



2019 Safety Conference
State College, PA



PA PUC - Safety Division
Rob Horensky

Safety Division – Program Overview

- ❑ **Number Of Current Pipeline Engineers – 20 Engineers/Inspectors**
- ❑ **Plans To Increase Staff -- 20 Additional Engineers/Inspectors**
- ❑ **2018 Distribution Mileage -- 48,346 Miles (2,545 Miles Per Inspector)**
- ❑ **2018 Number of Services -- 2,879,281 (151,541 Services Per Inspector)**

Intrastate Pipeline Facilities Overview

Natural Gas

- ❑ 2018 Transmission Mileage -- **1,407 Miles**
- ❑ 2018 Distribution Mileage -- **48,346 Miles**
- ❑ 2018 Number of Services -- **2,879,281**
- ❑ 2018 Gathering Line Mileage -- **832 Miles**
- ❑ Estimated Unregulated Gathering Line Mileage -- **100,000 Miles ??**
- ❑ Gas Underground Storage Facilities -- **9**
- ❑ Total Number of Operators – **116**
- ❑ Identifying Total Master Meters – **400 to 600 ??**

Intrastate Pipeline Facilities – Hazardous Liquids

- ❑ 2018 HL Mileage – **1,230 Miles with breakout tanks**
- ❑ 2018 HL Commodities -- **Refined Petroleum Products; Crude Oil; HVL**
- ❑ 2018 Total Number of Operators -- **7**

Distribution Pipeline Materials

- ❑ Cast Iron Main Mileage -- **2,503**
- ❑ Unprotected Steel Mileage -- **6,517**
- ❑ Cathodically Protected Steel Mileage -- **12,028**
- ❑ Plastic Main Mileage -- **23,539**
- ❑ Other -- **208**

% of Total Pipe

5.6%

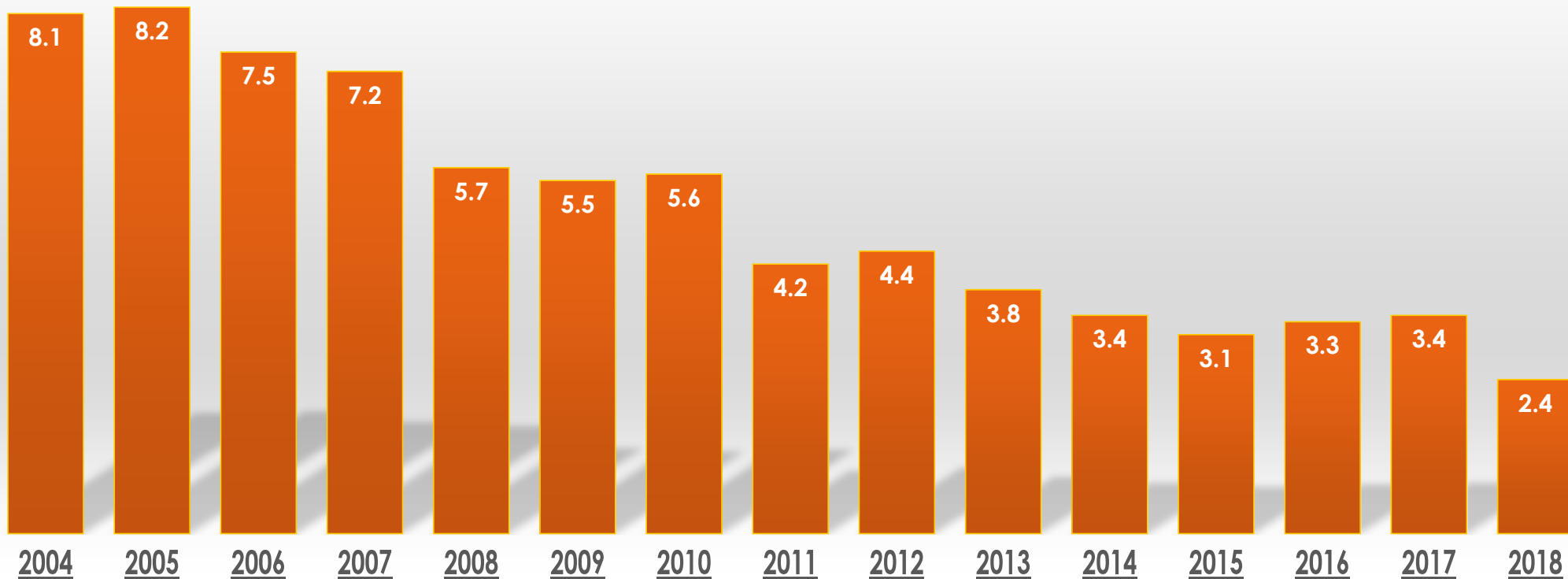
14.5%

26.9%

52.5%

0.5%

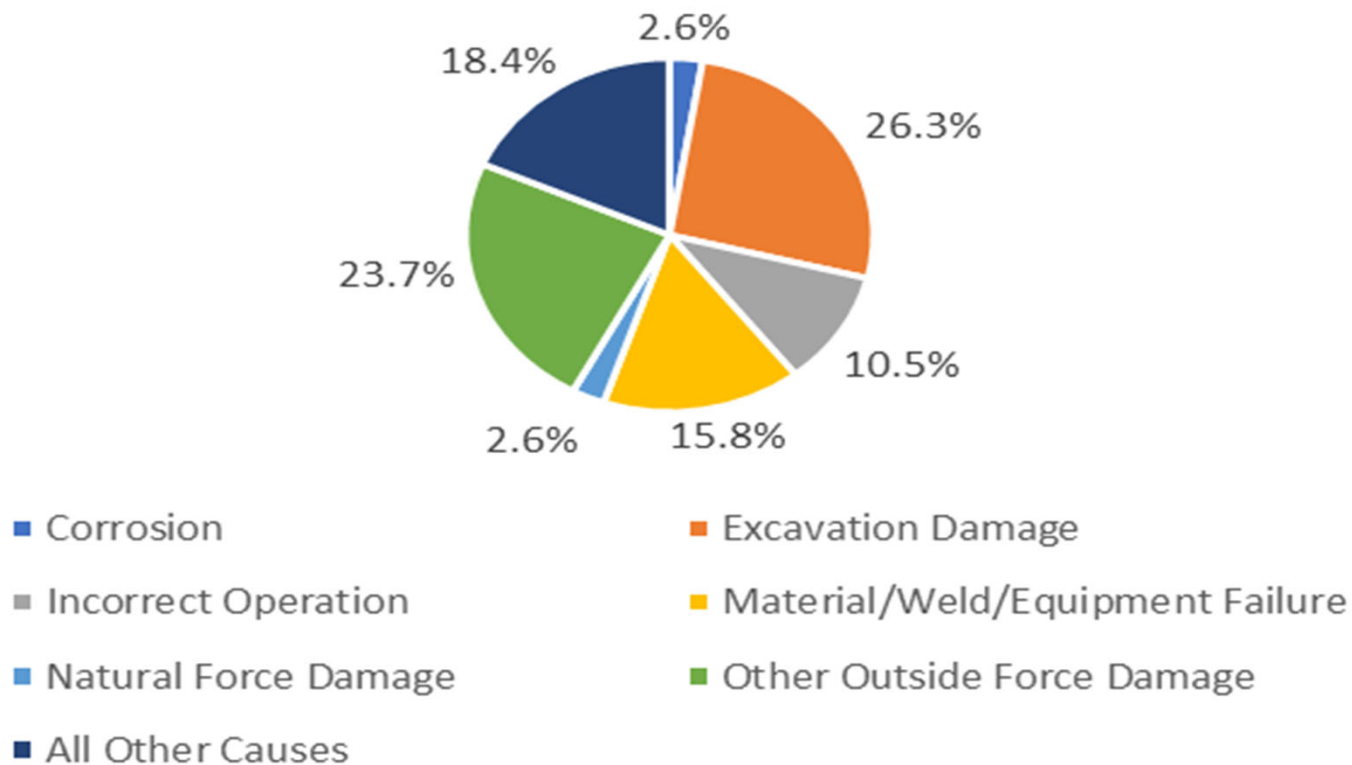
Total Gas Line Hits Per 1,000 Tickets Marked



2018 Serious Incidents By Cause – Across USA

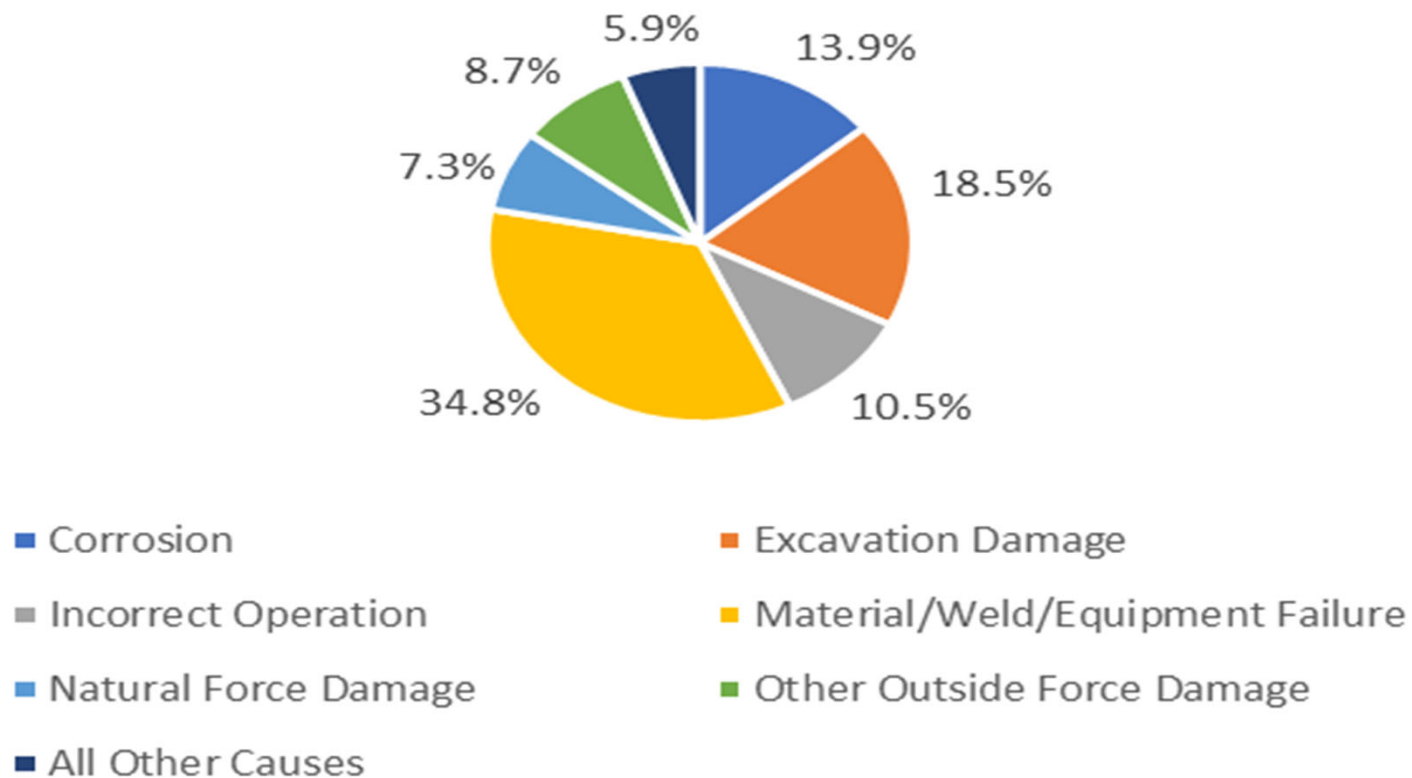
Serious Incidents include a fatality or injury requiring in-patient hospitalization

Serious Incident Cause Breakdown in 2018

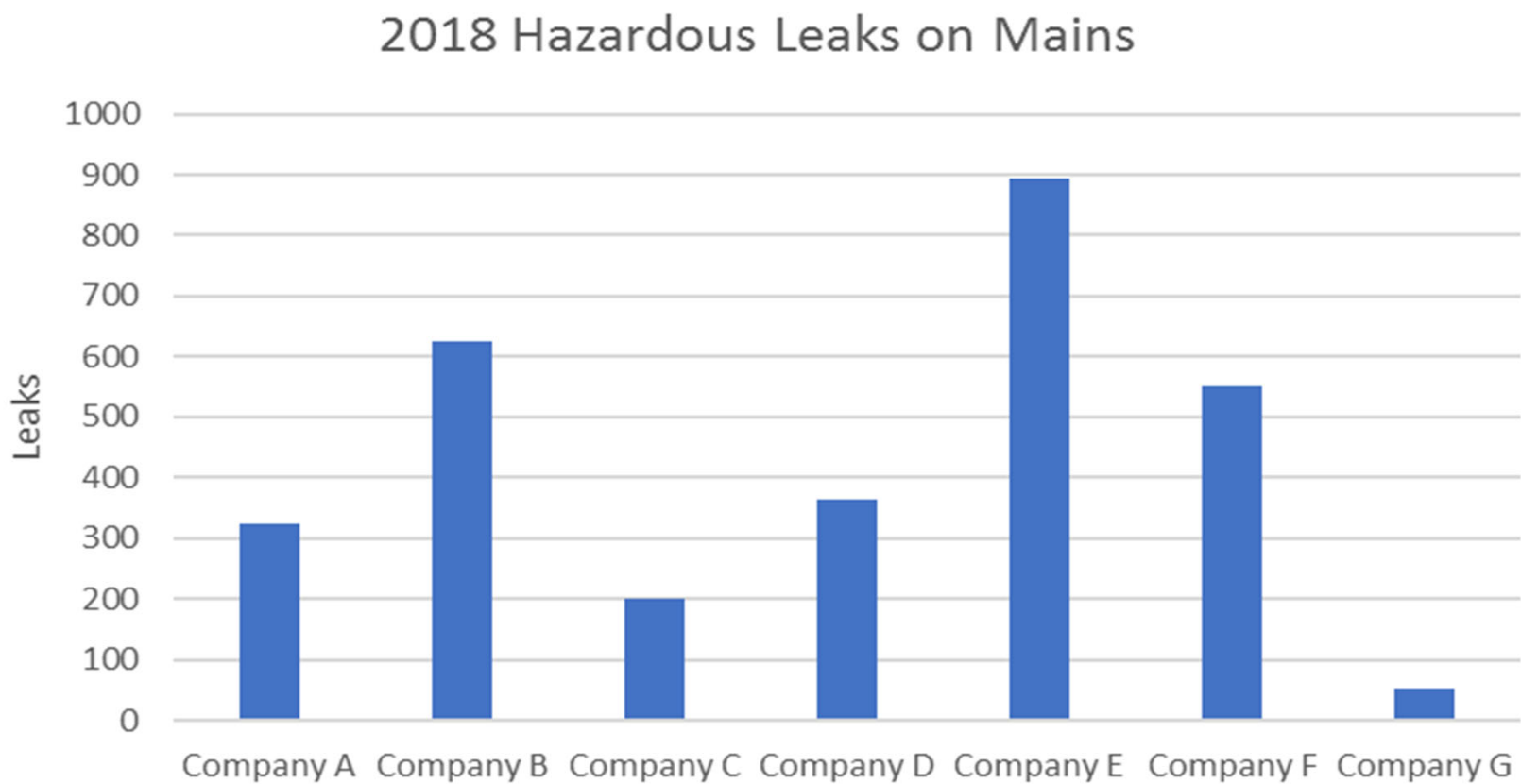


2018 Serious Incidents By Cause – Across USA

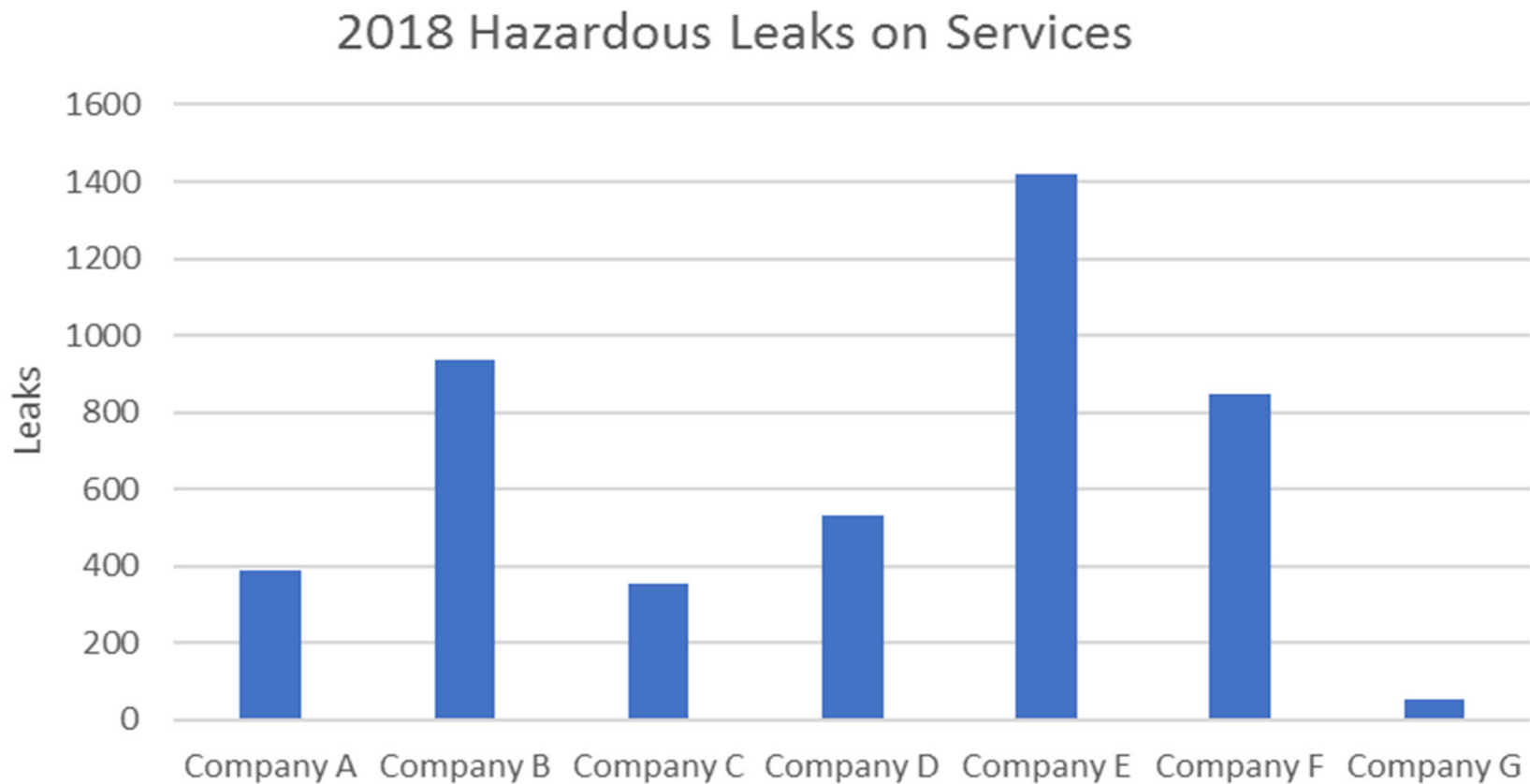
Significant Incident Cause Breakdown in 2018



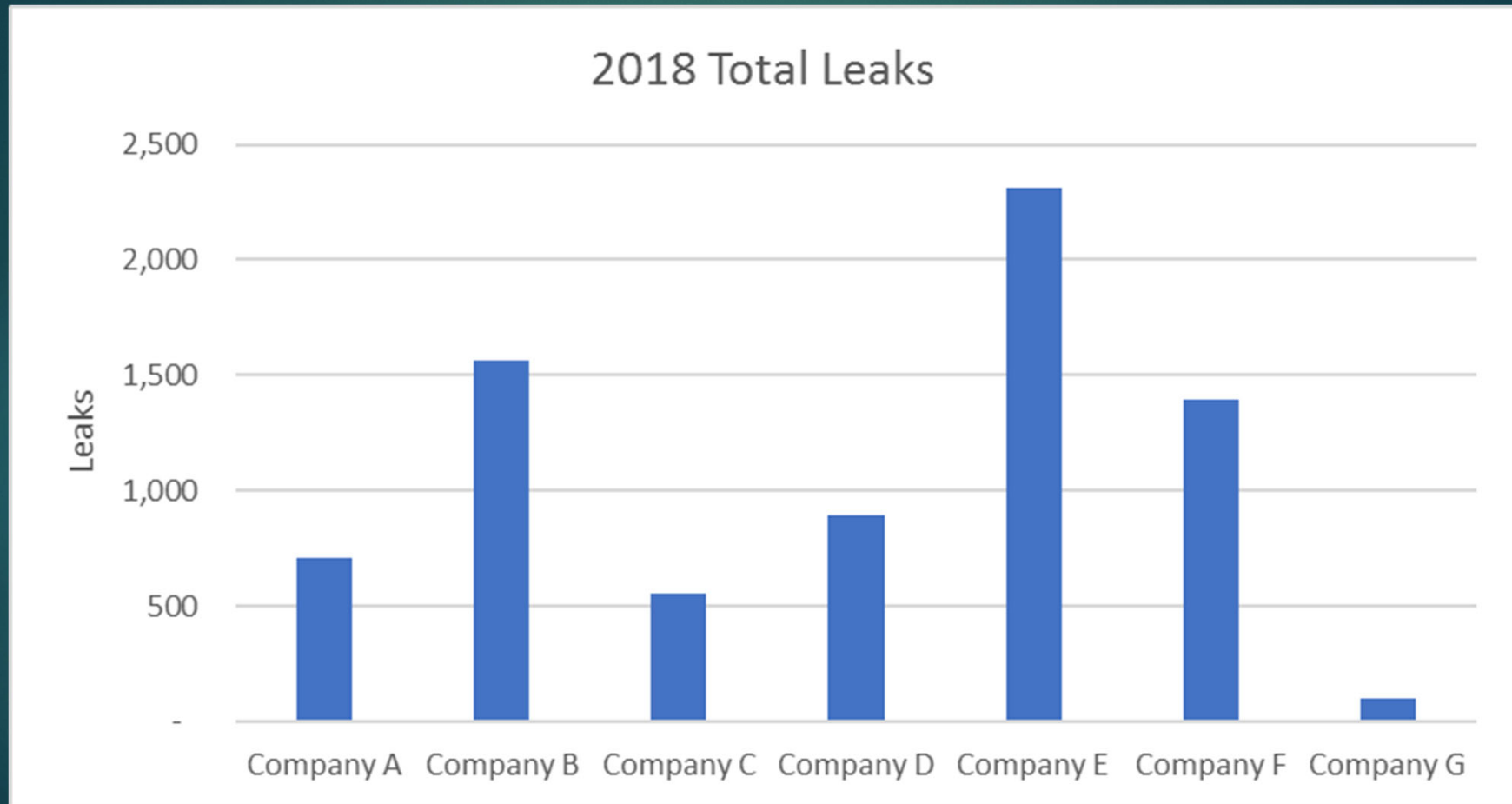
2018 Hazardous Leaks on Mains



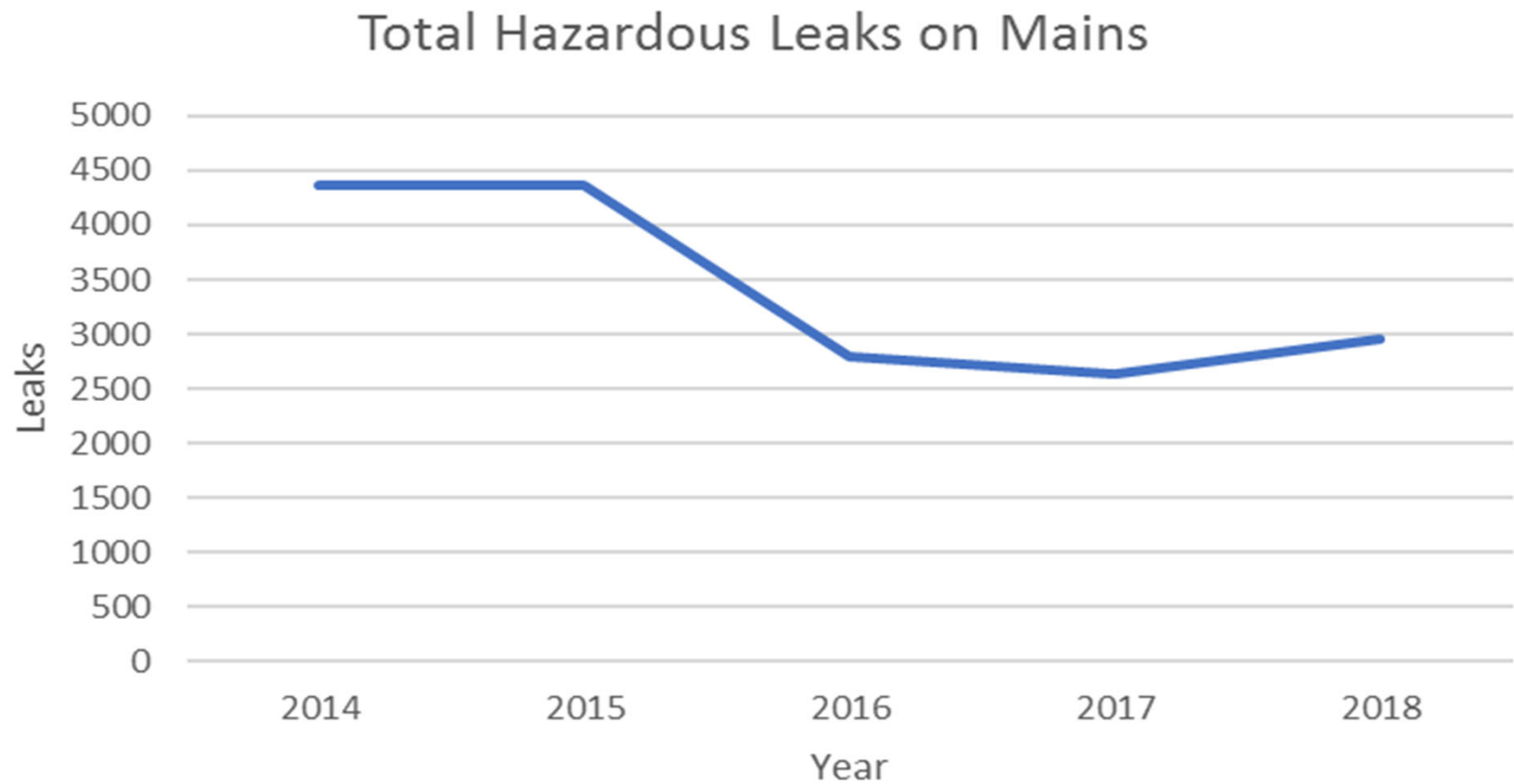
2018 Hazardous Leaks on Services



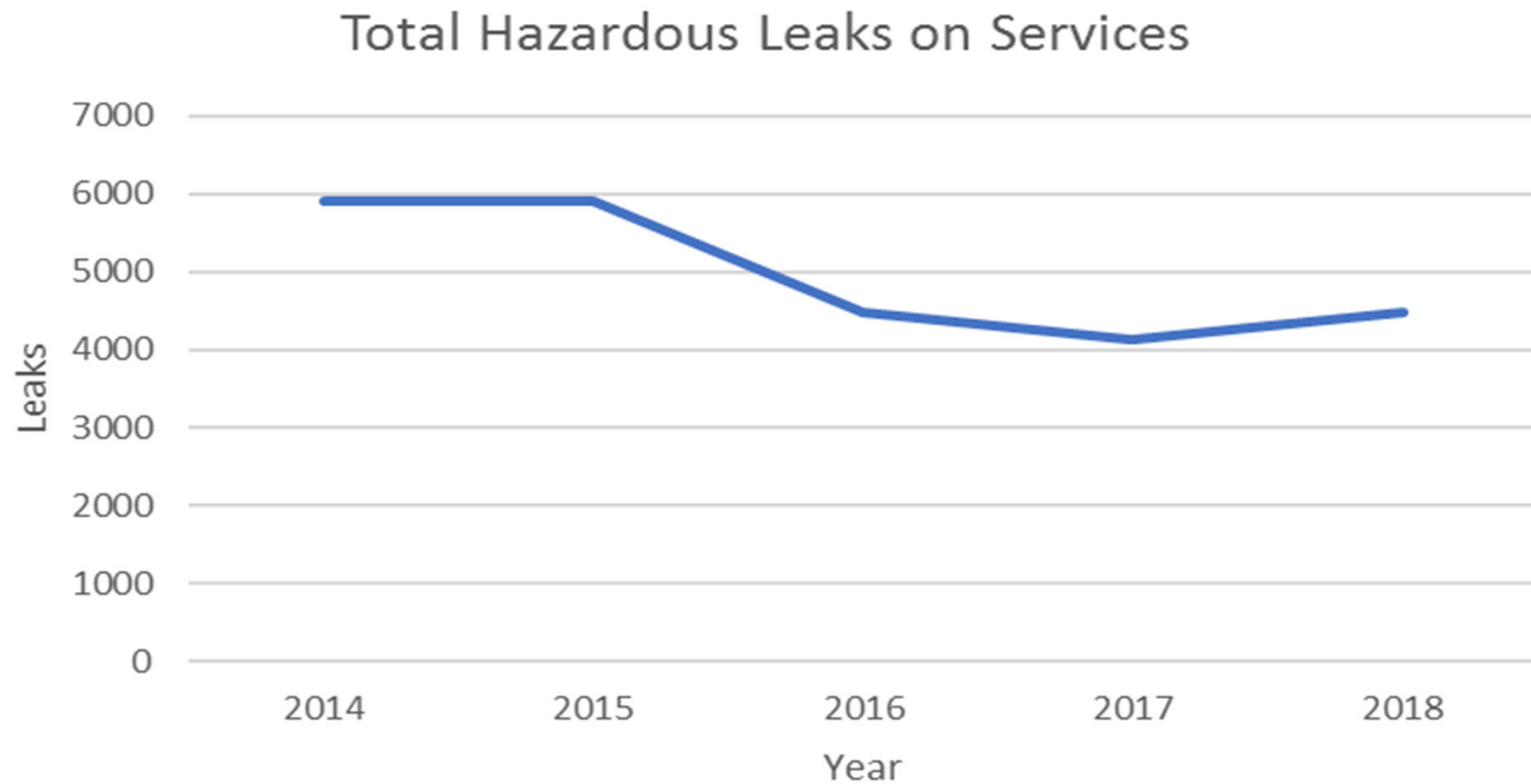
2018 Total Hazardous Leaks



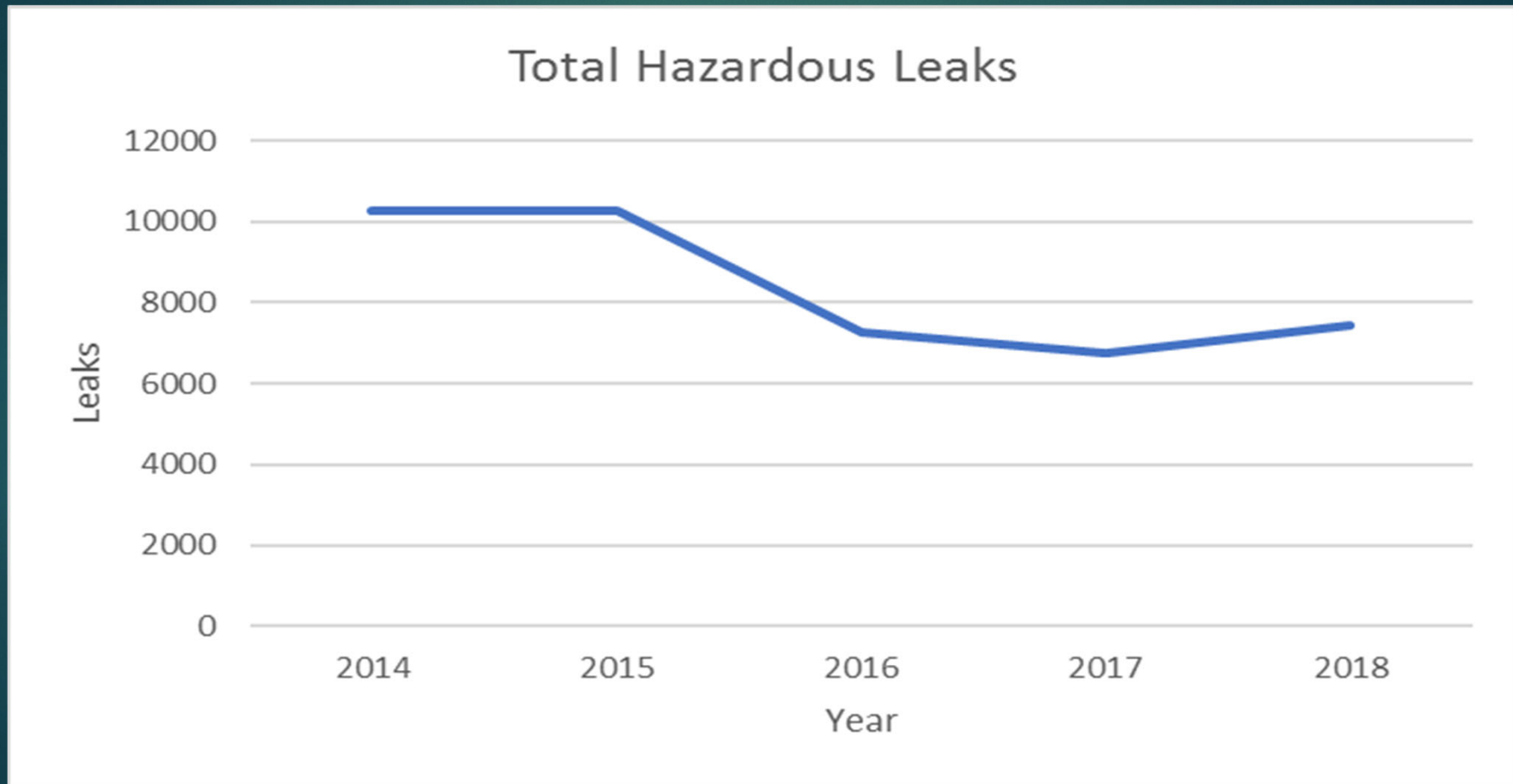
Total Hazardous Leaks on Mains/Year



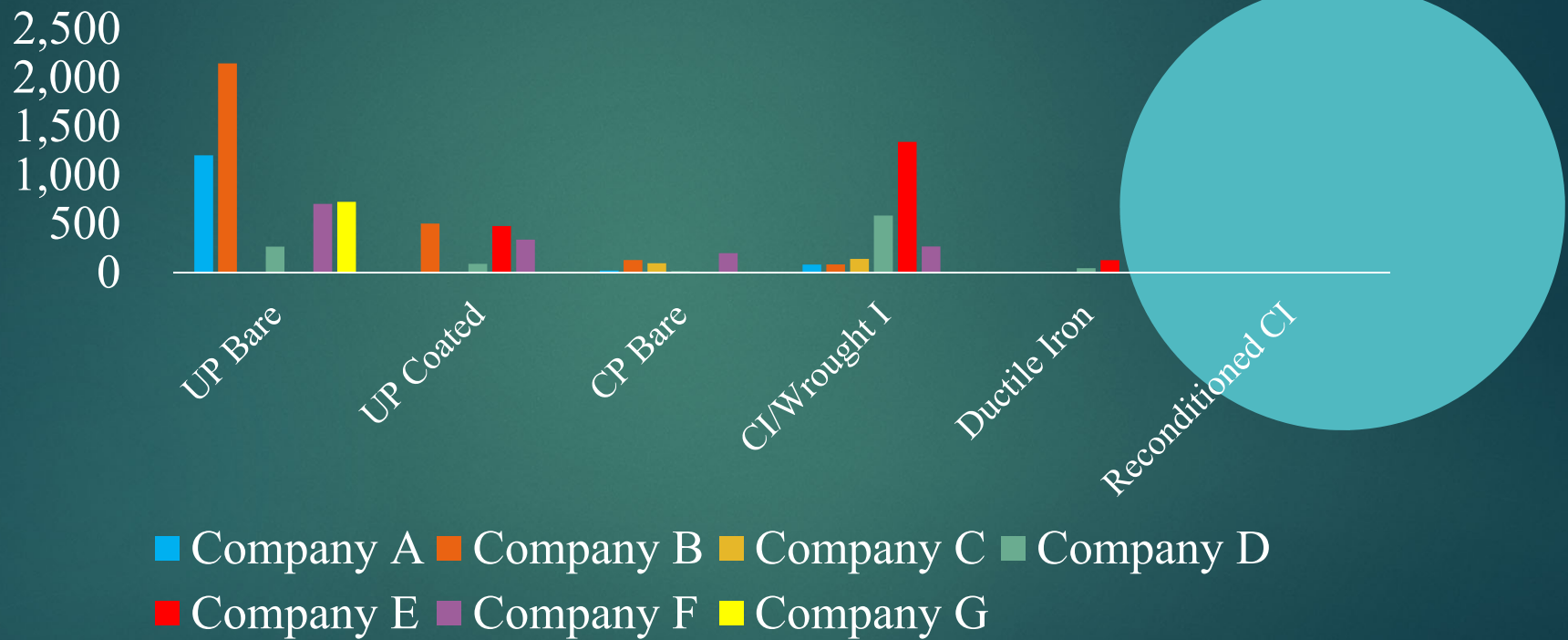
Total Hazardous Leaks on Services/Year



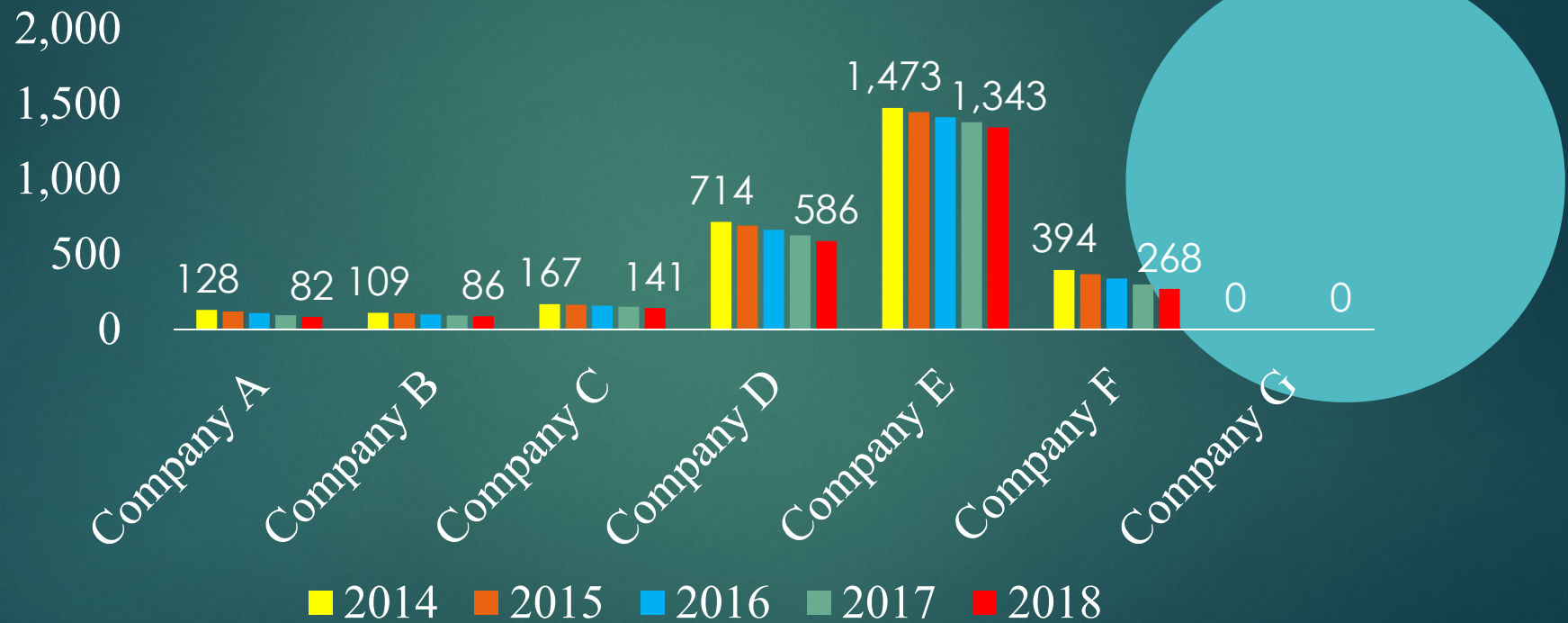
Total Hazardous Leaks/Year



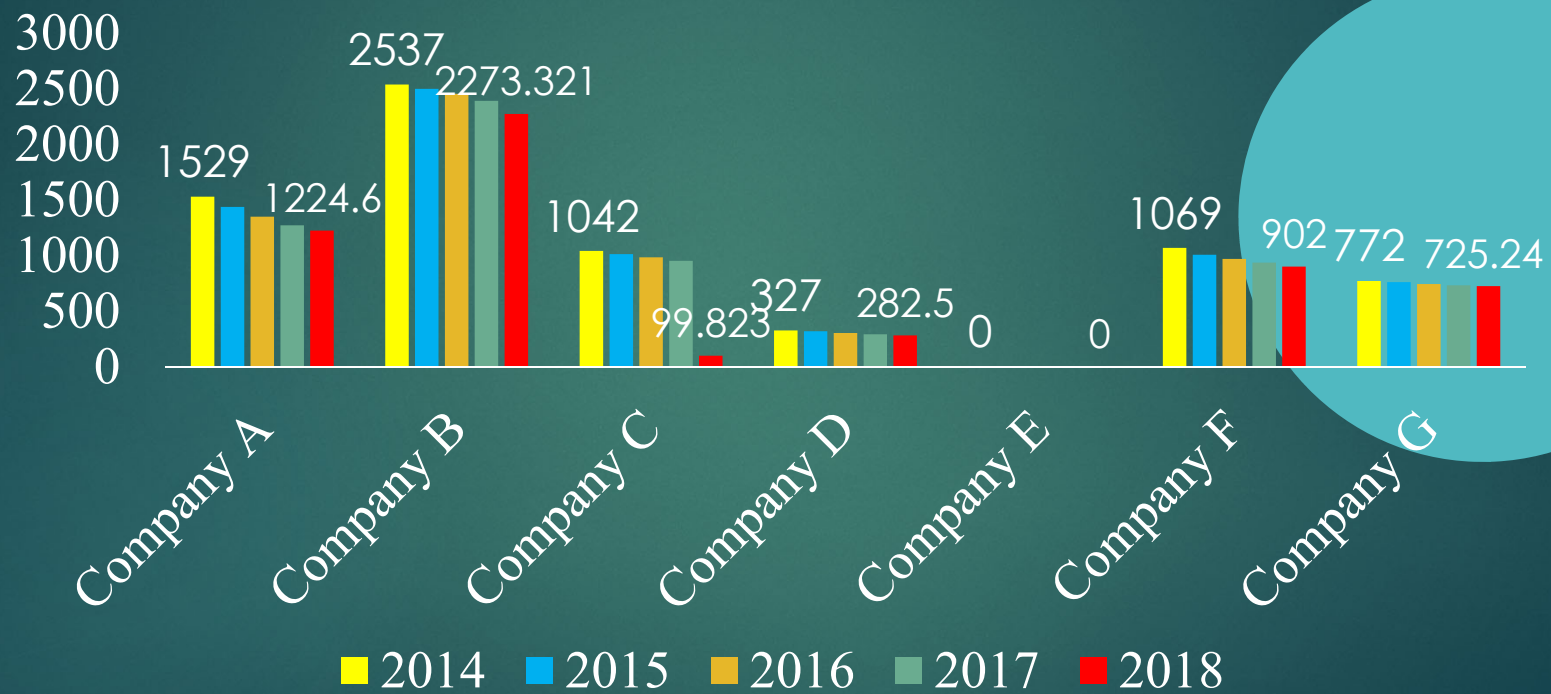
Miles of Pipe Material Remaining - End of 2018



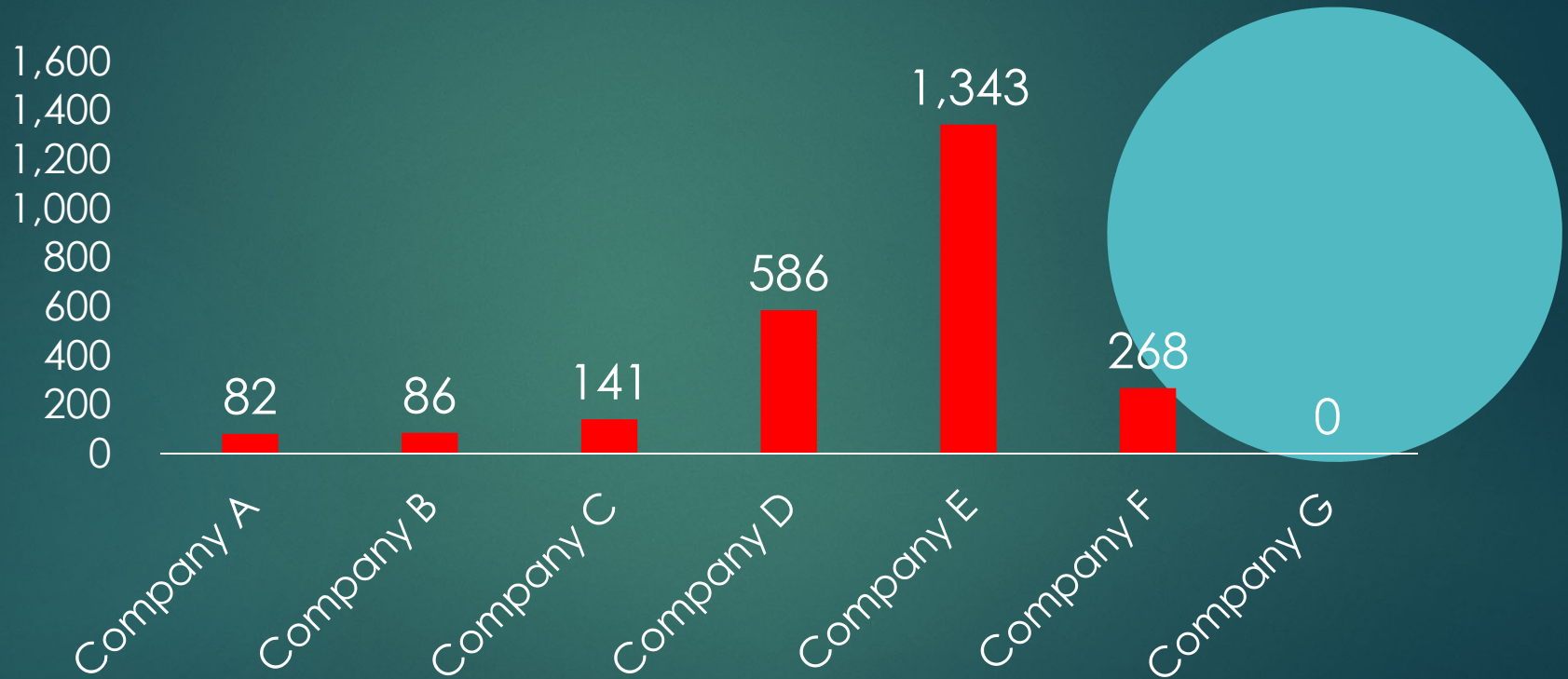
Miles of Cast Iron Remaining (2014 – 2018)



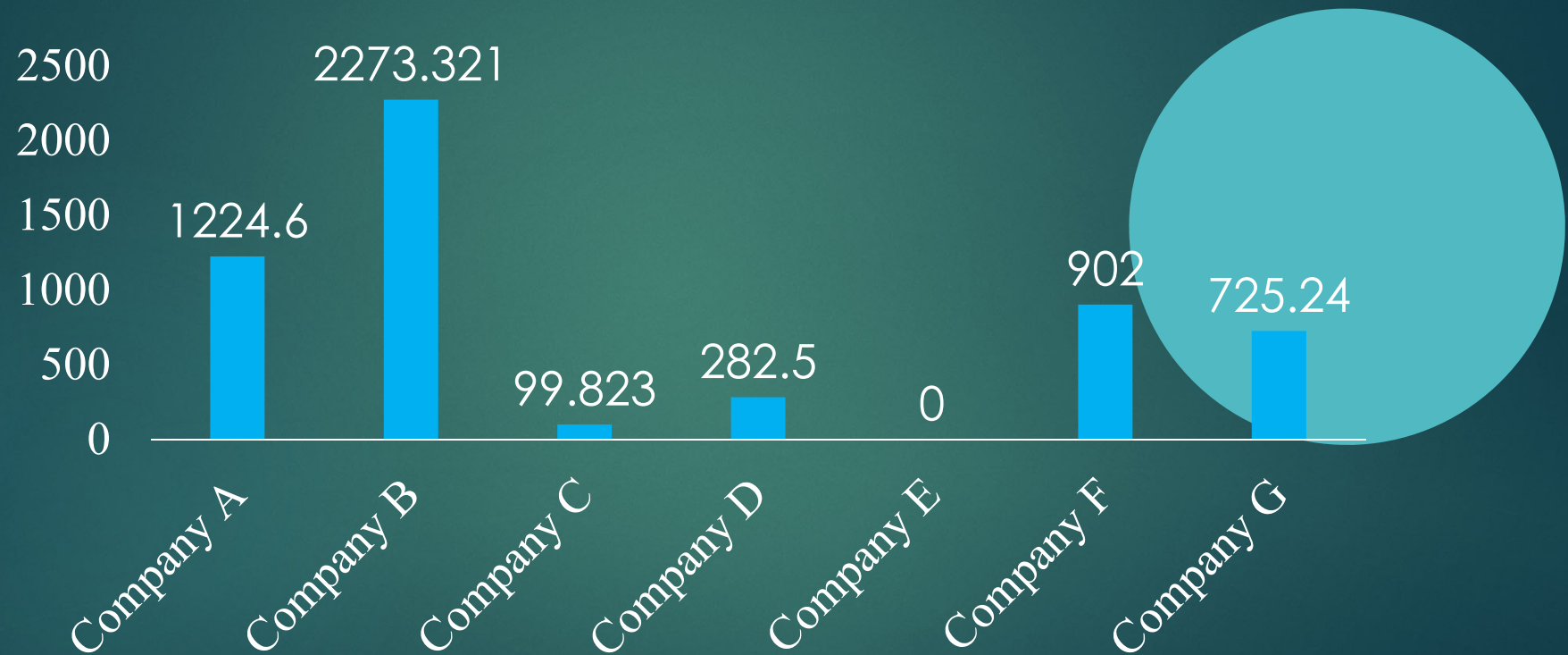
Annual Bare Steel Remaining (2014 - 2018)



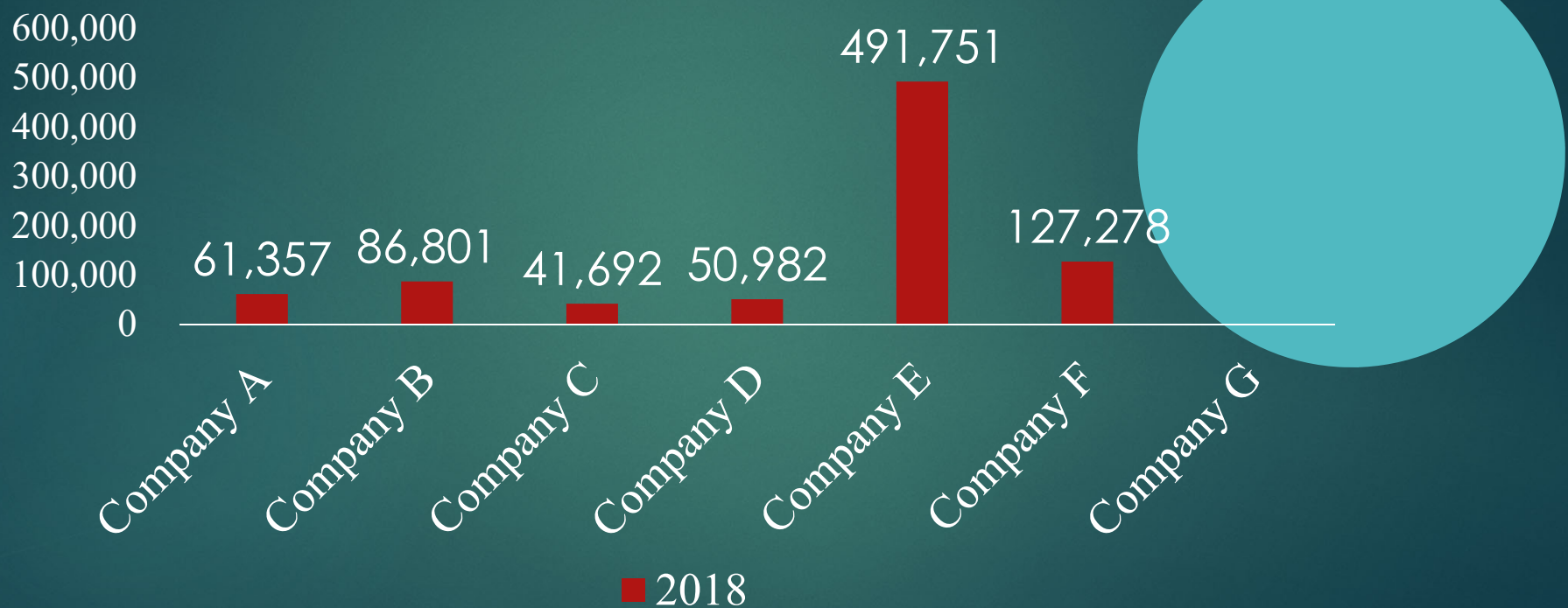
Miles Of Cast Iron Remaining – End of 2018



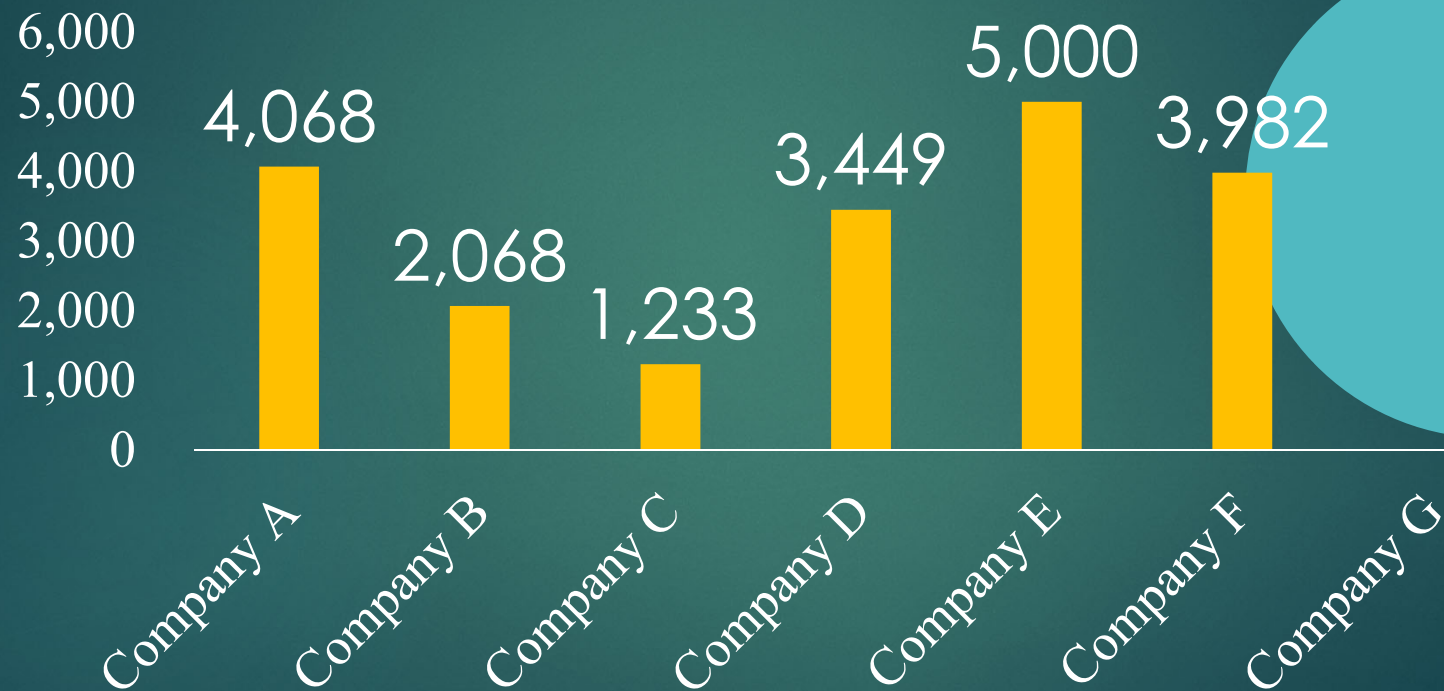
Miles of Bare Steel Remaining -- End of 2018



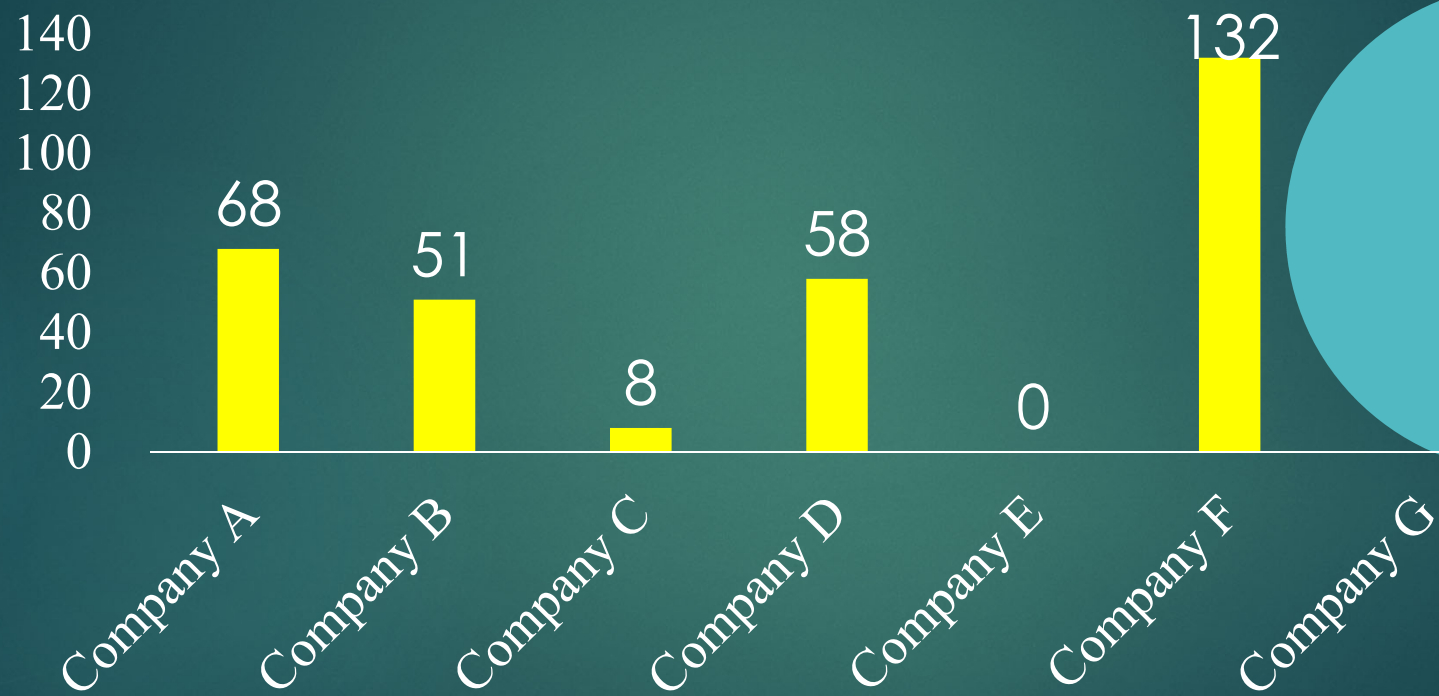
Inside Meter Sets - 2016 through 2018



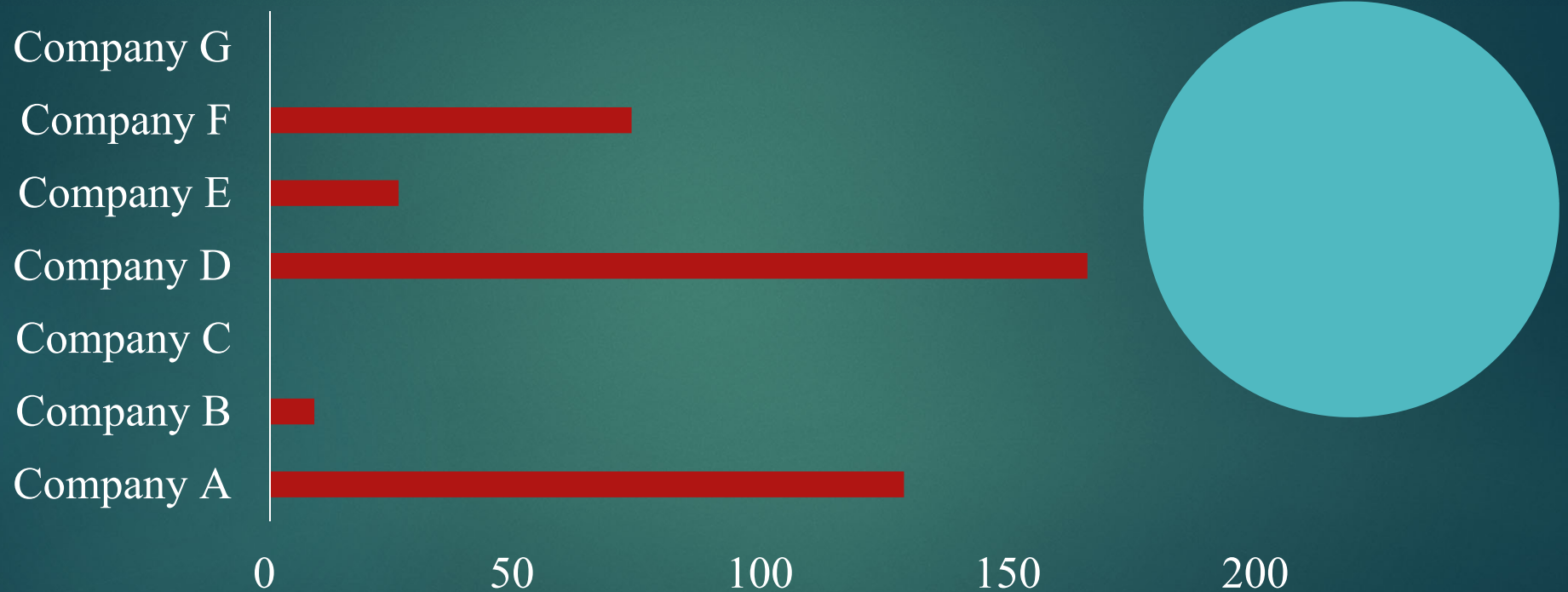
Average inside Meter Sets Removed or Converted in 2018



Annual Riser Failures - 2018

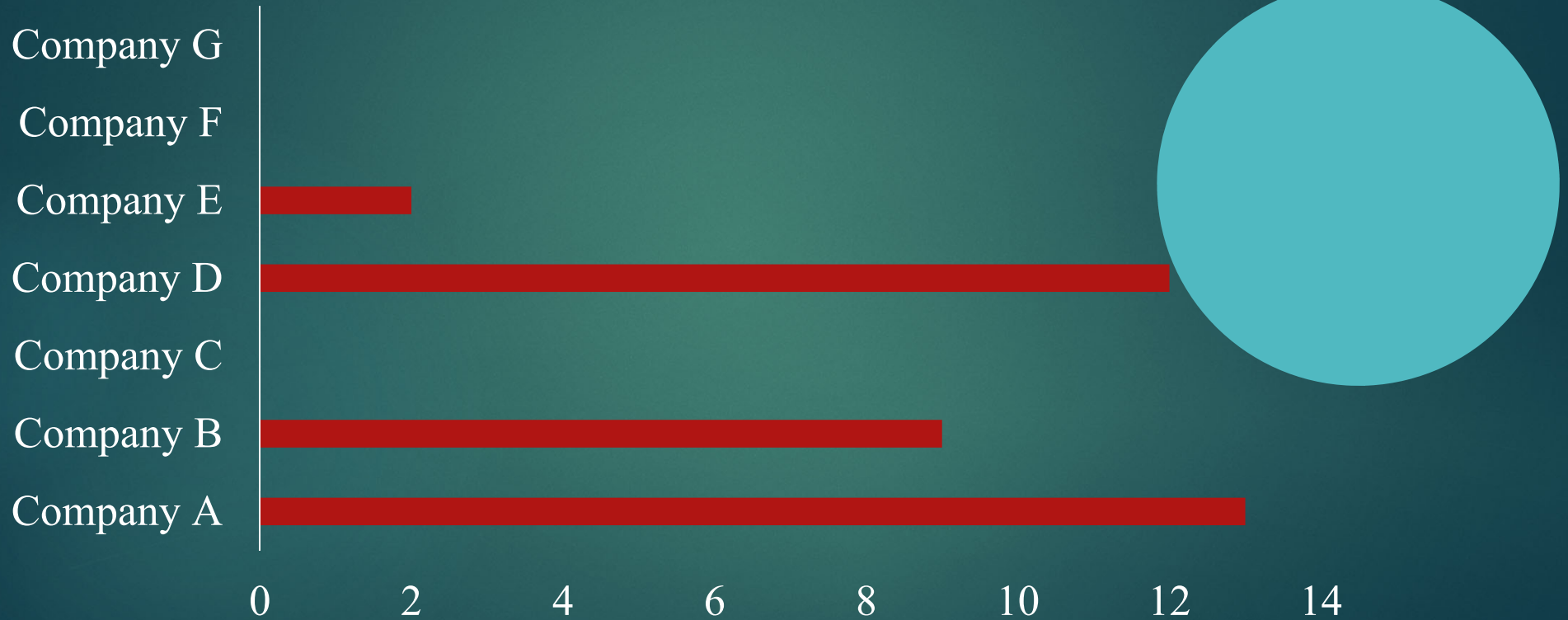


Total Master Meters by Company in 2018



Total Leaks Associated with Master Meters in 2018

Some Companies Don't Track Master Meter Leaks



Massachusetts Natural Gas Pipeline Incident



Source: Associated Press

Incident Summary

- ▶ 5:08 PM ET, September 13, 2018: Columbia Gas of Massachusetts notified the National Response Center that a house exploded.
- ▶ ~6:00 PM ET, National media outlets were reporting multiple explosions, and towns of Lawrence, Andover, and North Andover Massachusetts were evacuated.
- ▶ 3:01 AM ET, September 14, 2018: Columbia Gas of Massachusetts provided an updated report to the NRC that there was 1 fatality and 25 injuries due to the incident.



Source: CNN

State Program – NAPS SR Actions



- ▶ Several state programs volunteered qualified inspectors to help oversee the operator and contractors pipeline replacement and service tie in efforts.
- ▶ PA, AZ, CT, MN, OH, NY, VA and OR have volunteered and sent personnel.
- ▶ Pennsylvania sent several inspectors over several weeks to assist the Massachusetts Safety Program as mutual aid.
- ▶ PHMSA sent inspectors and personnel to aid the Massachusetts

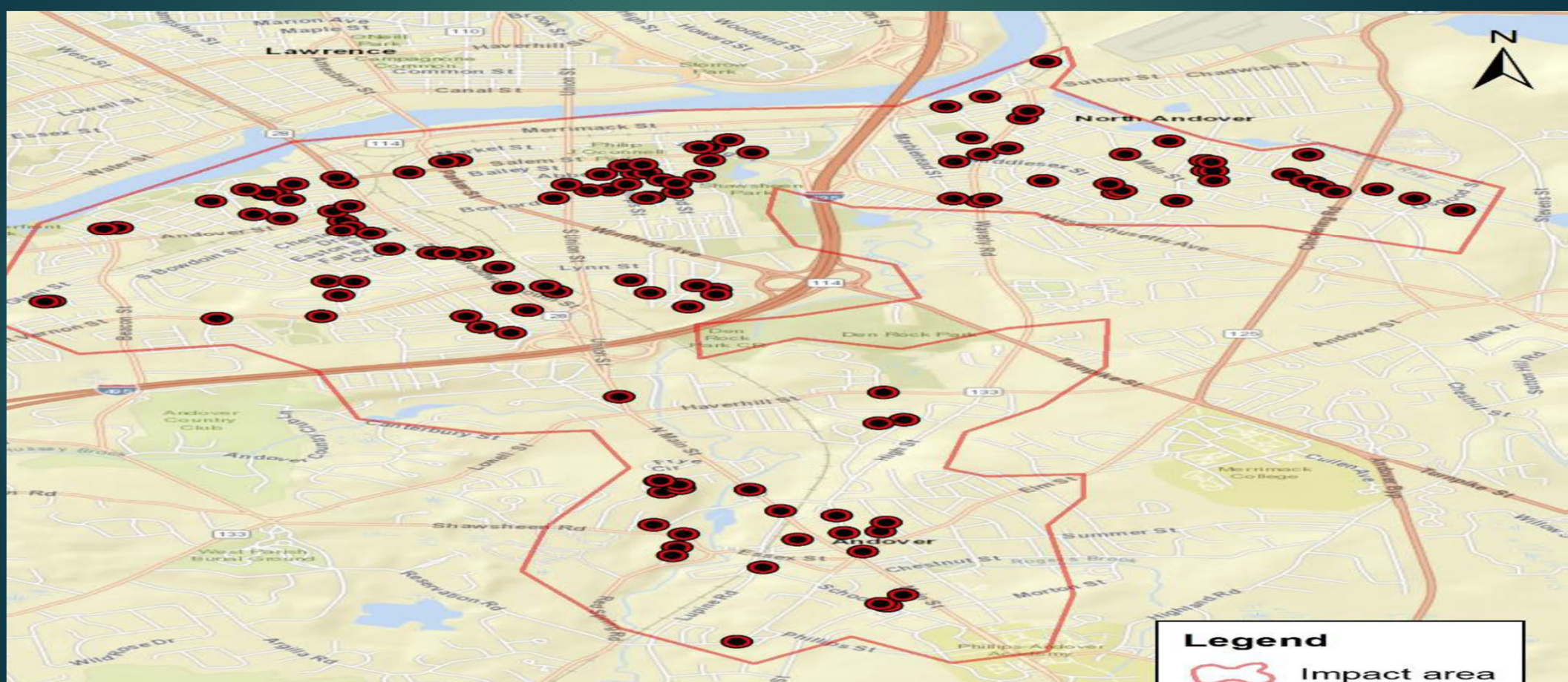
Incident Investigation

- ▶ The National Transportation Safety Board deployed a “go-team” to the incident scene in the early morning of September 14, 2018. The “go-team” included two board members.
- ▶ The NTSB established two teams for the investigation, Operations and Emergency Response. PHMSA and the Massachusetts Department of Public Utilities (MA-DPU) had multiple staff members on each team.



Source: @NTSB_Newsroom

Merrimack Valley: Lawrence, North Andover, and Andover



I&E Actions

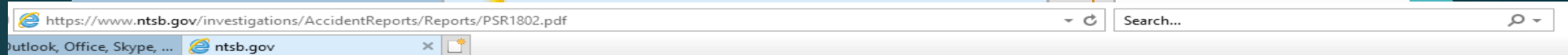


- ▶ Issued an advisory letter to the NGDC.
- ▶ Construction inspections with added emphasis on control/monitor stations with below ground sensing lines.
- ▶ NGDC review regulator station layout.
- ▶ Distribution Integrity Management Plan update considering risks.

NTSB Actions



<https://www.nts.gov/investigations/AccidentReports/Reports/PSR1802.pdf>



National Transportation Safety Board
Washington, DC 20594

Safety Recommendation Report
Natural Gas Distribution System Project Development and Review (Urgent)

Ongoing Investigation

NTSB Actions- Silver Spring, MD

Safety Recommendation P-19-002

- ▶ On August 10, 2016, at 11:51 p.m., eastern daylight time, a 14-unit apartment building, located at 8701 Arliss Street, in the unincorporated community of Silver Spring, in Montgomery County, Maryland, partially collapsed due to a natural gas-fueled explosion and fire.
- ▶ 7 residents died, 65 residents were transported to the hospital, and 3 firefighters were treated and released from the hospital.
- ▶ The damage from the accident exceeded \$1 million.

NTSB Actions- Safety Recommendation P-19-002

- ▶ Recommendation: TO THE PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION:
 - ▶ Require existing interior service regulators be relocated outside occupied structures whenever the gas service line, meter, or regulator is replaced. In addition, multifamily structures should be prioritized over single-family dwellings.

52 Pa. Code § 59.18. Location of meters.

- ▶ **§ 59.18. Meter, regulator and service line location.**
- ▶ (a) *General requirements for meter and regulator location.*
- ▶ (1) Unless otherwise allowed or required in this section, meters and regulators must be located outside and aboveground.

2019 data request titled FL-1, or Form Letter #1, included additional questions

- ▶ Q 31: 5 separate Excel spreadsheets requesting information on low pressure regulator stations listed as standby monitor stations and overpressure stations:
 - ▶ # of low pressure regulator stations
 - ▶ Stations with bypass configuration
 - ▶ Control line locations
 - ▶ Control lines connected to unconventional main
 - ▶ Exact dimension of control line location unknown

FL-1 Questions

► Question#31- Types of regulator stations

District Regulator Stations which at Least one or More Control Lines are Connected to Non-Contemporary Mains Subject to Abandonment (e.g. Bare Steel, Unprotected Coated Steel, Cast Iron, Wrought Iron, Ductile Iron, Ppre-1980 Plastic) and where the Outlet Pressure is Low Pressure (Inches Water Column)		
	2018	
Number of Stand-by Monitor	141	
Number of Over-Pressure District Regulator Stations		
Total	141	

FL-1 Question #32

- ▶ Q 32: Request for information on In-Service welding procedures
- ▶ Yes / no
 - ▶ If yes, provide these procedures

FL-1 Question #32 In-service welding

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FL-1 Question #32

► API 1104 Appendix B- 20th

APPENDIX B—IN-SERVICE

B.1 General

This appendix covers recommended welding practices for making repairs to or installing appurtenances on pipelines and piping systems that are in service. For the purposes of this appendix, in-service pipelines and piping systems are defined as those that contain crude petroleum, petroleum products, or fuel gases that may be pressurized and/or flowing. This appendix does not cover pipelines and piping systems that have been fully isolated and decommissioned, or have not been commissioned.

There are two primary concerns with welding onto in-service pipelines. The first concern is to avoid “burning through,” where the welding arc causes the pipe wall to be breached. The second concern is for hydrogen cracking, since welds made in-service cool at an accelerated rate as the result of the flowing contents’ ability to remove heat from the pipe wall.

Burning through is unlikely if the wall thickness is 0.250 in. (6.4 mm) or greater, provided that low-hydrogen electrodes (EXX18 type) and normal welding practices are used. Welding onto thinner-wall in-service pipelines is possible and considered routine by many companies; however, special precautions, such as the use of a procedure that limits heat input, are often specified.

For hydrogen cracking to occur, three conditions must be satisfied simultaneously. These conditions are: hydrogen in the weld, the development of a crack-susceptible weld microstructure, and tensile stress acting on the weld. To prevent hydrogen cracking, at least one of the three conditions necessary for its occurrence must be minimized or eliminated. For welds made onto in-service pipelines, success has been

FL-1 Question #32- In service welding

- ▶ **Amendment 192-123**



- ▶ Federal Register Volume 82, Number 13 (Monday, January 23, 2017)

- ▶ [Rules and Regulations] [Pages 7972-8002]



▶ 3. PHMSA Response

- ▶ In the past, PHMSA has encouraged pipeline operators to develop and use welding procedures that address improvements in pipeline safety and many operators have developed in service welding procedures. Welding procedures developed to API 1104 Appendix B consider the risks associated with hydrogen in the weld metal, type of welding electrode, sleeve/fitting and carrier pipe materials, accelerated cooling, and stresses across the fillet welds. Parts 192 and 195 do not include the addition of API 1104 Appendix B as an acceptable section for the development of welding procedures and welder qualification. To allow in-service welding, PHMSA is adopting Appendix B of API 1104 into parts 192 and 195. Therefore, PHMSA is not creating new requirement but only including Appendix B into already adopted API 1104 to qualify in service welding procedures or in service welders to perform in-service welding operators must follow Appendix B of API 1104. In addition, currently, PHMSA does not allow in service welding and, therefore, there are no existing options in the regulations for in service welding.
- ▶ The Advisory Committees agreed with PHMSA's responses to the public comments.