



**ENERGY
SOLUTIONS
CENTER**

Energy Industry Fundamentals

The LDC Organizational Structure

Eric Burgis, Energy Solutions Center

This unit is part of Energy Solutions Center's: Energy Industry Fundamentals Training Program

No portion of this material may be reproduced without the expressed written consent of the Energy Solutions Center Inc.
© Energy Solutions Center Inc. – All Rights Reserved

© Energy Solutions Center Inc. – All Rights Reserved

Presentation Outline

- LDC Organization Structure
- Gas Supply, Distribution & Metering
- Billing, Collections & Call Centers
- Business Functions
- Sales & Marketing
- Risk Management



LDC Organizational Structure

LDC Organizational Structure

- The natural gas distribution utility is typically organized into structural business units to help it deliver service to customers

Gas Supply	Distribution	Meter Shop
Billing	Collections	Call Center
Customer Service	Regulatory Affairs	Accounting

- Other support groups, i.e., Communications, Legal, IT
- Each utility decides for itself which business functions will be performed by which organizational unit.
- The following provides an overview of the primary business functions of a natural gas utility and the business units that usually perform each function

Gas Supply, Distribution & Metering

Gas Supply

- Obligation to Deliver

- The gas supply department is responsible for acquiring all natural gas that the utility is required to deliver to its sale customers
- This gas may be produced from geologic formations, or it may be supplemental gas such as propane-air mixtures, biomass gas, or synthetic gas

- Sources of Gas Supply

- Utilities acquire gas supply from a variety of producers, suppliers and marketers
- Marketers may be affiliates of producers, pipelines, or other utilities

Gas Supply

- Activities of Gas Supply Department
 - Purchases natural gas from a producer, marketer, or other supplier
 - Arranges transmission of the natural gas from the production or storage area to the city gate
 - Arranges for storage of the natural gas if it is held for later use
 - Accounts, both physically and financially, for the receipt of gas
 - Gas that is for the utility's sales customers is accounted for as a sale
 - Gas that is for the utility's transportation customers must be accounted for physically, but is not counted as a sale

Capacity Planning

- Maintaining reliable service delivery to customers depends on the condition and capacity of main and service lines and on line pressure, which are all interrelated with customer demand.
- Infrastructure investments are needed to ensure system safety and meet load growth include capital projects to upgrade and expand pipelines.
- Utilities typically present replacement programs to regulators for approval of the cost, with supporting justification for the investment's timing and need.

Gate Station Operations

- The gate station is the place where natural gas at high pressure in large, mostly interstate, transmission pipelines reaches the local utility
- Each utility may have more than one gate station receiving natural gas at several locations and from many pipelines



This Photo by Unknown Author is licensed under [CC BY-NC-ND](#)

Gate Station Operations

- Gate stations perform several important functions:
 - Reduce the pressure of the natural gas to a level close to what will be used by the customer
 - Adds odorant
 - Meters the amount of natural gas received by the utility
 - Controls the quality and characteristics of compounds associated with the natural gas supply

Quality Control of Gas Characteristics

- Although natural gas is a simple chemical compound, the characteristics of its composition differ according to the location from which it was produced
- Heat content (measured in British thermal units) and water vapor are two characteristics of natural gas that must be controlled before the gas can be delivered to end use customers



Quality Control of Gas Characteristics

- Other naturally occurring chemical compounds, some beneficial and some harmful, are associated with natural gas
- The gas quality control group takes steps to remove or mitigate the negative associated constituents and characteristics and to extract and recover the positive components (e.g., butane and other hydrocarbons)



[This Photo](#) by Unknown Author is licensed under [CC BY-ND](#)

Distribution

- Natural gas is moved throughout the utility's system in distribution pipes
- The various sections of the system operate at different pressures, and each section and the pressure within it is controlled by a mechanical regulator
- The natural gas is periodically compressed by engines to create pressure that forces gas through the pipes
- Line pack is the amount of gas in the pipe
 - By raising and lowering the pressure in a section of pipe, gas can be stored in the pipe
 - Utilities increase line pack in advance of cold weather and expected increases in consumption.

Trenching and Trenchless Piping

- The vast majority of natural gas distribution pipes are placed underground, and the installation of these under-ground pipes usually requires the excavation of a trench
- Utilities either lay the pipes themselves or contract out the service to a specialized excavation contractor



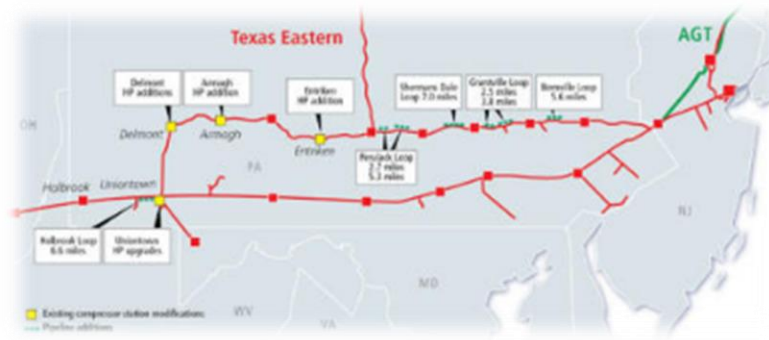
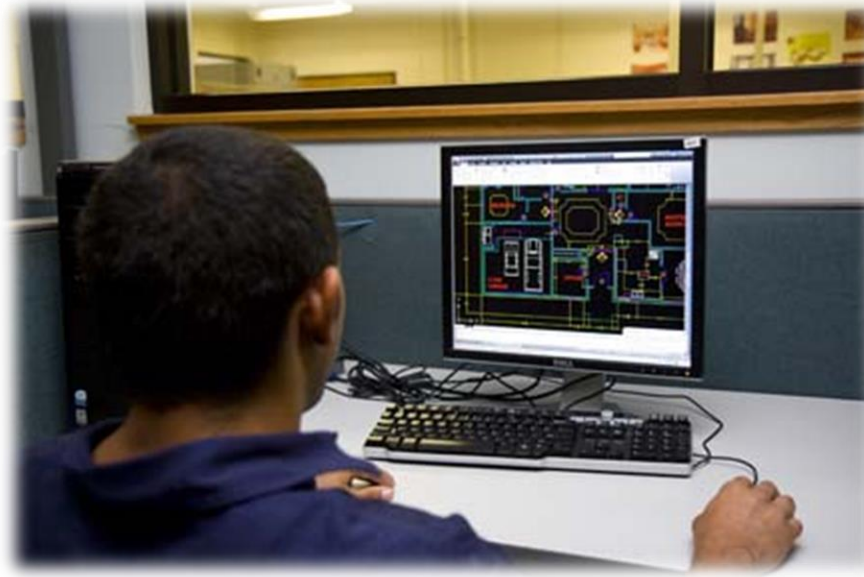
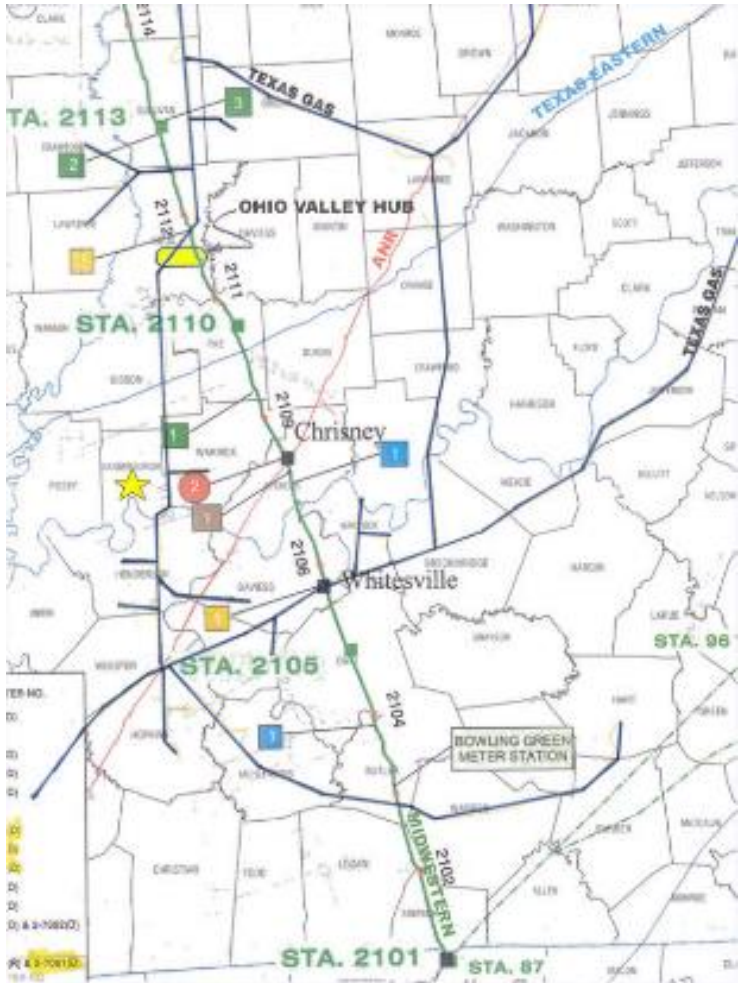
Trenching and Trenchless Piping

- Modern trenching techniques now allow for the installation of distribution pipe with less impact on the above ground surroundings
- These trenchless techniques use a guided drilling system to excavate an underground hole into which the pipe is inserted
- Trenchless pipe laying often leads to significant excavation savings, particularly in crowded urban environments

Pipeline Mapping

- This function may be part of Gas Supply or a separate GIS team.
- Once pipes are laid, the location must be recorded on a system map
- Modern maps are computerized, but a utility's earliest records of its system, extending back more than a hundred years for many utilities, may be on paper
- These old maps are bound in map books and maintained in the utility's offices

Pipeline Mapping



Pipeline Maintenance and Leak Detection

- Natural gas pipes are composed of lengths of steel cylinders (larger mains and transmission pipes) and segments of plastic cylinders (mostly service lines) that are welded and bonded together, and these pipes need periodic maintenance
- Pipes may develop leaks at the joints and from small cracks, and these leaks must be detected and repaired

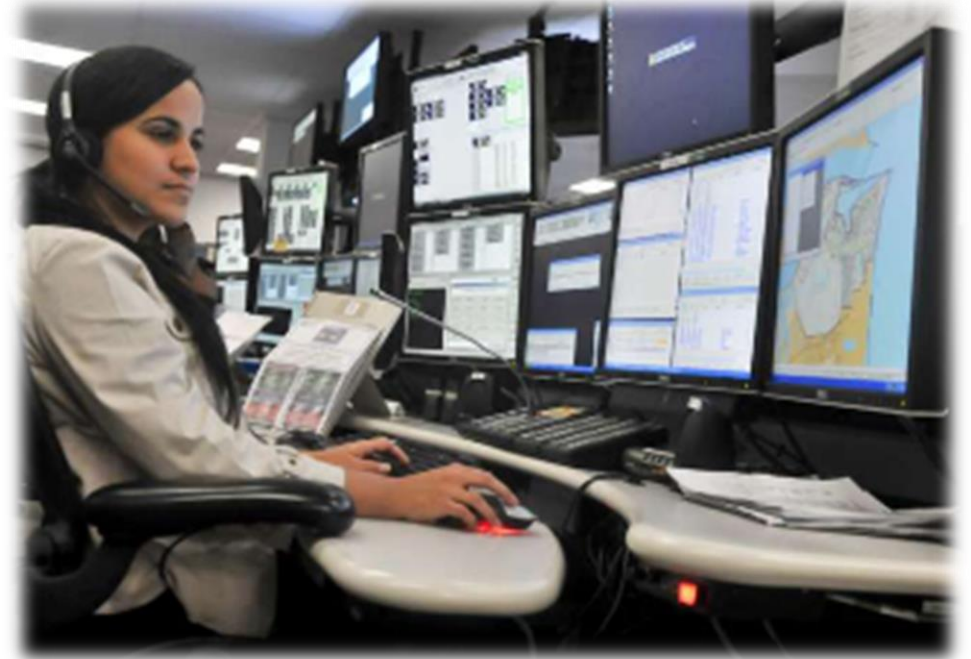


Pipeline Maintenance and Leak Detection

- The maintenance and leak detection departments of the natural gas utility may be part of Gas Supply or Field Operations.
- Pay close attention to the structure and reliability of the pipelines, and takes all necessary and appropriate steps to maintain and where necessary, repair natural gas pipelines
- These groups also document their actions and report on the safety and reliability of the entire system to regulatory authorities

Dispatch and Gas Control

- Gas dispatch coordinates the flow of natural gas throughout the distribution system to ensure that the volume and pressure of gas required to meet customers' demands are available at all times
- Dispatch monitors weather-related usage and other variables to forecast load and to make send-out adjustments



Dispatch and Gas Control

- Dispatch interrupts gas service as necessary during emergencies by curtailing interruptible customers or by shutting off customers within an affected area
- The pressure within each section of the distribution system, as well as the valves, regulators, and compressors that control those pressures and flows, are overseen by the SCADA system

Supervisory Control and Data Acquisition

- Supervisory Control And Data Acquisition (SCADA) is a centralized system that operates with coded signals over communication channels provide monitoring and control of remote equipment
- Gas dispatch and control operators man the control center 24/7 and monitor the SCADA feeds and all aspects of the distribution system



Metering

- Utilities meter gas into the system at the gate station and out of the system at each customer's place of service
- Residential meters are simple, inexpensive, and reliable; gate station meters are very expensive and very accurate
- Meters are tested and maintained to ensure reliable measurements



Meter Reading

- Customer meters are usually read monthly
- Meters used to be read visually by utility employees at customer sites, but automation now allows
- Employees to collect the readings by driving down the customer's street and using a remote device
- More recently, electronic meter reading has allowed customer usage to be sent to the company using radio or wireless communications



Billing, Collections & Call Centers

Billing

- The billing department receives information from the metering department and the rates department and calculates and sends monthly bills to regulated customers
- A majority of utilities update the price of gas to be charged to customers monthly or quarterly, so the billing department must constantly insure that its pricing information from the rates department is current

Collections

- The collections department receives customer payments and works with customers who require help paying for their service
- A number of needy customers have difficulty paying their bills, and this portion increases in times of cold weather, high natural gas prices, and increased unemployment in the service territory



Collections

- While utility customers have access to a number of payment plans, grants, and municipal help during times of need, a few customers with the ability to pay, nevertheless do not pay their bills on time
- The collections department works with all customers to structure payment plans, administer aid and grants, and seek legal means to recover payments from those able to pay

Customer Call and Service Centers

- Natural gas utilities use both call centers or customer care centers to help manage and service their customer interactions and provide superior customer service.
- The call center is a centralized work environment for receiving a large volume of requests by telephone



Customer Call Centers

- Natural gas call centers administer customer inquiries, many of which concern the customer's account or natural gas appliance operating characteristics
- Call centers can be operated by either an in-house department or by outsourcing the function to a third party
- These centers may also process requests for new customer connections.

Customer Service Centers

- Service centers are centrally located business facilities, usually at the utility's primary business location and sometimes at sites convenient for customer walk-in or drive-up visits
- Service centers provide the same function as call centers, but also handle in-person customer payments and may facilitate natural gas appliance sales and servicing



[This Photo](#) by Unknown Author is licensed under [CC BY](#)

Business Functions

Accounting

- Accounting is one of the key functions for almost any business, and the accounting department records and summarizes all financial transactions including:
 - Tracking receivables – including outstanding customer bills
 - Making sure vendors and employees are paid accurately and on time
 - Recording the assets and liabilities of the utility
 - Insuring that all tax assessments are accurate and that tax payments are made on time
 - Instituting financial controls that are required for compliance, fraud protection, and theft prevention.

Accounting

- Each state in which the utility does business has its own regulations
- Frequently these regulations mean the utility must calculate its rates differently in each state in which it operates
- The accounting department provides differentiated accounting data to ensure the rates and regulatory affairs departments have the data they need to comply with varying state regulations

Rates

- The prices a natural gas utility charges for its services are not set independently in the market place, but are established in a regulatory proceeding called a rate case
- In the regulated natural gas distribution business, prices are known as rates



Rates

- The principal objective of the rates department is to work with the utility's customers and regulatory authority to establish rates that permit the utility a reasonable opportunity to recover its costs and provide a profit to investors
- The rates department also performs many pricing and cost analyses and supports other departments in preparing financial and gas load (supply) forecasts
- The rates department works with many departments within the utility, and especially closely with accounting, gas supply, and regulatory affairs

Regulatory Affairs / Government Affairs

- Regulatory affairs works with federal, state, and local regulatory agencies on specific issues affecting the company, the most important of which is usually the utility's request for adequate rate levels
- Regulatory affairs prepares the utility's comments when regulators issue rulemaking proposals, prepares rate litigation strategy, and, if necessary, appeals regulatory decisions to the appropriate Court of Appeals

Regulatory Affairs

- Regulatory affairs activities may be assisted by the legal department or by outside counsel and expert witnesses
- When new rates are established and filed publicly, the department ensures that the filings conform to regulatory requirements and obligations
- Regulatory affairs staff members serve as the liaison between utility senior management and regulatory staff and commissioners

Legal

- The legal department is responsible for ensuring the utility complies with all applicable business, personnel, and regulatory laws
- The department also oversees all legal and external matters including litigation, investigations, contract matters, and labor issues



Legal Department

- The legal department may engage outside counsel to handle rate testimony, tax strategy, and other specialized work, while inside counsel handle routine contracts, personnel and administrative matters
- Staff members of the legal department work closely with and depending on the size of the utility, may oversee legislative affairs, government affairs, regulatory affairs, rates, HR, risk management, and communications

Information Technology (IT)

- The information technology (IT) department manages the utility's hardware, software, and physical communications equipment including:
 - The availability and security of electronic information the utility owns
 - Supports a wide array of business systems including payroll, billing, and human resources information
 - Provides guidance to staff on technology issues



Information Technology (IT)

- The information technology (IT) department manages the utility's hardware, software, and physical communications equipment including:
 - Assists the regulatory affairs department with electronic data requests
 - Manages physical communications between employees, vendors, and customers using email, live chat systems, online meeting tools and video-conferencing systems, Voice over Internet Protocol (VOIP) telephones, and smart-phones

Government Relations

- Government relations is the utility department that promotes the natural gas business in the public policy arena
- Natural gas utility government relations staff work to educate governmental leaders and the public about the potential consequences of legislation on issues of importance to the utility, such as the use of hydraulic fracturing of shale formations in the production of natural gas



Government Relations

- Government relations staff monitor a wide variety of public policy issues that may affect the utility and work to ensure that the utility's position is considered in the debate



Finance Department

- The utility finance department is responsible for all financial planning and management activities of the utility including:
 - Budgeting and financial forecasting
 - Issuing earnings reports to shareholders and the public
 - Preparing common financial statements that meet federal and state regulatory requirements
 - Preparing internal financial reports for the use of managers in decision-making
 - Providing strategic planning and risk analysis before making investment decisions
 - Placing and redeeming corporate debt and arranging short-term debt
 - Issuing new shares of company stock

Investor Relations

- Publicly held utilities whose shares are traded on a stock exchange have investor relations departments to provide shareholders (investors) and financial analysts with an accurate picture of the company's affairs



Investor Relations

- The Investor Relations Department:
 - Works to create favorable relationships with current and potential financial stakeholders
 - Builds and enhances the company's financial reputation
 - Provides senior management with market intelligence on how the utility is viewed; and
 - Complies with pertinent securities and financial regulations
 - Investor relations may be part of the finance department

Communications Department

- Most utilities have specialized groups of professionals who communicate with a variety of audiences such as customers, employees, investors, the media, regulators, and local government officials
- The communications department distributes information to these key constituencies and develops messages for a variety of purposes for inside and outside the organization



Communications Department

- Staff members of the communications department draft press releases; write speeches; oversee financial reports for investors and the regulatory community; develop marketing brochures; create customer bill inserts; and participate in community relations efforts
- The department also manages policies for internal email usage

Community Relations

- Community relations is the department that organizes the utility's formal interactions with the community in which it resides. Regulators have increasingly asked natural gas utilities to be socially responsible, meaning involved in and responsible for achieving social goods over and above profits



Community Relations

- Natural gas utilities frequently provide energy efficiency programs at no cost to the community and provide educational and safety programs in the local schools
- Other examples of utility community relations activities include charitable contributions, organizing volunteer programs, providing equipment and services for a community event, lending staff and executives to civic causes, and the establishment of scholarship or training programs
- Community relations may be part of the communications departments

Fleet Operations

- Natural gas utilities perform many field operations including maintaining and repairing distribution and service lines, staffing and inspecting gate and compressor stations, reading and servicing meters, and visiting customer locations
- All of these functions require the use of company motor vehicles, and utilities maintain a fairly sizable fleet of pick-up and larger trucks plus sedans



Fleet Operations

- Many of these vehicles are housed, maintained and fueled at centralized company garages
- Today, a large percentage of the company fleet may very well be fueled by natural gas



NGV
NATURAL GAS VEHICLE

Sales & Marketing

Sales and Marketing Department

- The sales and marketing departments help the utility sell natural gas
- May also be called Growth & Retention Department
- Although utilities face no competition for delivery service within their service area, utilities face plenty of competition from other sources of energy.

Sales and Marketing Department

- The sales and marketing department works with commercial and industrial customers, as well as with new residential customers, to acquire, maintain, and expand sales relationships, and is usually the first point of contact that customers have with the utility



Energy Efficiency

- EE may be part of Sales or separate Department
- Energy efficiency means using less energy to accomplish the same task
- With energy efficiency, customers spend less money for natural gas on their homes, businesses, and industries
- Energy efficiency may allow natural gas utilities to delay or reduce their need to expand, upgrade or replace pipelines and equipment

Energy Efficiency

- Energy efficiency programs can include:
 - Cash rebates and financial incentives for customer investments
 - Specific programs directed at helping low-income customers
 - Joint programs with other electric and natural gas utilities
 - Efficiency loans
 - Education campaigns
 - Energy audits
 - Customized retrofits of large facilities
 - The energy efficiency group may be part of the rates, regulatory, public or community affairs department

Risk Management

Risk Management

- Risk management is the practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce the risk
- The natural gas utility is exposed to many risks, some common to all businesses and some unique to the natural gas distribution sector



Risk Management

- Utilities employ a wide range of actions and processes to minimize and control their exposure to physical, cyber, financial, and legal risks
- These actions vary so greatly that the function of risk management is widely dispersed throughout the utility organization

Risk Management Types

- Property Risks

- Property damage risk is mitigated by instituting anti-theft and fraud protection programs, insuring property, and practicing vigilant safety practices. Distribution and finance play roles in managing these risks

- Personnel Security

- The legal department oversees risks associated with personnel and may have ultimate responsibility for the utility's overall risk management strategy

Risk Management Types

■ Price Volatility – Hedging Programs

- The finance or gas supply department manages the risk of natural gas price volatility by hedging their gas supply
- More than half of utilities in North America reduce their customers' exposure to the risk of commodity price fluctuations by hedging the purchase price of the natural gas they acquire on behalf of their firm sales customers
- Utilities must have expertise in financial instruments and markets to receive regulatory approval to engage in hedging practices, and regulators do not allow utilities to earn money by speculating on future market movements of natural gas prices

Summary

- The natural gas distribution utility performs a wide variety of business functions, some common to all businesses and some unique to natural gas utilities
- These business functions are performed by various departments that contribute to the company's overall mission and goals
- Each utility decides for itself which business functions will be performed by which department

Thank You



**ENERGY
SOLUTIONS
CENTER**

400 North Capitol Street, 4th Floor
Washington, DC 20001

escenter.org