



Corporation Commission

The Pipeline Industry and Natural Gas Pipeline Safety Regulations in Kansas

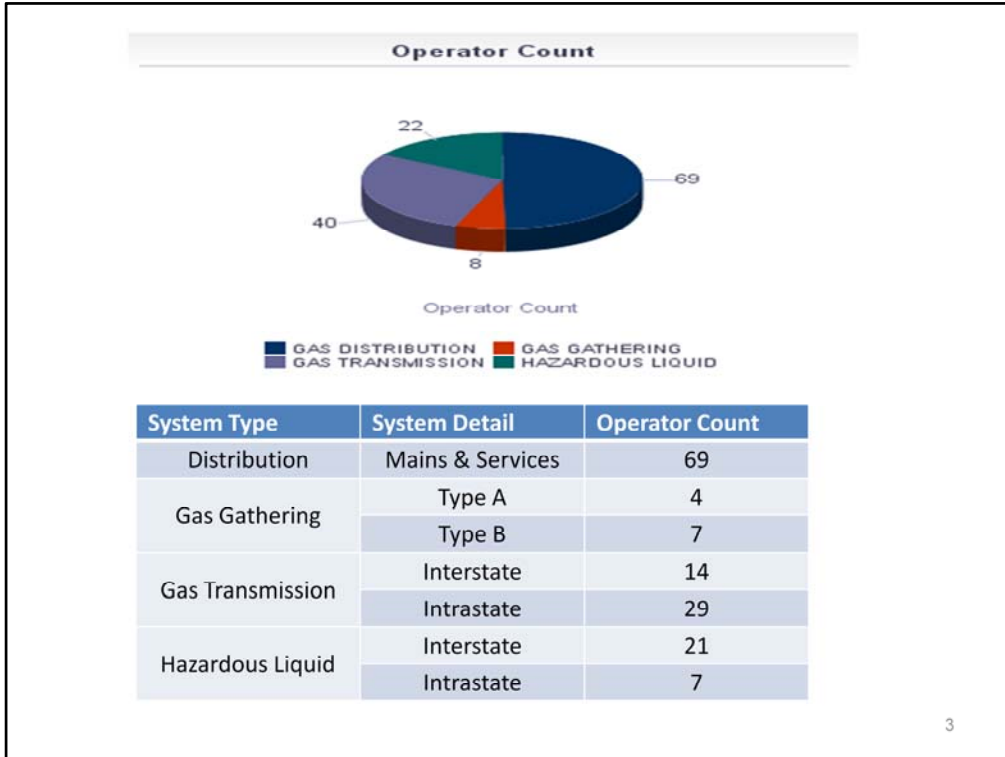
Leo Haynos, Chief of Gas Operations & Pipeline Safety

Pipeline Transportation

- Transportation Regulated for Safety
 - Hazardous or Highly Volatile Liquids
 - Flammable Gas
 - Affects Interstate Commerce
 - Gas Gathering jurisdictional, but not regulated
 - PHMSA regulations choose to not regulate low pressure gas gathering in rural areas.
 - Underground Storage jurisdictional, but not regulated by PHMSA.

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Pipeline safety regulations apply to all pipelines that transport either flammable gas or hazardous liquids where the product affects interstate commerce. For example, the piping within a refinery or within a school campus are not subject to pipeline safety regulations because they do not affect interstate commerce. There are some segments of the industry that PHMSA at this point in time chooses to not regulate: Gas gathering in rural areas and underground storage wellbores.



This slide is taken from PHMSA data. It shows the number of operators within Kansas. Kansas only has authority over intrastate natural gas pipelines. Of those listed, Kansas has authority over 70% of the pipeline operators in the state.

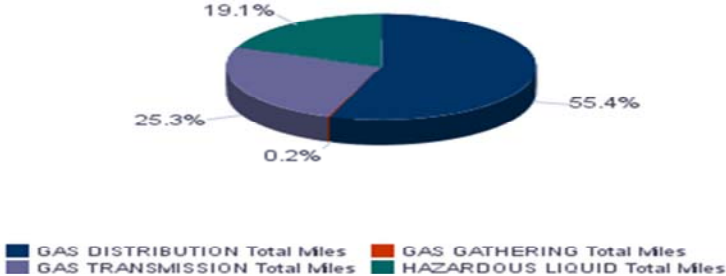
KANSAS REGULATED PIPELINE MILEAGE		
System Type	Detail	Total Miles
Gas Distribution	Mains	21,770
	Services	9,463
Gas Distribution Total		31,233
Gas Gathering Total		97.4
Gas Transmission	Interstate	11,732
	Intrastate	2,550
Gas Transmission Total		14,281
Hazardous Liquids	Interstate	9,343
	Intrastate	1,410
Hazardous Liquid Total		10,753

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Of the 56,000 miles of pipeline in the state that are jurisdictional and regulated for pipeline safety, Kansas has oversight of about 60% of the mileage. Note this is for regulated lines only. There is a significant amount of gas gathering pipelines that are jurisdictional but not regulated.

KANSAS PIPELINE MILEAGE JURISDICTIONAL FOR PIPELINE SAFETY

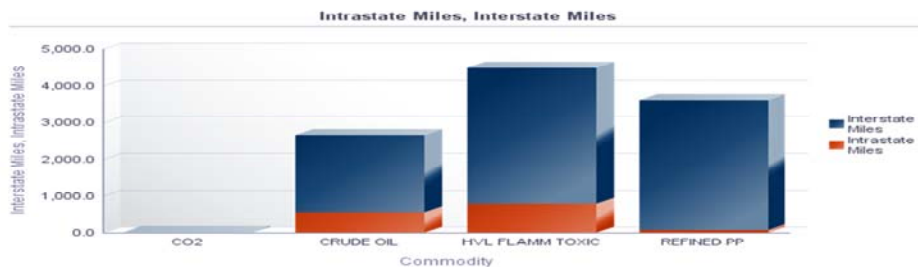
Total Miles



This slide gives a good depiction of the regulated gathering compared to the remainder of the pipelines. Gas Distribution would be expected to be the highest amount of regulated mileage because it is in high population density areas.

Liquid Pipelines Federal Jurisdiction

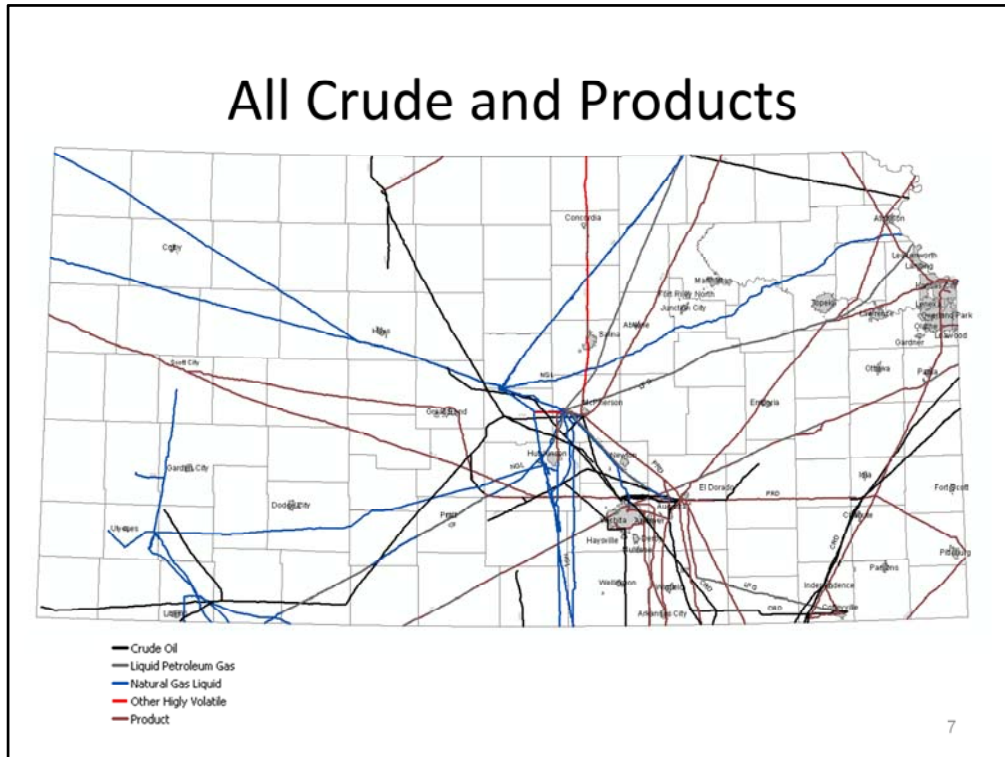
Commodity	Interstate Miles	Intrastate Miles	Total Miles
CO2	8.3		8.3
Crude Oil	2107	560	2667
Highly Volatile Liquids	3693	788	4481
Refined Petroleum Products	3634	63	3597
Grand Total	9343	1410	10753



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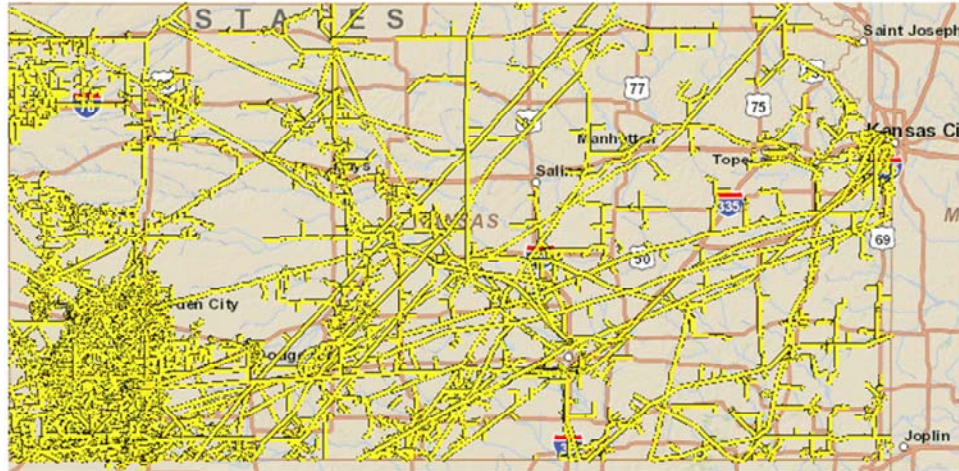
This slide provides additional PHMSA data on the liquid pipelines in Kansas. Even though there are 1410 miles of intrastate liquid lines, Kansas has never asked for the authority to regulate those lines so the enforcement of pipeline safety for intra and inter state lines remains with PHMSA.

All Crude and Products



This is a rough map of liquid pipelines in Kansas. If you think of the oil refinery history in Kansas, you can get a picture of how these developed. The main point of confluence in these lines is Conway Kansas just west of McPherson. This area has a significant amount of storage for natural gas liquids such as propane. Belvue Texas and Conway Kansas are two of the most important hubs for NGL marketing in the United States.

Kansas Natural Gas Pipelines

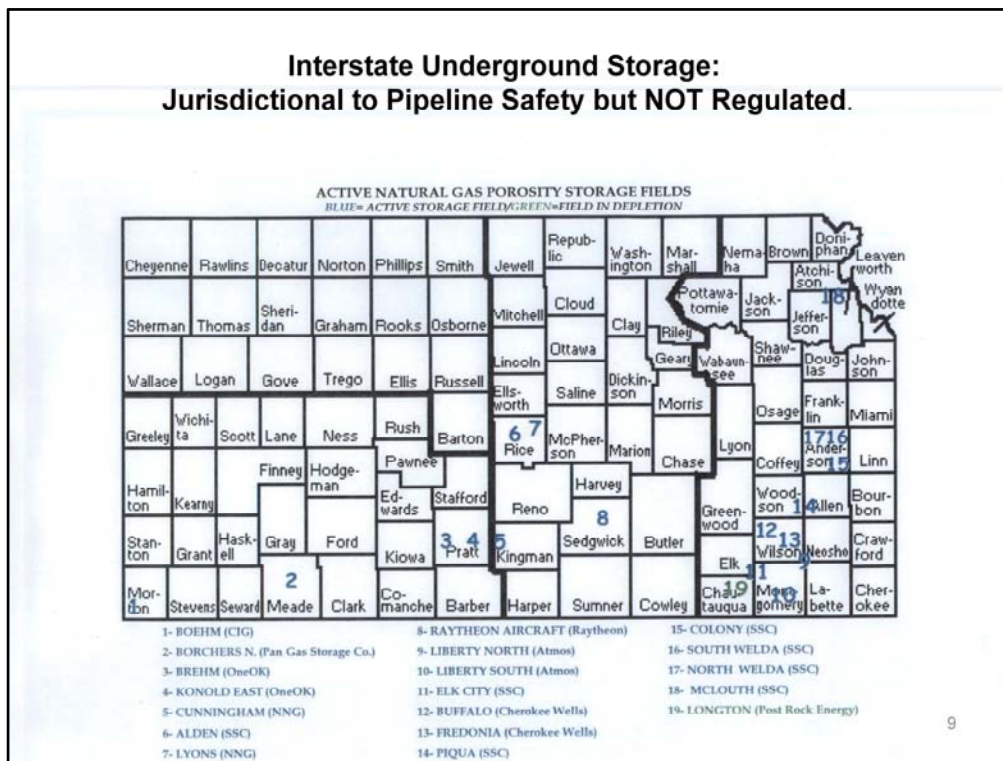


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This map of Kansas Natural gas pipelines is taken from a screen shot of a mapping program. At this scale it's difficult to interpret but it does show two very important aspects of Kansas gas pipelines. Number one is the importance of the Hugoton gas fields to the Kansas industry. The yellow spot on the southwest corner of the map symbolize the gas gathering systems that we have in our database. There are considerably more gathering systems that are not depicted on the map. Virtually none of these lines are regulated for pipeline safety or One Call.

The second important item is the southwest to northeast orientation of pipelines. Kansas natural gas supply is typically served from the Southwest gas fields. Only recently has there been significant contributions from the Colorado and Wyoming Rockies.

Interstate Underground Storage: Jurisdictional to Pipeline Safety but NOT Regulated.



Underground storage wellbores used for natural gas is another are that is jurisdictional to pipeline safety but not regulated by PHMSA. Kansas regulates the few intrastate storage wellbores under the KCC Conservation Division, but the interstate storage wellbores remain unregulated. PHMSA has recently begun to take comments on how to go about regulating those wellbores. The KCC has filed comments asking PHMSA to consider changing the law to allow states to regulate these storage wellbores rather than promulgate federal regulations.

Economic Impact of Kansas Natural Gas Distribution Systems

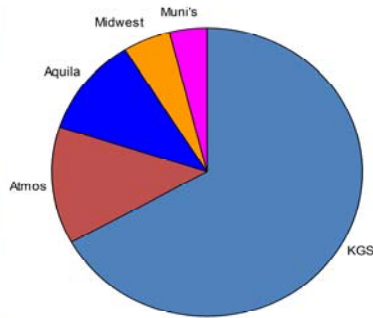
Company	Communities Served	Customers Served	Through Put BCF per Year	Total Investment MM\$
Single Municipal	62	36,600	4	
Midwest Energy	75	41,300	10.7	71
Black Hills	66	108,000	27	205
Atmos Energy	108	125,300	20.7	250
Kansas Gas Service	339	630,000	135	700
TOTALS	650	941,200	197	1226

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Distribution systems are the largest portion of Kansas Pipeline safety efforts. And the gas distribution industry plays a significant role in the Kansas economy. Serving 650 communities across the state and 940,000 customers. Annual gas throughput is approximately 197 Billion cubic feet of gas. The larger independently owned utilities and Midwest, a large cooperative, have approximately 1.3 Billion dollars of investment in facilities serving this industry.

Kansas Operators

Customer Share

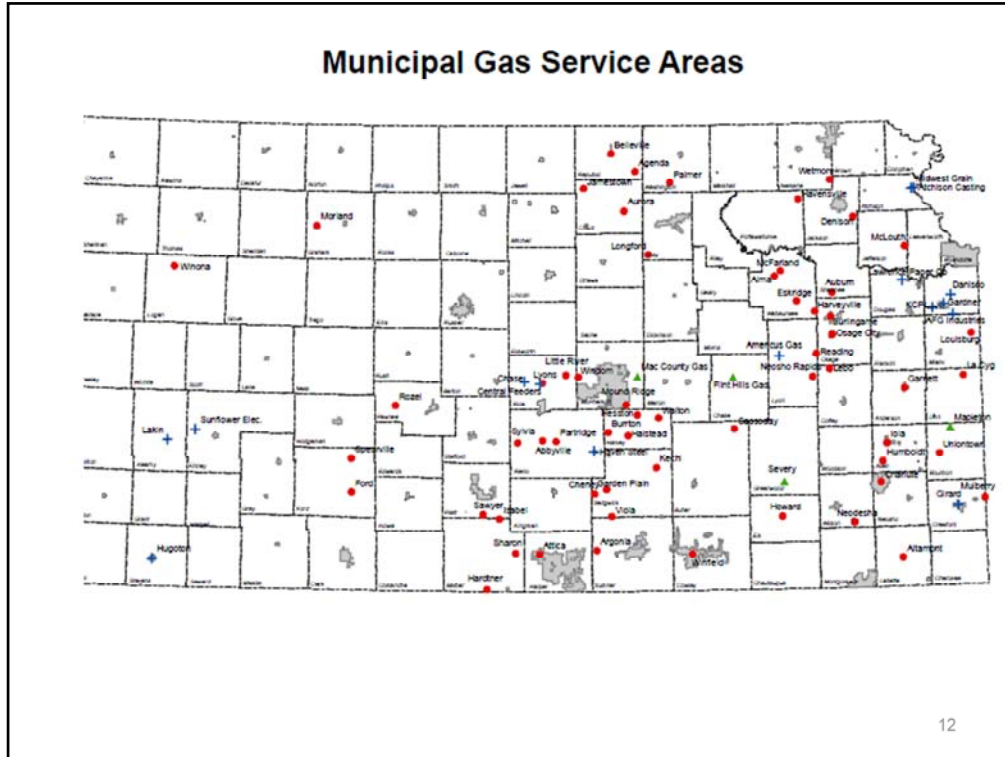


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Kansas Gas service is by far our largest regulated utility followed by the other private companies.

This little sliver of municipal operators represents about 4% of the customer share and yet they account for 80+% of our work load. There are 62 municipal systems that are subject to pipeline safety jurisdiction.

Municipal Gas Service Areas



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This map shows the municipals across the state as red dots. The gray areas are municipal electric systems. Generally speaking we have a concentration of municipal operators in the Northeast part of the state and in the South Central part. All told, a little over 35,000 customers.

Standards: The Beginning of Pipeline Safety Regulation

- **On March 18, 1937, a large natural gas pipeline explosion in a schoolhouse in New London, Texas.**
- **Killed 298 children.**
- **Texas law required odorants to be added to natural gas.**
- **Other states passed similar odorant requirement laws.**
- **In 1947, the industry established the "Air & Gas Piping Specifications" for the design and operation of gas pipelines.**

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Almost all safety programs are born out of tragedy and Pipeline Safety in the United States had a similar beginning. On March 18, 1937, the on/off switch from a sanding machine in a shop class ignited natural gas from a leaking boiler. The ensuing explosion caused 298 deaths. A pipe inside the building had been leaking and there was no odor in the gas.

Standards: The Beginning of Pipeline Safety Regulation

- **1951: A gas main pressure regulator failed in Rochester, New York causing a series of explosions that last for 4 hours. 3 people were killed, and 30 homes were destroyed.**
- **As a result , ASA established B31.8 "Gas Piping Specifications" in 1952.**

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Another significant explosion 14 years later resulted in the establishment of the engineering standard B31.8 which remains the backbone of pipeline safety construction standards. ASA was the American Standards Association which later became the American National Standards Institute or ANSI

Standards

- ▣ **Pipeline companies followed these standards for the design, construction, and operation of pipelines on a voluntary basis.**
- ▣ **During the peak period of pipeline construction (late 1950's through the mid-1960's), several states adopted regulations for pipelines as they were built across their areas.**

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Until this time, compliance with the construction standards was voluntary. But with the peak construction of pipelines in the 1950s, several states began to adopt regulations to provide for public safety within their state.

Standards

- **Twenty-five of twenty-six states that had adopted pipeline safety codes for gas pipelines used the ANSI Code B31.8 "Pressure Piping, Gas Transmission and Distribution Systems."**
- **Kansas adopted B31.8 code in Docket 34,856-U on January 16, 1961**
- **Meter testing and gas quality requirements from this docket still considered in effect today.**

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Kansas adopted the B31.8 code in 1961 and became one of the 25 states that had done so. In the early 1960s, the industry began to advocate for federal oversight because of the concern about the construction standards potentially changing every time the pipeline crossed a state line. This is a similar argument made by interstate companies today regarding the effort to regulate storage wellbores for underground gas storage.

Regulation Natural Gas

- ▣ **The Natural Gas Pipeline Safety Act (NGPSA) was adopted August 12, 1968.**
- ▣ **The result of a catastrophic gas pipeline failure from stress corrosion cracking that resulted in 17 deaths in Natchitoches, LA.**
- ▣ **Established the authority for government to oversee and regulate pipelines transporting natural gas and other gases by pipeline.**

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After yet another significant explosion in Louisiana, Congress adopted the Natural Gas Pipeline Safety Act in 1968. This regulation for the most part continued to adopt the B31.8 engineering standard.

This authority gave the federal government the right to oversee all pipelines whether interstate or intrastate that are transporting gas.

Regulation Natural Gas

- ▣ **Some of the requirements established in the NGPSA included:**
- ▣ A federal enforcement group to oversee pipelines (OPS).
- ▣ **A certification process with states to oversee and enforce the regulations for gas pipelines within that state.**
- ▣ Adopt "minimum safety standards" for all gas pipelines.
- ▣ Enforcement actions and civil penalty limits.
- ▣ Technical Pipeline Safety Standards Committee (TPSSC).

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The NGPSA is a little different than many federal rules in that it requires the federal government to relinquish its authority to the states if the states can successfully pass a certification requirement with the federal agency. It also requires the establishment of a technical standards committee to advise on regulatory initiatives. The committee is comprised of state, industry, and federal agency members.

Regulation Natural Gas

- ▣ **Who pays for the NGPSA?**
- ▣ **Assessment on interstate natural gas transmission lines.**
- ▣ **Money allocated for state programs by Congress can not be used by USDOT for other purposes.**
- ▣ **Congress allows Federal reimbursement up to 80% of State's program costs.**

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The federal pipeline safety program and the states' reimbursement are paid for by an assessment on the interstate gas transmission mileage. In its approval of the budget, Congress sets the overall amount of money that will be available to fund state programs.

Authority

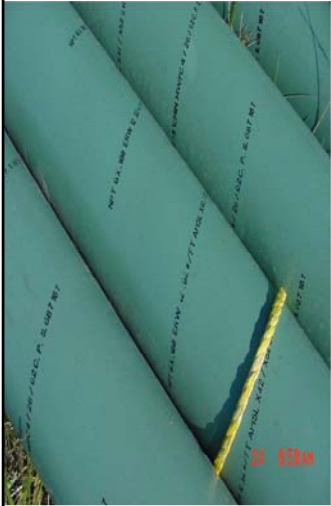
- ▣ **Administered by the Pipeline and Hazardous Materials Safety Administration (PHMSA) established on February 20, 2005.**

- ▣ **The Office of Pipeline Safety (OPS) , under PHMSA, has the oversight authority over pipelines that transport gas in the U.S.**

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- ▣ The Pipeline and Hazardous Materials Safety Administration is the agency within DOT that has authority over pipeline safety. This applies to all gas that is in transportation and affects commerce.

Jurisdiction



- Pipeline Safety authorized by USC 60-101 et seq.
- States agree to adopt federal regulations
- US DOT allowed to fund up to 80% of operating expense
- US DOT annually certifies the states' oversight

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The federal law establishing the NGPSA is found in USC 60-101. If the states agree to adopt the federal regulations, DOT will fund up to 80% of the operating expense. To make sure we are spending their money wisely, the federal side inspects us every year to certify we are doing what we agreed to do.

Jurisdiction



- KSA 66-1,150 adopts federal code
- Jurisdiction over all pipelines that “transport” flammable gas.
- Gathering lines
- Transmission lines
- Distribution piping
- Customer piping from meter to building wall.

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Kansas adopts the federal code in 66-1,150 with jurisdiction over transportation of all flammable gas. This is almost all natural gas but we do have one Hydrogen pipeline associated with Vulcan chemical down in Wichita. The rules vary for the segments that make up a piping system starting with gathering lines through distribution lines. Kansas also has jurisdiction over customer piping from the meter to the building wall of single family residences. This jurisdiction was taken after a series of house explosions in the late 1980's

49 CFR Part 192

- ▣ General : *(Describes the scope of what is regulated)*
- ▣ Materials
- ▣ Pipe Design
- ▣ Pipeline Components
- ▣ Welding
- ▣ Joining Other Than Welding
- ▣ Construction of Mains and Transmission Lines
- ▣ Construction of Service Lines
- ▣ Corrosion Control
- ▣ Testing
- ▣ Uprating
- ▣ Operations
- ▣ Maintenance
- ▣ Operator Qualification
- ▣ Pipeline Integrity Management

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These are the parts of the federal code. You can see the first 8 parts are concerned with facility construction which follows the old ANSI code. The remaining 7 parts deal with operations and maintenance of existing facilities.

Kansas Pipeline Safety Initiatives Beyond Federal Requirements

- Jurisdiction over residential customer piping.
 - (maintenance responsibility assigned to operator).
- More frequent leak surveys.
- More frequent monitoring for corrosion.
- More frequent patrolling of system.
- Cast iron pipe replacement plans.
- Unprotected steel main replacement plans.
- Unprotected steel service line replacement plans.

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Some of you may recall a series of pipeline accidents that occurred in Kansas in the late 1980s. This series of accidents resulted in the KCC promulgating regulations that went beyond the minimum requirements set in federal regulation. For the most part, we defined terms used in the federal regulations such as “as often as necessary” to mean a set value of time. We also required the companies to develop pipe replacement plans to address aging infrastructure.

Statistics



- 939,000 Meters
- 21,000 miles of distribution
- 2700 miles of transmission
- Annual Inspections
 - 127 Operators
 - 167 Inspection Units

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Kansas distribution operators have just under 1 million meters and 21,000 miles of distribution piping. We have 127 operators spread across the state. Our program does inspections of records for each of these inspection units every two years with the more high profile systems done every year.

The picture shows one of the things we look for. In this case a meter is sinking into the soil and the piping stress is breaking the siding of the house.

Pipeline Safety Oversight



- 5 Inspectors
- 2 Engineers
- 1 Analyst

- 2012 Budget: \$862,000
 - Federal can reimburse up to 80%.
 - 2011 PHMSA reimbursed \$667,500

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We have 5 inspectors, 2 engineers including me, and 1 analyst. Last year we had 700 person days of field work. Our budget is about \$850,000 . As I mentioned the new federal law allows up to 80% reimbursement, and lately Congress has been authorizing sufficient funds to almost meet that amount.

KCC Inspection Statistics 2010

- 700 Person-Days of Field Inspections.
- 98 Operator Inspection-Units Reviewed.
- 88 “Probable Non-Compliances” found
 - 80 pnc corrected.
- 2 Natural Gas Incident Investigations Conducted.

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These statistics are taken from the KCC certification with PHMSA demonstrating we are spending federal money wisely. The 700 person-days of field inspections include inspection of records and documents of 98 inspection units. It also includes time spent on construction inspections across the state and time spent witnessing such tasks as leak surveys.

Pipeline Safety Responsibilities

- Code Compliance
- Incident Investigation



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The two categories of our responsibilities can be broken down into code compliance and incident investigation. Code compliance deals with construction and operating/maintenance requirements.

The pipe in the picture shows a coating damage to a distribution pipeline. Without the coating, the pipe will corrode faster. In this case, we believe the damage was caused by a telecom line passing under the pipe.

Code Compliance



- Construction Inspections
- Operating Procedures
- Maintenance Procedures
- Emergency Response

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For code compliance, we look at how the operator builds their pipelines, how he takes care of them and then how he responds to an emergency. In many ways, it's essentially quality of service for a public utility except there is no customer service or billing oversight. For those operators that are public utilities, we also may respond to customer service issues and pass the information along to others in the utilities division.

Incident Investigation



- What happened
- Was incident related to jurisdictional piping
- Code violations
- Corrective Actions

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Fortunately incidents don't happen very often in Kansas. We average about one per year, but unfortunately, we have recently had two in a period of one month. When they happen, we investigate the causes and if it's related to pipeline safety regulations, we can penalize the operator or request they take action to minimize the chances of this type of incident recurring.

Code Compliance New Mandates



- Operator Qualifications
- Integrity Management
- Distribution Integrity Management
- Public Awareness Plans

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Every four years, congress has to reauthorize the pipeline safety program and over the last few reauthorizations, they have added ambitious new initiatives to the program. One of the reasons the federal side authorized up to 80% reimbursement is that most of the gas piping is intrastate distribution. These are the 4 newest mandates from congress..

Aging Distribution Infrastructure



- 116 Miles of Cast Iron.
- 2158 Miles of unprotected bare steel.
- 3319 Miles of protected bare steel.

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The distribution integrity management initiative is the most wide reaching initiative for Kansas distribution systems. The goal of this rule is to develop more proactive responses from the operators toward aging infrastructure. The Kansas initiatives I spoke of earlier have provided these proactive responses over the last 20 years, so Kansas is in relatively good shape. But we still have some old pipe that we need to address. Of most importance are the miles of cast iron we still have to address. All of this piping predates the pipeline safety codes from 1968— almost 44 years ago.

Fitness for Service



- Condition of Piping
- Location of Service
- RISK

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Although some of the piping is getting old, (about 20% of distribution piping was installed prior to 1960), that does not necessarily mean that the pipe is unfit for service. The real answer is – it depends. It depends on the type of piping, the condition of the piping as shown by leak surveys and visual observation, and the location of the piping. If you have older bare steel piping in rural service, there is a good possibility that the condition of the pipe may last for several more decades. If a leak does occur, the rural setting of the pipeline will minimize the probability of a serious accident. On the other hand, piping like cast iron, always found in an urban setting and sometimes difficult to leak survey may have a higher risk to safety.

San Bruno CA September 2010



- 8 Deaths
- 56 homes damaged or destroyed.
- 30" pipeline
 - 385 psi;
 - installed 1956

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The transmission pipeline explosion in San Bruno California was the deciding factor that influenced both the NTSB and Congress in the most recent reauthorization. The focus appears to be moving toward looking hard at aging infrastructure and the concept of fitness for service. In other words, going beyond the minimum requirements that have been in pipeline safety regulations and concentrating on managing the safety of the gas system. How this will be achieved through regulations remains to be seen.

Allentown and Philadelphia Pennsylvania

- January 2011 Philadelphia PA:

- 68 year-old cast iron pipe fails killing one gas worker and destroying home.

- February 2011 Allentown PA:

- 83 year-old cast iron pipe fails killing 5 and destroying or damaging several homes.



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Two other explosions played a significant role in the reauthorization. These occurred about 1 year ago in Pennsylvania. Both involved the failure of cast iron piping in urban areas. Cast iron pipe is a greater concern in eastern states, but Kansas still has over 100 miles of the pipe.

Other Statistics: Philadelphia Pennsylvania

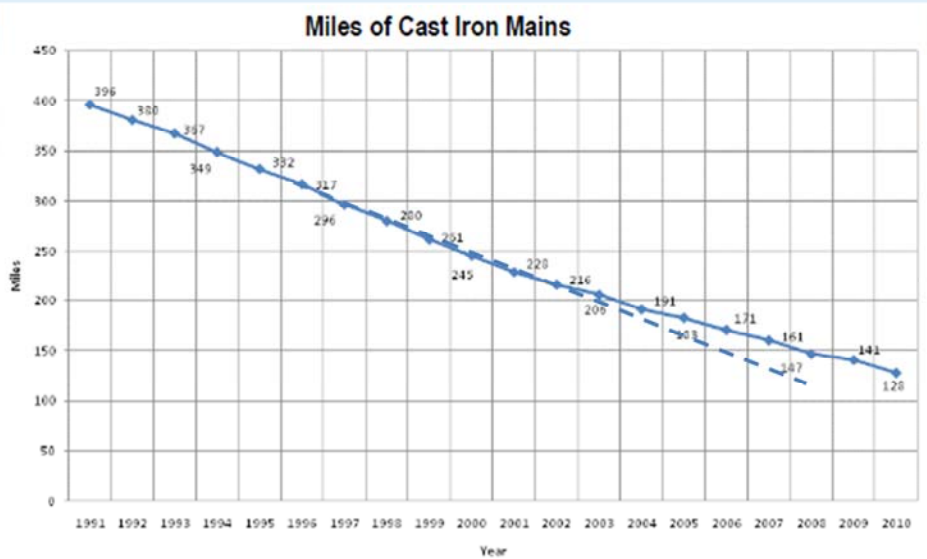
- 25% of piping was installed before 1920.
- 2000-2600 leaks per year on cast iron piping.
- 1100 city blocks with three or more cast iron breaks.
 - Source: Philadelphia Enquirer story

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But Kansas also has had a requirement that companies have a pipe replacement plan that replaces pipe based on the number of leaks found. Basically, each time a leak is found in cast iron that was the result of “graphitization” or corrosion, 500 feet or roughly one city block of pipe must be replaced. This type of regulation has removed much of the old pipe from our systems, but there is still some left that needs to be looked at.

Kansas Gas Service

Miles of Main



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Requirements of KCC regulations that each company have a cast iron pipe replacement plan and the safety culture of KGS in general have significantly reduced the amount of cast iron in service in Kansas. Today there is an estimated 116 miles of cast iron. 112 in the KGS system and 4 miles in Neodesha.

Gas Safety and Reliability Surcharge (GSRS)

- Passed by Legislature in 2006
- Allows costs for pipe replacements done as a safety requirement to be recovered as a surcharge.
- Cast iron replacement costs range from \$18/foot to \$50/foot.

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Replacing pipe comes with a cost. Six years ago this legislature passed what is known as the GSRS and I believe it has been an effective tool to assist the operators in recovering costs for pipe replacement projects. Because cast iron is located in cities, it generally has higher costs associated with replacement. The costs listed here are from a 2010 filing of KGS for some cast iron replacement projects.

NGPSA Reauthorization

- ▣ Some of these additions have been the requirement to develop new regulations or to conduct studies to see if additional regulations may be required.
- ▣ These changes have been prompted from several different sources - from within the federal government, from the general public, and several based upon NTSB findings and recommendations.

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As discussed earlier, most changes to pipeline safety laws always follow spectacular accidents. And that still holds true today. The changes are often prompted by the National Transportation Safety Board which investigates accidents and makes recommendations to Congress. There are also consumer advocate groups now that focus on pipeline safety and also have some impact on new requirements being placed in law. San Bruno and the two Pennsylvania incidents all happened when the pipeline safety act was being considered for reauthorization.

Transportation Act

- ◆ Pipeline Safety Improvement Act Expired in 2006.
- ◆ Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006 Expired in 2010.
- ◆ Pipeline Safety, Regulatory Certainty & Jobs Creation Act of 2011.

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The latest act, the pipeline safety regulatory certainty and jobs creation act was signed into law on January 3, 2012. The pipeline safety initiatives in this amendment are directed mainly at transmission pipelines in response to the failure in San Bruno California. The term regulatory certainty applies to the concept that PHMSA must study a problem for two years with industry input before acting on certain proposals. Part of the study will be looking at cast iron pipe and the means of replacing it.

PSRC&JCA

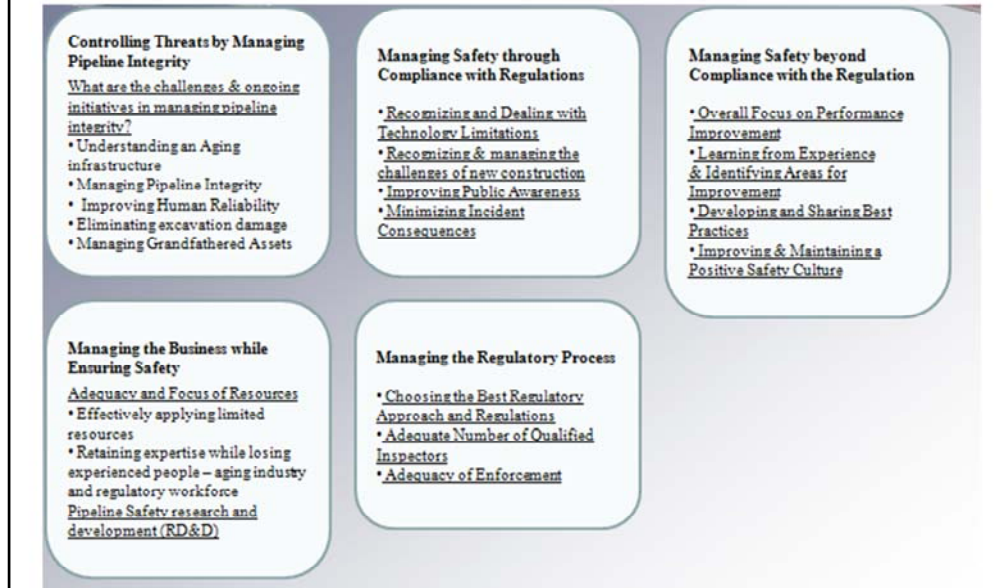
Significant Items

- Increase maximum penalties to \$2 million
 - Kansas currently at \$500,000.
- Withhold funding for One Call grants if excavator exemptions are in state laws.
 - 66-1802(c) provides some exemptions that need to be reviewed and perhaps modified by 2014 or risk loss of funding.

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The impact on intrastate systems are primarily limited to One Call provisions. In this area, Congress has stated that if states have certain exemptions for excavators in their One Call Law, PHMSA will not be allowed to provide the states with funding for One Call programs. The new law also increased the maximum penalty for pipeline safety violations to \$2 million on the federal side. The ability to impose civil penalties is another tool in the enforcement toolbox. At this time, we are planning to ask the legislature to set the maximum civil penalty in Kansas at \$1million which is the previous federal level. If we believe this level is ineffective, we will approach the legislature about raising the limit to meet the federal level of \$2 million. Matching federal penalty limits is a requirement of the federal certification process and we do lose a portion of our funding if we do not match that level.

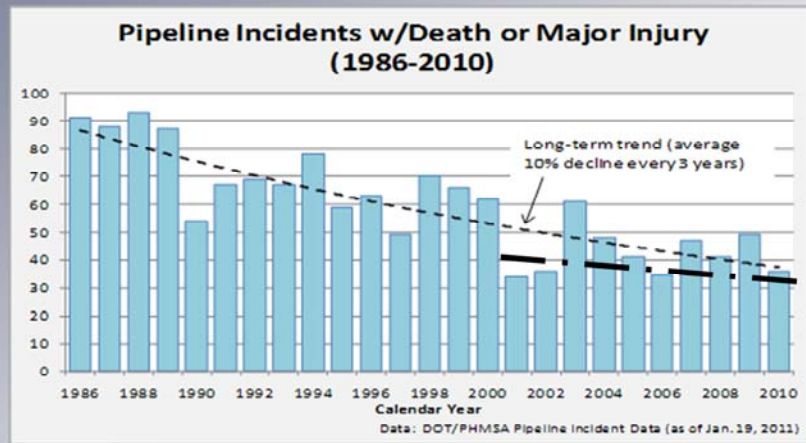
PHMSA Pipeline safety challenges and ongoing initiatives



This slide is difficult to read. It was provided in a PHMSA presentation on their path forward. It gives some ideas that I expect to see in the next few years. I believe there are some good ideas in this list and it provides a valid (although very broad) picture of the industry.

Is the Regulatory Process Successful?

Pipeline Incidents Causing Death or Major Injury Have Trended Downward

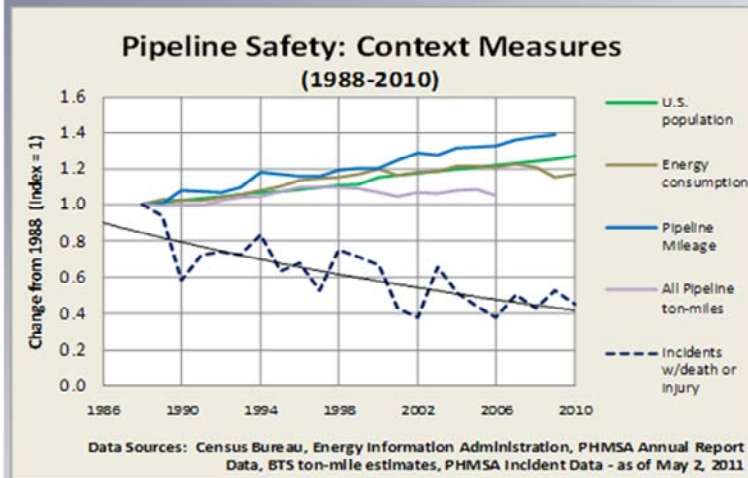


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Overall how is the process working? Nationally, major incidents have declined over the last 14 years. The trend appears to be flattening lately – it remains to be seen if that is an anomaly. One curious note is that PHMSA’s major push in new initiatives began in 2002– which is the same point at which the incident decline rate began to flatten. There are some claims that the decline is really due to more aggressive One Call regulation by the states. While the states each promulgated their own One Call law, PHMSA has aggressively supported this initiative with technical and financial support.

Is the Regulatory Process Successful?

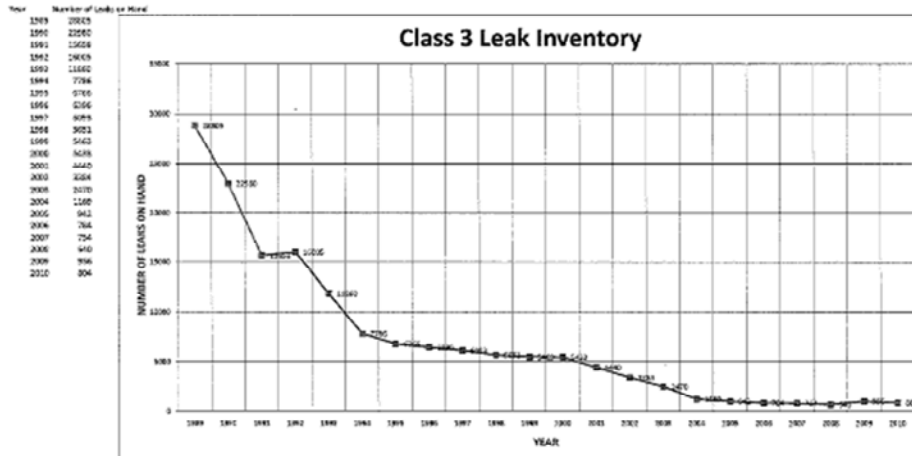
While Energy Demand has increased; Pipeline Incidents that Harm People have decreased



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Another way to look at incident statistics demonstrates that just looking at one parameter does not present a valid picture of the program. The US is continuing to move more energy by pipelines and there are many pipeline projects planned for the US. Generally, I think we can say the program is successful. But the old aging pipe that we are depending on needs to be carefully monitored.

Kansas LDC Leak Inventory



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A good indication of the health of a pipeline system, I believe, is the leak inventory of the system. To me, it makes more sense to focus on preventing leaks— which in turn will control the accident rate. Here is a good success story from one of our large operators. And I think it shows the impact of the KCC pipeline safety program since the late 1980s. Also to give credit where it is due, this type of progress took a lot of commitment on the part of the operator to develop an aggressive safety culture as well. This plot shows a leak inventory from almost 30,000 leaks in 1990 to around 800 leaks in the system today. Class 3 leaks are leaks that occur on a system but present no immediate danger. Federal code allows these leaks to exist; Kansas requires they be repaired within three years of finding them. Most Kansas operators repair them within 6 months.

What's on the Horizon...

Candidate New Initiatives

- Increase the Effectiveness of Lessons Learned Processes
 - *Continue and Expand Incident Cause Analysis and Communication of Implications*
 - *Evaluate What More can be done with Information Sharing*
- Strengthen Public Communications
 - *Expand upon Existing Information Sharing Processes*

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But more can be done. In closing, I picked another slide from a PHMSA presentation that sums up where pipeline safety needs to go. We need to use the data from the incidents that have happened around the nation to understand the root cause of the incident and work to minimize the possibilities of future recurrences. More proactively, the same idea can be applied to preventing leaks. But if we are going to be data driven, we must make sure the data is correct. This can only be done with the communication and cooperation of the industry which we regulate.