

# PG&E- Gas Operations

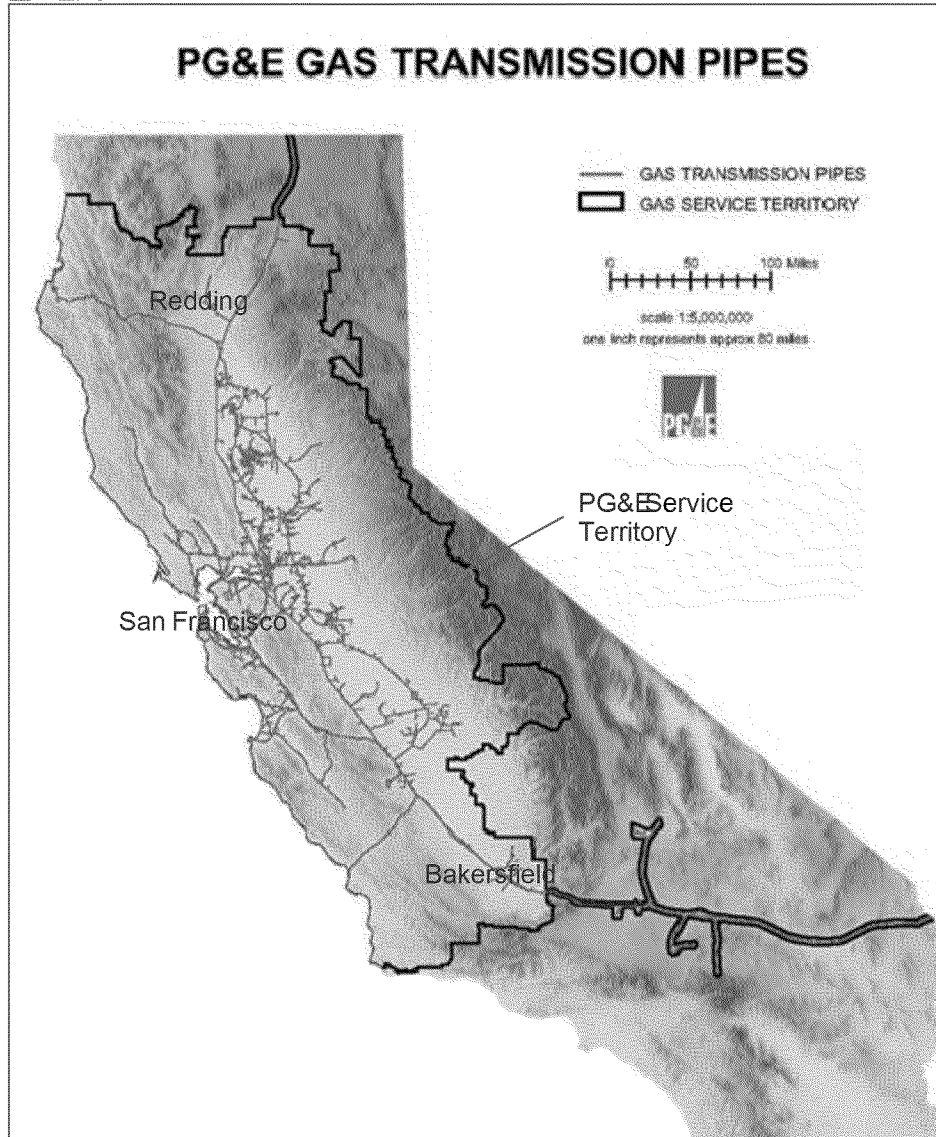
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PG&E PHMSA  
August 21, 2013



# PG&E Gas Operations



4.3 million natural gas customer accounts.

Serves approximately 15 million people throughout a 70,000-square-mile service area

Deliver 970 BCF/year (2.6 BCF/D)

Operates approximately 6,800 miles of gas transmission pipeline~ 42,000 miles of gas distribution pipeline

47% of Transmission Pipe installed before 1961

25% of HCAmiles piggable

Approximately 105 BCF of gas storage

Approximately 203,000 HP of compression



# Key Principles of Gas Safety Excellence

Our goal is zero incidents & a perfect record of safety and reliability for the PG&E gas pipeline system. We will work every day toward this goal.

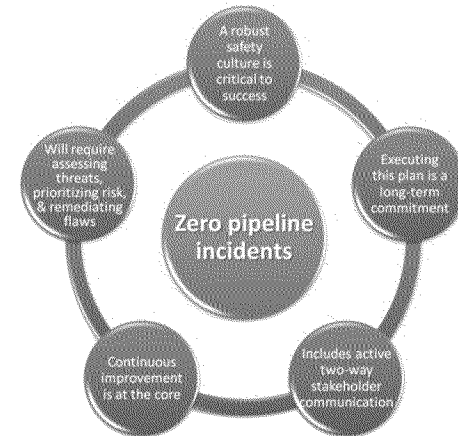
We are committed to safety culture and a safety management system as a critical dimension to continuously improve our safety performance.

We will be relentless in our pursuit of improving by learning from the past and anticipating the future.

We are committed to applying risk management principles on a system-wide basis.

We will engage our stakeholders - from the local community to the national level - so they understand and can participate in reducing risk.

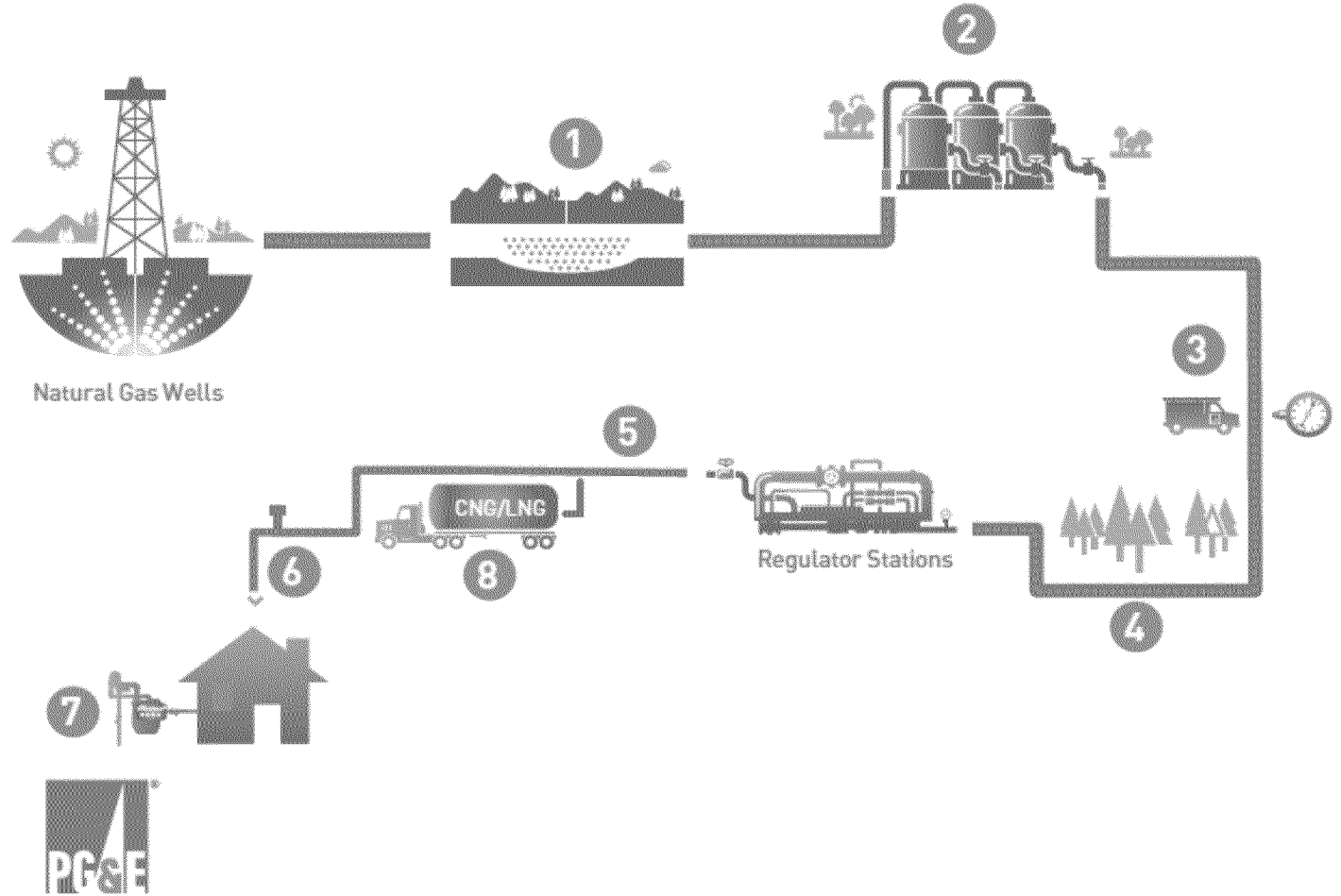
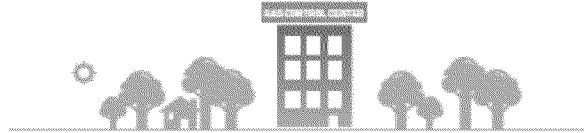
...safest, most reliable gas company in the United States





We will be the safest, most reliable gas company in the United States

# Natural Gas System Overview Asset Families



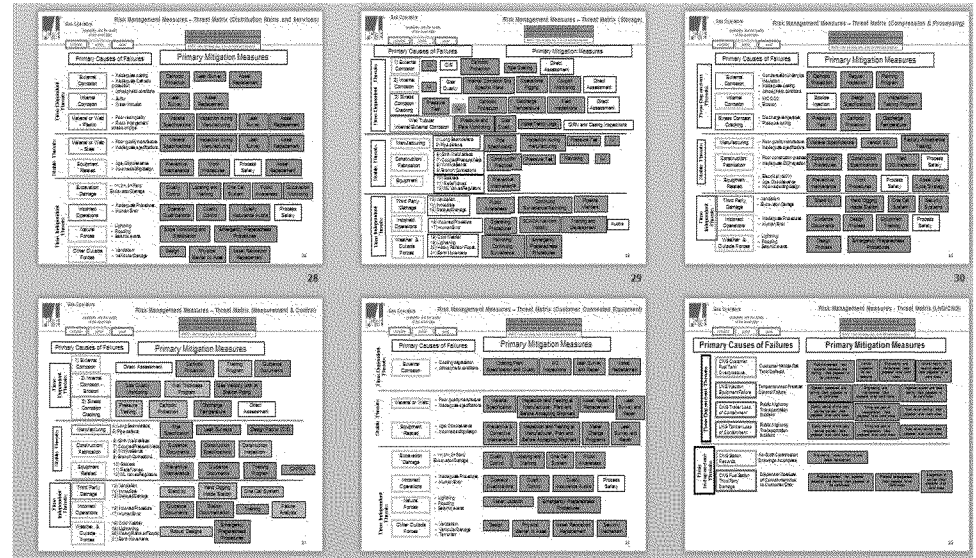
## Asset Families

- 1 Gas Storage
- 2 Compression & Processing
- 3 Measurement & Control
- 4 Transmission Pipe
- 5 Distribution Mains
- 6 Distribution Services
- 7 Customer-connected Equipment
- 8 Compressed Natural Gas/  
Liquefied Natural Gas

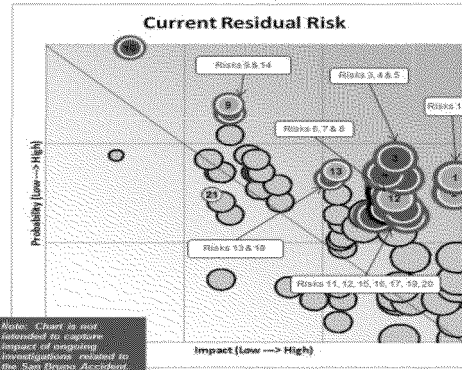


# Understanding our Risks

- By asset family, we have an enhanced understanding of what risks we have to manage
- Using an impact and likelihood score we can rank these risks
- and use them to highlight and prioritize mitigation actions



## Gas Operations Heat Map



Note: Chart is not intended to capture impact of ongoing investigations related to the San Bruno Accident.

- Analysis in progress, risk status unknown, funding needs unknown
- Current controls not sufficient, funding not sufficient
- Current controls not sufficient, funding is sufficient
- Current controls not sufficient, new controls are being implemented, additional funding needed
- Current controls not sufficient, new controls being implemented, no additional funds needed
- Current controls and funding are sufficient
- Non-Session D level risks

Risk #	Risk - In order of highest score
1	Transmission - Stable - Construction
2	Transmission - Stable - Manufacturing
3	Distribution - Time Dependent - Internal Corrosion
4	Distribution - Time Independent - Excavation Damage - Third Party - Rupture leading to potential impact on safety
5	Distribution - Time Independent - Excavation Damage - Cross Box
6	Distribution - Stable - Manufacturing
7	LNG/CNG - Time Independent - Equipment Failure - CNG Fueling Station
8	Customer Connected Equipment - All - Inside meter sets
9	Transmission - Time Dependent - External Corrosion
10	Distribution - Time Independent - Third Party Excavation Damage - No rupture
11	Distribution - Time Independent - Incorrect Operations
12	Measurement & Control - Time Independent - Large High Pressure Excursion
13	Storage - Time Dependent - Internal Corrosion - Erosion
14	Transmission - Time Independent - Mechanical Damage
15	Storage - Stable - Construction
16	Storage - Time Independent - Weather & Outside Forces - Flooding
17	Customer Connected Equipment - Stable - Manufacturing - Meter sets
18	LNG/CNG - Time Independent - Third Party Damage
19	Customer Connected Equipment - Stable - Manufacturing - regulators
20	Compression & Processing - Time Independent - Incorrect Operations
21	Risk of Non-Compliance

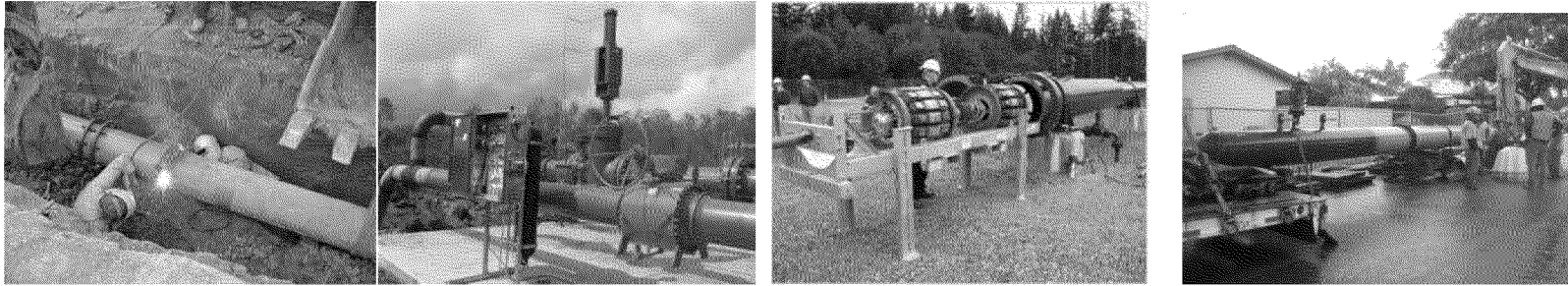
Threat Classification: Time Dependent = Likelihood of the threat increases with time; Stable = Stable unless activated by a change in service conditions; Time Independent = Random, independent of time.

### Size of Bubble = Safety Impact

- Low: as instantly correctable; b) Operations and practices could result in minor injury to employees or public.
- Medium: a) Correctable health and safety impact; b) Operations and practices which are reasonably possible to result in recordable injuries to employees or public.
- High: a) Non-reversible health and safety impact; imminent threat to life; b) Operations and practices that are probable to result in serious injuries to employees or public.



# Pipeline & Public Safety Work



## Pipe Replacement

Replace  
185 miles  
of pipeline

## Valve Automation

Replace  
and  
automate  
over 228  
Valves

## ILI Retrofit

Retrofit  
over 234  
miles

## Strength Testing

Strength  
test with  
water, over  
786 miles  
of pipeline.

- Committed to performing all the work that Lowers Risk Profile
- Minimize impact to customers
- Drive efficiencies / Lower Costs



# LNG & CNG Fleet & Capabilities

- LNG: Liquefied Natural Gas (-260 degrees; 600 times more volume)
- CNG: Compressed Natural Gas (3000 psi; 1% the volume)
- Replace pipelines without interrupting service;
- Test Longer pipeline sections; 42 Hydrotests in 2012
- Eliminate stopple & bypass configurations; \$4MM for 1.5 miles

Napa County :  
 6,000 Customers; (14) Days;  
 250,000 Gallons; 20 Million  
 Cubic Feet



Lowering Costs to enable Affordability & Minimize Customer Impact

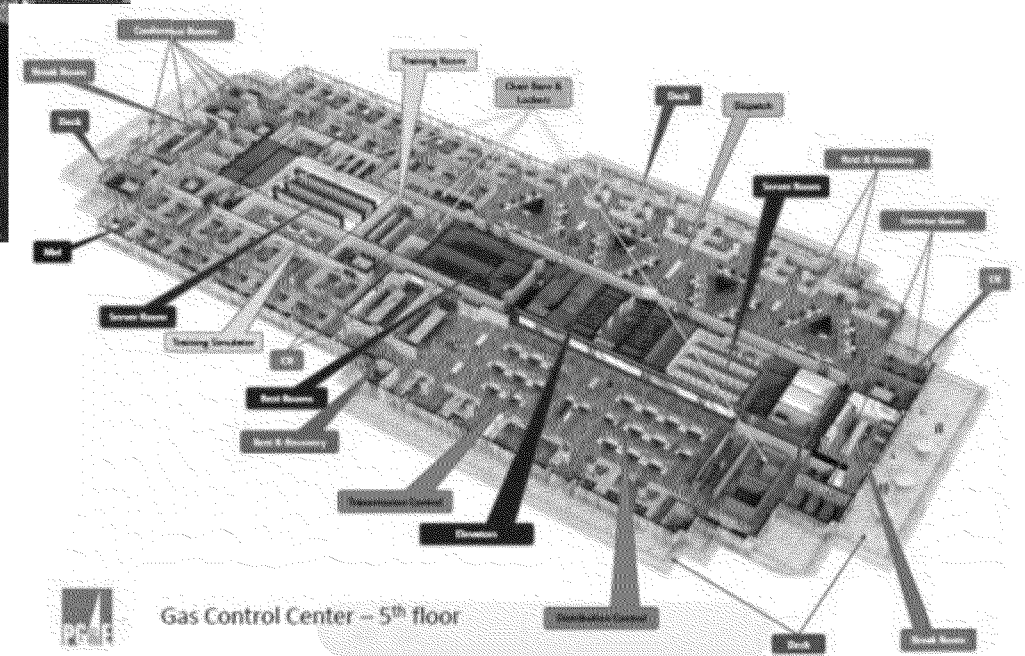


# Gas Visibility and Control



Accurate and reliable  
operating information  
Remote visibility and asset  
control

Front-line for emergency  
response  
Process control for  
operational activities  
Eliminate unplanned  
outages due to humanerror







# Leak Detection...Game Changer



Picarro car-mounted leak detection device

1,000 times more sensitive than traditional gas leak detection

PG&E first utility in the world to use this technology

Now mounted on six vehicles in Northern and Central California

Special Purpose Vehicle to Risk Management Tool



# Strength Testing at Facilities

Risk	Description
Inability to remove from service	<ul style="list-style-type: none"> <li>• Will result in station rebuild due of strength testing</li> <li>• Could result in significant system outages</li> </ul>
Work execution	<ul style="list-style-type: none"> <li>• Performing strength testing on GT stations presents inherent risk due to unique design and resulting clearance complexity</li> <li>• Strength testing will require the use of isolation valves as opposed to taking the station out of service as necessary when strength testing the suction side at Topock Compressor Station               <ul style="list-style-type: none"> <li>– Pipeline strength testing cannot be performed by taking the asset out of service</li> </ul> </li> </ul>
Limited industry experience	<ul style="list-style-type: none"> <li>• No precedence of post-construction strength testing to mitigate safety/risk or accomplish compliance for stations in the industry</li> <li>• G2 industry benchmarking study will validate</li> </ul>

Alternative methods to meet PHMSA's Traceable, Verifiable, and Complete advisory for MAOP validation presents lower risk than strength testing



# Class Location: Enhanced Data Quality

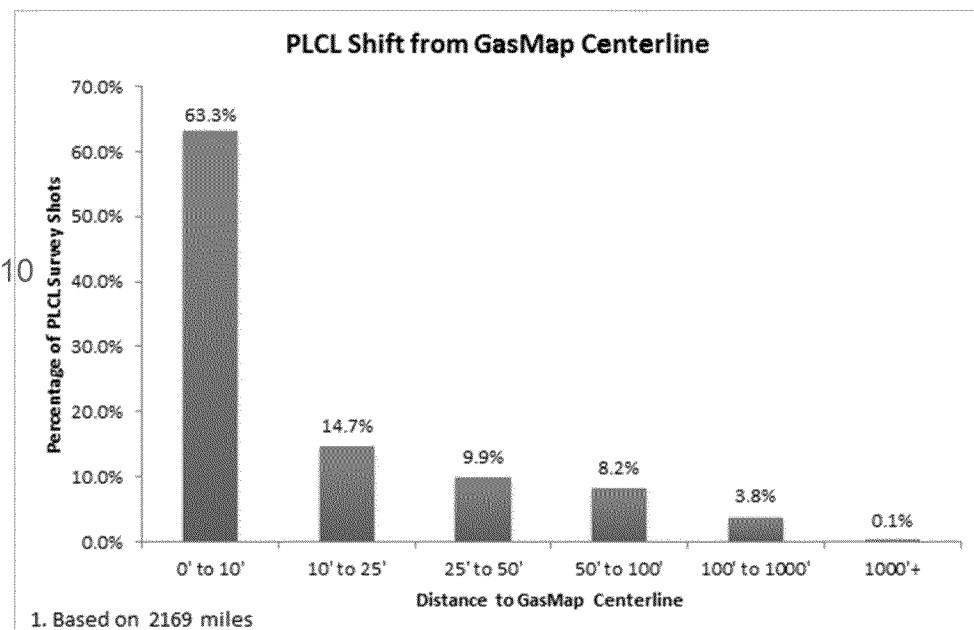
PG&E's efforts to enhance data quality:

- Performing Pipeline Centerline Survey consisting of field locating all transmission pipelines (6,750 miles<sup>1</sup>) to obtain survey grade pipeline centerline data and uploading the corresponding geospatial coordinates to GIS by end of 2013.
- Leveraging the most modern commercially available technology for geo-spatial positioning and classification of structures in 2013.

## Comparison of Existing GIS (GasMap) Accuracy to Pipeline Centerline Survey Data:

### Key Findings:

- Generally smaller discrepancies: Majority of centerline survey data is within 10 ft. of current GIS.
- Large discrepancies represent outliers: 3.9% of all miles surveyed show differences larger than 100 ft.



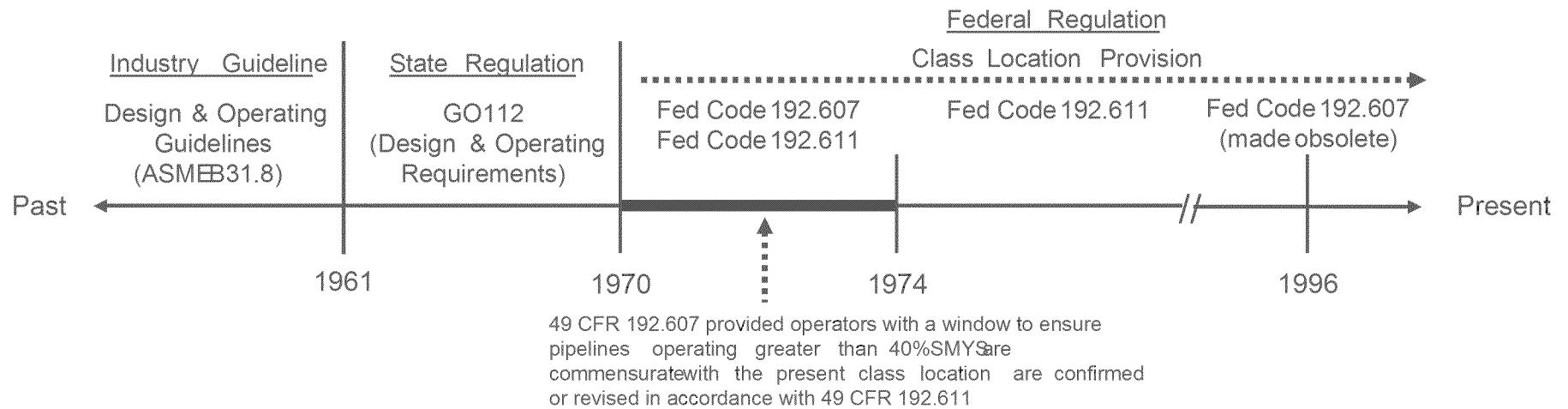
- Compliance Plan for potential Class Changes as a result of enhanced data quality
- Implementation under 192.611

<sup>1</sup>Based on an operating pressure of greater than 60 psig



# Class Location: “One Class-Out” Provision

Timeline of Regulatory Requirements:



## Current Discussion:

- 192.611 Provision: Pipelines can be operated ‘one class out,’ if:
  - Class location changes after the implementation of the federal regulations (1970).
  - Class location confirmed to be non-commensurate as a result of the 192.607 analysis during 1970– 1974 and a Subpart J strength test performed in accordance with the provisions of 192.611 during that time-frame.
- Current Situation: As a result of refined asset knowledge of PG&E’s pipelines, we are in the process of validating if the requirements of 192.607 were met by PG&E. Our current understanding of section 192.607 of the federal code is:
  - Pipelines with strength tests beyond 1974 are limited to a lower maximum allowable operating stress level based on the respective class location as compared to similar pipelines with strength tests performed between 1970– 1974 where the class location has not changed.

Class Location	Maximum Allowable Operating Stress Level (% SMYS)	
	Strength Test per 192.611 (1970 – 1974)	Strength Test per 192.611 (1974 and beyond)
2	72%	60%
3	60%	50%
4	50%	40%

What should be the appropriate consideration by operators regarding 192.607 given the recent increase of in-situ strength tests that typically include spike tests?