

Pipeline Safety in the Salt Lake Valley



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RALPH BECKER
MAYOR

SALT LAKE CITY CORPORATION

OFFICE OF THE MAYOR

July 2012

Dear Resident,

The 2010 Chevron oil spills have caused residents throughout the Salt Lake Valley to wonder about the safety of the many pipelines that traverse our area. While the specific issues that led to the crude oil spills have been investigated and are being addressed by the federal government, I felt the recommendation by the citizen working group to take a broader look at the safety of all pipelines in the Valley made sense.

Last year Salt Lake City learned of a new grant program from the U.S. Department of Transportation's Office of Pipeline Safety. Technical assistance grants up to \$50,000 are available for local communities to hire independent pipeline expertise to investigate and report on pipeline issues that are of concern to those communities. We applied for, and received, a grant to help provide expert, objective information about the safety of the pipelines that crisscross our neighborhoods.

The following report is the culmination of this grant effort, which also included two "Pipelines 101" workshops and a two-day pipeline safety conference held in the spring of 2012. The report contains a number of recommendations that various agencies and stakeholder groups can adopt to help make pipelines in the Salt Lake Valley safer. I hope you find the report informative and helpful in understanding and ultimately ensuring the safety of the pipelines in our area.

Sincerely,

Ralph Becker
Mayor

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Pipeline Safety in the Salt Lake Valley

by Carl Weimer,
Executive Director of the Pipeline Safety Trust

Report Summary

Since early in 2011 the Pipeline Safety Trust has been discussing with various parties in the Salt Lake Valley their concerns about pipeline safety. Many of these concerns have arisen because of the two crude oil spills into Red Butte Creek by Chevron in 2010. In January of 2011 we traveled to Salt Lake City and met with the mayors of both Salt Lake City and Salt Lake County and with their staff members who had been involved with the Red Butte Creek spills. We also met with the Oil Spill Work Group that the Mayor of Salt Lake City formed after the first spill. At that time we suggested to the Mayor's Office a number of activities that might help local government and citizens to take a more informed role in improving pipeline safety in the area.

In the fall of 2011 Salt Lake City was awarded a Community Technical Assistance Grant from the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) to implement a number of educational and involvement activities associated with pipeline safety in the Salt Lake Valley. The main activities included two "pipelines 101" workshops, a two day pipeline safety conference, and the development of a report about the pipelines that operate in the Salt Lake Valley. Salt Lake City contracted with the Pipeline Safety Trust to implement these activities. The workshops were held in early March of 2012, and the conference followed two weeks later on March 15th and 16th. At all three events attendees were asked what other information they would like to have included in this report.

The report tries to provide enough information so those not involved with pipelines on a daily basis can understand the differences between the different types of pipelines and how they are regulated, operated, maintained and where more information is available. We also try to address, from our point

of view, the various concerns we have heard from people in the Salt Lake Valley area.

In preparing this report we used a good deal of information that is publicly available, mainly from the federal Office of Pipeline Safety (OPS¹), the City's Red Butte Creek Oil Spill Website, and obtained from the areas pipeline operators and the Utah Pipeline Association. In some cases we tried to verify pieces of information that we found confusing, but for the most part we took this information at face value. In other words, if the OPS website data shows that 20% of the hazardous liquid pipeline failures in Utah were caused by excavation damage we have assumed that information is accurate enough for the purposes of this report.

Among the questions this report tried to answer are:

- What are the types of pipelines in the Salt Lake Valley and how can you learn the locations?
- Who operates and regulates these pipelines?
- What are the basic safety requirements for constructing, operating and maintaining these pipelines?
- What is the safety record of these pipelines?
- What risks do these pipelines pose to public safety?
- What can be done to reduce these public safety risks even further?

¹ The Office of Pipeline Safety is within the Pipeline and Hazardous Materials Safety Administration (PHMSA) which is part of the U.S. Department of Transportation. Often OPS and PHMSA are used synonymously.

Report Recommendations

In the report you will find a number of recommendations that various agencies and stakeholder groups could adopt that in our opinion would make pipelines in the Salt Lake Valley even safer. Those recommendations include:

The U.S. Congress or the Federal Office of Pipeline Safety (OPS) Could:

- Adopt clearer standards for leak detection on hazardous liquid pipelines
- Clarify ambiguities in regulations regarding emergency and spill response planning to ensure companies provide necessary information to local governments, and that initial evacuation and monitoring also consider potential long term toxic effects to individuals.
- OPS should update their 2009 findings on construction problems to provide any measurable changes that have been implemented by the agency, or the industry.

The Utah State Legislature Could

- Consider expanding state authority to include all hazardous liquid pipelines and interstate gas transmission pipelines.
- Require the Utah Division of Public Utilities to review the NAPS R Compendium of State Requirements & Initiatives along side the Utah pipeline safety regulations and report back to the legislature on any possible improvements that could be made.
- Consider creating a citizen pipeline safety advisory committee to work with the pipeline industry and regulators to review pipeline safety in the state on a regular basis and make any needed recommendations for improving pipeline safety to the industry, regulators or the state legislature.
- Increase pipeline safety by requiring excavators and underground utility operators to report all incidents of damage to a pipeline to the Division of Public Utilities.
- Request a report from the Attorney General describing his enforcement efforts under the state's damage prevention law (Utah Law 54-8a) and whether that enforcement authority would be more effective if transferred to another entity.

The Utah Pipeline Safety Program Could

- Provide information on their website that details the companies inspected, the types of inspections undertaken, and what was found.

- Provide more and easier to find information about their regulatory activities, maps of pipelines, and excavation damage reports on their website.

Local Governments in the Salt Lake Valley Could

- Encourage or require the use of Blue Stakes of Utah's One Call system whenever any permits are granted that include excavation.
- Adopt recommendations regarding planning near pipelines from the Pipelines and Informed Planning Alliance (PIPA) Report. To include at a minimum a consultation zone and inclusion of transmission pipelines on planning and zoning maps.
- Ensure that emergency response personnel (fire, police, health) have necessary equipment, training and information to respond to pipeline emergencies.
- Ensure there is a plan to advise people on the need for evacuations, and that air monitoring equipment adequate for determining long term health effects is onsite within a short time after an incident is recognized.

The Pipeline Industry Could

- Continue to expand the Utah Pipeline Association so all pipeline operators in the state are involved to make an easy "one stop" place for local government and the public to access pipeline info and training.
- Consider forming a public advisory committee of local government representatives and potentially affected citizens to help focus public awareness materials so they are better targeted at the appropriate audiences and include material important to the public.
- Make specific information about pipeline routes, construction, specifications, operations and inspections of their pipelines available on their websites.

The Citizens of the Salt Lake Valley Could

- Learn where the pipelines are in their neighborhoods, and make sure they use the One Call system before digging. They should learn whom to contact if they see someone else they believe is digging without using the free One Call locate service, and who to notify and what actions to take if they suspect a release is occurring.
- Continue to review pipeline safety information and make elected officials, regulatory agencies and the pipeline industry aware of any safety concerns, and concerns regarding any inability to access pipeline safety information.



Background

Salt Lake Valley is an approximate 500-square-mile valley in Salt Lake County in the north-central portion of the U.S. state of Utah. The county contains Salt Lake City and many other significant cities, notably West Valley City, Murray, Sandy, and West Jordan; its total population as of 2011 was 1,029,655. The valley is surrounded in every direction except the northwest by steep mountains that at some points rise 7,100 feet from the valley floor's base elevation. It lies nearly encircled by the Wasatch Mountains on the east, the Oquirrh Mountains on the west, Traverse Ridge to the south and the Great Salt Lake on the northwest.

The Jordan River runs north through the valley between Utah Lake and the Great Salt Lake bisecting the valley, and along with numerous mountain streams and reservoirs, provides water to the rapidly-growing valley. Big Cottonwood, Little Cottonwood, Red Butte, Mill, Parley's, and City creeks, as well as smaller streams flow through the basin and eventually empty into the Jordan River.

On June 11, 2010 a 10-inch pipeline operated by Chevron leaked approximately 33,600 gallons of crude oil over at least a ten-hour period from a hole in the pipeline caused by electrical arcing. Much of the oil flowed down Red Butte Creek through the city until it was diverted into Liberty Lake in Liberty Park and contained before it reached the Jordan River.

On December 1, 2010 a valve on the same 10-inch Chevron pipeline failed very near the earlier spill location when water in the valve froze. The estimated spill from this incident was 21,000 gallons of crude, although none of the oil reached Red Butte Creek.

These two spills raised the awareness of those living in the Salt Lake Valley of the potential dangers from the 347 miles of natural gas and hazardous liquid transmission pipelines in Salt Lake Valley. The Mayor's Office in Salt Lake City took a number of significant actions in response to these two spills to ensure that the people of Salt Lake City would be protected as this line was put back into service, as well as consider other changes that could be made to enhance pipeline safety throughout the Valley. These actions included:

- Hiring an independent ombudsman to become a neutral, confidential resource for residents affected by the oil spill as they sought to get their needs from the Chevron spill addressed.
- Hiring an independent pipeline safety expert to review Chevron's operations and plans for re-start of the pipeline.
- Forming a Oil Spill Work Group "to assess and address the health, welfare, and future safety of individual residents, the broader Salt Lake City community, and, the Red Butte Creek natural environment."

What Kind of Pipelines Are in the Salt Lake Valley

There are three main types of pipelines in the Salt Lake Valley, and it is important to understand what the different types are since they have different safety considerations and are regulated by different agencies under different rules.

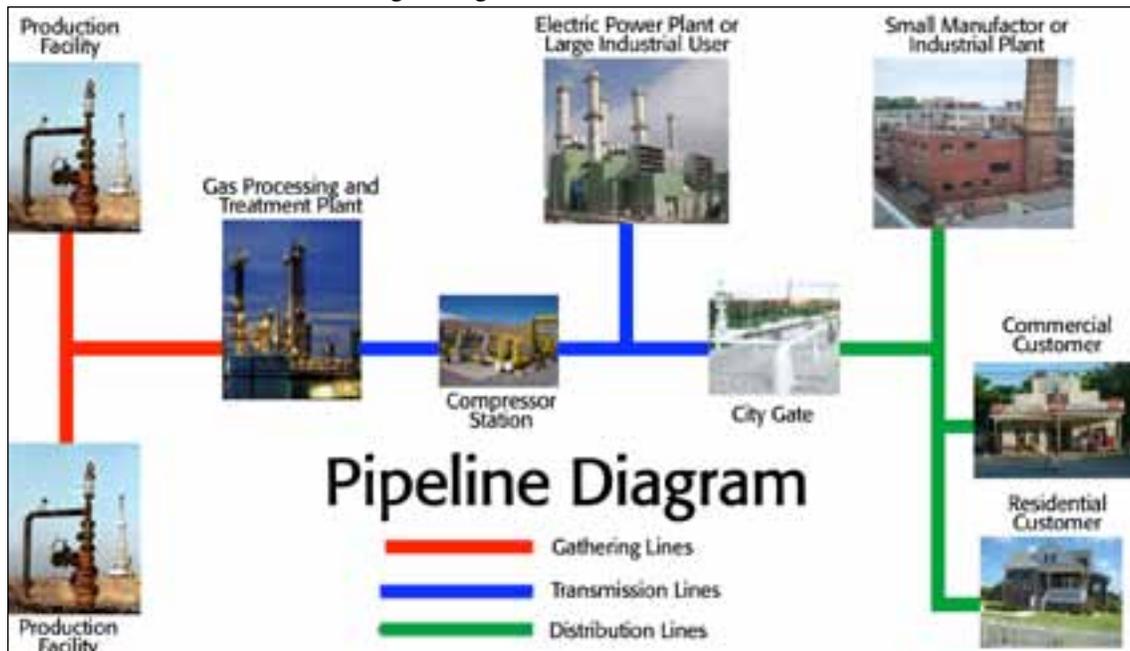
The three main types are:

Hazardous Liquid Lines: These are the lines that move crude oil to the local refineries and then move refined products (gasoline, jet fuel, diesel, etc) from the refineries to other markets.

Natural Gas Transmission Lines: These are the relatively larger, higher-pressure pipelines that move gas from production or storage to where the gas is distributed to our homes and businesses.

Natural Gas Distribution Lines: A distribution line is a relatively small, lower pressure pipeline used to supply natural gas to the consumer. A distribution line is located in a network of piping located downstream of a natural gas transmission line.

The figure below for a natural gas system may help make all this clearer. At the beginning of both natu-



ral gas and hazardous liquid systems there are production facilities and gathering pipeline systems, but to our knowledge there are no such early stage systems in the Salt Lake Valley.

Two other important distinctions are interstate pipelines compared to intrastate pipelines. Interstate pipelines run across state borders, while intrastate pipelines do not cross state borders.

Where Are the Pipelines in the Salt Lake Valley?

The reality is that there are pipelines of one type or another in every area of the Salt Lake Valley. Certainly the largest network of pipelines is the distribution pipeline system that consists of gas mains running throughout the city and the individual service pipelines that deliver natural gas to individual homes and businesses. If you were to view this on a map it would look like a spider web of pipelines covering the entire city.

There are five major pipeline companies operating in the Salt Lake Valley

- Kern River Gas Transmission Company can move about 2.17 billion cubic feet/day of natural gas from production areas in Wyoming to Utah, Nevada, and California. Kern River has two large pipelines (36 – 42 inches in diameter) running in parallel that come from the north out of Davis County, cross north of the Salt Lake City airport, and then turn south on the west side of the metropolitan area.
- Chevron Pipeline Company – Moves crude oil from a NW Colorado gathering system down Emigration Canyon in a

| Transmission Pipelines Commodities in Utah | | |
|--|--------------|-------------|
| Commodity | Mileage | % |
| Carbon Dioxide | 91 | 1.5% |
| Crude Oil | 482 | 8.4% |
| Hydrogen Gas | 5 | 0.0% |
| Natural Gas | 3,589 | 62.8% |
| Natural Gas Liquids HVL | 1,217 | 21.3% |
| Refined Products | 326 | 5.7% |
| Totals | 5,710 | 100% |

http://primis.phmsa.dot.gov/comm/reports/safety/UT_detail1.html

10-inch line to its refinery in Salt Lake City. Various product lines, such as jet fuel to the airport, leave the refinery, and a transmission pipeline also moves fuels north into other states.

- Questar Corporation operates Questar Gas and Questar Pipeline Company. Questar Pipeline Company transports natural gas from Wyoming to Questar Gas, which is a local gas distribution company with almost 900,000 customers in Utah, Wyoming and Idaho. Questar Gas also operates some large transmission lines within the Salt Lake Valley.
- UNEV Pipeline is a 12-inch petroleum products pipeline operated by Holly Energy Partners that begins at the Woods Cross Refineries, crosses north of the Salt Lake City airport and then roughly follows I-80 until turning south to cross the eastern end of Tooele County near Tooele. The pipeline continues to move south to deliver refined products to a Cedar City, Utah terminal and then on into Las Vegas, Nevada.
- Tesoro also operates some transmission crude oil and product pipelines near the refineries in the north part of Salt Lake County.

The larger hazardous liquid and natural gas transmission pipelines are more limited in distribution throughout the community. On this map of Salt Lake County developed by the National Pipeline Mapping System the hazardous liquid pipelines are shown in red and the natural gas transmission pipelines are shown in blue.

Anyone can access these maps to see where hazardous liquid and gas transmission pipelines run through their community. The “public viewer” for the maps is available online at: <http://www.npms.phmsa.dot.gov/>

The system takes 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 a general idea of where pipelines are located they should never be used as an indication of where it might be safe to dig. The One Call system is the only way to identify the exact location of a pipeline.

Who Regulates Pipeline Safety

Federal Powers

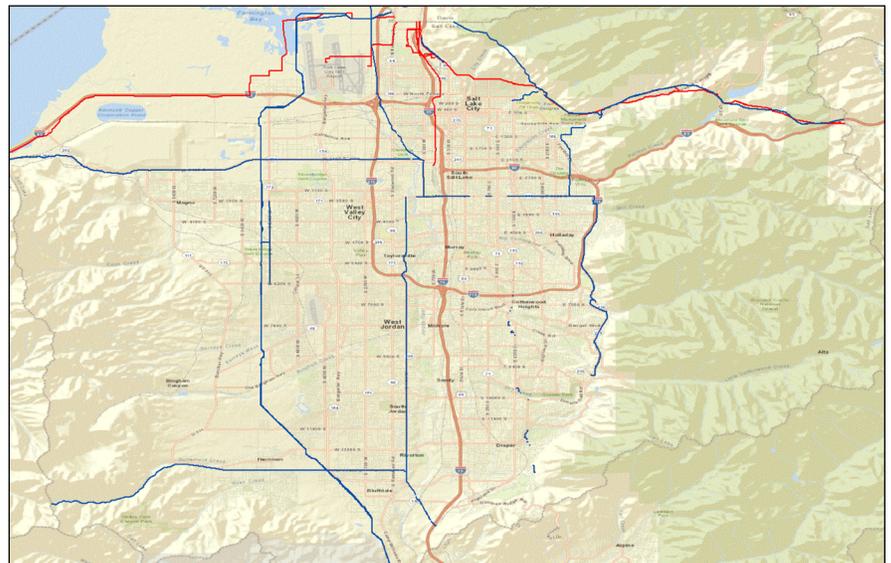
The U.S. Department of Transportation, through its Office of Pipeline Safety (OPS) establishes the minimum safety standards for the interstate and intrastate transportation of fuels by pipelines, as well as for the “pipeline facilities” used in these activities. The term “pipeline facilities” includes pipelines, rights-of-way, facilities, buildings, and equipment used in transporting or treating fuels during transportation.

| County | Natural Gas | Hazardous Liquid | % of State Total |
|-----------|-------------|------------------|------------------|
| Davis | 76 | 128 | 3.5% |
| Salt Lake | 179 | 54 | 4.1% |
| Tooele | 61 | 0 | 1.0% |
| Utah | 260 | 0 | 4.5% |
| Weber | 49 | 28 | 1.3% |

http://primis.phmsa.dot.gov/comm/reports/safety/UT_detail1.html

Congress mandated that OPS adopt certain safety standards. Among the areas in which standards must be adopted are operator qualifications, facility information and documents (for example, emergency response plans and mapping), and periodic pipeline inspections. Other mandated standards include those addressing risk analyses and integrity management programs for pipeline facilities (other than distribution pipelines) in high-density population areas, as well as integrity management programs for distribution pipelines. All of the mandates vary depending on whether a pipeline is for production, gathering, transmission or distribution.

Congress also gave OPS authority to adopt other



safety standards on its own. This discretionary authority is extremely broad and covers nearly the entire range of the risk to public safety related to pipeline facilities and transportation: design, installation, inspection, emergency plans and procedures, testing, construction, operation, replacement and maintenance. One area that OPS is not allowed to regulate is the routing of pipelines.

PHMSA’s minimum federal safety standards for pipelines are set out in Title 49, Part 190-199 of the Code of Federal Regulations, which can be found at: <http://phmsa.dot.gov/pipeline/regs>

State Powers

The federal Office of Pipeline Safety has certified Utah as having a valid pipeline safety program. Because of this certification the Legislature has given regulatory authority over the safety of intrastate natural gas pipelines to the Utah Division of Public Utilities. Although the federal government is responsible for setting minimum pipeline safety standards, Utah can adopt additional or stricter safety standards for intrastate natural gas pipeline facilities and transportation. However, any intrastate safety standards adopted by Utah must be compatible with the federal standards.

To date Utah has not chosen to seek any authority over hazardous liquid pipelines or interstate natural gas pipelines. Utah has also not adopted any pipeline safety regulations that go beyond the minimum federal regulations for the intrastate natural gas pipelines they do have authority over.

The Utah pipeline safety regulations can be found at: <http://www.publicutilities.utah.gov/pipeline.html>

City and County Governmental Powers

For the most part the federal and state regulations preclude local government from adopting any regulations that require a pipeline operator to take any actions regarding the safe operation of a pipeline. There is nothing in state or federal law that restricts a city’s ability to ask for increased safety measures as part of their negotiations regarding the use of city rights-of-way or other public property. While the City may not be able to require or enforce such measures, cities nationwide have been able to ob-

tain increased safety measures through such voluntary requests, especially when such safety measures are well thought out, supported by the public, and do not conflict with federal or state regulations.

Increasing Pipeline Safety Through Land Use and Zoning

One area in which local government has considerable ability to increase pipeline safety is through their land use and zoning authority. This is discussed below in the Land Use Planning Near Transmission Pipeline section.

Discussion of Regulatory Opportunities

Over the past two years there have been a series of high profile pipeline failures that have caught the attention of the public, the media, and ultimately the U.S. Congress. In 2010 and 2011 Congress held fifteen hearing on pipeline safety issues and in December of 2011 they passed the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011”. That bill doubled the fines that OPS can levy for pipeline safety viola-

tions and in response to the Red Butte Creek spill and the larger spill into the Kalamazoo River in Michigan ordered OPS to undertake a study to determine if better leak detection is feasible.

During that same time period OPS has initiated major rule makings to strengthen regulations regarding control rooms, state damage prevention programs, use of excess flow valves, and broad ranging reviews of hazardous liquid and gas transmission regulations. All of these efforts have the potential to increase pipeline safety.

It is our belief that expanding state authority over more miles of pipelines is one way to improve safety. The additional state inspectors provide another layer of oversight to aid the current 106 federal inspectors, and for intrastate pipelines states can set more stringent rules if they feel they are necessary to address issues specific to that state. In 2011 the National Association of Pipeline Safety Representatives (NAPSR), which represents all the state pipeline safety agencies, released a report and declared that the “Report Finds State Pipeline Safety Programs Stricter than Federal Requirements.” The report detailed 1154 safety enhancements that states have passed that go beyond the

| Probable Violations on Natural Gas Pipelines Identified by the Utah Division of Public Utilities | |
|--|-----|
| 2002 | 624 |
| 2003 | 560 |
| 2004 | 266 |
| 2005 | 311 |
| 2006 | 89 |
| 2007 | 83 |
| 2008 | 45 |
| 2009 | 45 |
| 2010 | 69 |
| 2011 | 76 |

http://primis.phmsa.dot.gov/comm/reports/stenforce/StateEnfDet_state_UT.html

federal minimum regulations to protect the public and the environment. The report also stated that 45 out of the 48 states covered by the report have adopted safety rules that go beyond what the federal regulations require. Utah is one of three states in the country that was noted for not adopting any enhanced safety rules.

The NAPS R Compendium of State Requirements & Initiatives can be found at: http://www.napsr.org/napsr_current_issues.htm

Recommendations Regarding Regulatory Oversight

The Utah State Legislature should consider expanding state authority as much as is possible to include all hazardous liquid pipelines and interstate gas transmission pipelines.

The Utah State Legislature should require the Utah Division of Public Utilities to review the NAPS R Compendium of State Requirements & Initiatives along side the Utah pipeline safety regulations and report back to the legislature on any possible improvements that could be made.

How Much Risk is There From the Pipelines in the Salt Lake Valley?

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 say whether the pipelines in the Salt Lake Valley 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.

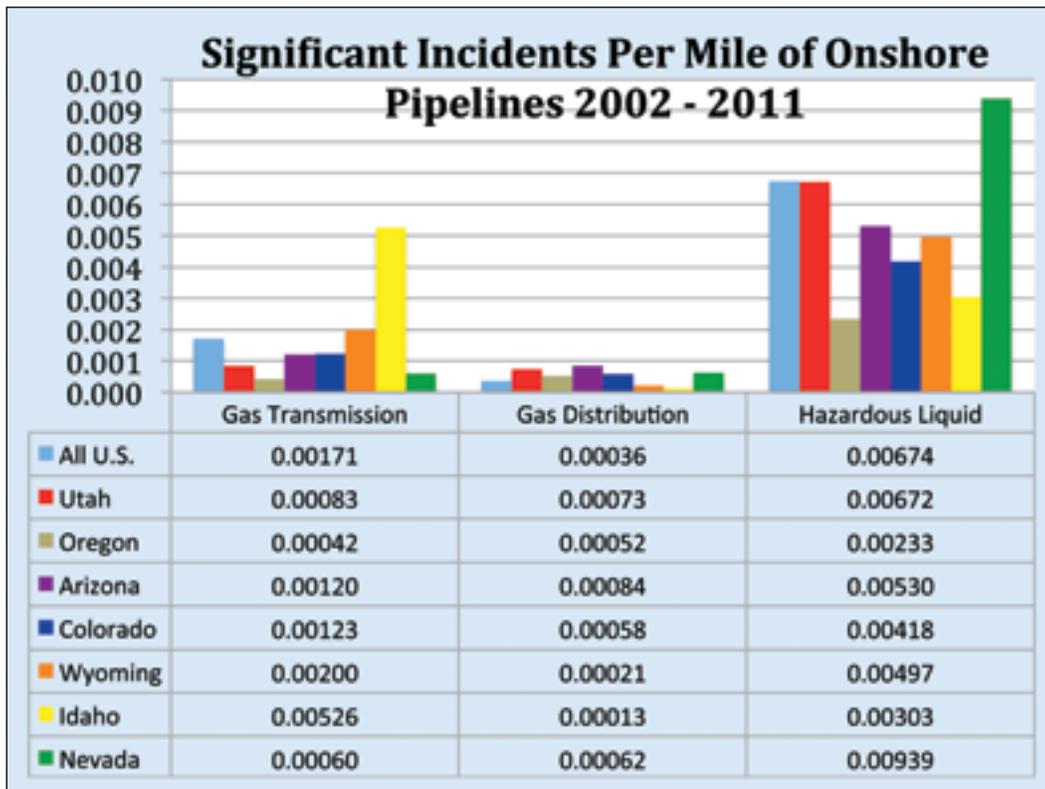
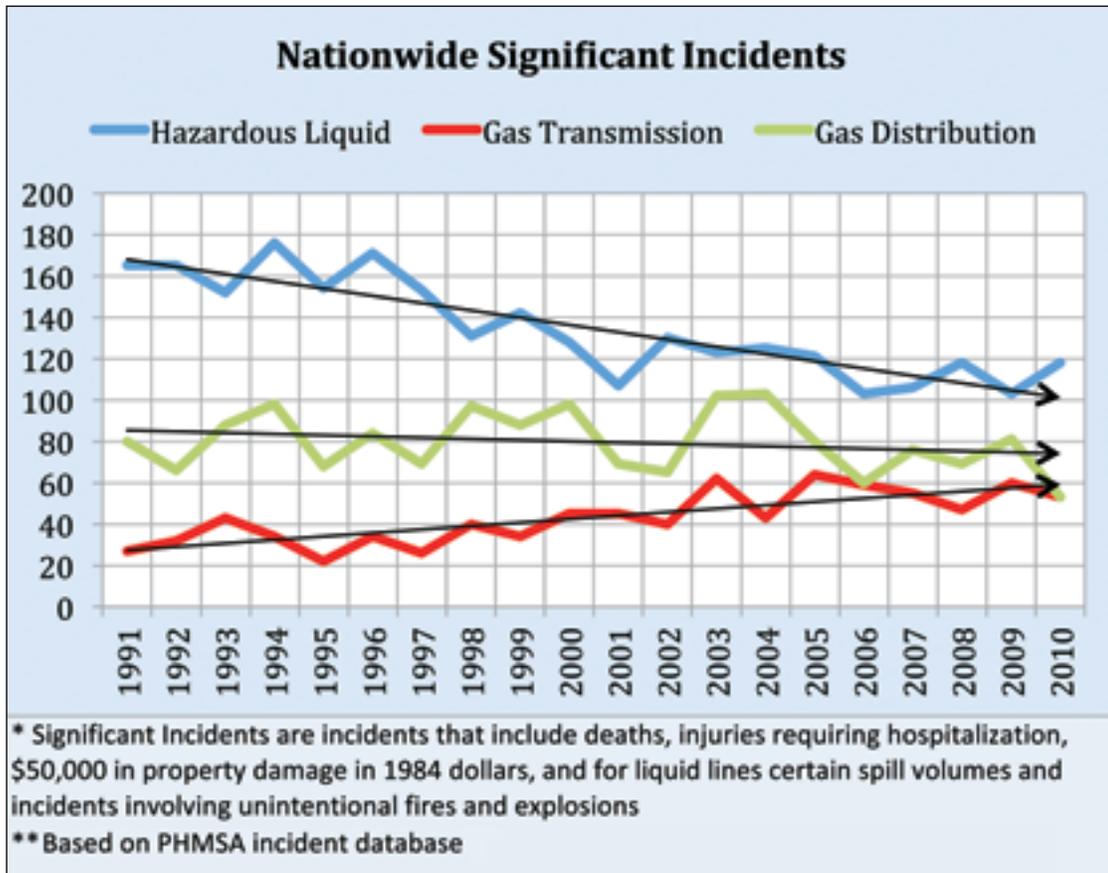
We believe that risk is made up of two different factors both of which need to be carefully considered when deciding how risky an activity is. Those factors are the probability that an event will occur (chance a pipeline will rupture or leak), and the possible consequences if it does. Below we will talk about the various things that pipeline operators are required to do to keep their pipelines safe and therefore reduce the probability of an event occurring.

One other measure that helps shed light on the probability of an occurrence is the past incident rates for pipelines in a given area. Past performance cannot accurately reflect future incidents since many factors could change over time, but such data can provide

trend lines that point to needed changes in pipeline operation, maintenance, public outreach and regulations. The graphs on the following pages show the number of significant incidents occurring on the different types of pipelines in the past ten years in both Utah and nationwide. These graphs also indicate the trend lines for incidents during this period for the entire United States. There have been so few incidents in Utah over the past ten years that trend lines are not really meaningful or accurate. We have also included graphs that show the causes of the incidents, so it is easier to tell which incidents were within the control of the pipeline operator.

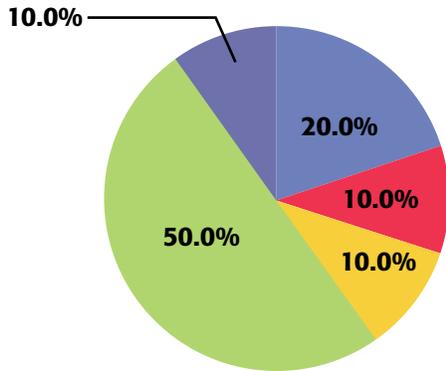
| | Miles of Pipeline | Number of Incidents | Number of Deaths & Injuries | Property Damage |
|--------------------------|-------------------|---------------------|-----------------------------|-----------------|
| Hazardous Liquid | 2,115 | 10 | 0 | \$50,236,494 |
| Natural Gas Transmission | 3,593 | 3 | 0 | \$2,838,864 |
| Natural Gas Distribution | 16,450 | 12 | 9 | \$2,985,261 |



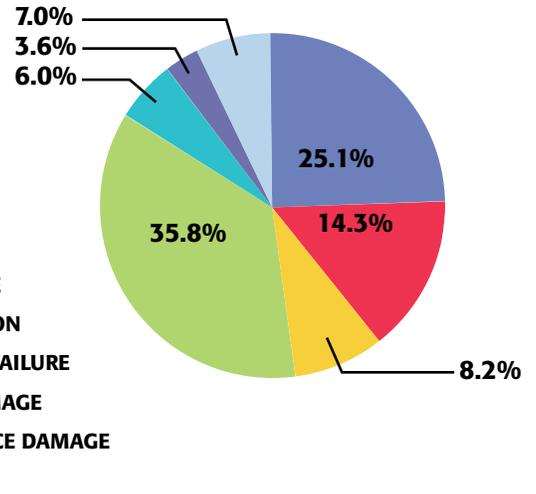


Comparison between Utah and the United States of the causes of pipeline incidents on specific pipeline types

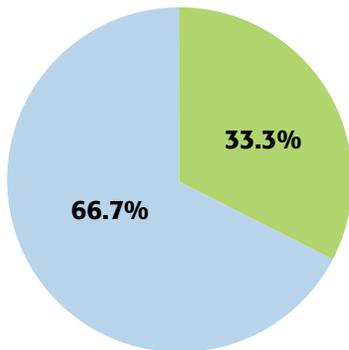
Significant Incident Cause Breakdown
Utah, Hazardous Liquid, 2002-2011



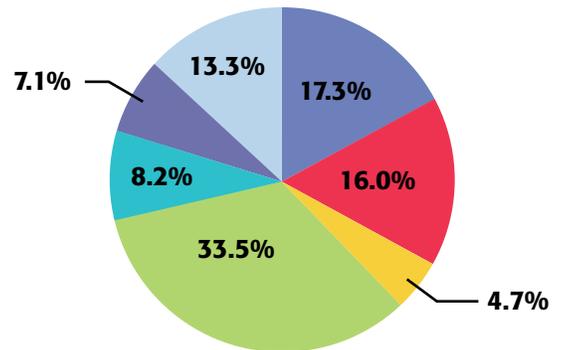
Significant Incident Cause Breakdown
National, Hazardous Liquid, 2002-2011



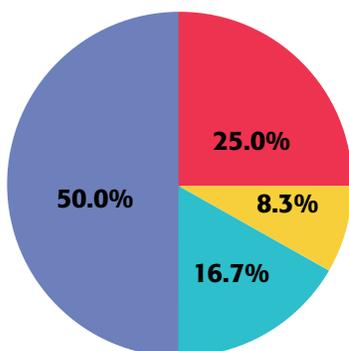
Significant Incident Cause Breakdown
Utah, Gas Transmission Onshore, 2002-2011



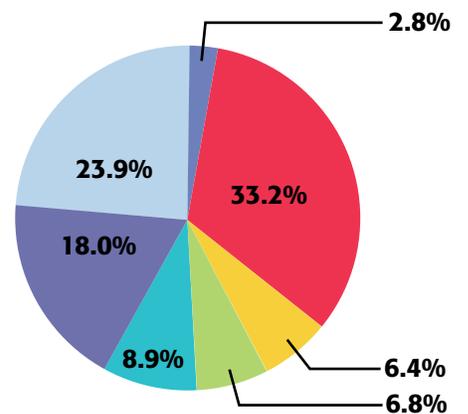
Significant Incident Cause Breakdown
National, Gas Transmission Onshore, 2002-2011



Significant Incident Cause Breakdown
Utah, Gas Distribution, 2002-2011



Significant Incident Cause Breakdown
National, Gas Distribution, 2002-2011



Below are the specific incidents that have occurred in the entire state of Utah in the past ten years.

| Significant Incidents on Utah All Pipeline Systems: 2001-2011 | | | | | | |
|---|-----------------------|--------------------------|----------------------------|------------|----------|---------------------|
| Date | City | Operator | Cause | Fatalities | Injuries | Property Damage |
| 01/12/2002 | | GIANT PIPELINE CO | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$6,188 |
| 02/06/2002 | SALT LAKE CITY | CHEVRON PIPELINE CO | CORROSION | 0 | 0 | \$325,688 |
| 02/09/2002 | PAYSON | QUESTAR GAS COMPANY | EXCAVATION DAMAGE | 0 | 0 | \$672,409 |
| 05/22/2002 | FORT DUCHESNE | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 0 | \$112,475 |
| 11/02/2002 | CORINNE | CHEVRON PIPELINE CO | CORROSION | 0 | 0 | \$305,640 |
| 11/29/2003 | GARLAND | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 2 | \$122,698 |
| 02/21/2004 | MAPLETON | QUESTAR GAS COMPANY | NATURAL FORCE DAMAGE | 0 | 0 | \$119,570 |
| 06/14/2004 | MURRAY | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 1 | \$896,951 |
| 08/25/2004 | PARK CITY | CHEVRON PIPE LINE CO | EXCAVATION DAMAGE | 0 | 0 | \$452,969 |
| 02/18/2006 | SOUTH WEBER | QUESTAR GAS COMPANY | ALL OTHER CAUSES | 0 | 0 | \$481,302 |
| 03/24/2006 | PARK CITY | QUESTAR GAS COMPANY | NATURAL FORCE DAMAGE | 0 | 0 | \$112,301 |
| 02/06/2007 | SARATOGA SPRINGS | QUESTAR GAS COMPANY | EXCAVATION DAMAGE | 2 | 0 | \$223,691 |
| 03/14/2007 | EVANSTON | ROCKY MOUNTAIN PIPELINE | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$50,001 |
| 04/08/2007 | PRICE | QUESTAR PIPELINE COMPANY | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$79,062 |
| 06/16/2007 | MONTEZUMA CREEK | RUNNING HORSE PIPELINE | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$259,502 |
| 10/09/2007 | MURRAY | QUESTAR GAS COMPANY | EXCAVATION DAMAGE | 0 | 0 | \$546,734 |
| 03/16/2008 | MAGNA | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 1 | \$9,587 |
| 04/13/2008 | WASHINGTON | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 0 | \$157,901 |
| 08/07/2008 | SALT LAKE CITY | QUESTAR GAS COMPANY | INCORRECT OPERATION | 0 | 1 | \$0 |
| 01/07/2009 | | CHEVRON PIPE LINE CO | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$1,576,179 |
| 06/01/2009 | WEST VALLEY CITY | QUESTAR GAS COMPANY | OTHER OUTSIDE FORCE DAMAGE | 0 | 2 | \$10,939 |
| 12/17/2009 | CORINNE | CHEVRON PIPE LINE CO | MAT'L/WELD/EQUIP FAILURE | 0 | 0 | \$517,226 |
| 06/12/2010 | SALT LAKE CITY | CHEVRON PIPE LINE CO | OTHER OUTSIDE FORCE DAMAGE | 0 | 0 | \$32,233,740* |
| 12/01/2010 | SALT LAKE CITY | CHEVRON PIPE LINE CO | INCORRECT OPERATION | 0 | 0 | \$14,509,357 |
| 12/10/2011 | NEAREST TOWN IS HYRUM | COLORADO INTERSTATE GAS | ALL OTHER CAUSES | 0 | 0 | \$2,278,500 |
| Totals | | | | 2 | 7 | \$56,060,610 |

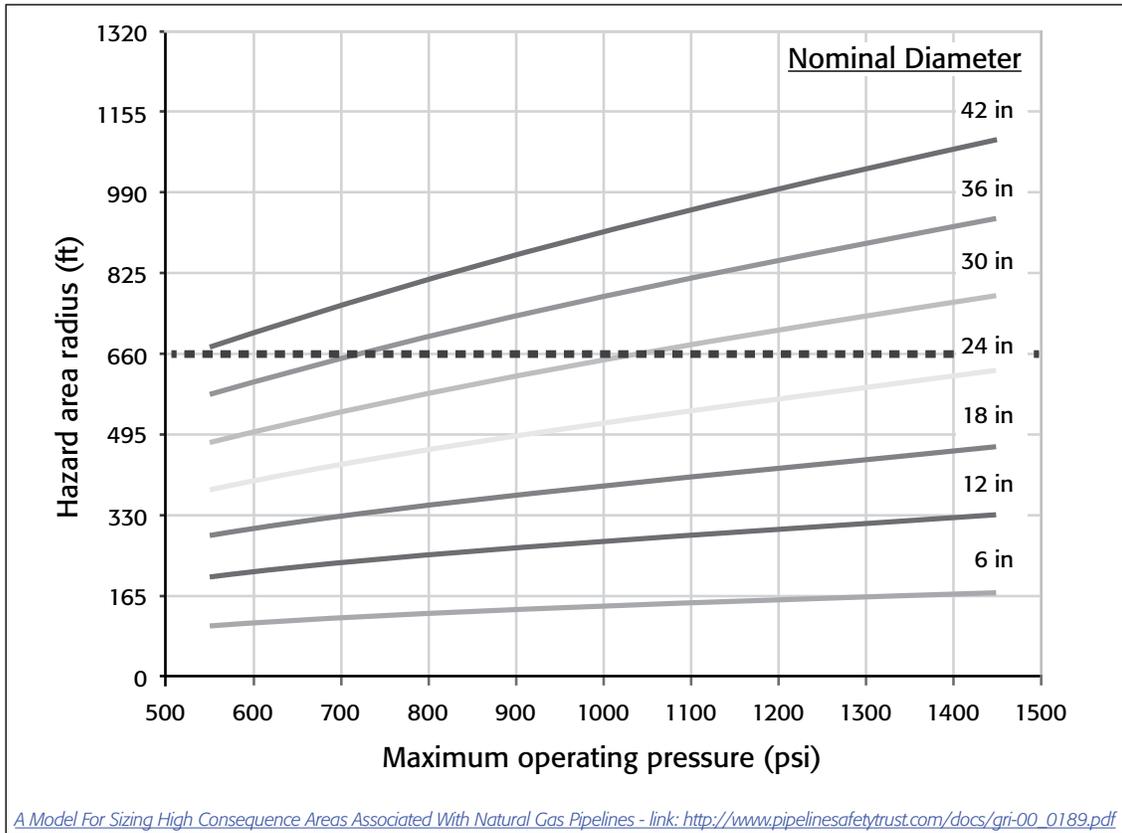
Source: PHMSA Hazardous Liquid Flagged Incidents File - June 29, 2012
 * Chevron Supplemental Accident Report - 7/17/12

The above charts and graphs should provide some measures of the probability of a pipeline incident happening and some of the consequences if it does. It is fairly clear from the data that the chance of a pipeline failing in any particular spot is very, very small, but of course if you ask the families of any of the 376 people who were killed by pipeline incidents over the past twenty years in United States they would tell you that the consequences are huge. So what are the possible consequences of pipeline failures, and how can they be quantified?

In 2000 the Gas Research Institute contracted with C-FER Technologies to produce—A Model For Sizing High Consequence Areas Associated With Natural Gas Pipelines - that became instrumental in helping define potential impact zones around natural

gas pipelines. While the model is complex, the basic idea is that by considering the diameter of the pipeline and the pressure it is operating at, it is possible to predict the impact area around the pipeline that could lead to a fatal exposure in the event of a catastrophic failure. Below is the chart out of the model that predicts these different zones.

It is possible to use this graph to analyze the potential impact radius of specific pipelines. Below is an aerial photo of a neighborhood along the Kern River gas transmission pipelines near Kearns, Utah (Two 36 inch diameter lines, Maximum Allowable Operating Pressure (MAOP) 1333psi). As you can see these pipelines run between the Thomas W Bacchus Elementary School on the left and the Thomas Jefferson Junior High School on the right.



The red circle shows the Potential Impact Radius (PIR) for one of the transmission pipelines if it should fail in the middle of the circle. As you can see over 125 homes and the elementary school fall within the PIR of the transmission pipeline.

Another way is to consider the actual consequence of a pipeline incident is by reviewing actual previous incidents. The National Transportation Safety Board investigates many of the most significant incidents and the reports of their investigations can be found at: http://www.nts.gov/Publictn/P_Acc.htm

This dramatically illustrates how the pressure and size of a pipeline can affect the area impacted by a complete pipeline rupture. It should be remembered that the PIR calculations are based on a rupture in an open area, so in this example the walls and trees near some of the houses could provide some shielding, and the houses closest to the rupture site would help shield the houses further away from some of the effects of the initial blast wave and heat radiation.

Some experts have argued that the C-FER Model underestimates the impact areas around natural gas pipelines, especially for large diameter pipelines at high pressures, however the basic concept provides a good context for understanding the function between pipeline size, pressure, and potential impact.



The photos below also provide some indication of the consequences of pipeline failures.



Natural Gas Transmission Pipeline Failure. Bushland TX, November 2009



Rupture and ignition of gasoline from a pipeline in Bellingham, Washington in 1999



Failure of a natural gas transmission pipeline. Arrow shows point of failure. Note how far from point of failure houses were destroyed



Fire caused by gas from a distribution pipeline leak building up in house and then exploding.



Failure of natural gas transmission pipeline. In this incident there was no explosion or fire, the crater was created by the pressure of the gas coming out of the pipeline. Note how far the pipe in the upper right corner was thrown.



Clean up caused by spill into Red Butte Creek in Salt Lake City 2010

Pipeline Safety Requirements During Design and Construction

The construction phase of pipeline installation is a critically important time to ensure the long-term integrity of the pipeline. Below are a few of the issues dealt with during the construction phase that affect pipeline safety. These various safety precautions discussed pertain mainly to gas transmission and hazardous liquid pipelines.

Choosing Pipe

Pipe sections for large transmission pipelines are 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, and nonmetallic material, such as plastic or composites. Natural gas distribution systems in particular have been transitioning to plastic pipes for a high percentage of their service lines over the past couple decades. Plastic pipe has become preferred in these low pressure, low stress conditions because it is easy to work with, low cost, and avoids many problems (such as corrosion) that metal pipes can have. Some older plastic pipe also has unique problems associated with becoming brittle as it ages. The manufacturers of this problematic pipe are well known, so companies that have used it in the past can keep a close eye on it or replace it.

Pipe Burial

Mechanical equipment such as wheel trenchers or backhoes are 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 underground without the need of trenching.

The trenches are dug deep enough to allow for an adequate amount of cover when the pipe is buried. Federal regulations require that transmission pipelines be buried at least 30 inches below the surface in rural areas and deeper (36 inches) in more popu-

lated areas. In addition, the pipeline must be buried deeper in some locations, such as at road and railroad crossings (36 inches) and crossings of navigable bodies of water (48 inches), and may be less in other locations such as when it is installed in consolidated rock (18 to 24 inches). Gas distribution mains need to be buried 24 inches deep unless state or local law allows less cover. There is no minimum burial depth for distribution service lines, which helps explain why excavation damage causes so many problems on them. The depth of burial of the line must be in accordance with federal pipeline safety regulations.

It should be remembered that while current regulations do require many pipelines to be buried at certain depths, the regulations do not require that a pipeline's depth of burial is maintained. Erosion and other factors can reduce the depth of a pipeline, so it should never be assumed that a pipeline that has been in the ground for many years is still at the required depth.

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 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 ensures the quality of the ongoing welding operation. To do this, 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. The X-ray technician processes the film in a small, portable darkroom at the site. If the technician detects certain flaws, the weld is repaired or cut out, and a new weld is made. Another method of weld quality inspection employs ultrasonic technology.

Coating

Several different types of 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 sidebooms. 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.

Once the pipeline is lowered into the ground, the trench is backfilled, to ensure that the pipe and its coating are not damaged. This is generally accomplished with either a backhoe or padding machine depending on the soil makeup.

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.

As the backfill operations begin, the excavated material is returned to the trench in reverse order, with the subsoil put back first, followed by the topsoil. This ensures the topsoil is returned to its original position.

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. How this pressure is determined is defined in federal regulations and is 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 hazardous liquid and natural gas transmission pipelines must be hydrostatically tested before they can be placed into service. The purpose of a hydrostatic pressure test is to eliminate any defect that might threaten the pipeline's ability to sustain its maximum operating pressure plus an additional safety margin, at the time of the hydrostatic test. 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 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 are used that permit the identification of specific types of defects, such as corrosion. But because not all lines can be inspected with ILI tools and because of the need to find types of defects that are not currently detected by ILI technology, hydrostatic testing is an accepted method for demonstrating the fitness of a pipeline segment for service.

Concerns During Pipeline Construction

In 2009 the federal Office of Pipeline Safety (OPS) held a special workshop to go over the numerous problems they found during just 35 inspections of new transmission pipelines under construction. These inspections found significant problems with the pipe coating, the pipe itself, the welding, the excavation methods, the testing, the design, etc. The findings and presentations from this workshop can

be found at: <http://primis.phmsa.dot.gov/construction/index.htm> OPS's findings call into question the current system of inspections for the construction of new pipelines. This construction phase is critical for the ongoing safety of these pipelines for years to come. While OPS has now acknowledged the problems occurring during construction it is unclear whether they have been able to ramp up their own inspection activities during construction. OPS has requested significantly more inspectors, and additional funding for the review of new pipelines, but to date those requests have not been addressed by Congress.

It is unclear to us how involved the Utah Division of Public Utilities is in inspecting the construction of new intrastate gas pipelines in Utah.

Recommendations Regarding Pipeline Construction

- The Utah Division of Public Utilities should provide information on their website that details the companies inspected, the types of inspections undertaken, and what was found.
- OPS should update their 2009 findings on construction problems to provide any measurable changes that have been implemented by the agency, or the industry.

Pipeline Safety Requirements During Operation

Corrosion Protection

Unprotected steel pipelines are susceptible to corrosion, and without proper corrosion protection every steel pipeline 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 to extend pipeline life 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 System (SCADA)

A SCADA 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 to equipment malfunctions and releases. Some SCADA systems also incorporate the ability to remotely operate certain equipment, including compressor 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.

Right-of-way Patrols

Regulations require regular patrols of pipeline rights-of-way 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 are a normal part of most gas pipeline systems.

Odorization of Natural Gas Lines

All distribution pipelines, and some transmission and gathering lines (those mainly in highly populated areas), are required to be odorized so leaking gas is readily detectable by a person with a normal sense of smell.

Leak Detection on Hazardous Liquid Pipelines

While federal regulations do not require leak detection systems on all liquid pipelines, the majority of operators do use some sort of leak detection system. The federal regulations do require that if a leak detection system is installed on a liquid pipeline that it meets certain standards drafted by the American Petroleum Institute, but those standards do not define the size or duration of a spill that a leak detection system must be able to detect.

Integrity Management

Integrity Management refers to a relatively new set of federal rules that specify how pipeline operators must identify, prioritize, assess, evaluate, repair and validate - through comprehensive analyses - the integrity of their pipelines. Some form of integrity management now applies to both transmission and distribution pipelines, although gathering lines are exempt from these requirements. For gas transmission pipelines, integrity management requires that lines that could affect High Consequence Areas (mainly more populated areas) have to be re-inspected by their operators every seven years. For hazardous liquid pipelines integrity management requires that lines that could affect High Consequence Areas have to be re-inspected by their operators every five years. This re-inspection is done mainly with internal inspection devices called smart pigs, 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. From 2004 - 2010 these rules required over 45,000 repairs be made to gas and liquid transmission pipelines that fall within High Consequence Areas. Unfortunately, only about 7% of the gas transmission pipelines, and 44% of hazardous liquid pipelines nationwide are required to do these important inspections.

Discussion of Operational Concerns

Overall, the incident rates for pipelines in Utah do not point at any specific problems with the operations of pipelines in the state. The Red Butte Creek spill did surprise many people because the leak continued for many hours without being detected by Chevron's leak detection system. Instead, those near the creek detected the leak as the smell became stronger and stronger. The failure of this leak detection system to find this leak, followed by the failure of leak detection on the Enbridge system in

Michigan to detect a leak of around a million gallons has once again raised the question of whether regulators need to adopt clear standards for how leak detection system need to perform, or whether they need to push for the development of better leak detection technology. Congress took note of these leak detection problems and has ordered OPS to produce a report on leak detection to consider the current limitations and practicability of establishing clearer performance standards. This report is due in early 2013.

After the Red Butte Creek spill Salt Lake City hired an independent pipeline safety expert to review many parts of the Chevron system, including leak detection (<http://www.slcclassic.com/oilspill/accufactsreport.pdf>). His conclusions at that time was that because of the elevation drop from Parley's Pass to Salt Lake City and the changing pressures in the pipeline it would be nearly impossible with current technology to develop a SCADA based leak detection system that could detect the size of leak that occurred on Red Butte Creek, and that Chevron's leak detection focus should be to ensure their leak detection would respond quickly to a major pipeline rupture.

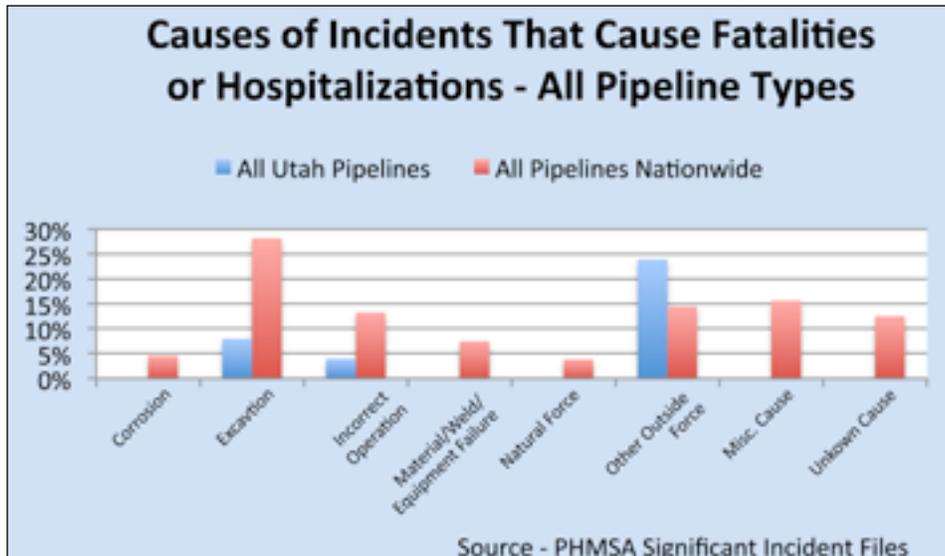
One other concern that has been raised and that Congress has also responded to is the need to expand the use of integrity management programs on more miles of transmission pipelines. Integrity management methods have been proven to find pipeline flaws and fix them, but unfortunately only about 7% of the gas transmission pipelines, and 44% of hazardous liquid pipelines nationwide are required to do these important inspections. This is particularly important in a state such as Utah that has many rural areas, since it is the people in those rural areas that are left out under current integrity management rules. Congress seeing this problem has again ordered OPS to study "whether integrity management system requirements, or elements thereof, should be expanded." This study is due around the summer of 2013. The Interstate Natural Gas Association of America, which represents most of the gas transmission pipeline companies in the country have already endorsed this expansion of integrity management as one of their new "guiding principles" stating - "We are committed to applying integrity management principles on a system-wide basis."

Recommendations Regarding Pipeline Operations

- OPS should adopt clearer performance standards for leak detection on hazardous liquid pipelines, and all hazardous liquid pipelines should be required to meet them.
- OPS should adopt some form of integrity management for all miles of hazardous liquid and gas transmission pipelines.
- Pipeline companies, instead of waiting for OPS and Congress to act, should follow INGAA's lead and adopt voluntary integrity management programs on all of their pipelines.

Pipeline Damage Prevention and Public Awareness Programs

One of the leading causes of pipeline incidents is damage to pipelines from people digging. In fact, as shown below, for the past 10 years this has been the main cause of deaths and injuries from pipelines in the U.S. While it appears that Utah is doing better than the national numbers in preventing damage from excavation the numbers are somewhat skewed by the small number of serious incidents that Utah has, and the high reporting requirement threshold for the federal statistics. For instance in a recent year Questar Gas alone reported 1416 occurrences of damage to its pipeline system from excavation damage, but hardly any of these incidents are required to be reported because they fall under the \$50,000 of property damage threshold. For this reason programs designed to decrease damage to pipelines caused by excavation may be more important to protect people and the environment than the statis-



tics imply. Below are brief descriptions of the major damage prevention efforts in Utah.

One-Call Centers

The primary tool for avoiding damages to underground facilities is timely communication between those digging (excavators) and the owners of the facilities. It is important to Call Before You Dig and Dig Safely. In Utah, Blue Stakes of Utah facilitates this communication process by enabling an excavator to place just one call, prior to digging, to request that all underground facilities in the area of a planned excavation be located and marked.



By simply dialing 811 or 1-800-662-4111, you can reach the one-call center where,

at no cost to you, companies that may operate underground utilities in the area you plan to dig will be notified. Those companies can then dispatch locate crews to determine and mark the exact location of their utilities so that you can avoid hitting them when you begin your excavation. Utah law requires anyone doing excavation to call to have the location of the utilities marked at least 48 working hours before any excavation is done, and Utah law defines excavation as “an operation in which earth, rock, or other material on or below the ground is moved or displaced by tools, equipment, or explosives.”

Hitting underground utilities when you are digging can cause injuries, even deaths, environmental damage and loss of critical infrastructure and services. Strikes that don't cause immediate problems can lead to failures years later. If you don't make the call, you could be liable for damage costs and repairs, as well as subject to potential penalties. Don't take the chance – Call before you dig.

Best Practices Regarding Damage Prevention

In 2000 a national organization called the Common Ground Alliance (CGA) was launched in an effort to reduce damages to all underground facilities in North America through shared responsibility among all stakeholders. In promoting a spirit of shared responsibility, the CGA welcomes all stakeholders who would like

to be a part of the identification and promotion of best practices that lead to a reduction in damage. Any “best practices,” endorsed by the CGA come with consensus support from experts representing the following stakeholder groups: Excavators, Locators, Road Builders, Electric, Telecommunications, Oil, Gas Distribution, Gas Transmission, Railroad, One Call, Public Works, Equipment Manufacturing, State Regulators, Insurance, Emergency Services and Engineering/Design.

CGA has taken the lead nationally is developing best practices to reduce damage to underground utilities, including pipelines. The latest version (Version 9.0) of their Best Practices manual includes 151 best practices in the following categories:

1. Planning & Design Best Practices
2. One Call Center Best Practices
3. Location & Marking Best Practices
4. Excavation Best Practices
5. Mapping Best Practices
6. Compliance Best Practices
7. Public Education Best Practices
8. Reporting & Evaluation Best Practices
9. Miscellaneous Practices

To obtain a free copy of the CGA Best Practices manual visit the CGA website at: <http://www.commongroundalliance.com/>

Reporting of Excavation Damage

Because federal pipeline incident reporting requirements often do not capture the serious potential of excavation damage, many states and underground utility associations have begun collecting data to support the need for better damage prevention education and regulations. Blue Stakes of Utah in collaboration with the Common Ground Alliance have implemented a Damage Information Reporting Tool (DIRT) to provide an easy-to-use process for excavators and utility operators in Utah to input damages to underground facilities. It is hoped this effort will provide good data on the specific causes of underground damage that can lead to more targeted education and legislation to prevent damages to underground facilities and ensure public safety.

Public Awareness

For many years, the pipeline industry has provided information to a variety of groups living and working near pipelines to ensure they know about the pipelines in their area, how to recognize and re-

spond to a problem, and ways to prevent damage to pipelines. The American Petroleum Institute developed a series of recommended practices for pipeline operators to use to help ensure the effectiveness of these public awareness efforts. In 2005 these recommended practices were incorporated by reference into the federal pipeline safety regulations (49 CFR 192.616 and 49 CFR 195.440), and now require that pipeline operators conduct continuing public awareness programs to provide pipeline safety information to four stakeholder audiences:

- * Affected Public
- * Excavators
- * Emergency Officials
- * Local Public Officials

Under these regulations, pipeline operators must provide the above groups with information about how to recognize, respond to, and report pipeline emergencies. The importance of using the one-call notification system prior to excavation is to be emphasized for all stakeholders. Emergency officials and local public officials must be provided information about the location of transmission pipelines to enhance emergency response and community growth planning. Affected municipalities, school districts, businesses, and residents must be advised of pipeline locations. Of particular significance is the requirement that operators must periodically review their programs for effectiveness and enhance the programs as necessary. After free registration a non-printable copy of these recommended practices can be downloaded at: <http://publications.api.org/>

Discussion of Damage Prevention and Public Awareness Programs

It is unclear to us from publicly available information how large of a problem excavation damage to pipelines in Utah represents, and whether state authorities are providing any enforcement to help curtail the damage that is caused. Questar’s report of hundreds of damages from excavation damage a year gives a good indication of the extent of the problem. While it is good that a voluntary pipeline damage reporting system has been started to collect data about the extent and cause of such excavation damage, such voluntary non-public systems have many reporting and quality control problems. The Attorney General in Utah is given enforcement authority under the damage prevention law, but we could find no information on the Attorney General’s website or the Division of Public Utilities website about the number of enforcement cases that have been originated to help reduce this problem.

We have a large number of the public awareness materials provided by pipeline companies to the “affected public” that live near their pipelines. While much of the information provided is very important (call before you dig, what to do if you suspect a leak, contact information) it often is presented in such a way that it appears to be more of a public relations piece on how safe and necessary pipelines are. We fear that these multiple mixed messages may undermine the public’s understanding of the important information included. Also, the information the public wants is not always included in the public awareness materials. The OPS has just begun inspecting pipeline company’s programs to ensure their effectiveness, and we hope that through that process and the industry’s own review this valuable program will continue to improve.

Some efforts have been made to consolidate some of these damage prevention and public awareness efforts to avoid expensive duplication, confusion by receiving too many similar messages, or overwhelming the targeted groups by too many requests. Fairly recently many of the pipeline operators in Utah came together to form the Utah Pipeline Association (UPA), which is affiliated with a larger national group called the Pipeline Association for Public Awareness. UPA has begun coordinating some of the public awareness programs and has been particularly active in outreach and training to local government emergency responders as well as the excavation community. As awareness of UPA continues to grow it may help provide a simple “one stop” point where those interested in learning more about pipeline safety or taking part in pertinent training can find answers.

Just as Salt Lake City formed an Oil Spill Task Force after the Red Butte Creek spill, other states have formed citizen advisory committees on pipeline safety. The longest ongoing such effort is in Washington State where the Governor-appointed Citizen Committee on Pipeline Safety (CCOPS) was created by the state legislature in 2000. The legislature directed 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 currently meets four times a year to discuss, identify, review and highlight pipeline safety issues on a local and national level. The committee consists of nine voting



<http://www.utc.wa.gov/publicSafety/pipelineSafety/Pages/CCOPSHome.aspx>

members representing the public, including local government, and elected officials. Four non-voting members represent owners and operators of hazardous liquid and gas pipelines. Citizens involved with the CCOPS and the pipeline industry agree that the committee has provided a valuable forum so everyone understands pipeline safety better from a variety of viewpoints.

Recommendations for Damage Prevention and Public Awareness Programs

- The Citizens of the Salt Lake Valley should familiarize themselves with where the pipelines are in their neighborhoods, and make sure they use the One Call system before digging. They should learn who to contact if they see someone else who they believe is digging without using the free One Call locate service.
- The Utah State Legislature should consider creating a citizen pipeline safety advisory committee to work with the pipeline industry and regulators to review pipeline safety in the state on a regular basis and make any needed recommendations for improving pipeline safety to the industry, regulators or the state legislature.
- The Utah State Legislature should increase pipeline safety by requiring excavators and underground utility operators to report all incidents of damage to a pipeline to the Division of Public Utilities.
- The Utah State Legislature should request a report from the Attorney General describing his enforcement efforts under the state’s damage prevention law (Utah Law 54-8a) and whether that enforcement authority would be more effective if transferred to another entity.
- Local governments should encourage or require the use of Blue Stakes of Utah’s One Call system whenever any permits are granted that include excavation.

- The pipeline industry should continue to expand the Utah Pipeline Association so all pipeline operators in the state are involved to make an easy “one stop” place for local government and the public to access pipeline info and training.
- The Utah Pipeline Association should consider forming a public advisory committee of local government representatives and potentially affected citizens to help focus public awareness materials so they are better targeted at the appropriate audiences and include material important to the public.

Emergency Planning and Response Requirements

The pipeline safety regulations require all pipeline operators to have emergency response manuals and provide ongoing training. Operators of hazardous liquid pipelines also have to prepare and get approved by OPS spill response plans to “reduce the environmental impact” of discharges.

The regulations (49 CFR 195.403) for hazardous liquid pipelines require that:

- “(a) Each operator shall establish and conduct a continuing training program to instruct emergency response personnel to:
 - (4) Take steps necessary to control any accidental release of hazardous liquid or carbon dioxide and to minimize the potential for fire, explosion, toxicity, or environmental damage;”

For natural gas pipelines the regulations (49 CFR 192.615(c)) require that:

“Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

- (1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;
- (2) Acquaint the officials with the operator’s ability in responding to a gas pipeline emergency;
- (3) Identify the types of gas pipeline emer-

gencies of which the operator notifies the officials; and

- (4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.”

Discussion of Emergency Planning and Response Programs

After the Red Butte Creek spill and the larger spill the same year in Marshall, Michigan many people questioned the adequacy of the emergency response and clean up activities. While there is general agreement that local emergency responders deal with these unexpected incidents efficiently, safely and work hard to protect the public, many question whether specific training on pipeline incidents and materials could not have created a better response. While pipeline companies are required by the regulations to provide information and training opportunities to local emergency responders, there are no requirements that local emergency responders pay attention to the information or take part in the trainings.

Two particular areas that seem to be in need of improvement are how people are notified and advised regarding the possible need to evacuate, and about how air quality monitoring for toxic materials during the initial stages of pipeline spills is handled. During the recent pipeline safety conference in Salt Lake City many citizens stated that the reverse 911 system was not adequate. At that conference the Utah Department of Health also stated that their health assessment was undermined by the lack of credible air monitoring data during the first six days of the spill cleanup. It is unclear to us whose responsibility it is to advise people on evacuation and to start monitoring for toxicity, but from numerous different spills in recent years it is apparent that these are two concerns that need to be clearly addressed.

After the Red Butte Creek spill many people wanted to know if the required Chevron spill response plan was adequate for responding quickly and handling such a spill. Unfortunately OPS and the companies do not make these spill response plans easily available for review. The Oil Pollution Act gives states the ability to take a role in spill response planning also, and some states such as Alaska and Washington have developed planning processes that include a public review and comment period. These states also make the fi-

nal plans easily available to the public. Congress recently addressed this issue by requiring OPS to make such response plans available to the public upon written request. Unfortunately Congress included so many exclusions that it is unclear how valuable of a document OPS may provide.

Finally, an issue that has arisen after the oil spill in the Kalamazoo River in Michigan, where much of the oil sank instead of floated, is whether response plans are specific enough and whether technology even exists to adequately clean up spills that include heavy oil from the oil sands of Alberta. It is unclear to us whether the refineries in Salt Lake City are currently processing such oil sands, but as people brought up at the recent pipeline safety conference in Salt Lake City the pipeline systems leading to them from the north could certainly move such oil. Congress has also recently addressed this issue by requiring OPS to complete a study of oil sands crude to determine if the current regulations are adequate to protect pipelines. This study is due out in the summer of 2013, but it is unclear whether it will address clean up issues associated with this heavy form of oil.

Recommendations for Emergency Planning and Response Programs

- Congress or OPS should clarify ambiguities in regulations regarding emergency and spill response planning to ensure companies provide necessary information to local governments, and that initial evacuation and monitoring also consider potential long term toxic effects to individuals.
- Local governments should ensure that emergency response personnel (fire, police, health) have necessary equipment, training and information to respond to pipeline emergencies.
- Local government needs to ensure there is a plan to advise people on the need for evacuations, and that air monitoring equipment adequate for determining long term health effects is onsite within a short time after an incident is recognized.

Land Use Planning Near Transmission Pipelines

The majority of the large transmission pipelines in this country were put in the ground decades ago in

what at the time were rural areas. As our communities have grown, more and more neighborhoods and businesses have been built near these once rural pipelines. This development near these large pipelines increases the risk to the people living near them in the rare event of a pipeline failure. It also increases the risk that the pipelines could be damaged, also putting people in harms way.



Over the past few years the Pipelines and Informed Planning Alliance (PIPA), started by the federal Office of Pipeline Safety, has worked to determine recommended best practices that local governments can use to ensure greater safety near pipelines. PIPA was made up of over 150 representatives from a wide variety of stakeholder groups. The final PIPA report includes 46 recommended practices, many of which would need to be adopted by local government. Those practices include things like:

- Consider the potential impact of a pipeline incident in new development
- Ensure pipeline rights-of-way are shown on all relevant zoning, planning, and public works maps
- Consider the Potential Impact of a Pipeline Incident in the Design and Location of New Roads
- Incorporate Emergency Response Plans into Land Development
- Creation of Consultation and/or Planning Zones Near Pipelines

These land use practices near pipelines have three major goals:

- ✓ Ensure communication between builders/developers/excavators and pipeline operators so everyone knows what is planned near pipelines
- ✓ Put in place practices that protect pipelines from construction damage
- ✓ Put in place more protective planning and building codes to protect people that live near pipelines

The Municipal Research and Services Center has developed an entire website that covers these “planning near pipelines” issues and includes samples of ordinances passed around the country. It can be found at: <http://www.mrsc.org/Subjects/PubSafe/transpipes.aspx>

Discussion of Land Use Planning Near Transmission Pipelines

Salt Lake County has been identified as one of the fastest growing areas in the United States. This means that as housing and commercial development expands the potential exists that pipelines that were once on the edge of town will soon be in much closer proximity to people.

To address these concerns Salt Lake County has already begun to look into adopting some of the PIPA recommendations into local ordinances as part of their Cooperative County Plan. Discussion of these efforts and a copy of the draft ordinance they have developed can be found at <http://cooperativeplan.slco.org/html/PipelineProtection.html>. Their initial efforts included a nicely done interactive map that included the transmission pipelines throughout Salt Lake County, but that map seems to have now been removed from this effort.

Recommendations for Land Use Planning Near Transmission Pipelines

Local governments should adopt recommendations regarding planning near pipelines from the Pipelines and Informed Planning Alliance (PIPA) Report. To include at a minimum a consultation zone and inclusion of transmission pipelines on planning and zoning maps.

Neighbor involvement, Transparency and Where to Get More Information

If you have made it this far in this report then you have taken an important step to help ensure that the pipelines in Salt Lake Valley will be as safe as possible by educating yourself about how they work, who's in charge, and what needs to be done to ensure the public's safety is being looked after. We believe that pipeline safety is like a three-legged stool with the industry, regulators and public each serving as one leg of the stool and each playing a crucial role. If any leg of the stool falters pipeline safety is at risk.



The industry uses its vast resources and expertise to install, operate and maintain safe pipelines. The regulators verify through inspections and data collection that the minimum safety regulations are being met, and when necessary use enforcement authority to ensure such compliance. The public, including elected officials, serve as the watchdogs to push for greater regulation and enforcement when necessary, and to make sure complacency doesn't set in.

The public can only do their part of the job if there is adequate transparency in what the industry and the regulators are doing. Adequate performance, inspection, and enforcement data needs to be easily publicly available so compliance can be verified. Adequate information about the specifications, contents, and routes of proposed pipelines also need to be easily available so people living in potentially impacted neighborhoods can decide for themselves if adequate safety precautions have been taken. And the information that decision makers use to make pipeline safety decisions also needs to be available to the public so they can decide whether their officials are making decisions with full knowledge of the impacts and with the public's safety and welfare in mind.

We believe that Ronald Reagan was right when he said “trust but verify.” Only through such verification can trust in pipeline safety grow, and only when government and industry is truly transparent is such verification possible.

As stated earlier much of this report is based on information that is publicly available. The pipeline Safety Trust in 2011 did a survey to find out how much basic pipeline information was easily available on state pipeline agency websites. Below is a chart of part of those findings. The federal Office of Pipeline Safety (OPS) has made great strides in the past few years increasing transparency by making better incident, enforcement and inspection data available. The Utah

Transparency Recommendations

- The Utah Division of Public Utilities should provide information on their website that details the companies inspected, the types of inspections undertaken, and what was found.
- The Utah Division of Public Utilities should provide more and easier to find informa-

Public Transparency by State Pipeline Safety Agencies & PHMSA - website review Updated 12/11/11

| | Contact Info for Agency Staff | Incident Data | Enforcement Records | Inspection Records | Transmission Pipeline Maps | Excavation Damage Data | Pipeline Company Contact Info | Easy to Access Regulations | Totals (avg) |
|---------------|-------------------------------|---------------|---------------------|--------------------|----------------------------|------------------------|-------------------------------|----------------------------|--------------|
| Arkansas | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2.875 |
| PHMSA | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | 2.625 |
| Minnesota | 3 | 3 | 3 | 0 | 2 | 2 | 3 | 3 | 2.375 |
| Washington | 3 | 3 | 1 | 3 | 3 | 0 | 3 | 3 | 2.375 |
| South Dakota | 3 | 2 | 2 | 0 | 2 | 1 | 3 | 3 | 2 |
| West Virginia | 3 | 3 | 1 | 0 | 3 | 0 | 3 | 2 | 1.875 |
| Kentucky | 3 | 1 | 1 | 1 | 3 | 0 | 2 | 3 | 1.75 |
| Texas | 3 | 3 | 0 | 0 | 1 | 1 | 3 | 3 | 1.75 |
| Michigan | 3 | 0 | 2 | 0 | 3 | 0 | 3 | 2 | 1.625 |
| New York | 2 | 2 | 2 | 0 | 0 | 0 | 3 | 3 | 1.5 |
| Utah | 3 | 2 | 2 | 0 | 0 | 0 | 2 | 3 | 1.5 |

Division of Public Utilities website contains lots of important information, but more could be available about how they do their jobs and how the pipelines under their jurisdiction are performing.

Concerns With Pipeline Information Transparency

While large amounts of information from state and federal regulators are publicly available and verifiable, there is still important information missing, which may lead to distrust of the process. With the current electronic abilities to post nearly unlimited materials online industry and government could create trust by posting more information than they already are required to prepare, instead of creating barriers by expecting the public to go through a formal public information request process. The industry in particular provides very little information about their particular pipelines and the associated operations, maintenance and inspection.

One of the very basic measures of pipeline safety is incident data. OPS has worked hard to upgrade their incident database in the past few years, and now provides state-by-state breakouts of incident data including the specifics for each incident.

Salt Lake City has done an admirable job since the first Chevron spill of working hard to post updates and data, and to inform the public on a variety of pipeline safety issues. These efforts could be a model for other communities.

tion about their regulatory activities, maps of pipelines, and excavation damage reports on their website.

- Pipeline operators should make specific information about pipeline routes, construction, specifications, operations and inspections of their pipelines available on their websites.
- The Citizens of the Salt Lake Valley should continue to review pipeline safety information and make elected officials, regulatory agencies and the pipeline industry aware of concerns they have regarding the inability to access pipeline safety information.

For More Information

Red Butte Creek Spill Information

Salt Lake City – Red Butte Creek Spill website - <http://www.slcclassic.com/oilspill/>

Utah Department of Health - <http://health.utah.gov/enviroepi/activities/hha/redbuttecreekoilspill/frontpage.htm>

Utah Department of Environmental Quality - <http://www.deq.utah.gov/locations/redbutte/index.htm>

Pipeline Regulations for Utah

Federal pipeline safety regulations - <http://phmsa.dot.gov/pipeline/regs>

Utah Law 54-13 Natural Gas Pipeline Safety- http://le.utah.gov/~code/TITLE54/54_13.htm

PSC Rules R746-409 Pipeline Safety - <http://www.rules.utah.gov/publicat/code/r746/r746-409.htm>

Utah underground pipeline damage prevention regulations – http://www.le.state.ut.us/~code/TITLE54/54_08a.htm

Pipeline Information, Maps and Data

Federal Office of Pipeline Safety's –

Utah Info Pages – <http://primis.phmsa.dot.gov/comm/StatePages/Utah.htm>

Stakeholder Communications - <http://primis.phmsa.dot.gov/comm/>

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

Utah Division of Public Utilities – Pipeline Safety – <http://www.publicutilities.utah.gov/pipeline.html>

Pipeline Safety Trust – <http://www.pstrust.org>

Utah Pipeline Association - <http://208.109.252.161/upa/>

Information regarding the workshops and pipeline safety conference leading up to this report

http://pstrust.org/initiatives_programs/other-communities/SaltLakeCity.htm

About the Author

The principal author of this report was Carl Weimer, executive director of the Pipeline Safety Trust.

Carl Weimer has been the executive director of the Pipeline Safety Trust since 2005. The Trust is the only national non-profit public interest organization that focuses on pipeline safety issues. He also serves on the U.S. Department of Transportation's Technical Hazardous Liquid Pipeline Safety Standards Committee, and the steering committee for



the Pipelines and Informed Planning Alliance. Mr. Weimer has testified to both the U.S. House of Representatives and Senate on pipeline safety issues multiple times, organized seven national pipeline safety conferences, runs the national Safe Pipelines and LNG Safety listservs that include over 800 people from around the country, and regularly serves as an independent source of pipeline safety information for news media, local government, and citizens around the country. Mr. Weimer was elected in 2005 to the Whatcom County Council. He is also the current chairman of the Northwest Clean Air Agency. He has a degree in Natural Resources and Environmental Education from the University of Michigan, as well a degree in Industrial Electronics Technology from Peninsula College.