

2nd Workshop on  
Integrity Management for  
Natural Gas Pipeline

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Risk Assessment

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# Risk Assessment in the Proposed Rule: 192.763

- Identification of threats (f)(1)
- Prioritization of segments for the baseline and continual reassessments (f)(3)
- Determination of additional preventive and mitigative measures that may be needed (f)(3)
- Risk assessment conducted by following ASME/ANSI B31.8S, section 5 (f)(3)
- Part of the “exceptional performance” (c)(5)(i) enabling companies to deviate from:
  - Reassessment time frames
  - Limitations on the use of direct assessment
  - Remediation time frames

# What is Risk Assessment? ASME B31.8S

**“An understanding of the failure likelihood and the resulting consequences of that event”**

- ASME B31.8S, defines the following components:
  - The following categories of threats creating a likelihood of failure (Section 2.2):
    - Time dependent
    - Stable
    - Time independent
  - Potential consequences of an event (Section 3.3) including:
    - Population density and proximity
    - Property and environmental damage
    - Reliability impacts
    - Impact of secondary failures

# What is Risk Assessment?

## ASME B31.8S

- Primary risk assessment approaches
  - Subject matter experts
  - Relative assessments
- Risk assessment validation
  - Experience-based reviews should be used to validate the assessment
  - Annual reassessments are required unless new or significant changes in data regarding a specific threat triggers an earlier reassessment
  - On going continuous improvement process

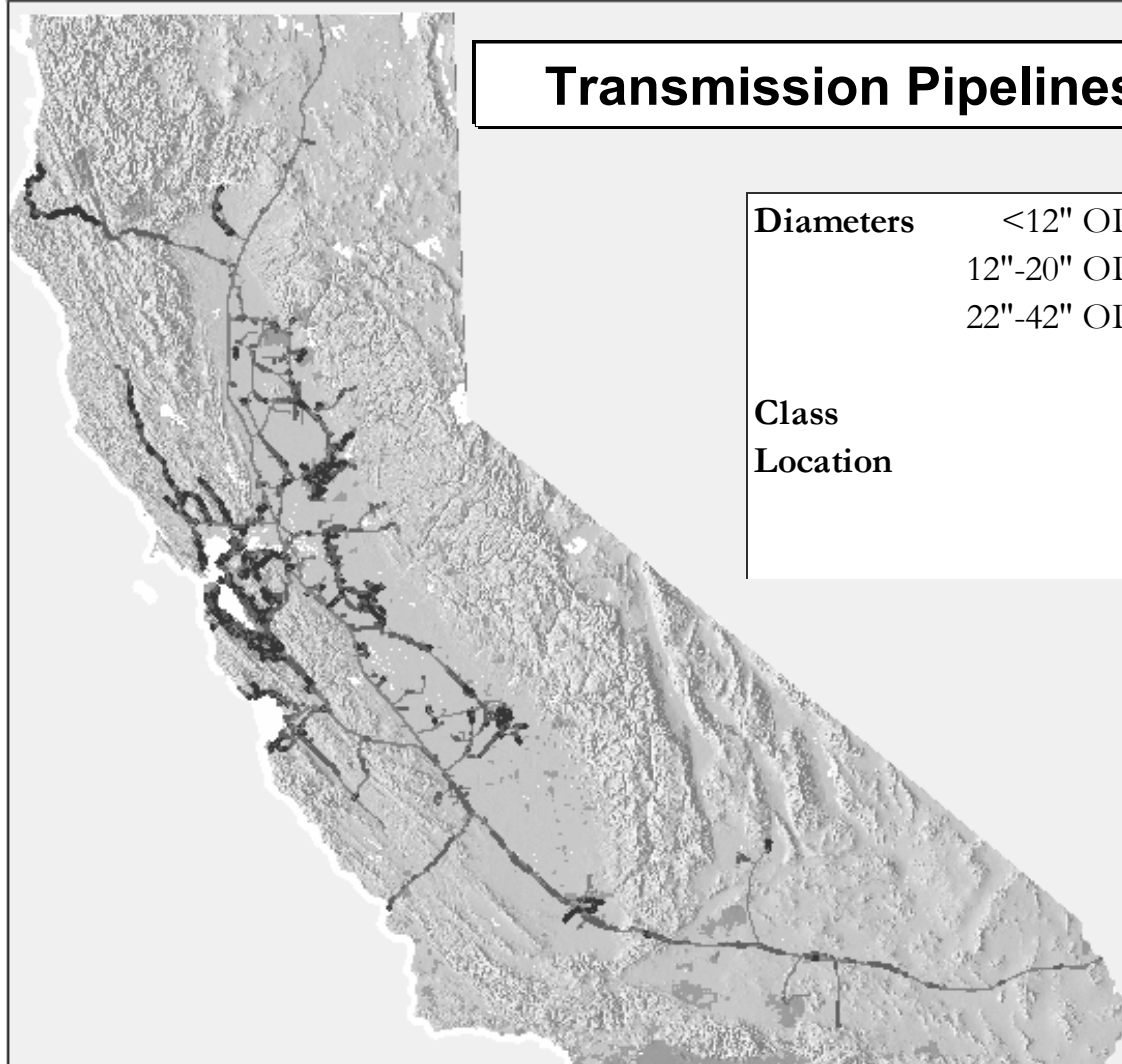
# El Paso Risk Assessment

- Risk prioritization screening
  - Logical segment: Determine in-line inspection schedule for long-term planning
  - HCA: Use to incorporate with and modify logical segment plan
  - Detail threat by threat assessment on individual segment when planning for integrity assessment
- Utilize relative risk model
- Utilize expert input to validate results
- Annual process and as needed

# El Paso Risk Assessment

- Data is key: Assessment only as good and complete as data
- Primary data collected from normal operations, maintenance, and construction records
- Risk algorithms and risk assessment process change with new data and validation of results
- Threat identification and risk assessment will be a combined process

# PG&E Gas Transmission System



**Transmission Pipelines: 5,280 miles**

<b>Diameters</b>	<12" OD	1483
	12"-20" OD	1371
	22"-42" OD	2426
<b>Class</b>	1	3430
<b>Location</b>	2	454
	3	1392
	4	4

# PG&E Risk Assessment

- Risk Management Program initiated in 1997 to promote and evaluate “voluntary” safety and reliability projects
- Utilize steering teams to review risk assessment algorithms annually
- Annual review with field personnel to validate results and incorporate field experience
- Automated pipeline risk notification report
- Report goals, achievements, and metrics to the CPUC annually
- Fully integrated with our GIS



# PG&E Risk Assessment Algorithm

## Risk = Likelihood x Consequences

$$\text{Risk} = (0.25L_{ec} + 0.45L_{3d} + 0.20L_{gm} + 0.10L_{wm}) \times (0.5C_{pop} + 0.1C_{env} + 0.4C_{rel})$$

Where  $L_{ec}$  = Likelihood of failure due to external corrosion

$L_{3d}$  = Likelihood of failure due to third party damage

$L_{gm}$  = Likelihood of failure due to ground movement

$L_{wm}$  = Likelihood of failure due to welds & materials

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$C_{pop}$  = Consequence to population

$C_{env}$  = Consequence to the environment

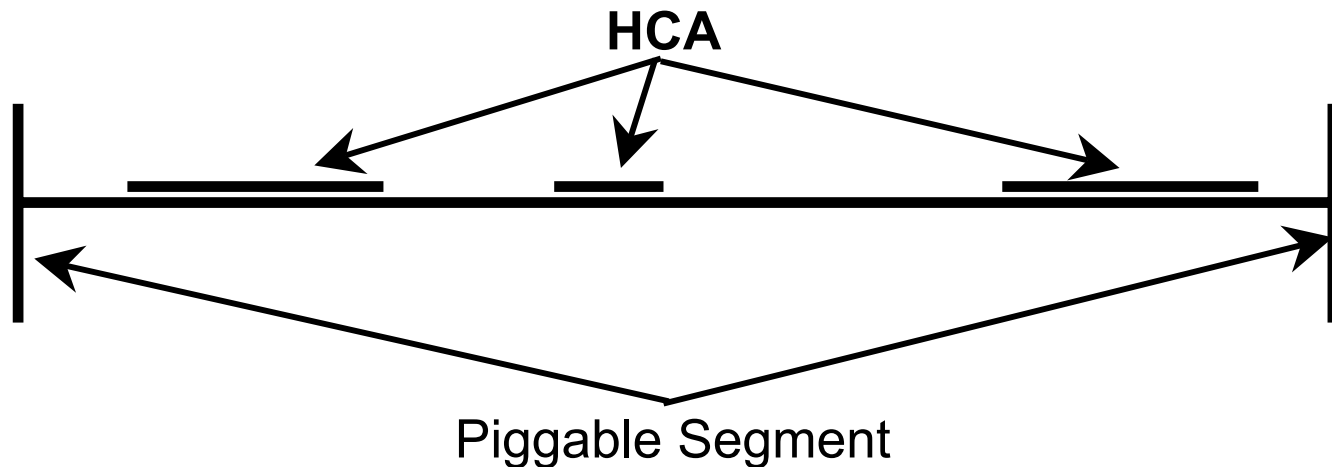
$C_{rel}$  = Consequence to reliability

**Risk Management Program algorithms built by subject matter experts and industry/company failure history**

Note: Other threat algorithms will be assessed using B31.8S

# Risk Assessment Questions and Issues

- Logical Segments and HCAs: Risk assessment on individual HCAs interacting with assessment of larger segments (e.g. piggable segment)



# Risk Assessment Questions and Issues

(8) Third-party damage will be addressed in common with Common Ground Alliance

Would like OPS' support to:

- Reduce or eliminate exemptions to one-call laws
- Require all stakeholders to submit third-party facility damage data
- For the purposes of data gathering and reporting, will the OPS define "near miss" as it relates to third-party damage?

# Risk Assessment Questions and Issues

(12) NPRM requires pressure test for pipelines with threat of Manufacturing and Construction Defects

- INGAA is funding additional data review to further substantiate B31.8S' exclusion of the threat unless a historical operating pressure increase or other factors increasing stress impacts the pipeline
- Could data review by an operator be used to “demonstrate why pressure testing is not necessary..”?