



**PAPUC**

**2023 Safety Seminar**

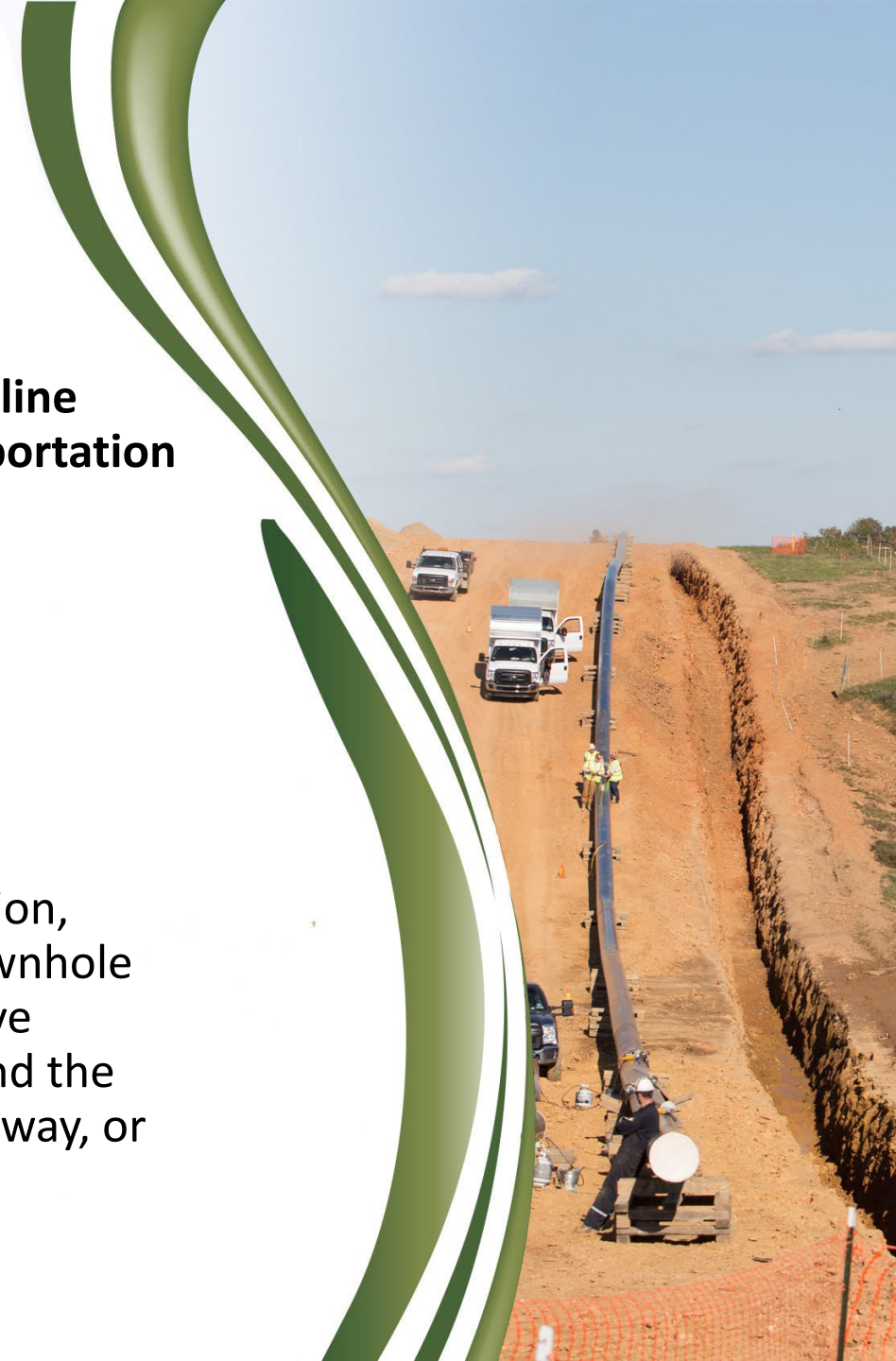
# What is underground natural gas storage?

- **Underground natural gas storage facility (UNGSF) means a gas pipeline facility that stores natural gas underground incidental to the transportation of natural gas, including:**

(1)

- (i) A depleted hydrocarbon reservoir;
- (ii) An aquifer reservoir; or
- (iii) A solution-mined salt cavern.

(2) In addition to the reservoir or cavern, a UNGSF includes injection, withdrawal, monitoring, and observation wells; wellbores and downhole components; wellheads and associated wellhead piping; wing-valve assemblies that isolate the wellhead from connected piping beyond the wing-valve assemblies; and any other equipment, facility, right-of-way, or building used in the underground storage of natural gas.



# Types of Reservoirs

## Cavern:

- Underground void developed by the solution mining of a salt formation.

## Aquifer Reservoir Storage:

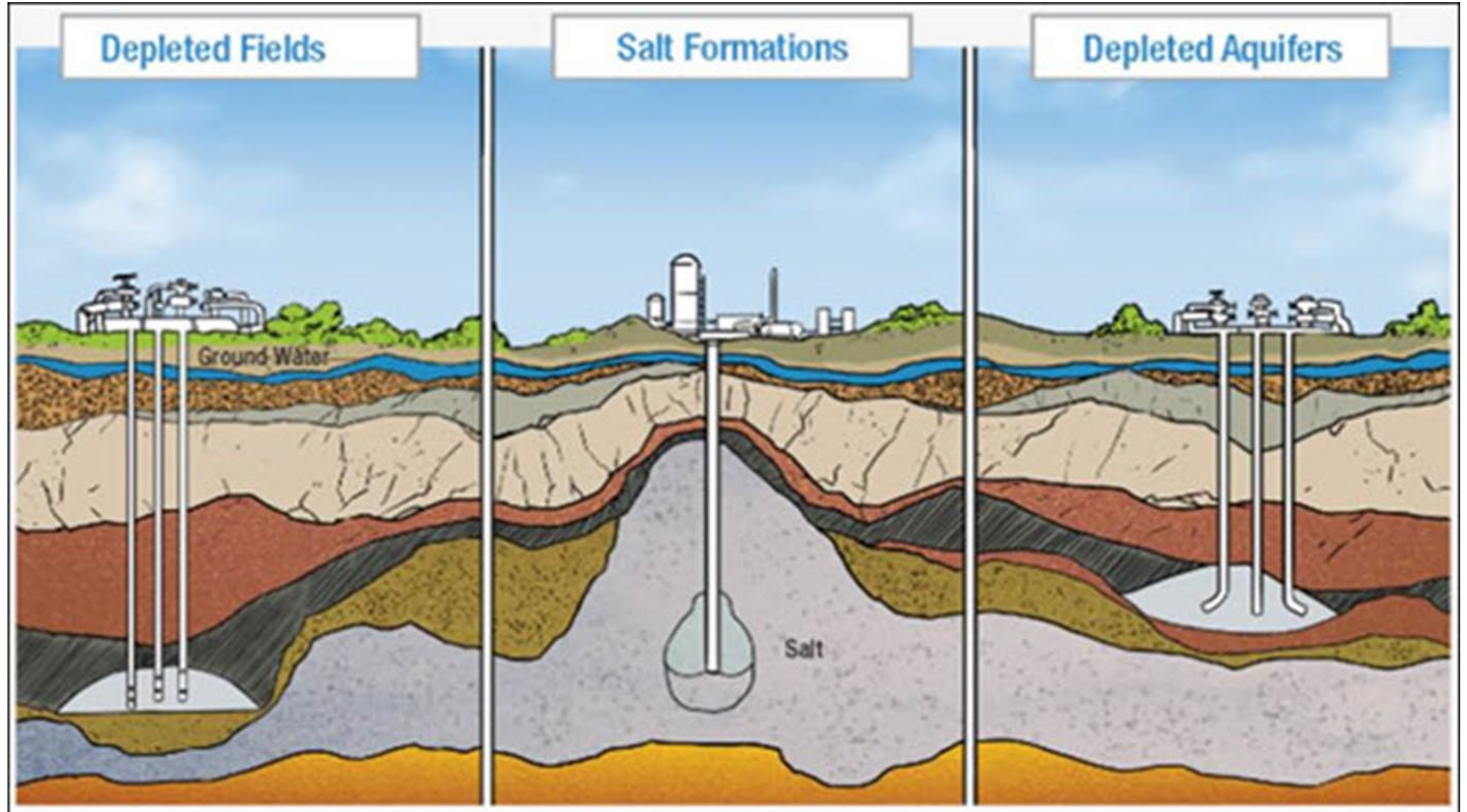
- Porous and permeable rock media originally filled with water and converted to gas storage.

## Depleted Hydrocarbon Reservoir:

- A reservoir in sub-surface sand or rock formation that has previously produced oil or gas and is used for storing natural gas.

All natural gas storage reservoirs in Pennsylvania are Depleted Hydrocarbon reservoirs.

# Three Types of UNGS Reservoirs





- Incident History &  
Regulatory Overview  
49 CFR § Part 192

# UNGS Incident Timeline

- Brenham Tx: 1992 Release of HVL's from salt dome cavern exploded causing 3 fatalities and 21 injuries

1992

- Hutchinson, KS: 2001 Natural Gas Release resulting in 2 fatalities from the Yaggy UNGS

2001

- Liberty County, TX: 2004 Moss Bluff UNGS – 6 BCF released and burned; no fatalities

2004

- Porter Ranch, CA: 2015-2016 Aliso Canyon – over 5 BCF released. Residents evacuated for extended time

2015–2016



# Brenham, Texas

- April 7, 1992 uncontrolled release of highly volatile liquids (HVLs), primarily ethane and propane, from a salt dome storage cavern
- Storage cavern is more than ½ mile below the surface
- A heavier than air cloud was formed and ignited
- Three people died and 21 people were treated for injuries
- Damage was sustained to more than 60 homes within a three-square mile area
- Seventy-Five beef cattle were also killed
- NTSB Investigation determined the probable cause of the release was overfilling of the storage cavern

# Brenham, Texas

- The volume of Brenham cavern increased from 20,000 barrels in 1981 to approximately 336,000 barrels in 1991.
- Rainwater dilution of surface brine and the addition of fresh water dilutes saturated brine and dissolves salt within the cavern.
- The operator also sold brine to drillers.
- Pre incident calculations estimated the cavern contained just over 288,000 barrels.
- Post accident audits indicated the cavern contained nearly 320,000 barrels at the time of the incident.







# Brenham, Texas Probable Cause

- Failure to incorporate fail-safe features in the stations wellhead safety system.
- Overfilling caused by inadequate company procedures for managing cavern storage.
- A lack of Federal and State regulations governing the design and operation of underground storage systems.

# Brenham Incident

Aerial view of the explosion area



Aftermath of the explosion



# Yaggy UNGS Storage Field, Hutchinson, KS

- On January 17 and 18, 2001, an accident occurred at the Yaggy underground natural gas storage field operated by Kansas Gas Service.
- Natural gas was injected to a depth of 600 to 900 feet underground into salt caverns.
- Gas leaked from the storage field well production casing, migrated approximately nine miles underground, and then traveled to the surface through old brine, or salt wells, in the Hutchinson, Kansas area.
- This led to a series of gas explosions in Hutchinson, Kansas. An explosion in downtown Hutchinson destroyed two businesses, damaged 26 other businesses, and killed two persons in a mobile home park.
- Approximately 143 million cubic feet of natural gas leaked from the storage field.

# Hutchinson Incident





# Moss Bluff, Liberty County, TX

- On August 19, 2004, the Market Hub Partners Moss Bluff storage facility located in Liberty County, Texas, had a well control incident and natural gas fire at.
- Over a period of six and one-half days, approximately 6 billion cubic feet of natural gas was released from the cavern and burned.
- The fire eventually self-extinguished, and late on August 26, 2004, installation of a blowout prevention valve was completed, effectively placing the well back under control.

# Moss Bluff, Liberty County, TX

- The Moss Bluff storage facility was comprised of three separated underground caverns, a compressor station, well head assemblies on each of the caverns, and natural gas, fresh water and salt water (brine) piping.
- A detailed investigation by company personnel and outside consultants determined the accident was caused by a separation of the well string inside the cavern; a breach of the brine piping above ground; and the separation of the wellhead assembly above the cavern.



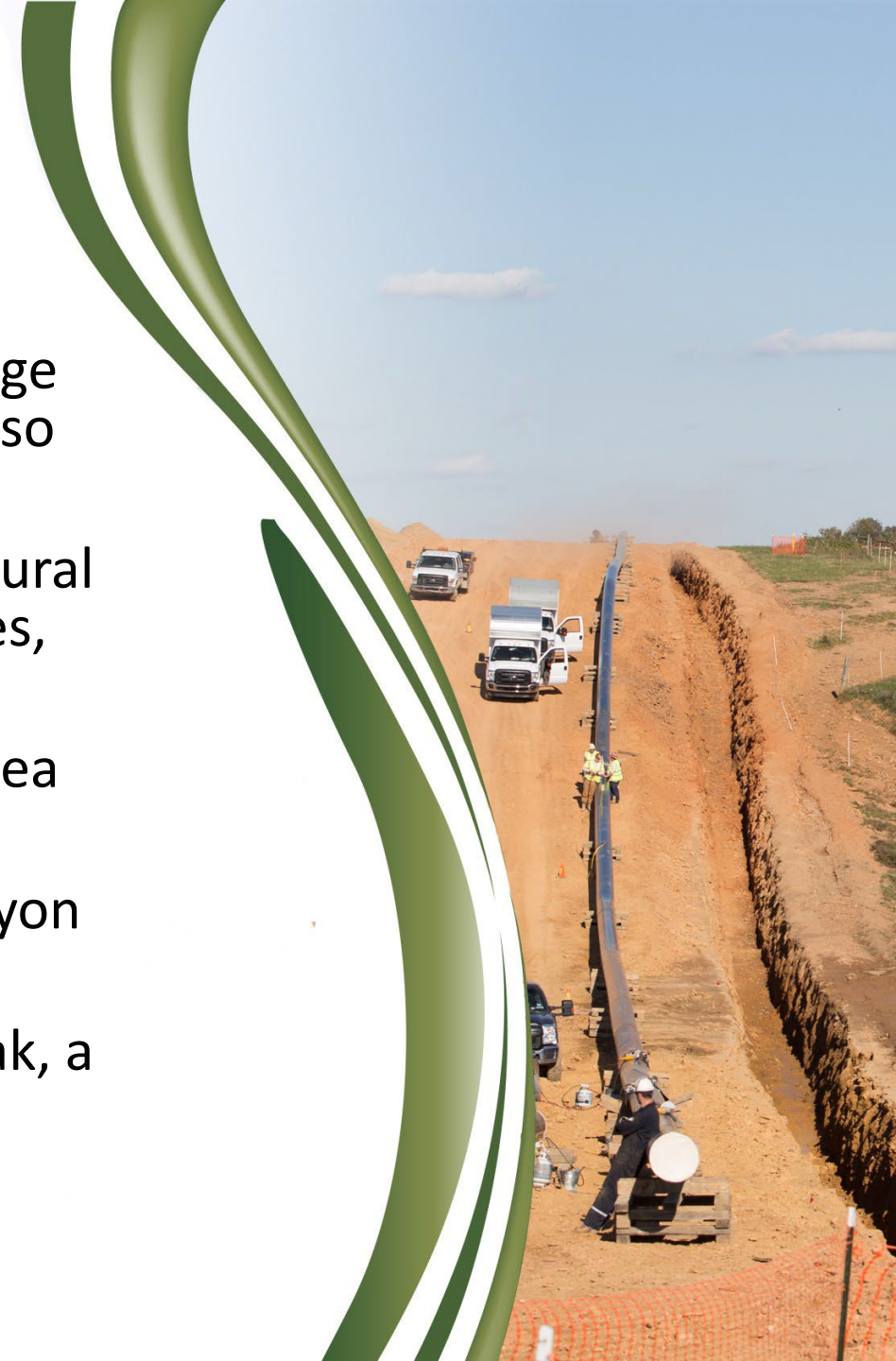
# Moss Bluff, Liberty County, TX



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# Aliso Canyon, Los Angeles, CA

- On October 23, 2015, an underground natural gas storage well, Southern California Gas Company's (SoCal Gas) Aliso Canyon Well SS25, failed.
- The failure resulted in a sustained and uncontrolled natural gas leak in an area known as Porter Ranch in Los Angeles, California.
- Over 5,000 households (families) in the Porter Ranch area had to be relocated.
- California Governor Jerry Brown declared the Aliso Canyon incident a state emergency.
- After repeated unsuccessful attempts to contain the leak, a relief well was drilled to plug the leaking well.





# Aliso Canyon, Los Angeles, CA

- The Aliso Canyon underground storage field can store up to 86 billion cubic feet of natural gas.
- It has 115 storage wells and is the second largest storage facility of its kind in the United States.
- The well was drilled in 1953 and was later converted to a natural gas storage well in 1972.
- Initially, the leak from Well SS25 was believed to be from the subsurface (downhole) well casing.

# As a result of Aliso Canyon:

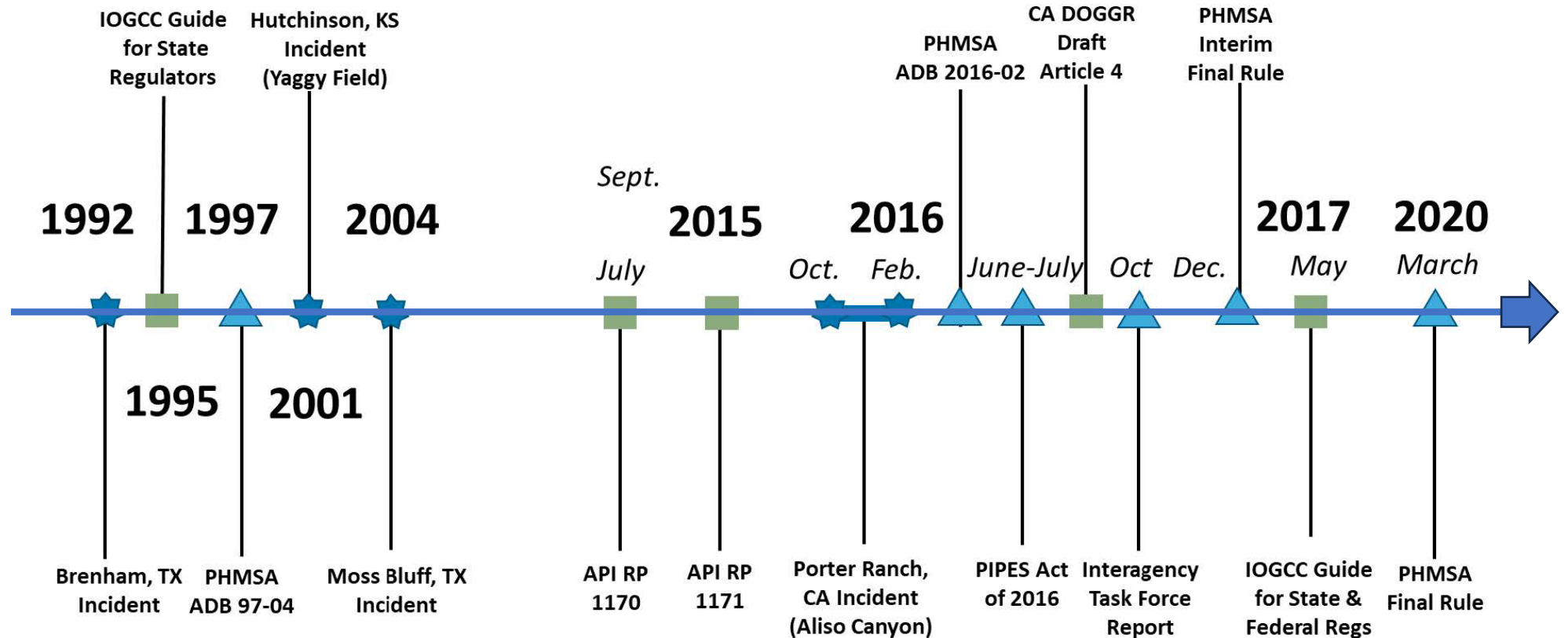
- The U.S. Department of Energy (DOE) and the Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) established an Interagency Task Force on Natural Gas Storage Safety.
- The Task Force included premier scientists, engineers and technical experts from across the DOE complex, including five National Labs, DOT, the Environmental Protection Agency (EPA), the Department of Health and Human Services (HHS), the Department of Commerce (DOC), the Department of the Interior (DOI), the Federal Energy Regulatory Commission (FERC), and the Executive Office of the President.



# Aliso Canyon Incident



# Timeline to Regulations





# Regulations

## **§192.12**

# **Underground natural gas storage facilities**

## §192.7 What documents are incorporated by reference partly or wholly in this part?

- (10) API Recommended Practice 1170, "Design and Operation of Solution-mined Salt Caverns Used for Natural Gas Storage," First edition, July 2015 (API RP 1170), IBR approved for [§192.12](#).
- (11) API Recommended Practice 1171, "Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs," First edition, September 2015, (API RP 1171), IBR approved for [§192.12](#).



# Requirements:

## § 192.12 Underground natural gas storage facilities.

(a) Salt cavern UNGSFs.

(b) Depleted hydrocarbon and aquifer reservoir UNGSFs.

- (1) Each depleted hydrocarbon UNGSF constructed after July 18, 2017 must meet all provisions of API RP 1171
- (2) Each depleted hydrocarbon UNGSF constructed before July 18, 2017 must meet the provisions of API RP 1171, sections 8, 9, 10, and 11



## Requirements:

# **§192.12(c) Procedural manuals.**

- Each operator of a UNGSF must prepare and follow for each facility one or more manuals of written procedures for conducting operations, maintenance, and emergency preparedness and response activities under paragraphs (a) and (b) of this section.
- Each operator must keep records necessary to administer such procedures and review and update these manuals at intervals not exceeding 15 months, but at least once each calendar year.
- Each operator must keep the appropriate parts of these manuals accessible at locations where UNGSF work is being performed. Each operator must have written procedures in place before commencing operations or beginning an activity not yet implemented.





Requirements Continued  
**§192.12(d) Integrity management program**

(1) Integrity management program elements:

- *Must, at a minimum consist of the framework outlined in API RP 1171, Section 8 Risk Management for Gas Storage Operations.*



# *API RP 1171, Section 8*

- 8.1 General
- 8.2 Risk Management
- 8.3 Data Collection and Integration
- 8.4 Threat and Hazard Identification and Analysis
- 8.5 Risk Assessment
- 8.6 Preventive and Mitigative Measures
- 8.7 Periodic Review and Reassessment
- 8.8 Recordkeeping

## Requirements Continued

# §192.12(d) Integrity management program

### (2) Integrity management baseline risk-assessment intervals:

- *All UNGSF operators must complete the baseline risk assessments of all reservoirs and at least 40% of the baseline risk assessments for each of its UNGSF wells by no later than March 13, 2024.*
- *By no later than March 13, 2027, an operator must complete baseline risk assessments on all its wells (including wellhead assemblies)*



## Requirements Continued

# §192.12(d) Integrity management program

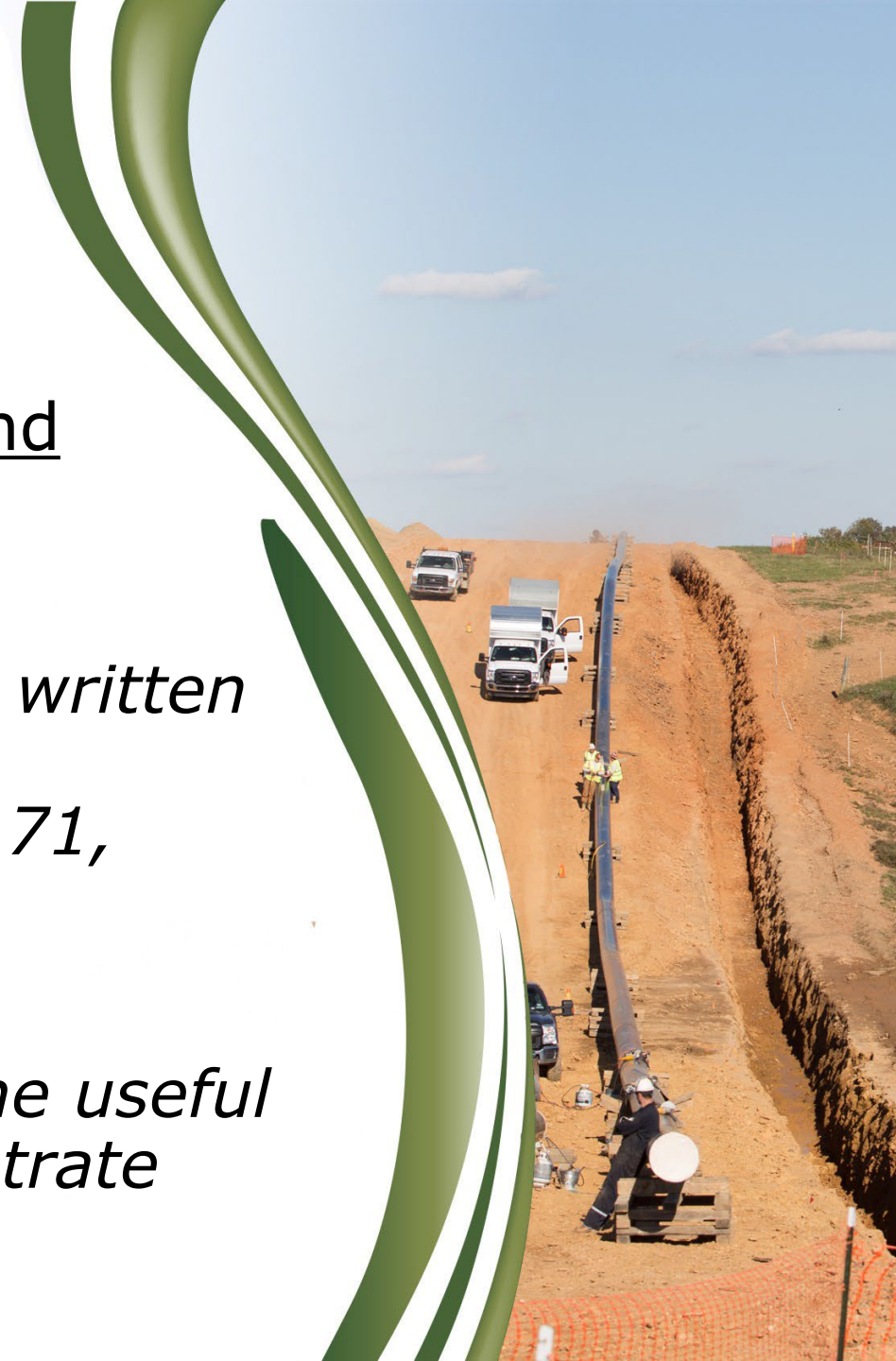
### (3) Integrity management re-assessment intervals:

- *The operator must determine the appropriate interval for risk assessments under API RP 1171 subsection 8.7.1, and the re-assessment interval must not exceed seven years from the date of the baseline assessment*

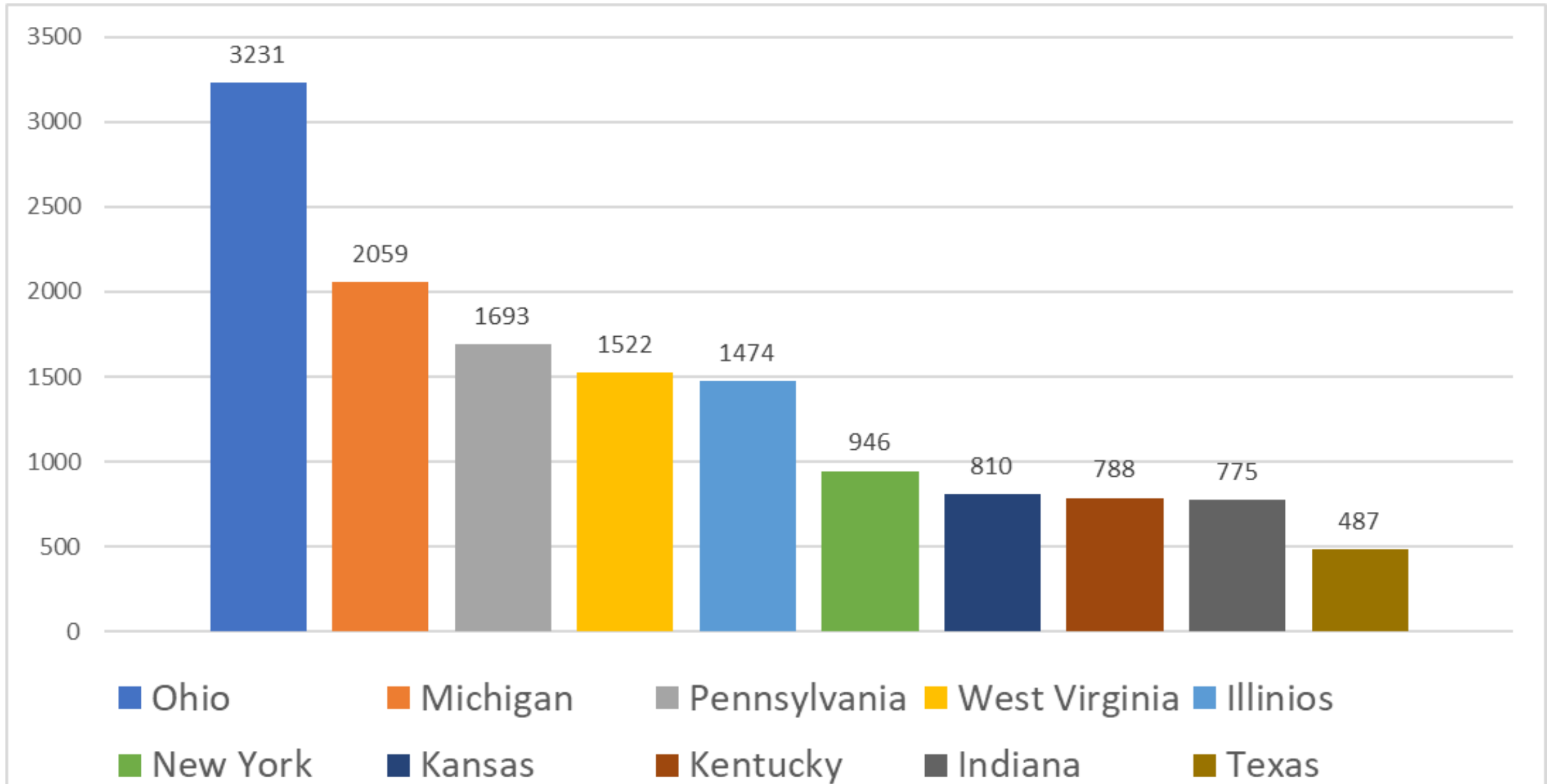
Requirements Continued  
**§192.12(d) Integrity  
management program**

(4) Integrity management procedures and  
recordkeeping:

- *The operator must establish and follow written procedures to carry out its integrity management program under API RP 1171, section 8*
- *The operator must also maintain, for the useful life of the UNGSF, records that demonstrate compliance with all requirements*



# States With Most Underground Storage Wells



# 2022 Pennsylvania Storage Facilities

**Interstate Operators**

**7**

**Intrastate Operators**

**4**

**Interstate Wells**

**1647**

**Intrastate Wells**

**43**





# 2022 PA jurisdictional facilities

- PA has 4 regulated UNGS Operators
  - Under these operators are 7 UNGS fields
    - These fields contain 43 wells
    - Well head pressures ranging from 365 psig to 2000 psig



# Inspections since 2018

- Pipeline Safety is currently in its 5th year of UNGS Program inspections
- To date the Safety Division has spent 131 inspection days on Underground Natural Gas Storage Fields.
- The last 5 years of UNGS inspections has resulted in two NC Letters



Please direct all questions to our  
Supervisor, **David Kline!**



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# Website Enhancements

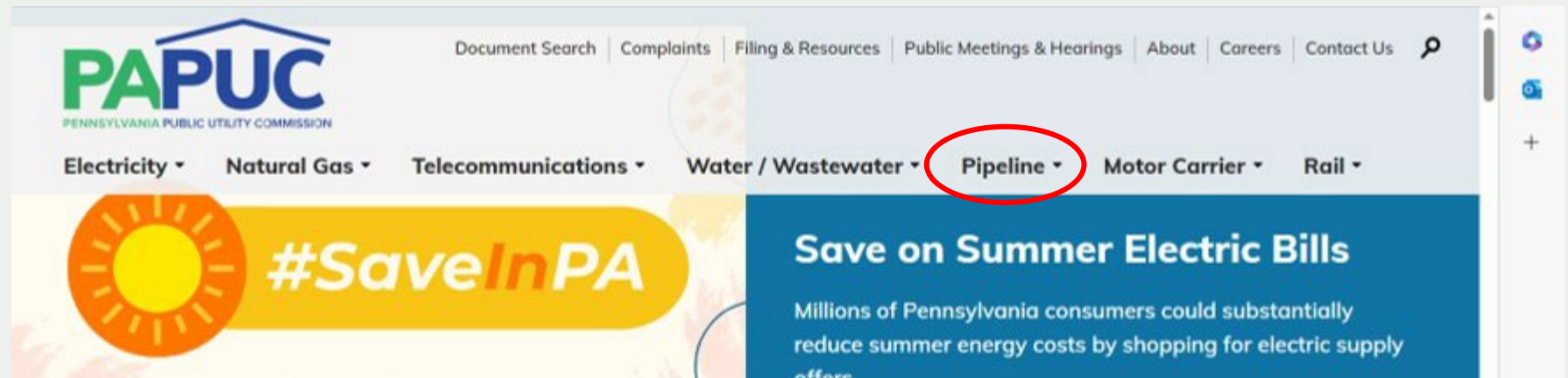
## PA PUC - Pipeline

September 6, 2023

Melissa McFeaters & Alex Pankiw

# Overview

- The goal of this presentation is to make you aware of the recent changes to the PA PUC website – Pipeline dropdown

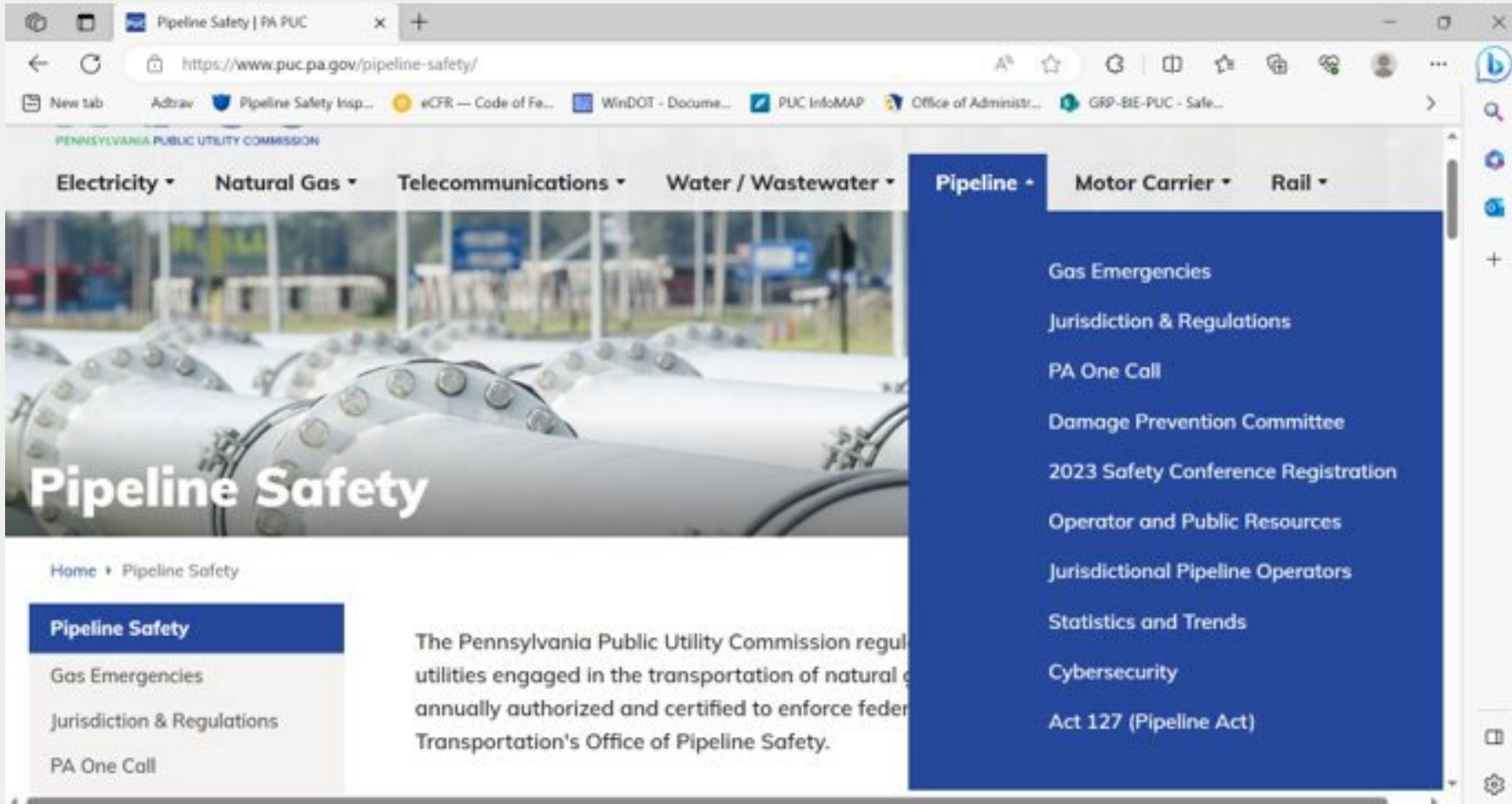


# Overview

- Why was it updated?
  - To make website more user friendly
  - Difficult to find information
  - Some links didn't work
  - Outdated



# Pipeline Dropdown



Opinions and content are that of I&E and I&E does not speak for the Commission



# Pipeline Dropdown

- Overview
- Gas Emergencies
- Jurisdiction & Regulations
- PA One Call
- Damage Prevention Committee
- 2023 Safety Conference Registration
- Operator & Public Resources
- Jurisdictional Pipeline Operators
- Statistics & Trends
- Cybersecurity
- Act 127 (Pipeline Act)



# Pipeline – Jurisdiction & Regulations

- Jurisdiction
  - Why PA PUC is authorized to inspect & enforce regulations.
- Regulations
  - [Link\(s\) to Federal & State Regulations](#)
- Formal Enforcement Actions
  - [Link to Public Document Search](#)



# Pipeline – PA One Call

- Call before you dig (811)
  - Consumer Resources for PA One Call
- Link to PA One Call Website
- PA One Call Enforcement



# Pipeline – Damage Prevention Committee

- Reporting Violations
- Damage Prevention Committee
  - Members
  - Meetings, Agendas, & Actions
  - Bylaws
- PA One Call Enforcements Staff



# Pipeline – Safety Conference

- Registration
  - Attendees
  - Vendors
- Pipeline Safety Seminary Presentations
  - Previous agendas & presentations (last 3-5 years)



Home ▶ Pipeline Safety ▶ 2023 Safety Conference Registration ▶ Pip

**Pipeline Safety**

- Gas Emergencies
- Jurisdiction & Regulations
- PA One Call
- Damage Prevention Committee
- 2023 Safety Conference Registration**
  - Pipeline Safety Seminar Presentations
  - 2023 Safety Conference Vendor Registration
- Operator and Public Resources

**Pipeline**

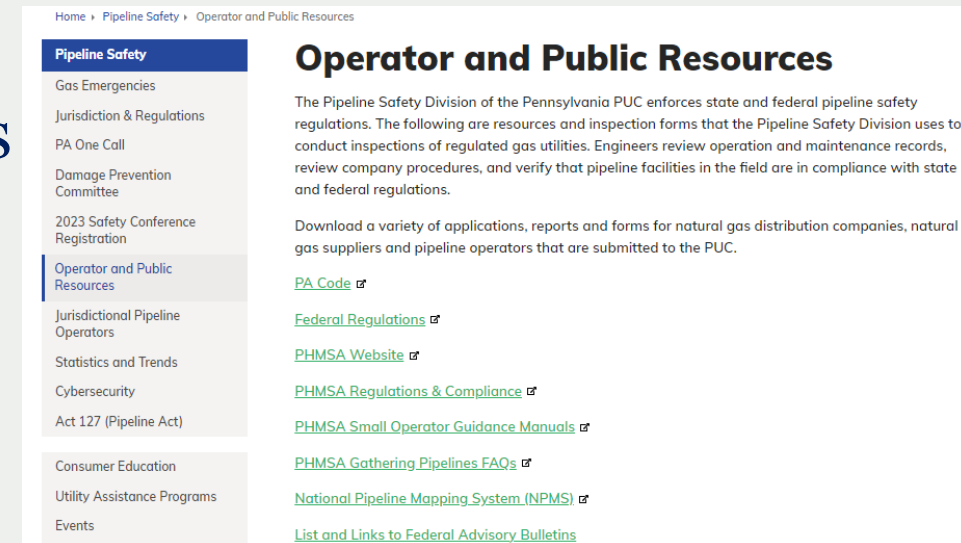
Each year the Penn  
any public utility, go  
pipeline safety. Bel

**2023 Safe**

The [Agenda](#) for the  
**September 7, 2023**

# Pipeline – Operator & Public Resources

- Federal & State Laws and Regulations
- PHMSA Website
- PHMSA Small Operator Guidance Manuals
- NPMS
- Federal Advisory Bulletins



The screenshot shows a webpage titled "Operator and Public Resources" under the "Pipeline Safety" section. The page includes a navigation menu on the left with items like "Gas Emergencies", "Jurisdiction & Regulations", "PA One Call", "Damage Prevention Committee", "2023 Safety Conference Registration", "Operator and Public Resources" (highlighted), "Jurisdictional Pipeline Operators", "Statistics and Trends", "Cybersecurity", and "Act 127 (Pipeline Act)". Below the menu, there are sections for "Consumer Education" and "Utility Assistance Programs". The main content area features the title "Operator and Public Resources" and a paragraph explaining the Pipeline Safety Division's role. It lists several resources with external links: "PA Code", "Federal Regulations", "PHMSA Website", "PHMSA Regulations & Compliance", "PHMSA Small Operator Guidance Manuals", "PHMSA Gathering Pipelines FAQs", "National Pipeline Mapping System (NPMS)", and "List and Links to Federal Advisory Bulletins".

# Pipeline – Operator & Public Resources

- PA PUC Forms
  - Pipeline Safety Inspection Forms
  - Natural Gas Forms
  - PHMSA Pipeline Forms

## PUC Forms

[PUC Pipeline Safety Inspection Forms](#)

[PUC Natural Gas Utility Forms](#)

## PHMSA Forms

[PHMSA Pipeline Forms](#) 



# Pipeline – Operator & Public Resources

- Public Resources
  - PHMSA Notices
  - PHMSA Rulemaking Documents
  - PHMSA SHRIMP
  - Pipes Act (2020)

## PUC Forms

[PUC Pipeline Safety Inspection Forms](#)

[PUC Natural Gas Utility Forms](#)

## PHMSA Forms

[PHMSA Pipeline Forms](#) [↗](#)

## Public Resources

[PHMSA Notices and Rulemaking Documents](#) [↗](#)

[PHMSA SHRIMP \(Simple, Handy, Risk-based Integrity Management Plan\)](#) [↗](#)

[Protecting Our Infrastructure of Pipelines and Enhancing Safety \(PIPES\) Act of 2020](#) [↗](#)



# Pipeline – Jurisdictional Pipeline Operators

- Natural Gas Pipelines
- Hazardous Liquids Pipelines
- Natural Gas Storage Facilities

Home › Pipeline Safety › Jurisdictional Pipeline Operators

**Pipeline Safety**

- Gas Emergencies
- Jurisdiction & Regulations
- PA One Call
- Damage Prevention Committee
- 2023 Safety Conference Registration
- Operator and Public Resources
- Jurisdictional Pipeline Operators**
- Statistics and Trends
- Cybersecurity
- Act 127 (Pipeline Act)

Consumer Education  
Utility Assistance Programs

## Jurisdictional Pipeline Operators

The Pipeline Safety Division inspects pipelines of natural gas jurisdictional pipeline operators in Pennsylvania.

### Natural Gas Pipeline

[Jurisdictional Natural Gas Pipeline Operators](#) – This list includes all jurisdictional natural gas pipeline operators in the Commonwealth of Pennsylvania and is current as of Dec. 31, 2022.

### Hazardous Liquids

[Jurisdictional Hazardous Liquid Pipeline Operators](#) - This list includes all jurisdictional hazardous liquid pipeline operators in the Commonwealth of Pennsylvania and is current as of Dec. 31, 2022.

### Natural Gas Storage

[Jurisdictional Underground Natural Gas Storage Operators](#) - This list includes all jurisdictional underground natural gas storage operators in the Commonwealth of Pennsylvania and is current as of Dec. 31, 2022.



# Pipeline – Statistics & Trends

- PHMSA Annual Reports
- PHMSA Incident Trends
- State Performance Metrics – US
- State Performance Metrics – Pennsylvania

Home » Pipeline Safety » Statistics and Trends

## Pipeline Safety

Gas Emergencies

Jurisdiction & Regulations

PA One Call

Damage Prevention  
Committee

2023 Safety Conference  
Registration

Operator and Public  
Resources

Jurisdictional Pipeline  
Operators

Statistics and Trends

Cybersecurity

Act 127 (Pipeline Act)

## Statistics and Trends

While a small portion of the Pipeline Safety Division's findings lead to formal enforcement actions, the Pipeline Safety Division thoroughly investigates all methods and practices of pipeline companies, including reports, records and other information to evaluate compliance with state and federal regulations. The voluntary cooperation of the pipeline company to provide the Pipeline Safety Division with full and open access to the operator's premises and records is essential to the effective operation of gas safety enforcement inspections. For this reason, inspection records and accident reports where a formal enforcement action has not been initiated are not made public. Aggregated data is available on the U.S. Department of Transportation Pipeline & Hazardous Materials Safety Administration's (PHMSA) website.

[PHMSA Annual Reports](#) 

[PHMSA Incident Trends](#) 

[State Performance Metrics – US](#) 

[State Performance Metrics - Pennsylvania](#) 



# Pipeline – Statistics & Trends

- Annual Data Submissions (FL-1)
  - FL-1 Data Templates
  - Contact Information

## FL-1 Data Templates

[2022 Damage Prevention Statistics](#)

[2022 Plastic System Failures](#)

[2022 Leak Data](#)

[2022 Inside Meter Sets](#)

[2022 Steel and Plastic Coupling Failure](#)

[2022 MAOP Verification](#)

[2022 Master Meter Operators](#)

[2022 Reportable Incidents](#)



# Pipeline – Act 127

- Overview: The Pipeline Act requires the Commission to develop and maintain a registry of pipeline operators within Pennsylvania.
- Final & Implementation Order
- Annual Registration Form
  - Due Annually by March 31st
- Pipeline Operators Registry (Active Status)



# Thank you!

- Website Team:
  - Terri Cooper-Smith
  - Dave Kline
  - Melissa McFeaters
  - Alex Pankiw

Comments & suggestions welcome!

# Emergency Plans and Response

Bob Biggard

Sunil Patel



# Emergency Plans and Response


Past & Present



# The Beginning...

- **On March 18, 1937**, a large natural gas pipeline explosion in a schoolhouse in New London, Texas killed 298 children. There was no odorant in the gas; Teachers and children were unaware of a gas leak in the basement.

# An Abbreviated History Lesson

- **Late 50's to mid-60's** peak period of pipeline construction
  - Most states that had adopted pipeline safety codes for gas pipelines used the **ANSI Code B31.8 "Pressure Piping, Gas Transmission and Distribution Systems."**
- 

# The Last Straw...

- The Natural Gas Pipeline Safety Act (NGPSA) was adopted August 12, 1968, - 17 deaths in Natchitoches, LA.





## The Present Regulations Evolved

- On August 11, 1970, OPS removed Part 190 and published the first issue of Part 192, titled
- "Transportation of Natural and Other Gas by Pipeline; Minimum Federal Safety Standards."

Original  
Code  
192.615

**§ 192.615 Emergency plans.**

Each operator shall—

(a) Have written emergency procedures;

(b) Acquaint appropriate operating and maintenance employees with the procedures;

(c) Establish liaison with appropriate public officials, including fire and police officials, with respect to the procedures; and

(d) Establish an educational program to enable customers and the general public to recognize and report a gas emergency to the appropriate officials.

49 CFR  
192.615(a)

- Requires written procedures for emergencies
- 1 - Receiving, identifying, & classifying notices
  - 2 - Communication with 911  
\*NEW
  - 3 - Prompt & effective response for... (GFEN)

49 CFR  
192.615(a)(3)

- Gas detected inside or near buildings
- Fire located near or directly involving a pipeline facility
- Explosion near or directly involving a pipeline facility
- Natural Disaster.

49 CFR  
192.615(a)

4 – Availability Personnel,  
Equipment, Tools, & Materials

5 – Actions protecting People first  
then Property

6 – Shutdown to minimize hazards  
to Life Property Environment

49 CFR  
192.615(a)

7 – Making Safe Actual or  
Potential Hazard

8 – Notifying 911 coordinate &  
share info of the emergency \*

9 – Restoring any outage

49 CFR  
192.615(a)

10 – Beginning 192.617 actions

11 – Actions required by  
controller per 192.631,  
634, 636 \*

12 – Develop rupture  
identification procedures \*

49 CFR  
192.615(b)

- Each operator shall:
- Furnish Supervisors Emergency Procedures
- Train operations personnel & verify effectiveness
- Review employee activities - procedures effectively followed



49 CFR  
192.615(c)

Must Establish & Maintain Liaison with  
911 and F,P,&P officials\*

- 1 - Learn, responsibility & resources  
of each
- 2 - Acquaint officials with ability in  
responding

49 CFR  
192.615(c)

- 3 – Identify type of gas pipeline emergencies which the operator notifies officials
- 4 – Plan how operator and officials can engage in mutual assistance to minimize hazards



# Gas Distribution Incidents 1970-2022

	1970 - 1984*	1984 - 2010	2011 - 2022
Pennsylvania	583	176	49
Other USA	14028	2785	1172
Total USA	14611	2961	1221

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# Gas Transmission Incidents 1970-2022

	1970 - 1984*	1984 - 2001	2002 - 2009	2010 - 2022
Pennsylvania	338	37	27	57
Other USA	7526	1465	1002	1604
Total USA	7864	1502	1029	1661
Reportable incidents filed with PHMSA				

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# Hazardous Liquid Accidents 1968-2022

	1968-1986	1986-2002	2002-2009	2010-2022
Pennsylvania	131	54	47	71
Other USA	4602	3040	2983	5084
Total USA	4733	3094	3030	5155

Reportable HL accidents filed with PHMSA

Original  
code 49 CFR  
195.402

**§ 195.402 General requirements.**

(a) Each carrier shall establish and maintain current written procedures:

(1) To ensure the safe operation and maintenance of its pipeline system in accordance with this Part during normal operations.

(2) To be followed during abnormal operations and emergencies.

(b) No carrier may operate or maintain its pipeline systems at a level of safety lower than that required by this subpart and the procedures it is required to establish under paragraph (a) of this section.

# Current Code: 49 CFR 195.402(e)

## Emergencies

- (1) Receiving, identifying, and classifying notices of events that need immediate response
- (2) Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental release
- (3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.



# Current Code: 49 CFR 195.402(e)

## Emergencies

- (4) Taking necessary actions, to minimize hazards
- (5) Control of released hazardous liquid
- (6) Minimization of public exposure
- (7) Notifying the appropriate public safety answering point





# Current Code: 49 CFR 195.402(e)

## Emergencies

- (8) For highly volatile liquid, use of appropriate instruments
- (9) Providing for a post accident review of employee activities
- (10) Actions required by a controller during an emergency

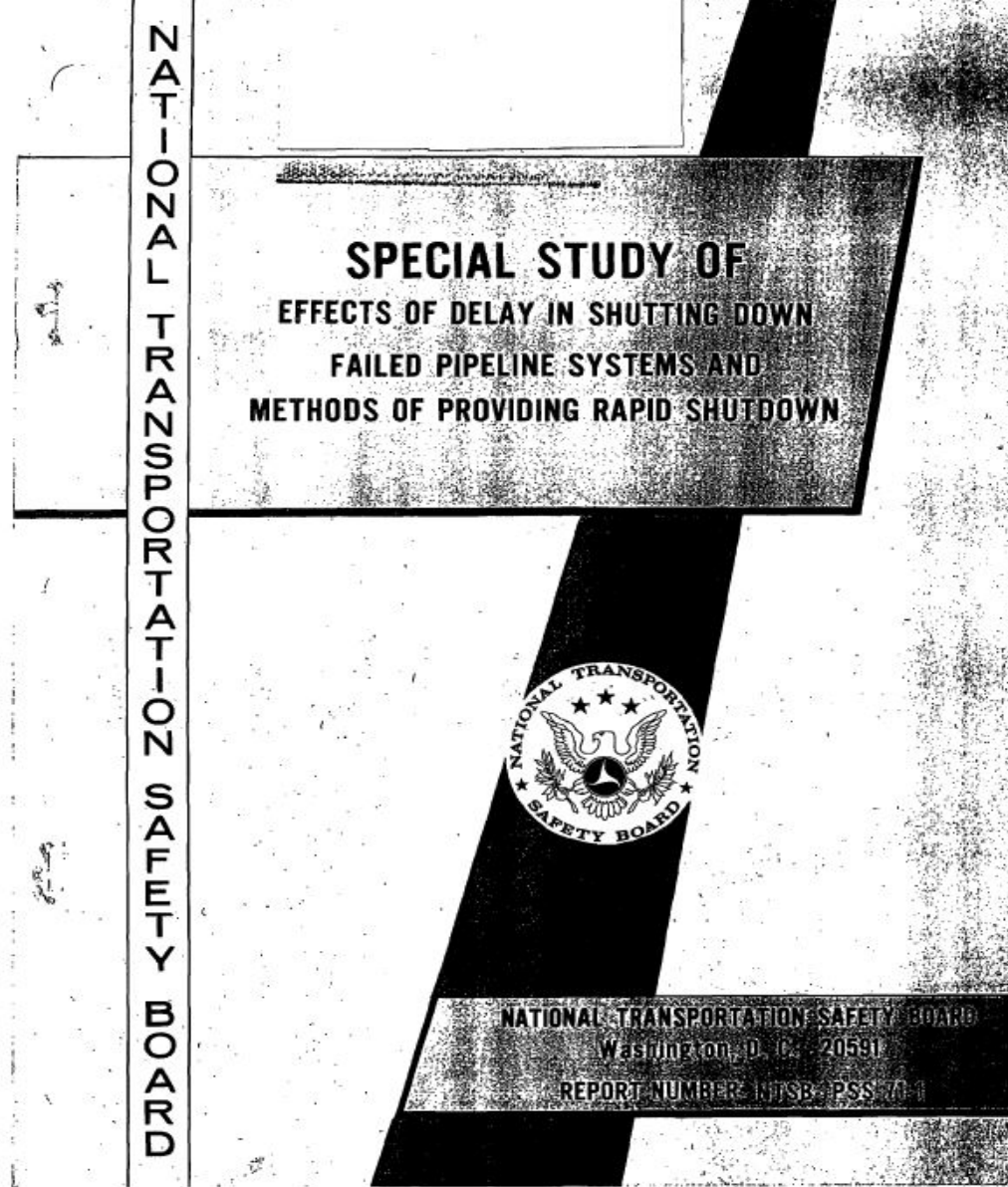


# Current Code: 49 CFR 195.403(b)

## Training

- At the intervals not exceeding 15 months, but at least once each calendar year





# Coshocton, OH, June 1, 1968

- 8-inch propane (HVL) propane, >750 psi
- Ruptured by landslide
- Vapor cloud 1 mile by 100 - 400 yards wide
- Valley-like terrain
- 4 vehicles; stalled in cloud
- Ignition - explosion



# Coshocton, OH, June 1, 1968

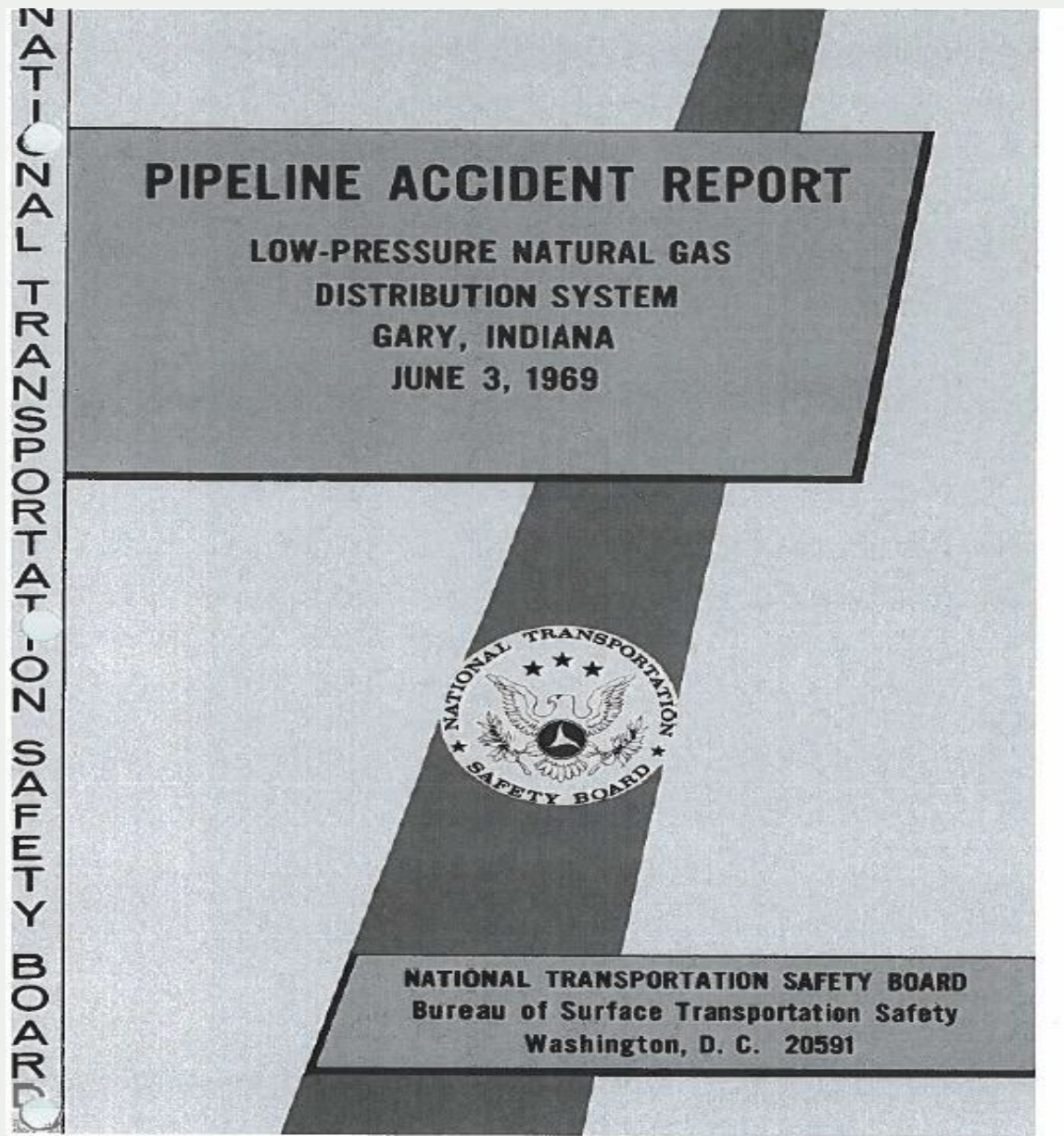
- Pumping stations > 50 mi both sides of rupture
- Shutdown 30 min after rupture
- Manual valves located 3 & 5 mi upstream and downstream
- Employee dispatched from 50 mi away



# Coshocton, OH, June 1, 1968

- Manual valves closed 2 hrs 20 min after the explosion
- 12 hours to burn off
- 3 vehicle occupants killed, 5 others injured





# Case Study

## Gary, Indiana

### June 3, 1969

Upgrade from low pressure system to 20 psi

By June 1969, 95% of the city upgraded to 20 psi

Glen Park – two sections East to increase pressure  
– the West side approximately 140 customers were to remain on low - pressure

East side ready for the increase to 20 psi. Service lines replaced; service regulators installed



# Remember this was before Federal Regulations

B31.8 was standard which did not say to retrofit

2 district regulators equipped with by-pass valves

East side – to be used to increase pressure

West was to maintain  $\frac{1}{4}$ " psi pressure on remaining LP

These regulator stations were in pits with shutoff valves inside the pit and had *no overpressure protection*

Pressure increments were to be from  $\frac{1}{4}$  psi to 6 psi then to 20 psi

# Gary, Indiana – Event sequence

Pressure increase started

Crew at the separation valve, saw the increase in pressure with a manometer, removed it, then closed the valve

@6 psi, lines patrolled, everything seemed OK

10 minutes past, the by-pass at the regulator station was slowly opened to increase the pressure to 20 psi another valve opened

@ 20 psi - Notified of a leak on an 8" main located on the East side

# Gary, Indiana – Event sequence

Crews dispatched and responded to repair the leak. It was discovered that the leakage was extensive, and the Foreman also responded.

A crew member returning from a doctor's appointment was stationed at the separation valve decided to operate the separation valve;

Thinking he was closing the valve, he erroneously opened the valve allowing 20 psi gas into the low-pressure system

# Gary, Indiana – Event sequence

The open separation valve, was open 1-2 minutes before being closed, allowed gas downstream into the low-pressure system

This ruptured the diaphragm on the Rockwell 014– causing it to fail wide-open

Gas flowed into the system for 15 minutes

The foreman responded and went to the west side regulator station but couldn't open the doors caused a 15-minute delay for another person to assist

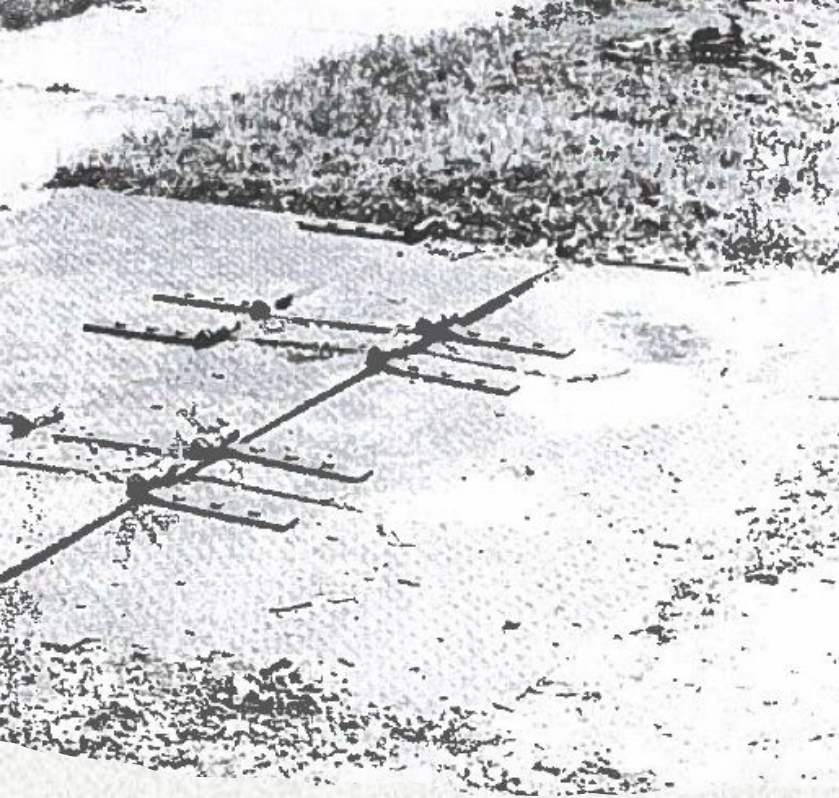
# Gary, Indiana – Result of Over-pressure

Another 15-20 minutes delay in shutdown

9 residents and 5 firemen were injured, there were no fatalities.

7 houses were lost due to fires and explosions.

45 other homes suffered fire damage.



Gary, Indiana – photos  
from the NTSB report



The Future?

# Pipeline Safety: Gas Pipeline Leak Detection and Repair

## Action

Notice of proposed rulemaking; extension of comment period.

## Summary

On May 18, 2023, PHMSA published a Notice of Proposed Rulemaking (NPRM) in the Federal Register titled: "Pipeline Safety: Gas Pipeline Leak Detection and Repair." PHMSA received requests to extend the comment period for stakeholders to have more time to evaluate the NPRM. PHMSA is therefore extending the comment period to August 16, 2023.

Thank You for your attention!

