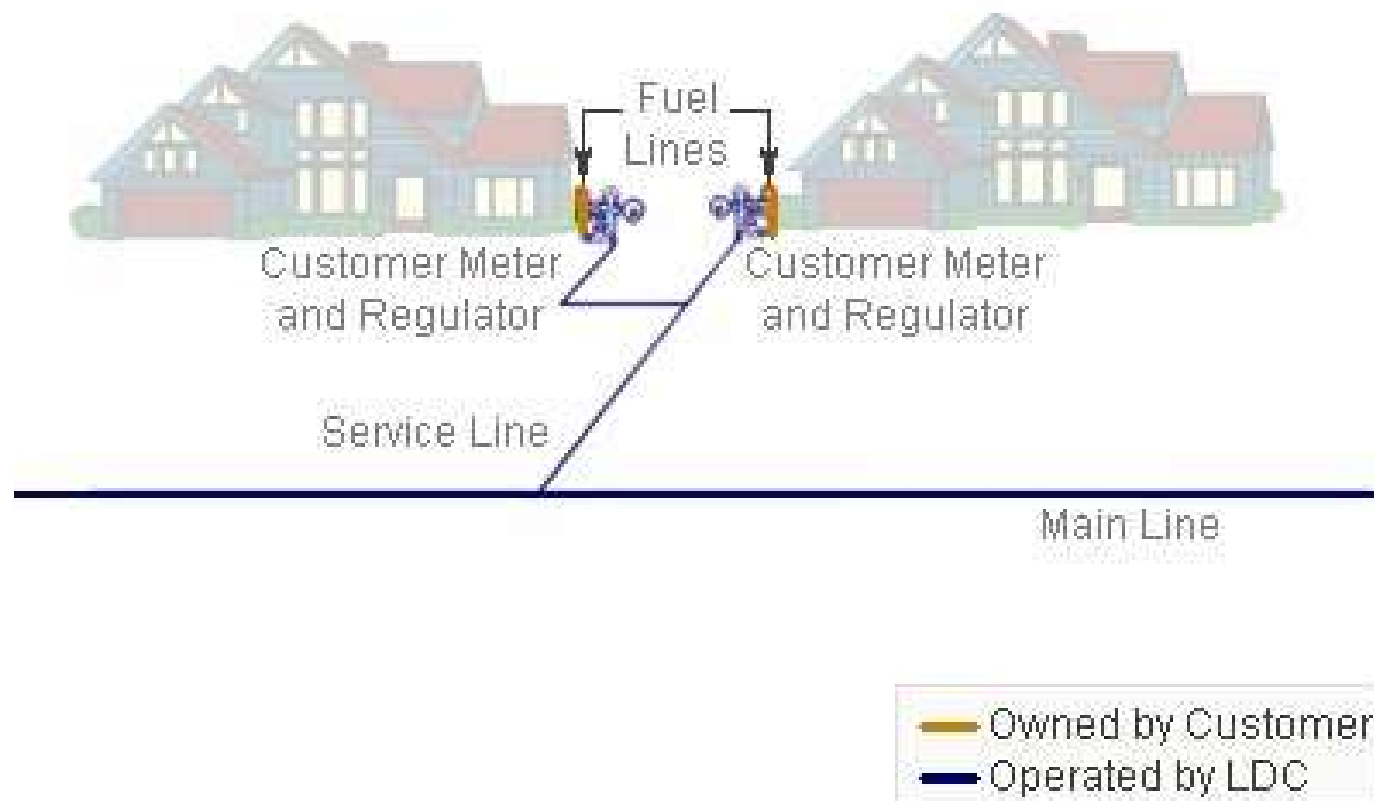


### Service Lines: Scenario 4

In some cases, an LDC requires the customer to install the line from the tap at the main to the meter at the building. Because of the definition, "...the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream," the service line goes to the outlet of the meter even though the line across the yard is owned by the customer. The type of service line is a "customer-owned service line."



## Service Line Determination



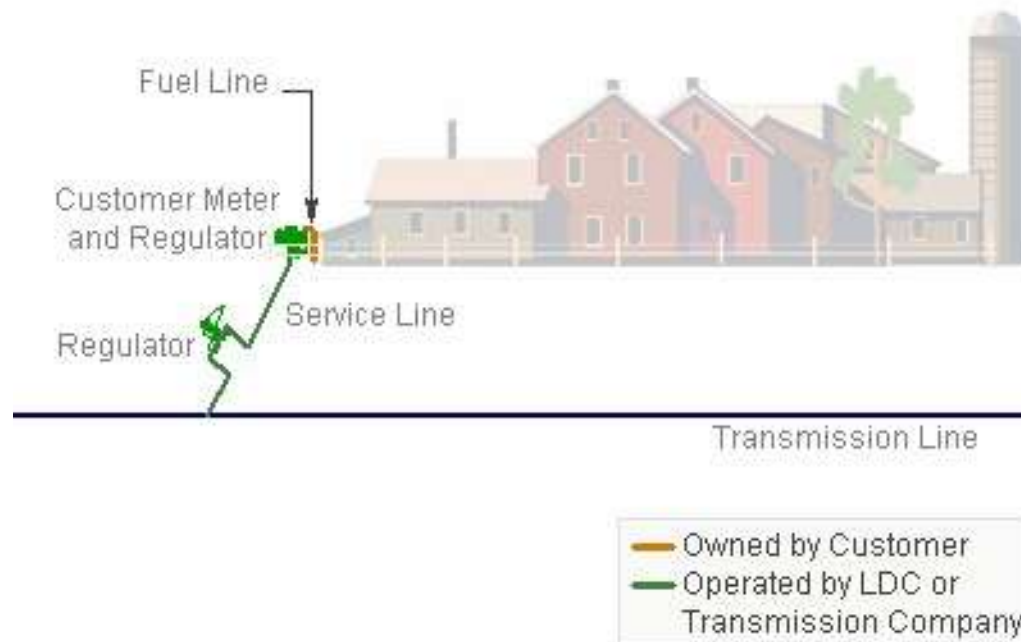
**Service Lines: Scenario 5** There are instances, however, where a service line may serve more than one customer. The definition describes a service line coming from a common source of supply to two adjacent or adjoining residential or small commercial customers. The service line will end at the outlet of the meter on both houses.



**Service Lines: Scenario 6** The definition also describes a service line coming from a common source of supply to multiple residential or small commercial customers served through a meter header or manifold. The service line will end at the outlet of each meter on the manifold.



Service Line Determination - Farm Tap

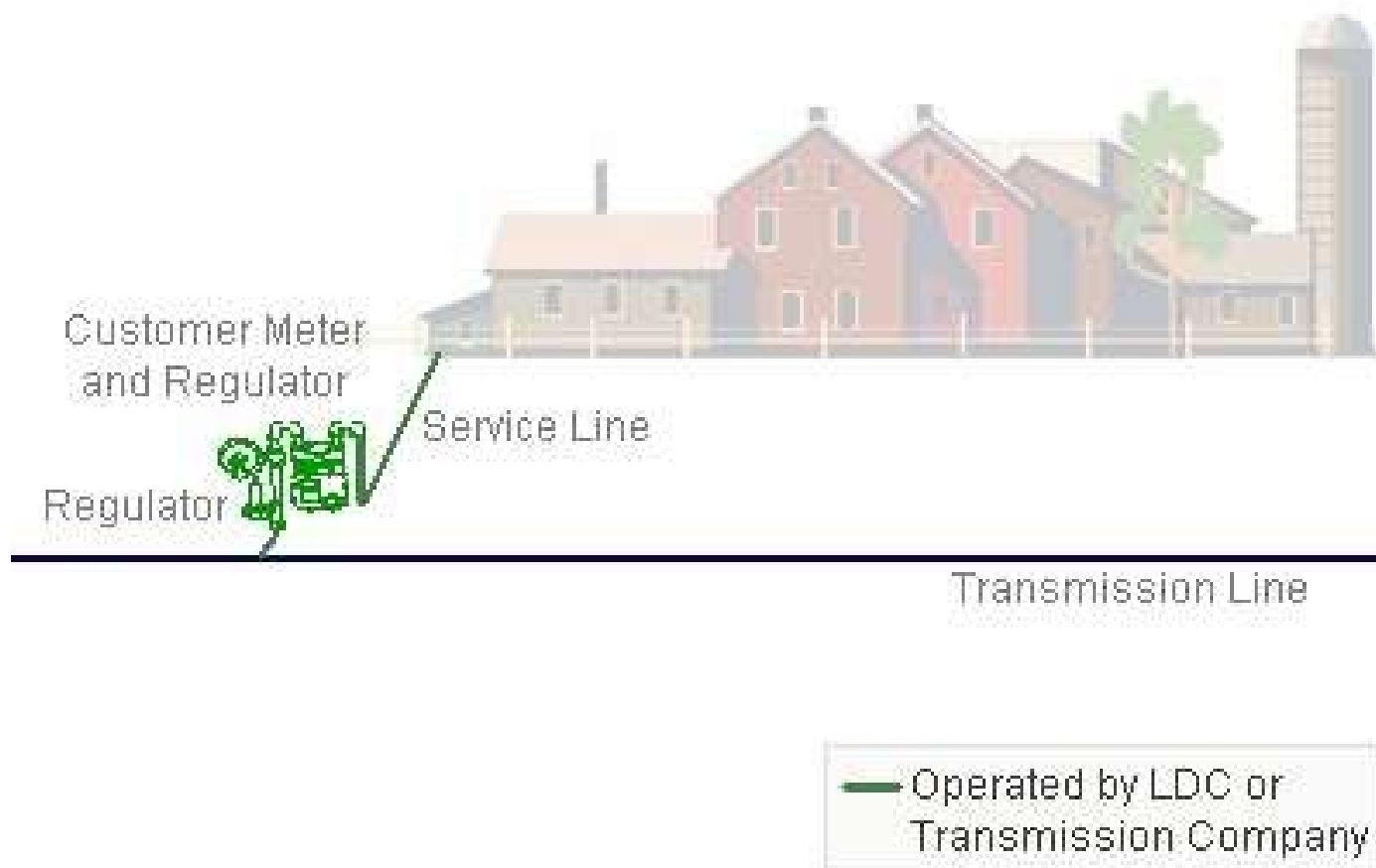


### Service Lines: Scenario 7

The last example of a service line is called a "farm tap." Typically, these types of installations are in rural areas where a transmission line has taps along it to serve farms and individual houses along the right-of-way (ROW). These types of installations were common when the transmission line was being originally built as part of the ROW agreement to cross a landowner's property with the pipeline. As part of the negotiation to cross the land, operators provided gas to the landowner. Because of the higher pressures on the transmission lines, there is another regulator inline to reduce the pressure to distribution pressures prior to the customer meter and regulator. In the case above, the service line ends at the outlet of the meter.



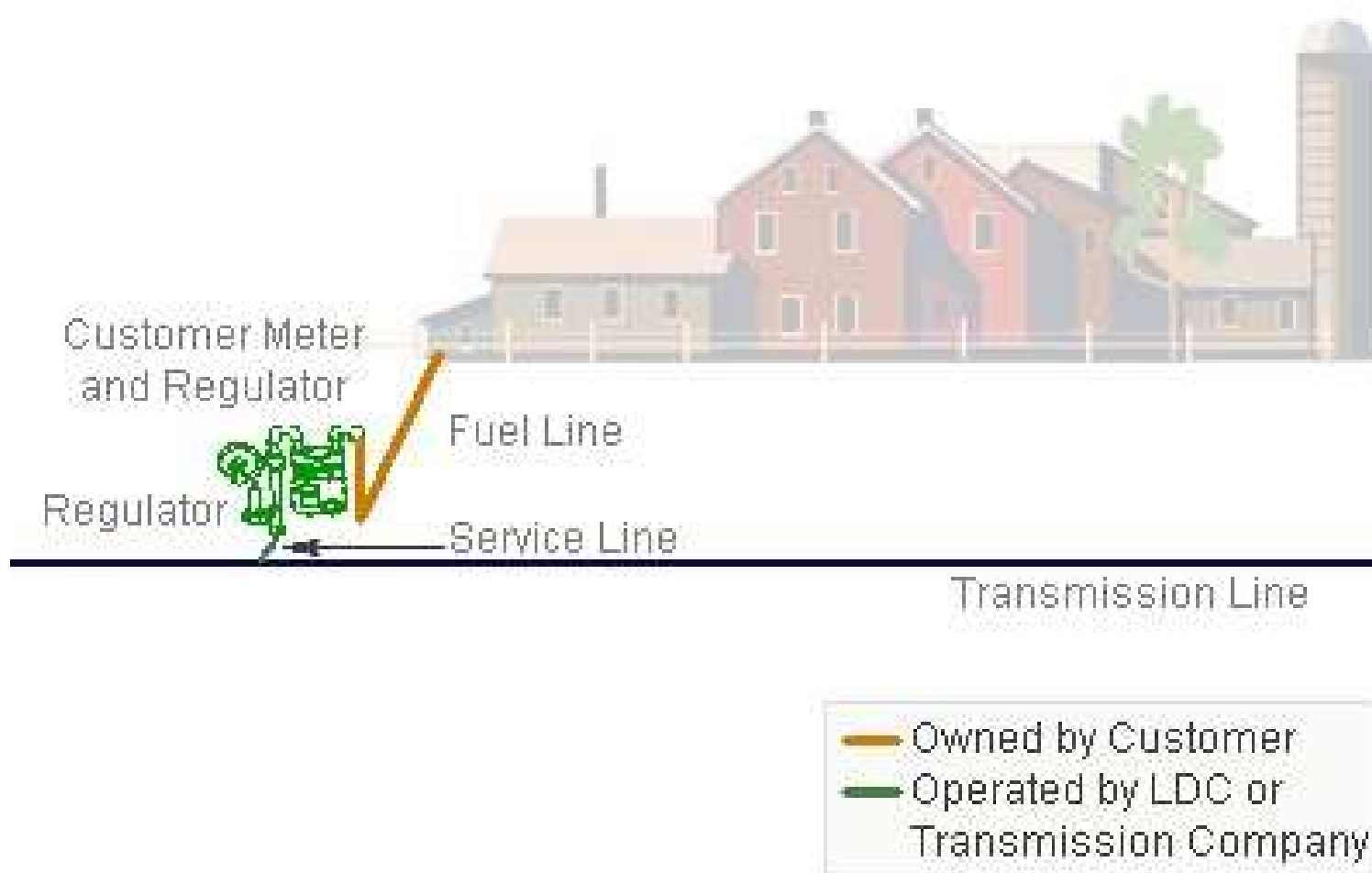
## Service Line Determination - Farm Tap



**Service Lines: Scenario 8** As discussed previously, the transmission company or LDC may place the meter at the tap off of the transmission line. In this case, if the piping downstream of the meter that runs to the house is operated by the LDC or transmission company, the service line ends at the building wall where the connection to customer piping is located.



## Service Line Determination - Farm Tap



**Service Lines: Scenario 9** In the same scenario, if the line on the downstream side of the meter is owned by the customer, the service line ends at the outlet of the meter.



**Service Lines: Scenario 10** Sometimes an LDC will place a meter inside a customer's building for various reasons, such as local building codes or limited outside space as in large metropolitan cities. In these situations, the entire line from the main to the outlet of the meter inside the building is the service line.



**A low-pressure distribution system is one in which the gas pressure in the main is substantially the same as the pressure provided to the customer.**

These systems were typically installed in downtown business districts where the operating pressure in the mains and service lines were less than 1 psig and service regulators were not required. The gas goes straight through the meters to the appliances. There are very few low pressure distribution systems being installed in the U.S. and most of the remaining ones are being replaced with high pressure distribution systems.



**A high pressure distribution system is one in which the gas pressure in the main is higher than the pressure provided to the customer.** These systems typically operate at 60 psig where the pressure is reduced at the service regulator just upstream of the customer meter to less than 1 psig to be delivered to the appliances within residences.



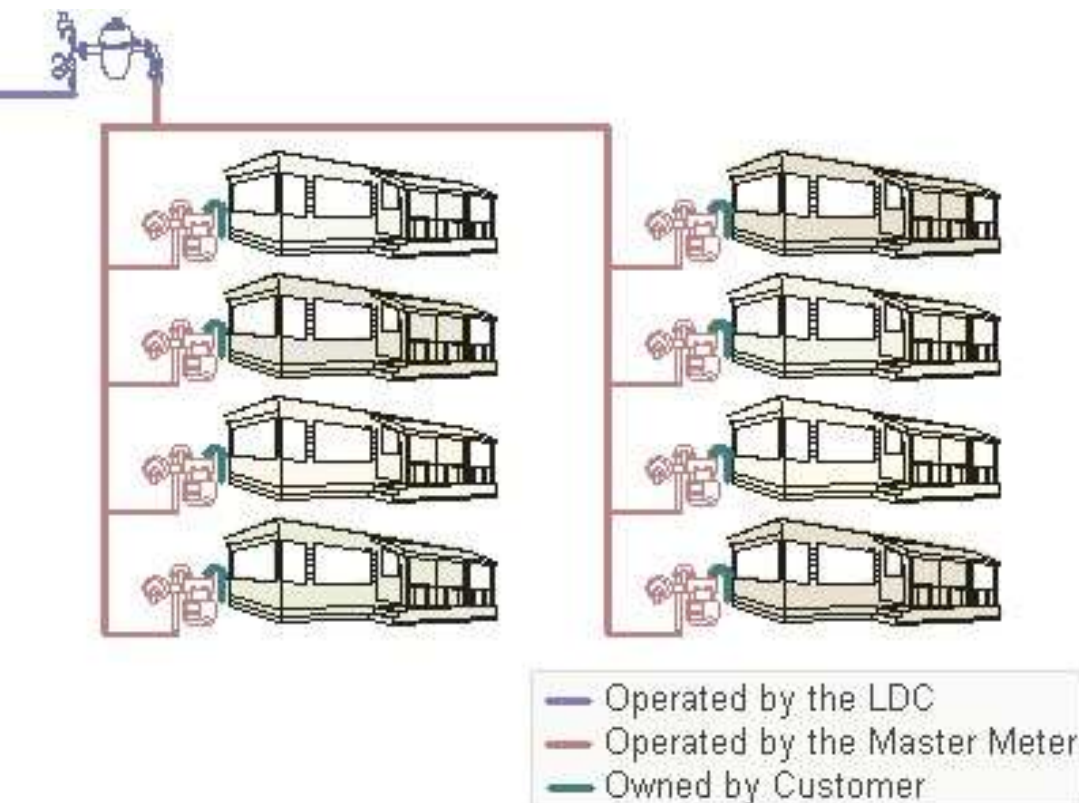


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**Public Gas Meter System** means a pipeline system that distributes natural gas or liquid propane gas within a public place, such as a mobile home park, housing project, apartment complex, school, university or hospital and which is owned, operated and maintained by an operator that purchases the gas from an outside source.

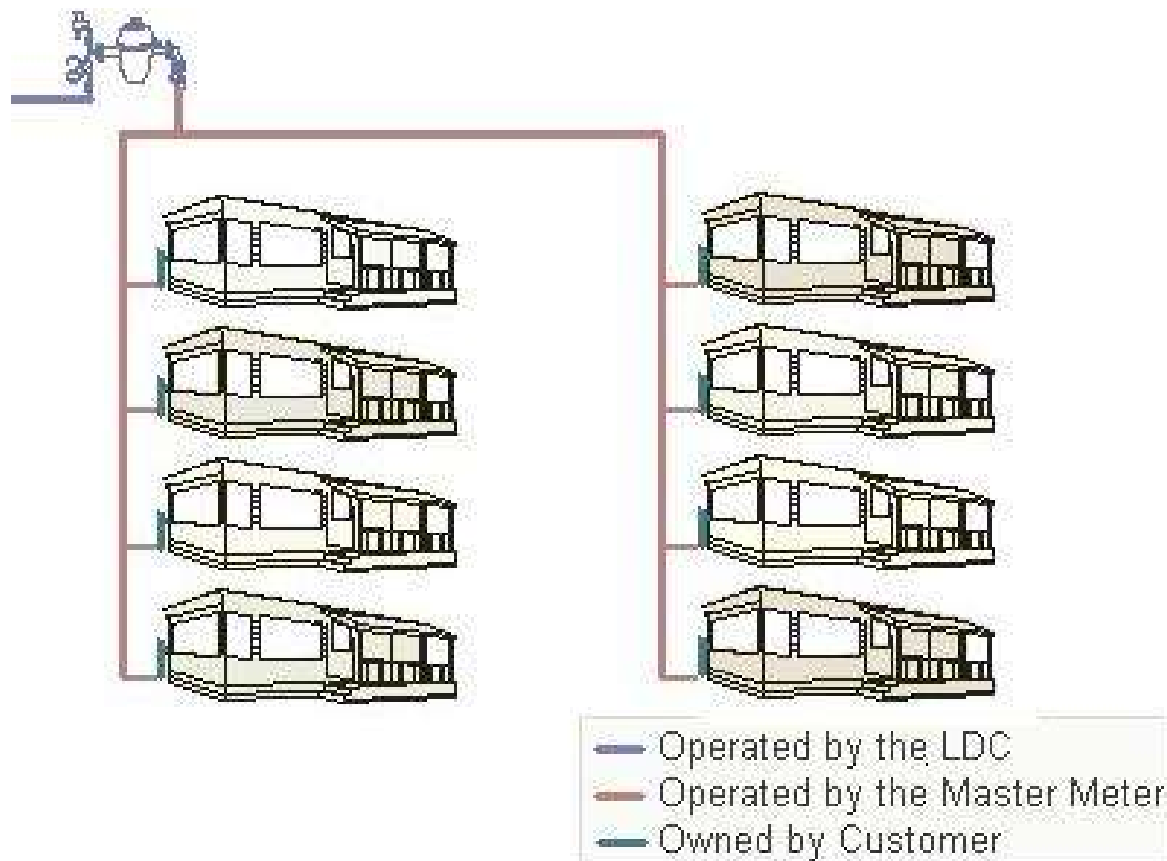




**Master meter system** is defined in Part 191 as a small pipeline system that distributes natural gas within an area, such as a mobile home park, housing project, or apartment complex, where the operator of the master meter system purchases gas from an LDC, through a single large meter and resells the gas through a gas distribution pipeline system. The gas distribution pipeline system supplies the ultimate consumer. The ultimate consumer is the customer who has control of the gas, such as through a water heater or range. The ultimate consumer either purchases the gas directly through a house meter or by other means, such as a lease or rent (all utilities paid).



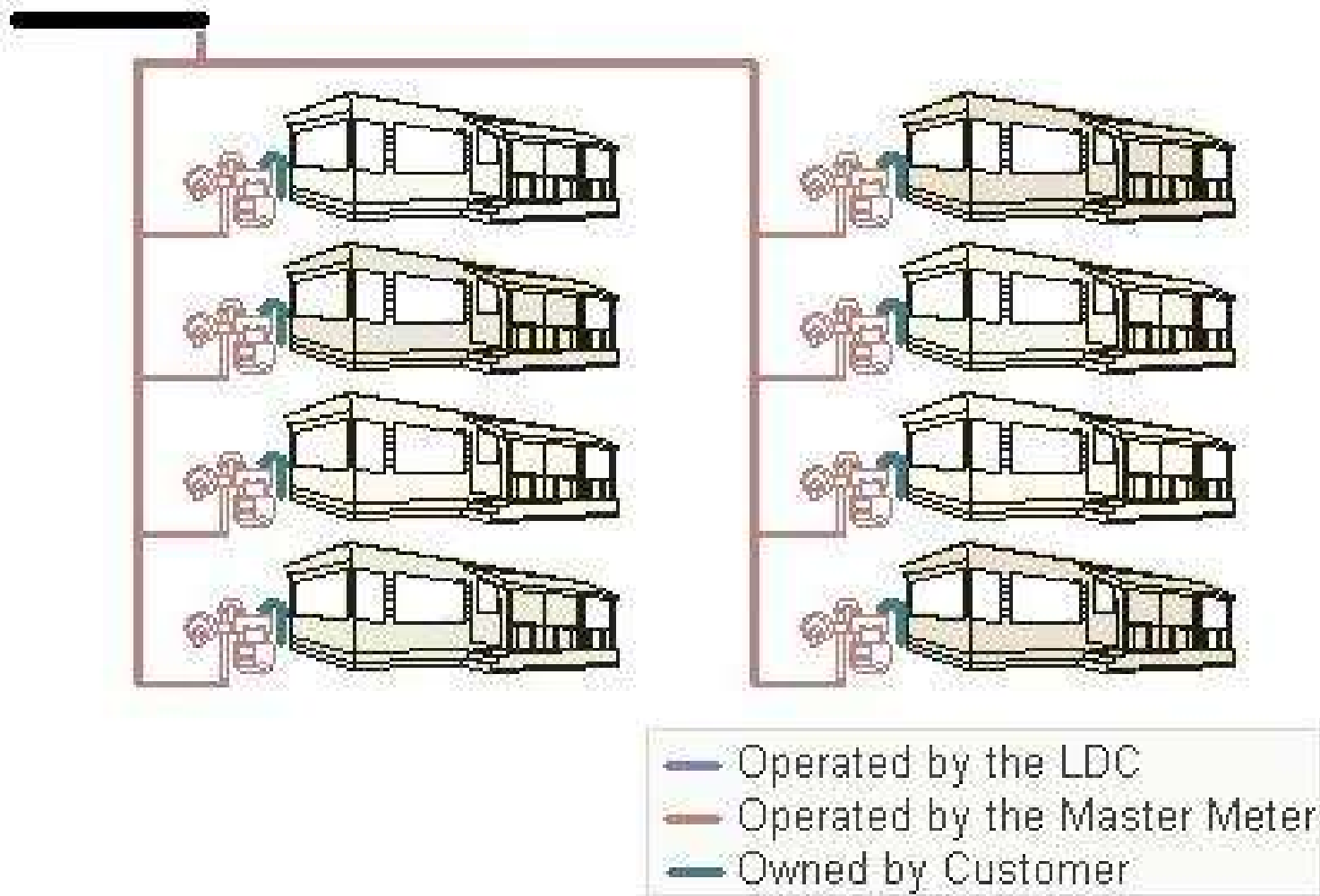
# Regulated Master Meter Systems



In this situation, there are no separate meters for individual tenants who were charged a flat rate. Under this condition, the mains and service lines downstream of the master meter are considered to be a distribution system subject to the Natural Gas Pipeline Safety Act, and the landlord of the mobile home park is considered an operator under the gas pipeline safety regulations.

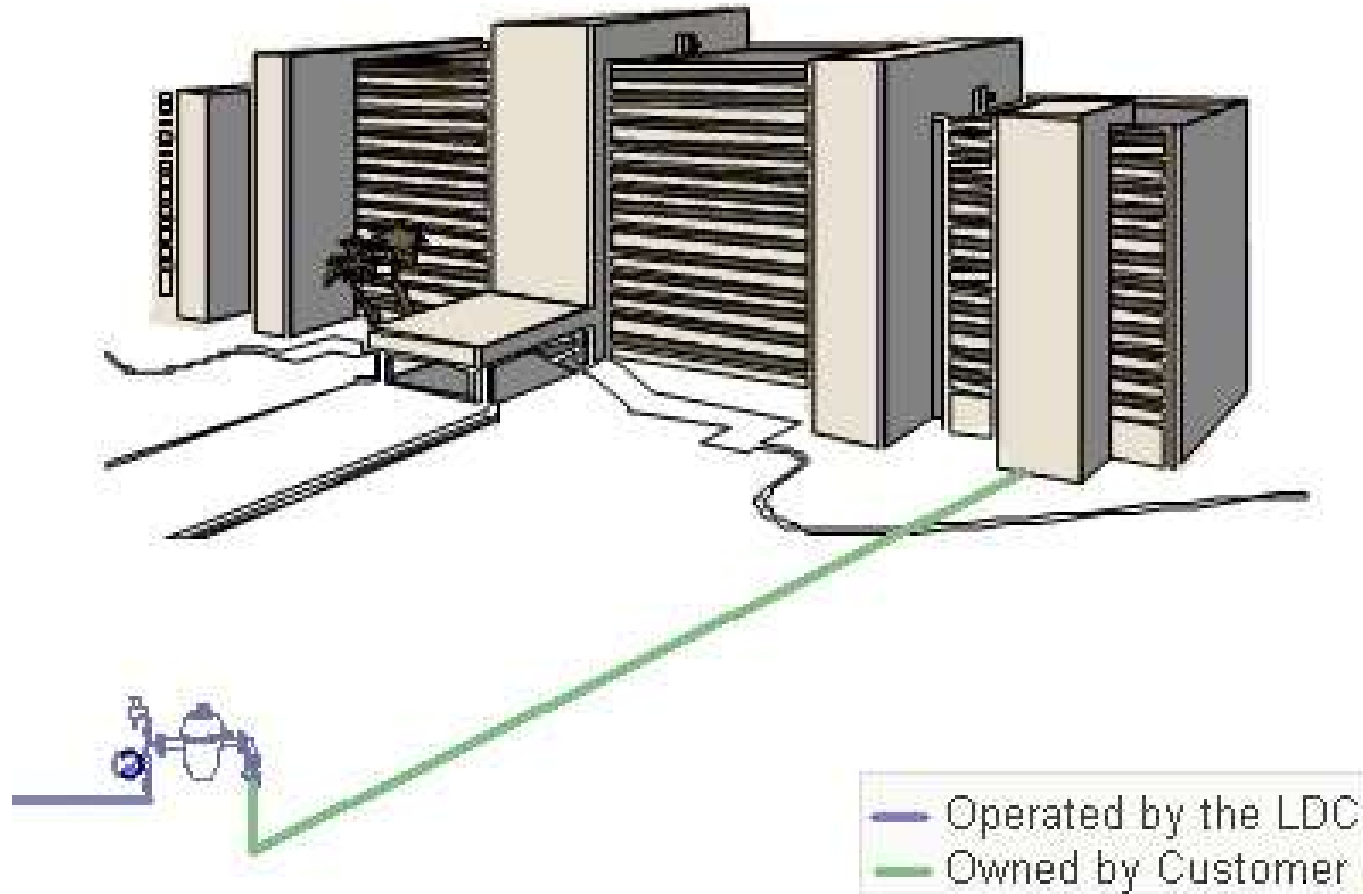


# Non-Regulated Master Meter Systems





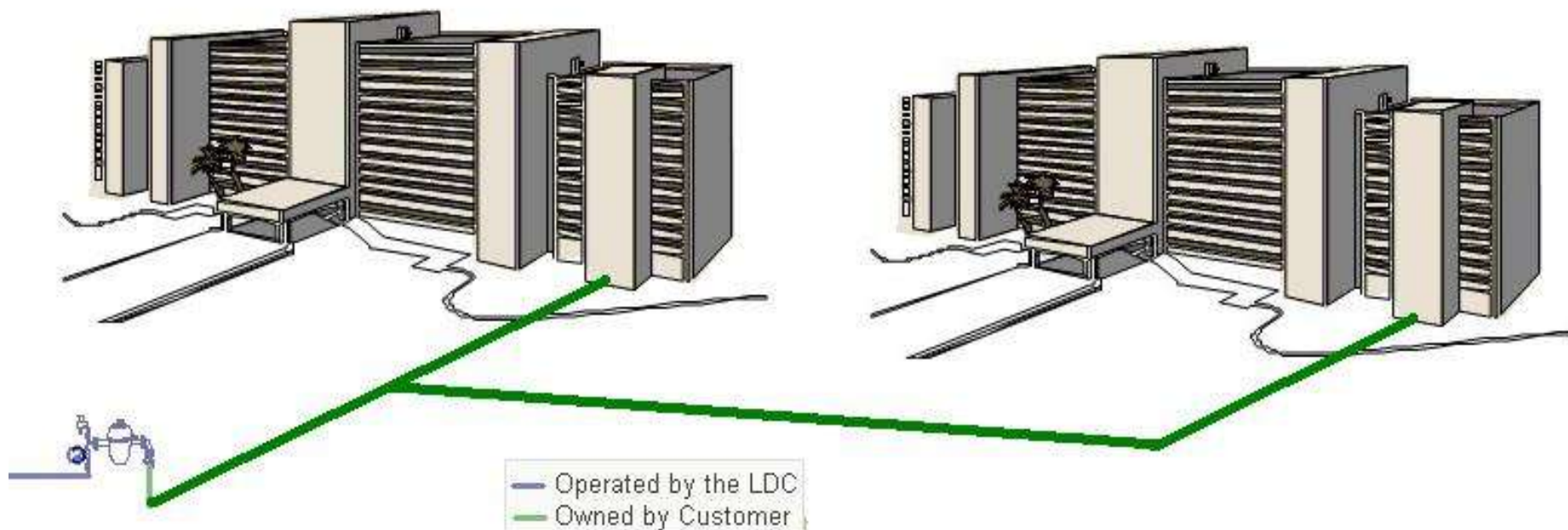
# Non-Regulated Master Meter Systems



If, on the other hand, the natural gas is used by an apartment complex to heat water in a boiler which is then distributed to each individual apartment, the customer does not have control of the gas. In this situation, the apartment complex would not be considered a master meter distribution system.



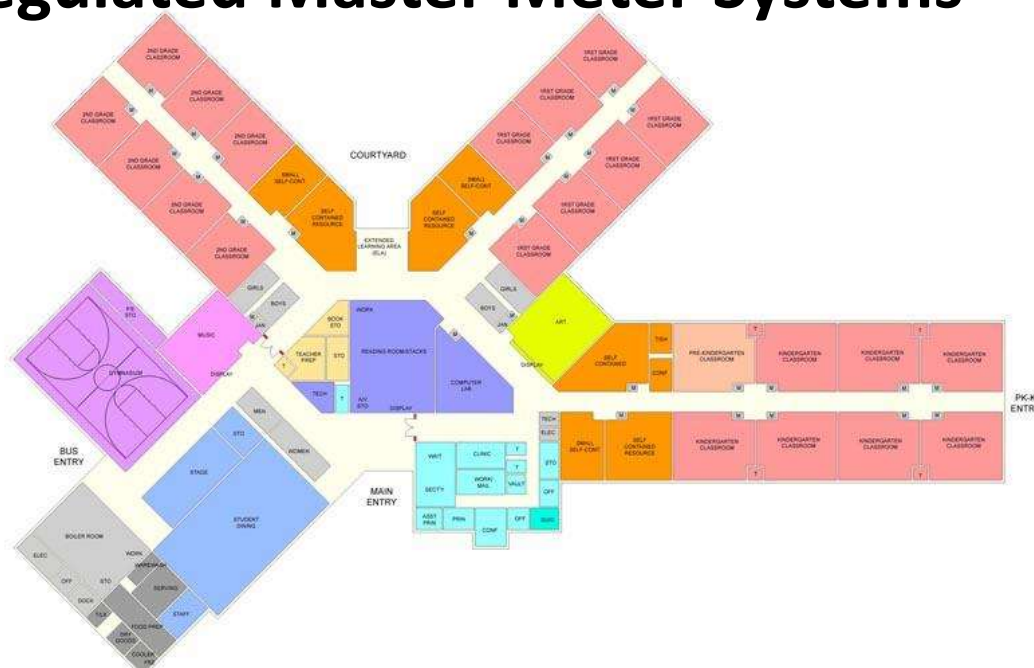
# Regulated Master Meter Systems



Mains and service lines downstream of the master meter are considered to be a distribution system subject to the Natural Gas Pipeline Safety Act, and that the housing authority or the mobile home park landlord is an operator within the meaning of Part 192.

Those characteristics are first, the existence of underground or exterior piping serving multiple buildings and, second, the transfer (sale) of gas (metered or unmetered) from the master meter system operator to the ultimate gas consumers (tenants) for use in the consumers' appliances.

# Regulated Master Meter Systems

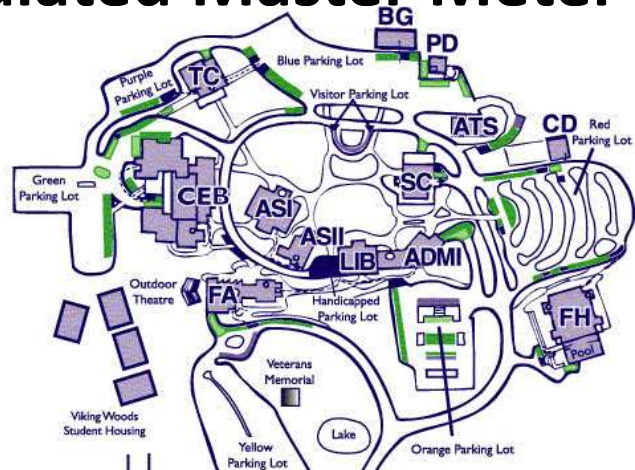


"...where a school is master metered and distributes the gas through its own piping to different buildings and they are ultimate consumers, would they be under gas pipeline safety regulations?"

One of the characteristics of a master meter system that makes it subject to the regulations is a transfer of the gas from the operator to other persons who are the ultimate consumers of the gas. In the situation described, however, the school taking delivery on gas through the "master" meter is not reselling or distributing any of the gas to any other person. Where the gas is being used entirely by school employees for school purposes on school property, the gas system is not subject to the federal gas pipeline safety regulations.



# Non-Regulated Master Meter Systems



XYZ College's system is clearly a pipeline facility. It distributes gas through underground pipelines to campus buildings. It does not appear to meet the definition of Master Meter System because it is using the gas delivered through its pipeline system to provide heat and hot water to campus buildings. In this instance the college would be the consumer of the gas.

However, if the XYZ College gas system provides gas to consumers, such as concessionaires, tenants, or others, it is engaged in the distribution of gas, and the persons to whom it is providing gas would be considered the customers even though they may not be individually metered. In this situation the pipelines downstream of the master meter used to distribute the gas to these ultimate consumers would be considered mains and service lines subject to the Federal pipeline safety regulations. The XYZ College pipeline system would then be a Master Meter System.



**Pipe** means any pipe or tubing used in the transportation of gas, including pipe-type holders. Pipe comes in different types and sizes that are manufactured in accordance with approved specifications and standards. A pipe-type holder is typically a container made from pipe to hold gas for different functions. Typically, these holders are used to store gas that might be needed when the gas supply gets low. Other applications include providing a pressure supply to actuate a valve.



**Pipeline** means all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies. This means, wherever the gas flows, it is considered part of the pipeline. There are different requirements for each portion of the pipeline. These requirements include design, installation, operation and maintenance discussed in Part 192.



**Pipeline facility** means new and existing pipeline, 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. This definition encompasses the pipeline itself, as well as all equipment, buildings, and locations where the pipeline is installed. The equipment can include odorization equipment, fire-fighting facilities, telemetering equipment and signs for the pipeline. The physical location or real estate of the pipeline ROW is also part of the pipeline facility. Several parts of the pipeline may be protected by buildings along the ROW making them part of the pipeline facility. These include buildings for compressor stations, metering facilities, valves, odorization equipment and other instrumentation. These buildings may or may not be occupied.



**Operator** is a person who engages in the transportation of gas. The inspection authority of OPS and the state pipeline safety programs recognize the operator as being ultimately responsible for compliance with Part 192. Pipelines can be owned or leased by multiple partners or companies, so the operator is not necessarily the owner of the pipeline. However, the company that operates it has the responsibility for compliance with Part 192.

**Person** is any individual, firm, joint venture, partnership, corporation, association, State, municipality, cooperative association, or joint stock association, and including any trustee, receiver, assignee, or personal representative thereof. Person refers to the individual or company that is recognized as the operator of the pipeline and is inspected by OPS or the State pipeline program for compliance with Part 192.



**The pipeline safety regulations require operators of natural gas master meter systems to:**

- 1) deliver gas safely and reliably to customers;**
- 2) provide training and written instruction for employees;**
- 3) establish written procedures to minimize the hazards resulting from natural gas pipeline emergencies;**
- 4) and, keep records of inspection and testing**





**Determination of Class Locations**  
**Public Education**  
**Investigation of Failures**  
**Maximum Allowable Operating Pressure (MAOP)**  
**Tapping and/or Purging of Pipelines**  
**Odorization**  
**Patrolling**  
**Leak Surveys**  
**Line Markers**  
**Testing for Reinstating a Service Line**  
**Abandonment of Facilities**  
**Key Valve Maintenance**

**Accidental Ignition of Gas**  
**Corrosion Protection**  
**Construction and Leak Repair**  
**Construction Records, Maps and Operating History**  
**Gathering of Data Needed for Reporting Incidents**  
**Starting Up and Shutting Down any Part of the Pipeline**



Each operator is required to keep a written plan of procedures to cope with gas emergencies. The emergency plan should contain the following information:

**Emergency notification list**

**Map of key valve locations**

**Description and location of emergency equipment**

**How to respond to gas leak reports and interruptions of gas service**

**Check list for use in emergency situations**

**Reporting requirements (Telephone Reports)**

**How to restore gas service after an outage**

**Accident investigation procedures**

**Education and training plan**



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