Pipeline Safety in Washington State

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Pipeline Safety

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Background & Purpose

WA Department of Ecology

Pig Launchers on a hazardous liquid pipeline near Mt. Vernon, WA

Background

In 1999 a pipeline tragedy in Bellingham, Washington killed three young men playing in a city park, destroyed an entire salmon stream, and provided a wake up call for the need to increase pipeline safety across the nation. In Washington State two new organizations grew out of that tragedy. The first one was the governor-appointed Citizens Committee on Pipeline Safety (CCOPS), created by the governor and the state legislature "*to advise the state agencies and other appropriate federal and local government agencies and officials on matters relating to hazardous liquid and gas pipeline safety, routing, construction, operation, and maintenance.*" The other was the national Pipeline Safety Trust (PST), a non-profit based out of Bellingham, which was created by the victims' families and the community, and funded with four million dollars of the criminal penalties that resulted from that tragedy. The PST was the dream of parents who lost their children in the pipeline failure, and was to serve as a watchdog group over the pipeline industry and regulators alike to try to ensure that another tragedy like Bellingham would not occur again anywhere else. The creation of the PST gained written support from then Washington Governor Gary Locke, the Washington State Utilities and Transportation Commission (WUTC), the Washington State Citizens Committee on Pipeline Safety, state legislators, many local governments, and pipeline safety advocates nationwide.

Purpose and scope of report

The purpose of this report is to provide an easy-to-understand primer of how pipelines are routed, constructed, operated, maintained, regulated, and inspected in Washington State and the shared responsibilities that the pipeline industry, regulators, local government, and citizens have to ensure continued safe operations. The scope is focused on the safe operations of the pipelines themselves and does not get into associated concerns about the impacts from the production or use of the various fuels that the pipelines transport.

To complete the 2017 report, from which this version is distilled, the PST met with CCOPS twice, talked with and received clarification from the WUTC Pipeline Safety Program staff, requested information from Pipeline and Hazardous Materials Safety Administration (PHMSA), and acquired information through three different surveys. The surveys were targeted at three different stakeholder groups – elected officials, emergency responders, and representatives from pipeline companies operating in Washington. The survey questions and results, and other information used to produce this report, can be found on the report's webpage.[1]

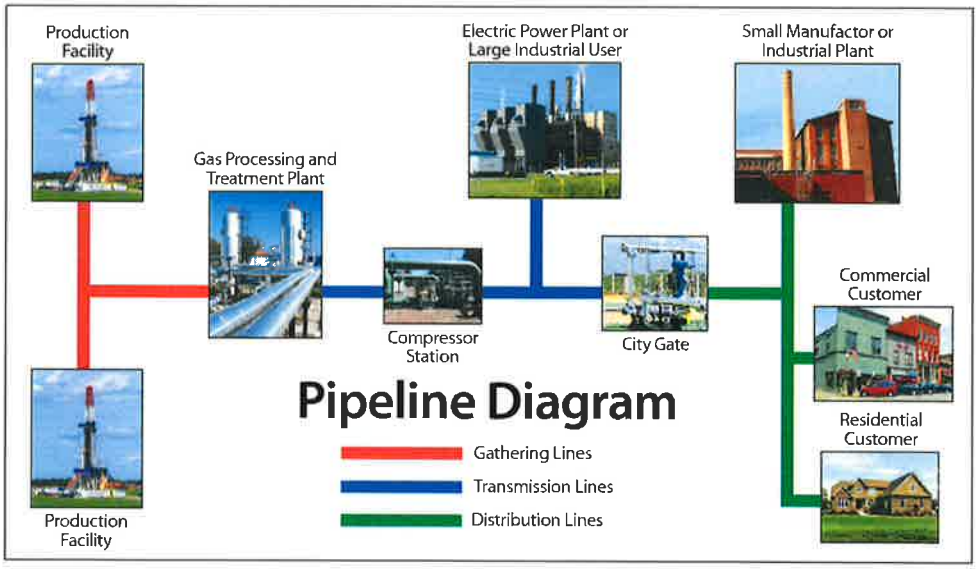
1 Pipeline Safety in Washington State: http://pstrust.org/pipeline-safety-in-washington-state/

Pipeline Basics

Washington UTC

Gas Transmission Pipeline Failure, near Auburn, WA

WHAT KINDS OF PIPELINES ARE IN WASHINGTON STATE?



There are three main types of pipelines in Washington State: hazardous liquid pipelines, gas transmission pipelines, and gas distribution pipelines. This diagram shows a complete natural gas pipeline system, although in Washington State we don't have any production areas or gathering lines. Understanding the different types of pipelines is important because each type of pipeline has different safety considerations and is regulated under different rules by potentially different agencies.

Hazardous Liquid Pipelines: These are the lines that move crude oil to refineries and then move refined products (gasoline, jet fuel, diesel, and by-products) from the refineries to other markets. Highly Volatile Liquids (HVLs) such as propane, butane, etc. that take a gaseous form at normal pressures move through these pressurized hazardous liquid pipelines as liquids.

Gas Transmission Pipelines: These are the relatively larger, higher-pressure pipelines that move gas from storage or post-production processing plants to where the gas is distributed to our homes and businesses. They operate at pressures in the range of 200 to over 1500 pounds per square inch.

Gas Distribution Pipelines: A distribution line is a relatively small, lower pressure pipeline used to supply natural gas directly to our homes and businesses. A distribution line is located in a network of piping located downstream of a natural gas transmission line. The "city gate" is where a transmission system feeds into a lower pressure distribution system. Gas distribution pipelines comprise, by far, the most mileage of pipes; they carry odorized gas (with the characteristic smell of rotten eggs) throughout urban areas.

Table 1: Mileage of Regulated Pipelines – U.S. and Washington*

	U.S.	Washington
Gas Transmission	301,578	1,972
Gas Gathering	17,944	0
Gas Distribution Mains	1,307,735	22,337
Gas Distribution Service Lines	930,877	19,638
Crude Oil	80,528	69
Refined Products	62,751	732
HVLs (like propane, butane, etc)	70,130	5
Total	**2,771,543**	**44,753**

* Data from PHMSA as of 10/30/2019

Another important way that pipelines are differentiated is to distinguish between **interstate pipelines** and **intrastate pipelines.** Interstate pipelines are typically longer transmission pipelines that cross state lines; intrastate pipelines are typically transmission or distribution pipelines that lie wholly within a single state. For more information see: 49 CFR 195, Appendix A.

WHERE ARE THE PIPELINES IN WASHINGTON STATE?

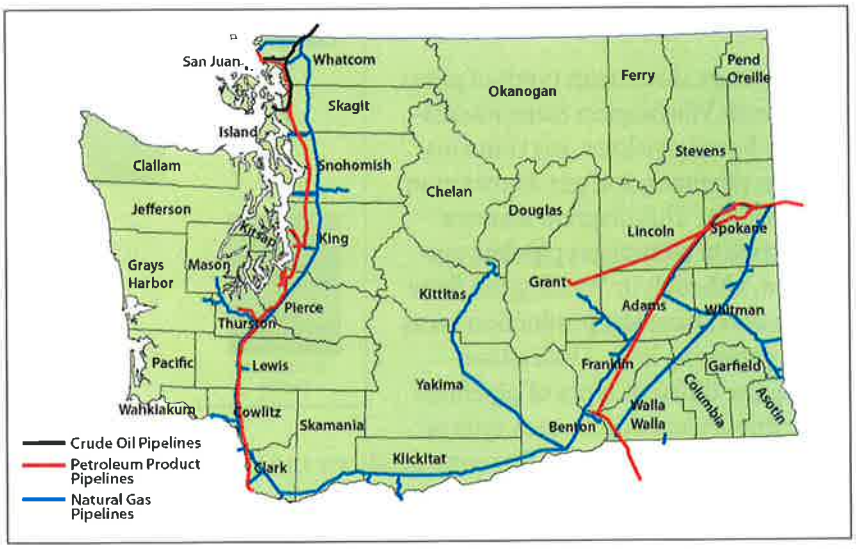
As of 2018, the United States has more than 2.7 million miles of pipelines. As shown in Table 1, most of these (approximately 92%) carry gas — predominantly natural gas — and the rest (approximately 8%) carry hazardous liquids. Hazardous liquid and natural gas pipelines are governed by separate regulations. Whether and how pipelines are regulated also depends on what product is carried and where the pipeline is located.

This map shows the major transmission pipelines in the state. According to the most recent data there are 30 pipeline operators in Washington operating 44,753 miles of pipelines. Twenty of the pipelines carry various gases and 11 carry hazardous liquids such as gasoline, jet fuel, and crude oil. Slightly over 63% by length of the pipelines in this state are made of polyethylene plastic, which is used mainly in the low pressure gas distribution network.

The public may access a more detailed version of the map below, on a county-by-county basis, through the National Pipeline Mapping System (NPMS)[2].

Both systems take practice to navigate, but once a person figures it out it is possible to zoom in to get an idea of where these types of pipelines are generally located and some basic information about the pipelines themselves. While these types of maps can provide an idea of where pipelines are located in a neighborhood, they should never be used as an indication of where it might be safe to dig. The mandatory One Call system — 811 in Washington State — is the only way to identify the exact location of a pipeline, and is discussed in more detail later in this report.

The WUTC provides basic information including individual maps of major pipeline systems in Washington. That information can be found under "List of Pipelines We Inspect" on the WUTC website.[3] You can also find the maps of all the pipeline systems over ten miles long in the state on this report's webpage.[4]



Map of crude oil, petroleum product and natural gas transmission pipelines (Data source: WUTC)

WHO REGULATES PIPELINES

2 NPMS - https://pvnpms.phmsa.dot.gov/PublicViewer/

3 Pipelines WUTC inspects - https://www.utc.wa.gov/publicSafety/pipelineSafety/

4 Pipeline Safety Report Website - http://pstrust.org/pipeline-safety-in-washington-state/

AND WHERE DO THE REGULATIONS COME FROM?

Pipeline Safety Regulations

Pipeline and Hazardous Materials Safety Administration (PHMSA)
Ultimately the U.S. Congress has responsibility for setting the framework for pipeline safety regulations through Title 49 of the U.S. Code in chapters 601 through 605. The U.S. Department of Transportation, through the Pipeline and Hazardous Materials Safety Administration (PHMSA), is primarily responsible for issuing and enforcing the minimum pipeline safety regulations in Title 49 of the Code of Federal Regulations (CFR) in parts 190, 191, 192, 193, 194, 195, 198 and 199. Most of these regulations are performance-based. For example, pipeline operators are required by the federal regulations to operate and repair pipelines in a safe manner so as to prevent damage to persons or property, but the specific way in which they do so is generally not spelled out prescriptively. This flexibility allows pipeline operators to prioritize pipeline inspections and repairs in areas with higher populations or risk factors, but it also makes the regulations more ambiguous and challenging to enforce.

Washington State Utilities and Transportation Commission (WUTC)
The federal pipeline safety laws allow for states to accept the responsibility to regulate, inspect, and enforce safety rules over intrastate pipelines within their borders under an annual certification from PHMSA. If a state receives such intrastate authority they can set regulations that are more stringent than those PHMSA sets as long as the state rules do not conflict with the federal regulations. PHMSA also can enter into an agreement with the state pipeline regulator to carry out inspections on interstate pipelines, although only PHMSA regulations can apply and PHMSA remains in charge of any enforcement that may come out of state-led inspections. Local governments, such as cities and counties, are not allowed to create rules to regulate the operational safety of pipelines, though they may have involvement in emergency response, routing and siting issues, and franchise or easement agreements.

The Washington Utilities and Transportation Commission (WUTC) has received authorization from PHMSA to oversee all intra- and interstate regulated pipelines in the state. There are currently only three other states (Arizona, Minnesota, New York) that have been given this level of authority for both natural gas and hazardous liquid pipelines. The WUTC also oversees three liquefied natural gas facilities, an underground natural gas storage site, propane storage sites, and natural gas master meter systems. Master meters are small natural gas distribution systems operated and maintained by schools, hospitals or by residential complexes such as apartment buildings and mobile home parks.

Regulations and rules related to pipeline safety in Washington State are located in the following sections of Revised Code of Washington (RCW) and Washington Administrative Code (WAC) respectively:

- RCW 19.122: Underground Utilities
- RCW 81.88: Gas and Hazardous Liquid Pipelines
- WAC 480-93: Gas Companies—Safety
- WAC 480-75: Hazardous Liquid Pipelines—Safety

Spill Response Planning and Prevention Regulations

After the Exxon Valdez spill in Alaska, Congress amended the Clean Water Act by passing the Oil Pollution Act of 1990, and put into place requirements for the prevention of, preparedness for, and response to oil discharges, with the goal of preventing oil from reaching navigable waters and adjoining shorelines, and to contain and clean up any spills. Spill response planning is governed by both the Washington Department of Ecology and several federal agencies.

Pipeline and Hazardous Materials Safety Administration (PHMSA)
Under the requirements of the Oil Pollution Act of 1990 and regulations and executive orders implementing it, pipeline operators are required to submit a Facility Response Plan to PHMSA, showing how operators will prepare for and respond to a worst-case discharge from their on-shore pipelines. These plans must be submitted every five years, unless circumstances warrant a new plan sooner than five years. The plan must include procedures for responding to a spill safely and quickly. Copies of these plans may be obtained through a Freedom of Information Act (FOIA) request to PHMSA or a pulbic records request to the Department of Ecology.

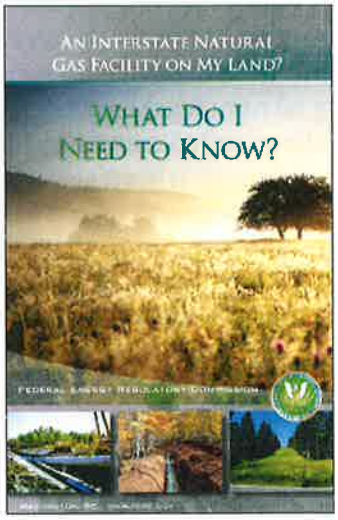
Washington State Department of Ecology
Department of Ecology is responsible for spill response preparedness within Washington State. Plans submitted to Ecology can be the same as those submitted to PHMSA as long as the plans comply with both sets of rules. Plans are made available to the public for a 30-day

comment period and they are available via public records request. Unlike PHMSA, Ecology circulates these plans largely un-redacted. Ecology also requires quarterly reports on the amount of hazardous liquids moved by pipeline. The rules for prevention planning reside in WAC Section 173-180 Facility oil handling standards, 173-182 Oil spill contingency plan, and 173-185 Oil movement by rail and pipeline notification.

Environmental Protection Agency/U.S. Coast Guard
The The Environmental Protection Agency (EPA) is the lead federal response agency for oil spills in inland waters and the U.S. Coast Guard is the lead agency for spills in coastal waters and deepwater ports.

Siting of new pipelines

Federal Energy Regulatory Commission (FERC)
For new interstate gas lines, once the pipeline company has a pipeline proposal and route in mind they must apply to the Federal Energy Regulatory Commission (FERC) for approval. That approval comes in the form of a Certificate of Public Convenience and Necessity. Before that approval is granted, FERC undertakes a complete environmental review that normally includes development of an environmental impact statement.



There is a citizen's guide to the FERC process on its website.[5] The guide describes the FERC process, including when pre-filing occurs, when an application is filed, the deadlines for intervening in the FERC proceeding, and how to find information on the FERC website regarding a particular project.

Energy Facility Site Evaluation Council (EFSEC)
In Washington State, EFSEC is responsible for recommending approval or denial of crude or refined petroleum or liquid petroleum product pipelines larger than six inches in diameter and greater than 15 miles in length. They are also responsible for recommending approval or denial of intrastate natural gas, synthetic fuel, gas, or liquefied petroleum gas pipelines larger than 14 inches in diameter and greater than 15 miles in length. EFSEC recommendations are submitted to the Governor. If EFSEC determines that a proposed pipeline under its jurisdiction will produce minimal adverse effects on the environment and meets its construction and operation standards, the board recommends approval of a Site Certification Agreement (SCA).

WHAT IS THE RISK AND HOW DO THE REGULATIONS ACCOUNT FOR RISK?

Risk is one of those things that one person cannot really define for another, since each person thinks about risks in their own personal way. While some feel that skydiving is a risk worth taking, others won't even go up in the airplane. In other words, it is not possible for us to tell others whether the pipelines in Washington State are safe enough. All we can do is to try to provide enough information so individuals can make that decision on their own, and then work with others in their community to set policies based on the beliefs of as many people as possible.

Risk is made up of two different factors both of which need to be carefully considered when deciding how risky an activity is. Those factors are the probability that an event will occur (chance a pipeline will rupture or leak), and the possible consequences if it does.

Probability
First let's take a look at some of the publicly available data to try to get a sense of the probability of a pipeline incident occurring in Washington State.

PHMSA maintains a database of a variety of different incident types.[6] In this section of the report we are using the "Significant Incident" data from PHMSA which is based on the following criteria:

1. Fatality or injury requiring in-patient hospitalization
2. $50,000 or more in total costs, measured in 1984 dollars
3. Highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more
4. Liquid releases resulting in an unintentional fire or explosion
5. Does not include gas distribution incidents caused by a nearby fire or explosion that impacted the pipeline system

Table 2 shows the number and some of the consequences

5 FERC Website - http://www.ferc.gov/for-citizens/citizen-guides.asp

6 See https://www.phmsa.dot.gov/data-and-statistics/pipeline/data-and-statistics-overview for both online pipeline incident data and downloadable files.

of all the significant incidents in Washington since 1997. The biggest and most costly pipeline failure occurred in 1999 when two boys and a young man were killed in a pipeline rupture and explosion in Bellingham.

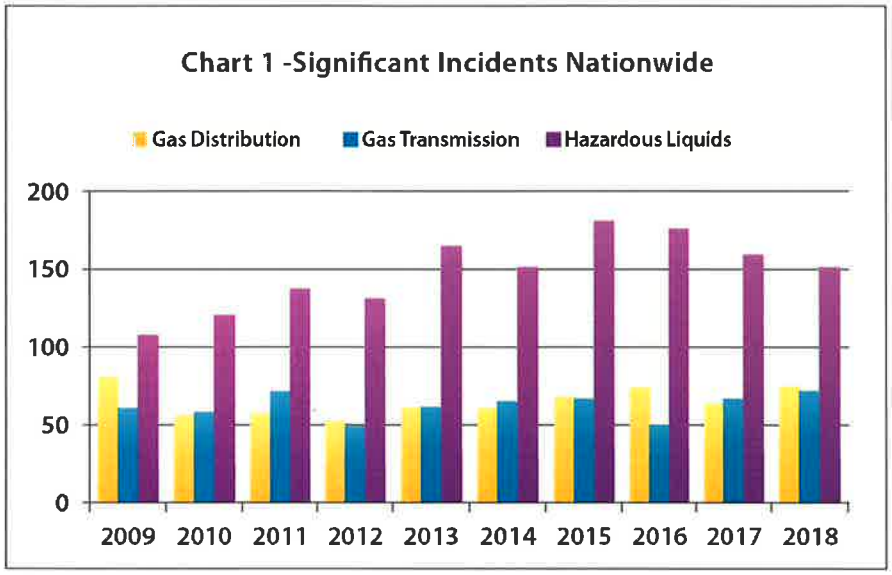
It is difficult to evaluate how Washington's statistics compare to national averages, or the probability of a failure in Washington, because Washington has had so few failures in the past 20 years that trends cannot really be determined. Charts 1 and 2 show the significant incidents over the past decade where it does appear that nationally the number of incidents is increasing on hazardous liquid pipelines (while the amount spilled is actually decreasing). There is no real discernable trend on any of the different pipeline types in Washington.

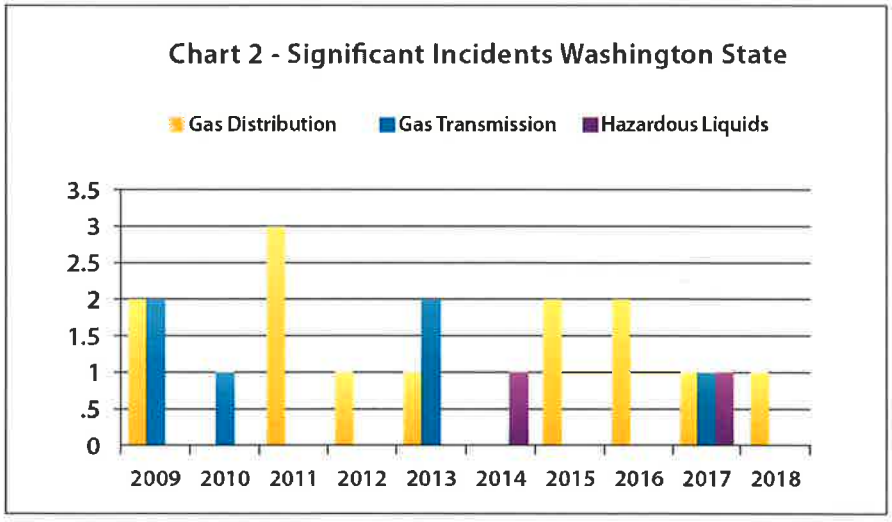
On the webpage for this report we have provided a list of all the individual reportable incidents on all pipelines in Washington State since 1997 with the significant incidents highlighted, and from that list it is clear that significant incidents are relatively uncommon. The bottom line is that the probability of a pipeline failing in any specific location is very, very small.

One other consideration is the cause of pipeline failures. Charts 3 and 4 on the following page compared the causes of significant failures on all pipelines over the past decade both nationally and in Washington. Remember again that there have been so few failures on pipelines in Washington State that drawing too many conclusions from the data only from this state is hard to do, but there are a couple of things to note here. One is that while nationally a significant cause of failures is corrosion, we have seen no corrosion failures in this state. The other is the large percentage of failures caused by "other outside force" damage. Both in this state, and nationally, this cause percentage has increased in the last decade and for distribution pipelines is now the second leading cause of significant incidents. Most of these incidents are caused by vehicles driving into gas infrastructure, such as the gas regulator shown hanging in a driveway in the picture on the following page.

Table 2 - Washington Significant Incidents 1999 - 2019

	Number of Incidents	Number of Deaths	Number of Injuries	Property Damage	Gallons Spilled
Hazardous Liquids	8	3	8	$71,836,388	311,514
Gas Transmission	12	0	0	$8,279,519	
Gas Distribution	19	1	10	$6,834,086	
LNG Facilities	1	0	0	$49,428,938	
Totals	40	4	18	$136,378,931	311,514





Consequence of failures

For natural gas pipelines, it is fairly easy to predict a potential impact zone around a pipeline failure that ruptures and ignites. The federal regulations use a formula based on the size and pressure of the pipeline that predicts the "potential impact radius," and that radius is then used to define some elements of the regulations. Chart 5 depicts the relationship between pipe size and

Chart 3 - Significant Incident Cause Breakdown 10 Year Average (2009-2018)

System Type: All **State:** Washington

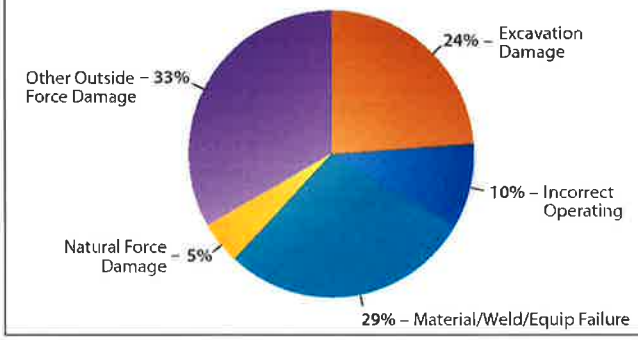
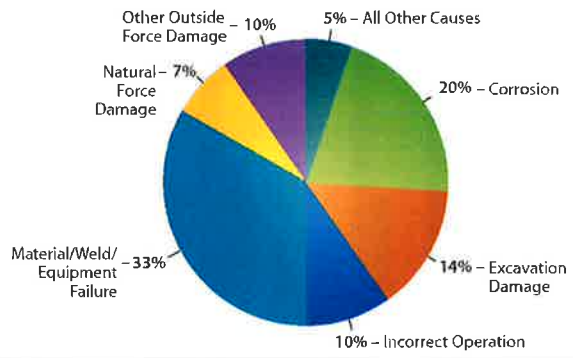


Chart 4 - Significant Incident Cause Breakdown 10 Year Average (2009-2018)

All Pipelines Nationwide



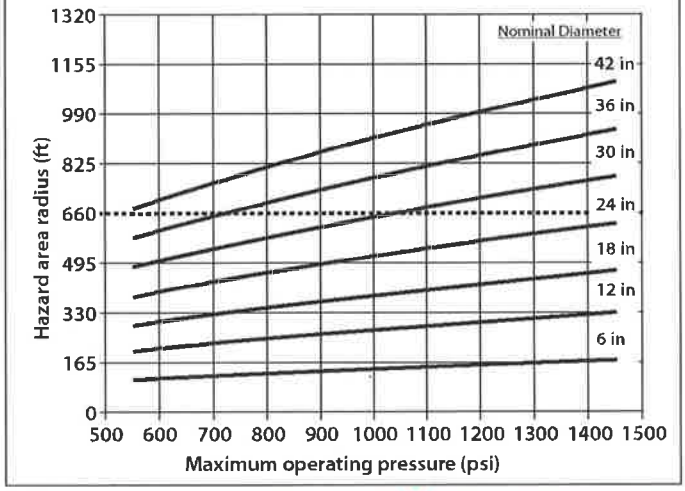
Gas infrastructure vulnerable to outside force damage.

pressure that determines this potential impact radius,[7] and the associated graphic shows how that radius can be used to consider the potential impacts of a gas transmission pipeline failure on a particular area.

For hazardous liquid pipelines, predicting the consequence area is much more difficult because of the different products involved and because the products may flow long distances based on the terrain and whether they reach water. While each pipeline operator is required to do an analysis of whether a failure along any section of the pipeline could affect a high consequence area, that information is not shared with the public. The best that the public can do is to look at their own area and compare that with the consequences of past liquid failures. In our own state, the 1999 Olympic Pipe Line failure in Bellingham is a good example of what is possible. In that failure gasoline flowed nearly two miles down a creek until ignition took place killing every living thing within and near the creek, including two boys and a young man.

The National Transportation Safety Board investigates many of the most significant incidents and the reports of their investigations are publicly available[8] and serve as a clear example of the consequences when pipelines fail. These photos from major failures on the three different types of pipelines here in Washington also show potential consequences.

Chart 5



Example of potential impact radius.

7 A Model For Sizing High Consequence Areas Associated With Natural Gas Pipelines - http://pstrust.org/docs/C-FERstudy.pdf#search=%22C-fer%22

8 NTSB Pipeline Investigations - http://www.ntsb.gov/investigations/AccidentReports/Pages/pipeline.aspx

How the regulations address varying risks
Pipelines in more densely populated areas, and areas that are unusually sensitive to environmental damage from hazardous liquid releases, are called out in the regulations for extra attention. These are often referred to as High Consequence Areas (HCAs).

For natural gas pipelines HCAs are determined by population density, and to a large part that is determined by the class location. The class locations defined in the gas pipeline regulations consider the area within 220 yards of any given 1-mile stretch of a pipeline:

- Class 1: rural areas with ten or fewer homes/ apartments;
- Class 2: an area with more than 10 but fewer than 46 homes/apartments;
- Class 3: an area with 46 or more homes/apartments, or areas of public assembly that regularly are occupied by 20 or more people; and
- Class 4: where buildings with four or more stories above ground are prevalent.

Most HCAs for gas transmission pipelines are in class 3 and 4 areas. Within HCAs the regulations require higher standards of care on pipelines. Some examples for gas transmission pipelines would include greater safety factors for the pressure the pipeline can be operated at, more frequent valves, more comprehensive testing of welds after construction, greater analysis and mitigation of risks including the use of in-line inspection devices every seven years. Rules for gas pipelines do not take into account potential environmental risk.

Federal hazardous liquid pipeline regulations do not include class locations, although the WUTC rules for intrastate hazardous liquid pipelines have incorporated class location definitions to increase safety by controlling the design factors used for the construction of new pipelines. All liquid pipeline regulations do have additional protections for populated areas and also unusually sensitive environmental areas built into them through integrity management requirements that are discussed elsewhere.

2003 rupture (with no ignition) of a natural gas transmission pipeline near Toledo, WA

Photo: Angela Lee Hairston

1999 failure of a hazardous liquid pipeline in Bellingham, WA

Photo: WUTC

2016 explosion from a gas distribution pipeline in Seattle, WA

Pipeline Safety Requirements During Design, Construction and Operation

Construction of Gas Transmission Pipeline

Many of the pipelines in place today were constructed before regulations existed for pipelines. Some of the current regulations have to do with ongoing operations and maintenance, and apply to both existing and new lines. Existing "grandfathered" pipelines built prior to 1979 for hazardous liquid pipelines, or prior to 1968 for gas pipelines, may not have been constructed according to the current regulations. What are pipeline operators required to do to maintain safe pipelines? In this section, we go through basic information and dive more deeply into some technical issues that are relevant to Washington State.

Choosing Pipe

The majority of transmission pipelines are steel, fabricated in steel rolling mills and inspected to assure they meet government and industry safety standards. Generally between 40 and 80 feet in length, they are designed specifically for their intended location in the pipeline. A variety of soil conditions and geographic or population characteristics of the route will dictate different requirements for pipe size, strength, wall thickness and coating material. Not all pipe is steel. Some low pressure gathering, transmission and distribution pipelines use other materials such as other metals, plastic or composites.

Pipe Burial

Mechanical equipment, such as a wheel trencher or backhoe, is used to dig the pipe trench. Occasionally, rock drilling and blasting is required to break rock in a controlled manner. The material that is excavated during trenching operations is temporarily stockpiled on the non-working side of the trench. This material will be used again in the backfill operation. In some limited locations, horizontal directional drilling (HDD) as well as boring is used to place pipe.

Pipeline trenches are dug deep enough to allow the buried pipe to be at the required depth. Federal regulations require that hazardous liquid pipelines be buried between 18 and 48 inches below the surface, and that buried gas transmission and regulated gathering lines be between 18 and 36 inches below the surface, depending on location and soil properties. For example, more depth is required in normal soil conditions near residential or developed areas (36 inches) and certain water body crossings (48 inches for liquid lines), and less depth where rock excavation is required. The depth of burial must be according to the regulations at the time of burial, but there is nothing in the federal regulations that requires this depth be maintained over time.

Welding of Steel Pipelines

To carry out the welding process, the pipe sections are temporarily supported along the edge of the trench and aligned. The various pipe sections are then welded together into one continuous length, using manual, semiautomatic or automatic welding procedures.

As part of the quality-assurance process, each welder must pass qualification tests to work on a particular pipeline

job, and each weld procedure must be approved for use on that job in accordance with federally adopted welding standards. Welder qualification takes place before the project begins. Each welder must complete several welds using the same type of pipe as that to be used in the project. The welds are then evaluated by placing the welded material in a tensile testing machine and measuring the force required to pull the weld apart. It is interesting to note that a proper weld is actually stronger than the pipe itself.

For higher stress pipelines over 6 inches in diameter, a second level of quality assurance occurs, wherein qualified technicians sample a certain number of the welds (the sample number varies based on the population near the pipeline) using radiological techniques (i.e., X-ray or ultrasonic inspection) to ensure the completed welds meet federally prescribed quality standards. If the technician detects certain flaws, the weld is repaired or cut out, and a new weld is made.

Coatings on Steel Pipelines

Several different types of anti-corrosion coatings may be used to coat the pipe at the factory and the joints made in the field, with the most common at this time being fusion bond epoxy or polyethylene heat-shrink sleeves. Prior to application, the bare pipe is thoroughly cleaned to remove any dirt, mill scale or debris. The coating is then applied and allowed to dry. After field coating and before the pipe is lowered into the trench, the entire coating of the pipe is inspected to ensure that it is free from defects.

Lowering and Backfilling

Once the pipeline is welded and coated, it is lowered into the trench. Lowering is done with multiple pieces of specialized construction equipment called side-booms. This equipment acts in tandem to lift and lower segments of the assembled pipeline into the trench in a smooth and uniform manner to prevent damaging the pipe.

Care is taken to protect the pipe and coating from sharp rocks and abrasion as the backfill is returned to the trench. In areas where the ground is rocky and coarse, the backfill material is screened to remove rocks or the pipe is covered with a material to protect it from sharp rocks and abrasion. Alternatively, clean fill may be brought in to cover the pipe. Once the pipe is sufficiently covered, the coarser soil and rock can then be used to complete the backfill.

Valves and Valve Placement

A valve is a mechanical device installed in a pipeline and used to control the flow of fuel. Some valves have to be operated manually by pipeline personnel, some valves can be operated remotely from a control room, and some valves are designed to operate automatically if a certain condition occurs on the pipeline. If a pipeline should fail, how quickly the valves can be closed and the distance between the valves are some of the main determinations for how much fuel is released.

Operating Pressure

Maximum Allowable Operating Pressure (MAOP) for natural gas pipelines, and Maximum Operating Pressure (MOP) for liquid pipelines, are the maximum internal pressure at which a pipeline or pipeline segment may be continuously operated. These pressures are set at levels meant to ensure safety by requiring that the pressure does not cause undue stress on the pipeline. These pressures are defined in federal regulations and are based on a number of different factors such as the location of the pipeline, pipe wall thickness, previous pressure tests, and the pressure ratings of various components.

Testing

Generally, but with certain exceptions, all newly constructed transmission pipelines must be pressure tested before they can be placed into service. The purpose of a pressure test is to identify and eliminate any defect that might threaten the pipeline's ability to sustain its maximum operating pressure plus an additional safety margin. A pipeline is designed to a specified strength based on its intended operating pressure. Hydrostatic pressure testing consists of filling the pipeline with water, and raising and sustaining the internal pressure to a specified level above the intended operating pressure. Critical defects that cannot withstand the pressure will fail. Upon detection of such failures, the defects are repaired or the affected section of the pipeline is replaced and the test resumed until the pipeline "passes."

Hydrostatic testing is not the only means for detecting pipe defects. For example, inline inspection (ILI) technologies (often referred to as smart pigs) are used that permit the identification of specific types of defects, such as corrosion, dents, and excavation damage. But because not all pipelines can be inspected with ILI tools and because of the need to find types of imperfections that are not currently detected by ILI technology, hydrostatic testing is an accepted method for demonstrating that a pipe segment is ready to be in service.

Corrosion Protection

Unprotected steel pipelines are susceptible to corrosion, and without proper corrosion protection steel pipelines will eventually deteriorate. Corrosion can weaken the pipeline and make it unsafe. Luckily, technology has been developed to allow corrosion to be controlled in many cases, if applied correctly and maintained consistently.

Here are the three common methods used to control corrosion on pipelines:

- Cathodic protection (CP) is a system that uses direct electrical current to counteract the normal external corrosion of a metal pipeline. CP is used where all or part of a pipeline is buried underground or submerged in water. On new pipelines, CP can help prevent corrosion from starting; on existing pipelines, CP can help stop existing corrosion from getting worse.
- Pipeline coatings and linings are principal tools for defending against corrosion by protecting the bare steel.
- Corrosion inhibitors are substances that can be added to a pipeline to decrease the rate of attack of internal corrosion on the steel since CP cannot protect against internal corrosion.

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM

A SCADA system is a pipeline computer system designed to gather information such as flow rate through the pipeline, operational status, pressure, and temperature readings. Depending on the pipeline, this information allows pipeline operators to know what is happening along the pipeline, and allows quicker reactions for normal operations and equipment malfunctions, failures and releases. Some SCADA systems also incorporate the ability to remotely operate certain equipment - including compressors, pump stations, and valves - allowing operators in a control center to adjust flow rates in the pipeline as well as to isolate certain sections of a pipeline. Many SCADA systems also include leak detection systems based on the pressure and mass balance in the pipelines. Unfortunately, leak detection systems are not yet capable of identifying all leaks; PHMSA's 2012 leak detection study[9] shows that only about 17% of hazardous liquid and gas transmission pipeline incidents were initially detected by SCADA or other computerized leak detection.

RIGHT-OF-WAY PATROLS

Regulations require regular patrols of pipeline right-of-ways to check for indications of leaks and ensure that no excavation activities are taking place on or near the right-of-way that may compromise pipeline safety. For transmission pipelines, these patrols are often accomplished by aerial patrols, but federal regulations do not require them to be done by aerial inspection.

LEAKAGE SURVEYS

Regulations also require regular leakage surveys for all types of natural gas pipelines along the pipeline routes. Personnel walk or drive the route using specialized equipment to determine if any gas is leaking and to then quantify the size of the leak. Very small leaks may be deemed non-hazardous, do not need to be repaired immediately, and are not uncommon on gas pipeline systems.

ODORIZATION

All distribution pipelines, and some natural gas transmission and gathering lines (mainly those in highly populated areas), are required to be odorized so leaking gas is readily detectable by a person with a normal sense of smell. Most often Mercaptan is added as an odorant to give the natural gas that familiar rotten egg smell.

INTEGRITY MANAGEMENT

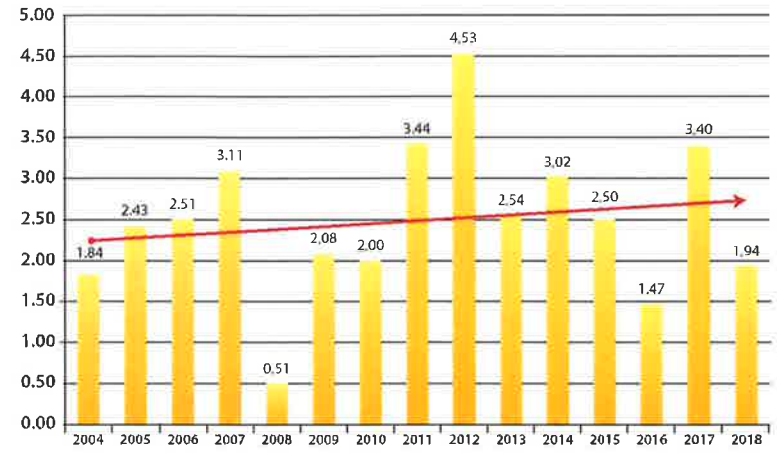
Integrity management refers to a set of federal rules that specify how pipeline operators must develop a plan to identify, prioritize, assess, evaluate, repair and validate the integrity of their pipelines. Some form of this requirement for comprehensive analysis through integrity management applies to both transmission and distribution pipelines. Gathering lines are exempt from these requirements. For gas transmission pipelines, integrity management requires lines that are located *within* High Consequence Areas (mainly more populated areas) to be reassessed by their operators at least every seven years. For hazardous liquid pipelines, integrity management rules require lines *that could affect* HCAs to be reassessed by their operators at least every five years. Reassessment of pipelines is done mainly with internal inspection devices, but may also be done through pressure tests or direct assessment. Once inspected, the rules require that operators respond to certain anomalies found on their pipeline in certain ways within certain timeframes. In the first nine years of this program, these rules required over 53,000 repairs be made to gas and liquid transmission pipelines that fall within HCAs. Only about 7%[12] of the gas transmission pipelines, and 43%[13] of hazardous liquid pipelines nationwide fall within the definition of HCAs so are required to do these important inspections, although many operators provide such inspections beyond just the HCAs.

Integrity management is more than just running smart pigs and then digging up weaknesses identified. The intent of integrity management is to continiually assess the threats to a section of pipeline,

9 PHMSA, Final Report, Leak Detection Study – DTPH56-11-D-000001: https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/16691/leak-detection-study.pdf

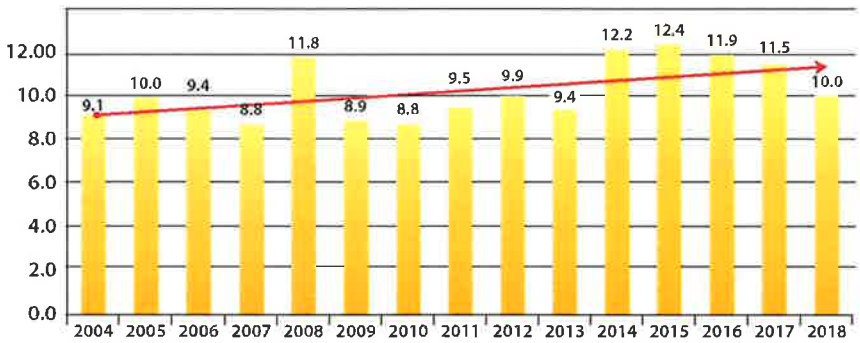
preventing failures, mitigating potential consequences, and integrating data about that section from all operational activities back into the threat assessment. Somewhere along the way, that system is not working properly, because even though many anomalies have been found and repaired as a result of the required inspections and repairs, the number of incidents on gas transmission and hazardous liquid pipelines in areas covered by integrity management has actually risen in the years since integrity management became the law (see charts 6 & 7).[10, 11] While there are clearly opportunities to improve the implementation of integrity management, the basic theory of risk assessment, inspection, verification, program changes, and re-inspection that should lead to continuous improvement of pipeline safety seems sound. In the future, applying integrity management requirements beyond HCAs for transmission pipelines, and better implementation of risk assessments and inspections, may help lead pipeline operators to their stated goal of zero pipeline incidents.

Chart 6 - Gas Transmission Failures per 5000 HCA Miles Nationwide



Gas Transmission Pipeline Integrity Management Performance

Chart 7 - Hazardous Liquid Pipeline - Large Spills per 10,000 HCA Miles Nationwide



Hazardous Liquid Pipeline Integrity Management Performance

10 PHMSA Gas Transmission Pipelines Integrity Management Performance Measures - https://opsweb.phmsa.dot.gov/primis_pdm/gt_imp_perf_nat_sum.asp

11 PHMSA Hazardous Liquid Pipelines Integrity Management Performance Measures - https://opsweb.phmsa.dot.gov/primis_pdm/hl_imp_perf_nat_sum.asp

Pipeline Issues of Importance in Washington State

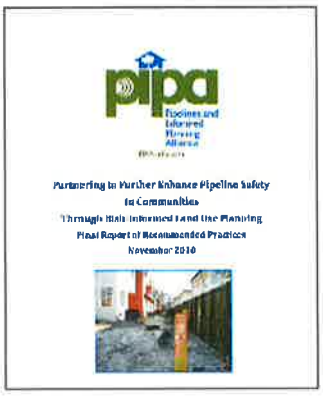
Carl Weimer photo

Hazardous Liquid Pipeline Easement near homes, Bellingham, WA

LAND USE PLANNING AND PIPELINES

There are two ways to think about land use planning and pipelines. The first is to utilize planning tools to limit impacts of new pipelines on existing land uses. For the siting of nearly all new pipelines, the pipeline company decides on a general route they prefer for their pipeline, and possibly some alternative routes. Once they feel fairly confident with the feasibility of their chosen route, the more formal process with various government agencies begins. That process is not consistent for every pipeline, and varies greatly depending on the type of pipeline and the proposed location. As was discussed earlier, companies wishing to construct interstate gas pipelines must apply to the Federal Energy Regulatory Commission (FERC) for construction and route approval. And for all other pipelines proposed to be constructed in Washington— greater than six inches in diameter and 15 miles in length — the Energy Facility Site Evaluation Council (EFSEC) has authority for siting and routing per RCW 80.50. The county and city where a project is proposed can appoint a voting member to the EFSEC for review of that project. Local governments otherwise have little say or involvement with siting and routing of pipelines, but they may engage in the state or federal activities by providing comments at the appropriate points in the process. Local governments in other states have used their zoning powers to require conditional use permits for the construction of certain pipelines.

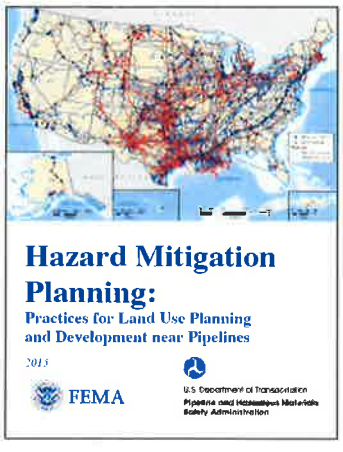
The second way to think about land use planning and pipelines is once pipelines are built. Local governments can use the power granted to them by the state to protect health, safety and general welfare to coordinate and regulate new development near pipelines. Many pipelines existed prior to surrounding development, and housing density sometimes increases in areas near pipelines that once were predominantly undeveloped rural areas. Local governments can enact regulations governing the type of buildings and construction that can occur near existing pipelines, requiring consultation with the pipeline operator, establishing setbacks or enacting a variety of other land use permit requirements.



To assist local communities with planning near pipelines, in 2010 PHMSA published the final report of the Pipelines and Informed Planning Alliance (PIPA), a three-year effort to provide information and recommendations on the types of tools local government can use to regulate new development near existing pipelines. Forty-three recommended practices are contained in the report, and 29 of them speak specifically to local

governments about things they can do to encourage safety near transmission pipelines. These recommendations stress the importance of having a relationship with local pipeline operators that includes open communication, incorporating the existence of pipelines into planning process and infrastructure projects, and the importance of safe excavation practices. One example of a specific recommendation is the use of consultation areas or zones that require early consultation among stakeholders when any development is proposed within a specified distance from a transmission pipeline. In 2015, the Federal Emergency Management Agency (FEMA) produced the report Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines. This report built on PHMSA's earlier effort, hoping to reach local emergency planners. In our survey of emergency planners 81% said they had never received a copy of the report. All recommendations and reports mentioned above can be found on the PIPA report website.[12]

Over the past decade CCOPS, WUTC, PST, MRSC, and the Association of Washington Cities have coordinated a number of efforts to reach out to elected officials and local government planners to encourage adoption of PIPA recommendations. While these efforts have been more successful than in any other state in the nation, they have only led to the adoption of PIPA recomended practices by a handful of communities in the state. Much of this effort is documented on the MRSC's Planning Near Pipelines website (http://mrsc.org/Home/Explore-Topics/Public-Safety/Special-Topics/Pipeline-Safety/Planning-Near-Pipelines.aspx).



In Washington State, city and county governments have a role to play in pipeline safety and oversight. Federal and state regulations generally preclude local governments from adopting any regulations that require a pipeline operator to take any actions regarding the safe operation of a pipeline. Pipeline operators, however, might willingly enter into development agreements or mitigation agreements that include additional safety aspects in certain situations, in response to local conditions.

There are actions that local governments could take that are not precluded, such as negotiated rights-of-way agreements, spill and emergency preparations and response, or land use and zoning provisions.

Twenty-nine of the 39 counties in Washington State contain a hazardous liquid and/or gas pipeline system. Some of those systems are very small while some of them contain segments of interstate or international systems. Of the 15 counties with transmission pipelines, all of them have gas pipelines and 10 of them have hazardous liquid pipelines within their boundaries.

Counties like King, Pierce, Clark and Snohomish contain many cities with pipelines running through them or immediately adjacent. It is in these areas, and places that cities intend to expand their boundaries, where planning can have the most influence. Undeveloped areas that are not already within a city, are primarily the responsibility of the county although the county may coordinate with the city utilizing development agreements or other mechanisms.

EXCAVATION DAMAGE PREVENTION

One of the leading causes of deaths and injuries from pipeline incidents is from damage to pipelines related to excavation activities. These types of incidents are almost completely preventable, and over the past two decades a significant effort has taken place to identify and implement best practices to prevent these incidents, as well as upgrade state damage prevention programs and enforcement. Charts 8 and 9 show some specifics of this issue in Washington State.

In 2000 the national Common Ground Alliance (CGA) was formed to help enhance worker safety, and better protect the public and underground infrastructure during excavation activities. Since that time CGA has successfully developed a system to adopt national best practices, and produced and updated the Best Practices Guide. CGA was also instrumental in the adoption of the national 811 Call Before You Dig number, as well as the Damage Information Reporting Tool (DIRT) to identify the root cause of incidents that occur as a result in breakdowns in the one call process.

Starting in 2009, PHMSA began to assess the adequacy of various aspects of each state's damage prevention

12 PHMSA-Land Use Planning and Transmission Pipelines webpage - http://primis.phmsa.dot.gov/comm/pipa/LandUsePlanning.htm

program,[13] and in 2015 they passed a rule that spelled out how they would determine if a state's damage prevention program was adequate, the steps they would take to correct inadequate programs, and the process PHMSA could use to enforce damage prevention laws against excavators if a state was not doing it adequately. This effort by PHMSA helped drive states to improve their damage prevention rules, and Washington State was no exception.

In the 2009 PHMSA assessment, Washington State's Damage Prevention program was found to be inadequate both in terms of an "enforcement agencies' role to help resolve issues" and "fair and consistent enforcement of the law." In 2009, the WUTC spearheaded formation of the Dig Law Group; a consortium of regulated utilities, utility districts of all types, cities, counties, contractors, and excavators. The goals of the Dig Law Group were to address PHMSA concerns, and to draft significant updates to the state's Underground Utility Damage Prevention Law.[14] Two years of work by the Dig Law Group resulted in a much revised law that includes clearer enforcement definitions and procedures, requires reporting of damages to underground utilities, establishes a Safety Committee of stakeholder representatives to review complaints of alleged underground utility violations, and establishes the Damage Prevention Account where fines are deposited to be used for educational purposes to improve excavation safety. In PHMSA's last assessment (2014) of State Damage Prevention programs only 20 states received perfect scores, Washington being one of them.

WUTC takes "Call Before You Dig" very seriously, traveling throughout the state to educate people about the danger of digging even a small hole without a locate request. In Washington, as in all states, a person who wishes to dig calls 811 a few days before doing so. This call triggers a series of requests to utilities operating in the area, asking them to visit the identified area and mark the location of the facilities on the ground so the person who wishes to dig in that area knows where they can and can't dig and what kind of tools are appropriate for the job so they don't damage existing

13 Characterization of State Damage Prevention Programs - https://primis.phmsa.dot.gov/comm/SDPPCDiscussion.htm?nocache=7122

14 Underground Utility Damage Prevention Law - http://apps.leg.wa.gov/rcw/default.aspx?cite=19.122

Chart 8 - Washington State Gas Distribution Pipeline Leaks by Cause 2005-2018

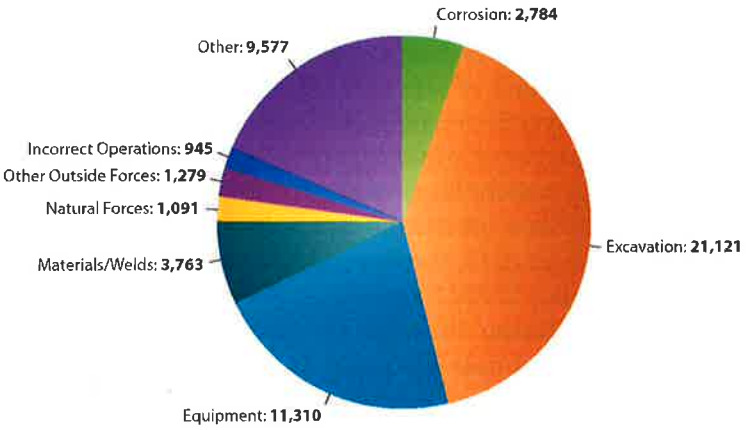


Chart 9 - Washington State Gas Distribution Pipeline Excavation Damages by Root Cause 2015 to Present

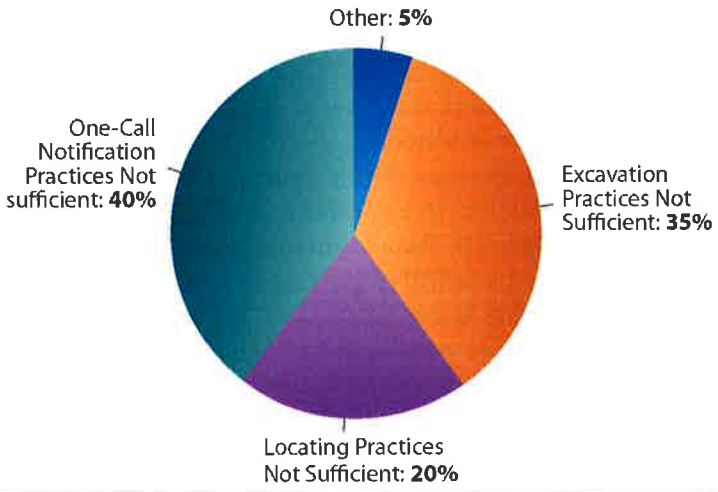
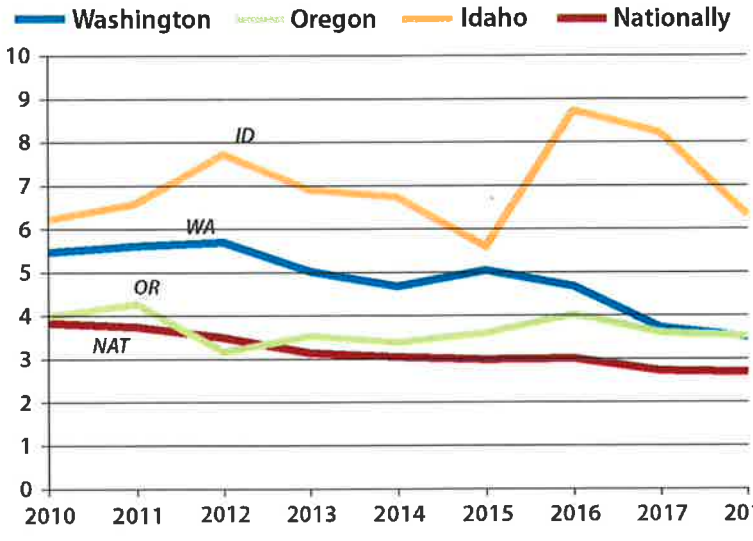


Chart 10 - Gas Distribution Pipeline Excavation Damages Per Thousand One-Call Tickets



utilities. This program leads to less frequent unintentional damage to underground utilities including pipelines and is a key part of Washington's damage prevention program.

With the changes in the state's dig law, and the creation of the Safety Committee, the state's damage prevention program has become more proactive and hopefully effective. With money from both the Damage Prevention Account and PHMSA One Call grants, multiple successful trainings were held for both excavators and locators. Since 2014 enforcement proceedings were conducted in 56 cases for a total of $156,000 in proposed fines. As seen in Chart 10 the trend line for damages per 1000 one-call tickets is going in the right direction and compares well with neighboring states. Washington State has had no deaths or injuries caused by excavation damage to pipelines in the past decade.

CITIZENS COMMITTEE ON PIPELINE SAFETY (CCOPS)

After the 1999 Olympic Pipeline tragedy the Washington State Legislature created the Citizens Committee on Pipeline Safety (CCOPS):

> *"to advise the state agencies and other appropriate federal and local government agencies and officials on matters relating to hazardous liquid and gas pipeline safety, routing, construction, operation, and maintenance. The committee shall serve as an advisory committee for the commission on matters relating to the commission's pipeline safety programs and activities."*

Members of the committee are appointed by the governor. The committee consists of nine voting members representing the public, including local government, and elected officials. Four non-voting members represent owners and operators of hazardous liquid and gas pipelines. The members serve three year staggered terms. The committee is staffed by the WUTC's Pipeline Safety Program, and currently meets four times a year.

CCOPS is one of only three such state advisory committees in the nation, and as such has some unique power granted to it by congress in the Pipeline Safety Improvement Act of 2002.

> *SEC. 24. STATE PIPELINE SAFETY ADVISORY COMMITTEES.*
>
> *Within 90 days after receiving recommendations for improvements to pipeline safety from an advisory committee appointed by the Governor of any State, the Secretary of Transportation shall respond in writing to the committee setting forth what action, if any, the Secretary will take on those recommendations and the Secretary's reasons for acting or not acting upon any of the recommendations.*

CCOPS is well suited to provide insight and assistance on non-technical pipeline safety issues such as required public awareness adequacy, land use issues around pipelines, transparency of information from agencies and the industry, damage prevention, landowner and local government easement issues, emergency response preparedness, and providing an independent sounding board when pipeline issues arise in communities.

SPILL AND EMERGENCY RESPONSE PLANNING

What is required by federal and state law?

Pipeline operators are required by federal law to prepare two different kinds of plans to prepare for pipeline emergencies: Emergency plans (for gas lines pursuant to 49 CFR 192.615 and for hazardous liquid lines under 195.402 and 403); and, for hazardous liquid lines meeting certain criteria, oil spill response plans under the Oil Pollution Act of 1990 (OPA) – the law passed after the *Exxon Valdez* tanker spill in Alaska. The federal regulations for oil spill response plans can be found at 49 CFR Part 194. OPA explicitly permits states to establish their own spill response requirements and does not preempt them. Washington state prepares geographic response plans and requires operators to submit Facility Response Plans under state rules adopted to implement OPA. WAC Chapter 173-182.

Emergency Response Planning

Natural Gas

The regulations for gas emergency plans are not complicated and are quite short. Although each section has a few descriptive clarifiers, it boils down to this:

1) Each operator has to have a written plan on how it will respond to a list of various emergencies, including available personnel and equipment, shutdown procedures, notification of fire, police and other public officials, service restoration, etc.
2) The plan has to be furnished to supervisors, employees must be trained to it, and following an emergency, actions must be reviewed to determine if the plan was followed; and

3) Each operator "shall establish and maintain liaison with appropriate fire, police and other public officials" to coordinate responses and preparedness. 192.615(c).

That last requirement, to maintain a liaison with local first responders, is one aspect of emergency planning efforts that came under serious scrutiny following the failure of a Pacific Gas & Electric (PG&E) transmission line in San Bruno, California, when the San Bruno fire chief testified that he was completely unaware that there was a gas transmission line in that neighborhood. Following San Bruno, PHMSA issued an advisory bulletin to operators, ADB-10-08, reminding them of their regulatory obligations to make their pipeline emergency response plans available to local emergency response officials. The National Transportation Safety Board (NTSB) went even further in its report: one of the many new safety recommendations it made to PHMSA following San Bruno was to "[r]equire operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines to provide system-specific information about their pipeline systems to the emergency response agencies of the communities and jurisdictions in which those pipelines are located. This information should include pipe diameter, operating pressure, product transported, and potential impact radius." (P-11-8) This recommendation, if implemented, would provide local emergency management and first responders with the information they need to appropriately plan responses and preventative and mitigating measures for dealing with the presence of a transmission line through their jurisdictions. PHMSA has not yet responded to this recommendation beyond issuing the Advisory Bulletin.

Hazardous Liquid Emergency Response Planning

Each hazardous liquid pipeline operator must also develop an emergency response plan describing the operator's procedures for responding to and containing releases. It must include procedures for prompt and effective response to emergencies; personnel, equipment, instruments, tools, and material needed; taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume released; control of the released liquids; minimizing public exposure to spilled liquids; notifying emergency responders; and reviewing the efficacy of emergency procedures following any accident. Operators must review and, if needed, update the plan every calendar year. They must also create an emergency response training program. Neither PHMSA nor the WUTC reviews or approves these plans, but they do assess these procedures in inspections. If PHMSA determines that the plan must be amended to provide a reasonable level of safety, it cannot do so without giving the operator notice and providing an opportunity for a hearing. Operators are required to share the emergency plans with local emergency responders.

PHMSA has sole authority to determine the emergency planning requirements for interstate pipelines; states may not alter these requirements or directly enforce them. However, states may impose more stringent requirements on intrastate pipelines if they have a certified program for the regulation of intrastate pipelines. Washington has adopted specific requirements that these plans must include procedures to respond to earthquakes and for assessing, monitoring and remediating areas subject to landslides. WAC 480-75-660(1). The federal regulations for hazardous liquid emergency plans and training are found at 49 CFR 195.402 and 403.

Interaction of Federal Regulations and Department of Ecology's Spill Planning Program

Under both federal and state law, hazardous liquid pipeline operators must develop plans to respond to spills and must report spills when they occur.

In the wake of the 1989 Exxon Valdez disaster, Congress passed the Oil Pollution Act (OPA) in 1990. The OPA, an amendment to the Clean Water Act, establishes a tiered planning process to respond to oil spills that threaten navigable waters. The broadest geographic tiers, the Area Contingency Plans, are developed by the EPA and the US Coast Guard, and identify the locations that are sensitive to oil pollution. PHMSA is responsible for reviewing the facility response plans of onshore transportation facilities, including oil pipelines, to ensure that they are in compliance with the OPA and area plans. Under the regulations found in 49 CFR Part 194, PHMSA requires operators to determine the potential worst case discharge scenario by calculating maximum figures for response times, release times, and flow rates. The plans must also identify environmentally and economically sensitive areas, divide responsibilities among federal, state, and local responders, and include procedures for spill detection and mitigation. PHMSA's regulations allow operators to incorporate by reference appropriate procedures from their Pipeline Safety Act-mandated manuals for operations, maintenance, and emergencies into the OPA-mandated facility response plans.

States may impose additional requirements for facility response plans under the OPA as long as the requirements are at least as stringent as the federal standards, and PHMSA allows plans prepared for state compliance to be submitted to PHMSA for compliance with Part 194, so operators needn't prepare two separate plans. Only a handful of states have adopted any spill response

requirements, and fewer still – notably including Washington – have adopted regulations that exceed those of PHMSA.

The Washington program, perhaps the strongest in the nation, and certainly the most transparent, is administered by the Department of Ecology under rules found at WAC Chapter 173-182. It mandates public participation (a 30-day notice and comment period for each new or revised plan) and detailed response plans including plans for heavy, non-floating oils. Spill response plans are made available through public records requests, and are available for review during public comment periods, allowing the public to determine whether sensitive environmental areas and high populations areas have been properly identified and whether sufficient response resources have been placed along the pipelines allowing for quicker responses. It also requires regular drills of spill response plans, both tabletop and in the field, including some unannounced drills, a practice that most closely duplicates an actual emergency. Recent improvements to the program include the addition of a Community Air Monitoring program in Area Contingency plans, ensuring that public health effects of spills from volatile compounds released from pipelines will be monitored, allowing emergency responders to make better-informed decisions.

USEPA

Cleanup of Crude Oil Pipeline Spill, Kalamazoo River, Michigan

Pipeline Safety TRUST

Credible.
Independent.
In the public interest.

Carl Weimer, Executive Director
300 North Commercial Street, Suite B
Bellingham, WA 98225
360-543-5686
carl@pstrust.org
Website – www.pstrust.org

Pipeline Safety In Whatcom County

The Pipeline Safety Trust
Born from a pipeline tragedy

What happened in Bellingham

- Pipeline was damaged by 3rd party
- Damage known but not fixed
- Valve installed wrong but not fixed
- Valve malfunctioned multiple times
- SCADA failure
- Operator Error
- Pipeline burst and exploded killing 3 youngsters and an entire salmon stream

The Pipeline Safety Trust
Who we are and where we came from?

"… there's going to be a Trust that's going to be funded as part of today's sentencing. With $4,000,000 … they've nowhere near the lobbying potential of the oil industry. It's not even David and Goliath. It's more like Bambi and Godzilla. You've heard people today that are going to spend their lives trying to make this right, and they should be listened to. No industry polices itself very well… you need outside people, and these are going to be the people so pay attention to them."

The Honorable Barbara Rothstein
United States District Judge
At Olympic Pipe Line Co Sentencing

The things the Pipeline Safety Trust does to try to increase safety

- Improve pipeline safety regulations
- Increase transparency and access to pipeline information
- Provide a "public interest" voice to pipeline safety processes and events
- Partner with groups trying to move pipeline safety forward.
- Provide technical assistance to impacted communities

Path to Greater Pipeline Safety

Regulators

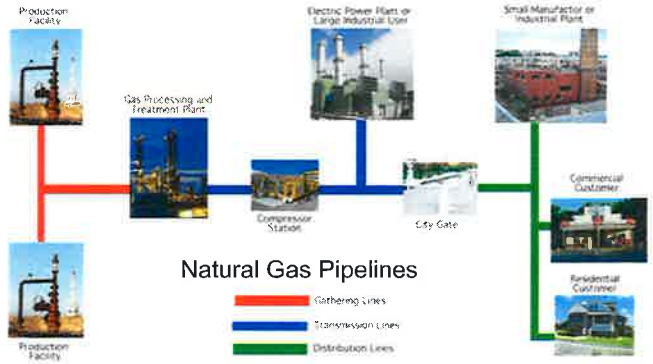
The Public & Local Government

Pipeline Operators

Pipeline Systems Near Bellingham

Natural Gas Pipelines
- Transmission lines
- Distribution lines

Hazardous Liquid Pipelines
- Transmission lines



INTERstate pipelines vs. INTRAstate pipelines

Hazardous Liquid Pipelines Carry

- **Crude oil**
- **Refined petroleum products** such as **gasoline, diesel, jet fuel**
- **Highly Volatile Liquids** such as propane, butane, ethylene, condensates
- **Carbon dioxide**
- **Anhydrous Ammonia**

National and Washington Pipeline System

Table 1: Mileage of Regulated Pipelines – U.S. and Washington*

	U.S.	Washington
Gas Transmission	301,578	1,972
Gas Gathering	17,944	0
Gas Distribution Mains	1,307,735	22,337
Gas Distribution Service Lines	930,877	19,638
Crude Oil	80,528	69
Refined Products	62,751	732
HVLs (like propane, butane, etc)	70,130	5
Total	**2,771,543**	**44,753**

* Data from PHMSA as of 10/30/2019

Transmission Pipelines In Washington

Where are the major pipelines in Whatcom County?

National Pipeline Mapping System
https://www.npms.phmsa.dot.gov/PublicViewer/

2128

Attribute	Value
Category: PIPELINE ATTRIBUTES	
OPERATOR ID	2128
OPERATOR NAME	CASCADE NATURAL GAS CORP
SYSTEM NAME	BELLINGHAM TRANSMISSION SYS
SUBSYSTEM NAME	
PIPELINE ID	42491
MILES	5.53
COMMODITY CATEGORY	Natural Gas
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	N
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/20/2019
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	
FIRST NAME	Lynsay
LAST NAME	Demko-Edwards
TITLE	Public Awareness Coord
ENTITY	
PHONE	(509) 734-4584
EMAIL	lynsay.demko-edwards@cngc.com
ADDRESS	8113 W. Grandridge Blvd.
CITY	Kennewick
STATE	WA
ZIP	99336

Who Currently Operates Pipelines in Whatcom County?

Pipeline Operator ID & Name	Person To Contact	Phone / Fax / Email
13845 - NORTHWEST PIPELINE LLC	Katy Rich (Director - GIS)	Phone: (405) 250-7894 Fax: Email: Katy.Rich@williams.com
19585 - TRANS MOUNTAIN PIPELINE	Patrick Davis (Operations Supervisor)	Phone: (360) 398-1541 Fax: Email: patrick_davis@transmountain.com
2128 - CASCADE NATURAL GAS CORP	Lynsay Demko-Edwards (Public Awareness Coord)	Phone: (509) 734-4584 Fax: Email: lynsay.demko-edwards@cngc.com
22189 - PUGET SOUND ENERGY	Cheryl McGrath (Mgr Compliance & Reg Audits - Gas)	Phone: (425) 462-3207 Fax: Email: cheryl.mcgrath@pse.com
30781 - OLYMPIC PIPE LINE COMPANY	Bobby Roye (Damage Prevention Manager)	Phone: (800) 548-6482 Fax: Email: bobby.roye@bp.com
31189 - BP PIPELINE	Bobby Roye (Damage Prevention Manager)	Phone: (800) 548-6482 Fax: Email: bobby.roye@bp.com
39663 - PETROGAS WEST, LLC	Gavin Carscallen (Public Relations)	Phone: (403) 296-1667 Fax: Email: GCarscallen@petrogascorp.com
570 - FERNDALE PIPELINE SYSTEM	Bobby Roye (Damage Prevention Manager)	Phone: (800) 548-6482 Fax: Email: bobby.roye@bp.com

Who Regulates Pipeline Safety in WA?

PHMSA
Pipeline and Hazardous Materials Safety Administration

The federal Office of Pipeline Safety (OPS) within the Pipelines and Hazardous Materials Safety Administration (PHMSA) enforces the pipeline safety regulations for interstate gas and hazardous liquid pipeline operators in Washington based on inspections performed by the state.

UTC
UTILITIES AND TRANSPORTATION COMMISSION

Through certification and agreements with OPS, the state inspects and enforces the pipeline safety regulations for intrastate gas and hazardous liquid pipeline operators, and also, inspects interstate gas and hazardous liquid pipeline operators in Washington

Where Do The Regulations Come From?

Main Sources of Pipeline Regulations

- U.S. Congress – the Statutes
- U.S. Department of Transportation, Office of Pipeline Safety (PHMSA) – the safety regulations
- The States – Can pass stronger rules for intrastate pipelines
- Local Government – Cannot regulate the safety of pipelines, but can use their authority to help increase the safety of people living near pipelines

What Do The Regulations Cover?

- Materials
- Pipe Design
- Design of Components
- Welding of Steel in Pipelines
- General Construction Requirements
- Requirements for Corrosion Control
- Test Requirements
- Operations
- Maintenance
- Qualifications of Pipeline Personnel
- Pipeline Integrity Management

Main Things To Remember About The Regulations

- Rules often have multiple layers to prevent a single threat
- Many parts of the regulations are based on risk assessment and management
- Regulations are more stringent in higher consequence areas

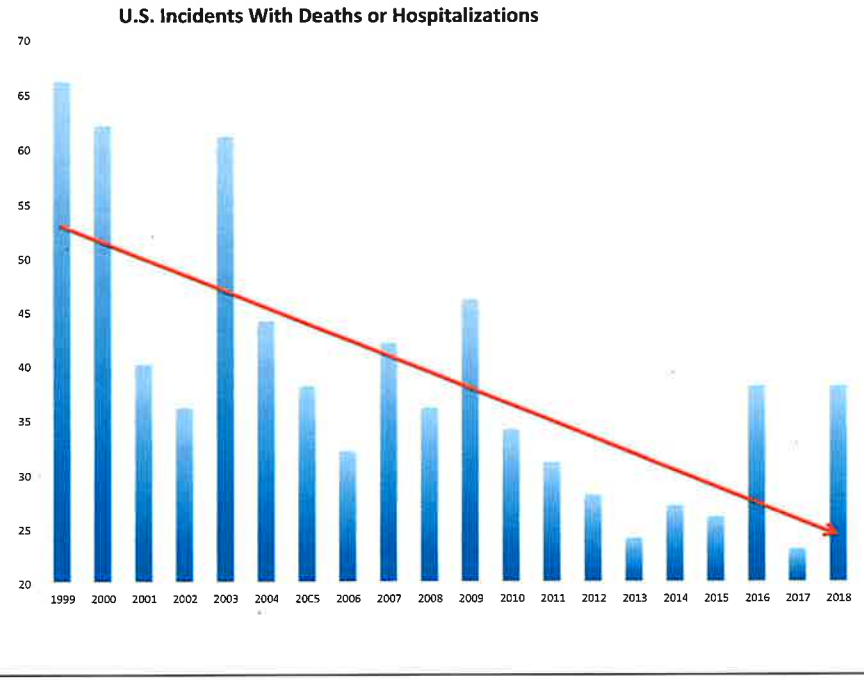
Important parts of the Regulations

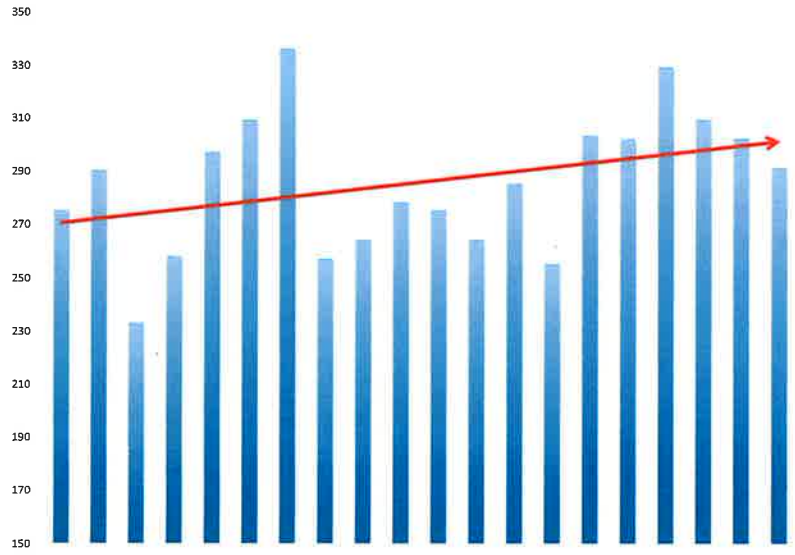
Integrity Management – A set of regulations that only apply to pipeline segments in High Consequence Areas. These regulations require more stringent identification of risks, and testing and analysis to mitigate those risks. This is the set of regulations that require physical inspections, mainly using in-line inspection devices (smart pigs). These regulations also set repair criteria for problems found.

Thinking About Risk

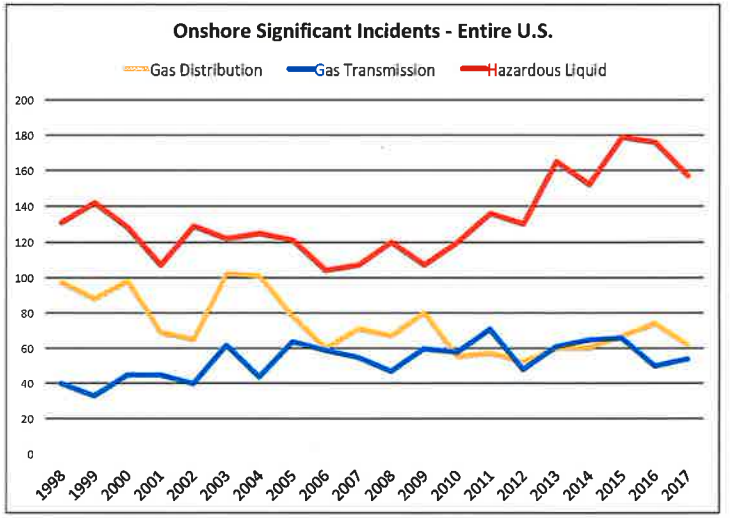
What can the consequences be?

What can the consequences be?





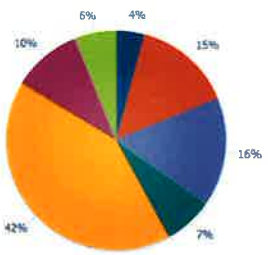
What's the Probability?
Incident Trends – U.S.



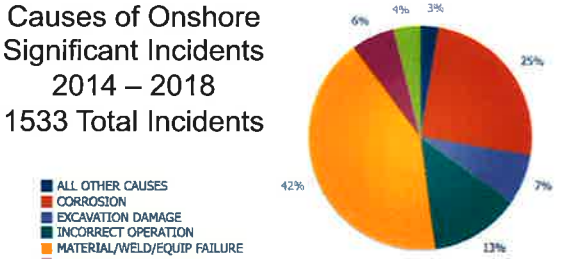
Washington Significant Incidents – Past Decade

Date	Reported Cause of Incident	County	Operator Name	System Type	Fatalities	Injuries	Total Cost As Reported
03/02/2010	INCORRECT OPERATION	SKAGIT	NORTHWEST PIPELINE LLC	GAS TRANSMISSION	0	0	$300,100
06/04/2011	EXCAVATION DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	0	$103,133
09/13/2011	OTHER OUTSIDE FORCE DAMAGE	KITSAP	CASCADE NATURAL GAS CORP	GAS DISTRIBUTION	0	1	$59,201
09/26/2011	OTHER OUTSIDE FORCE DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	2	$511,500
04/28/2012	OTHER OUTSIDE FORCE DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	0	$155,350
03/14/2013	MATERIAL/WELD/EQUIP FAILURE	WHITMAN	GAS TRANSMISSION NORTHWEST LLC	GAS TRANSMISSION	0	0	$544,030
04/12/2013	EXCAVATION DAMAGE	SPOKANE	AVISTA CORP	GAS DISTRIBUTION	0	0	$147,349
12/16/2013	NATURAL FORCE DAMAGE	CHELAN	NORTHWEST PIPELINE LLC	GAS TRANSMISSION	0	0	$250,847
03/31/2014	INCORRECT OPERATION	BENTON	WILLIAMS PARTNERS OPERATING LLC	LIQUEFIED NATURAL GAS	0	1	$46,503,060
11/10/2014	MATERIAL/WELD/EQUIP FAILURE	SKAGIT	OLYMPIC PIPE LINE COMPANY	HAZARDOUS LIQUID	0	0	$1,561,513
06/18/2015	OTHER OUTSIDE FORCE DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	2	$8,972
08/18/2015	OTHER OUTSIDE FORCE DAMAGE	KITSAP	CASCADE NATURAL GAS CORP	GAS DISTRIBUTION	0	1	$1,006,935
03/09/2016	OTHER OUTSIDE FORCE DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	0	$3,018,172
03/29/2017	MATERIAL/WELD/EQUIP FAILURE	PIERCE	NORTHWEST PIPELINE LLC	GAS TRANSMISSION	0	0	$68,250
06/12/2017	MATERIAL/WELD/EQUIP FAILURE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	0	$183,374
08/02/2017	EXCAVATION DAMAGE	PIERCE	MCCHORD PIPELINE CO.	HAZARDOUS LIQUID	0	0	$1,550,000
10/31/2018	EXCAVATION DAMAGE	THURSTON	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	0	$127,509
09/01/2019	OTHER OUTSIDE FORCE DAMAGE	WHATCOM	CASCADE NATURAL GAS CORP	GAS DISTRIBUTION	0	0	$401,753
10/11/2019	EXCAVATION DAMAGE	KING	PUGET SOUND ENERGY	GAS DISTRIBUTION	0	1	$9,738

Causes of Onshore Significant Incidents 2014 – 2018 1533 Total Incidents



Gas Transmission



Hazardous Liquids

Local Government can help reduce these causes

Gas Distribution

U.S. Fatalities - Pipelines Compared to other Causes – 2014 data

- Heart Disease – 633,842
- Flu and Pneumonia – 57,062
- Occupant in passenger vehicle crash – 21,022
- Assault by firearm – 10,945
- Hit by vehicle while walking – 6,259
- Falling on stairs – 2,285
- Drowning in a swimming pool – 701
- Air transport accident – 412
- Earthquake and ground movement – 86
- Killed by tornado - 47
- Bitten or struck by dog – 36
- All Types of Pipelines - 26
- Hit by lightning - 25
- Gas Transmission Pipeline – 2

What Can Local Government Do?

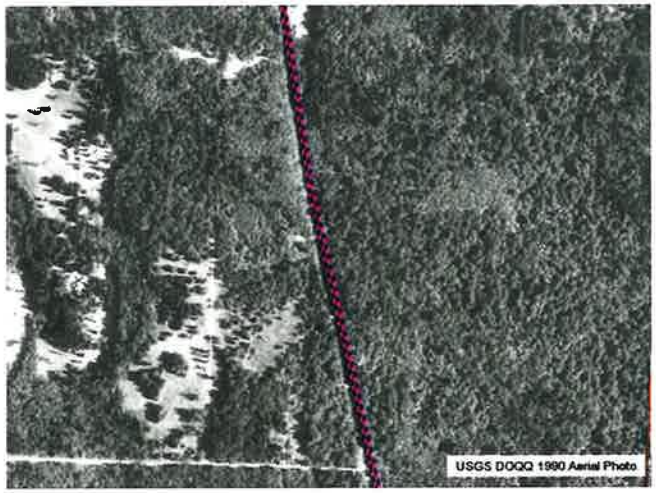
811

Know what's **below.**
Call before you dig.

Help prevent excavation damage

- Require use 811 system
- Report others not using 811

Planning Near Transmission Pipelines



Most pipelines were put in rural areas

But now growth is encroaching on many pipelines

This creates an increased risk that communities should consider when planning

Different types of development near pipelines

Multiple layers of bad planning

What Can Local Government Do?

Ensure Your People Are Ready

What Else Can Local Government Do?

Push for inclusion and engage your state and federal officials

Consider applying to be a member of CCOPS

STATE OF WASHINGTON
Citizens Advisory Committee on
Pipeline Safety

Ensure there is a 3rd leg

Lots of good information available!

Where to get more information?

- PHMSA Stakeholder website – http://primis.phmsa.dot.gov/comm/Index.htm
- Washington Utilities and Transportation Commission https://www.utc.wa.gov/publicSafety/pipelineSafety/
- Pipeline Safety Trust - http://pstrust.org/
- Individual Pipeline Companies
- Pipeline Association of the Northwest – https://panw.pipelineawareness.org/

Thanks for listening and for your interest in pipeline safety

Pipeline Safety TRUST

Credible.
Independent.
In the public interest.

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