

Plan for addressing noncompliant girth weld inspection system wide

CPUC Citation 13-003, Item 3

Presented to SED
06/06/14





Objective

Address CPUC Citation 13-003, Item 3:

- **“Expand the existing corrective action plan to systematically address the full extent of noncompliance of nondestructive testing. The corrective action plan must be based on risk management principles, addressing the highest safety risk areas first.”**



Accomplishments

- **By end of 2013, leak surveyed 600 miles (monthly surveys on all 600 miles through March 2014)**
- **As of 3/11/2014, excavated and re-inspected 43 TCI inspected welds. All 43 welds met API 1104 inspection criteria**
- **Revised NDE Inspection Program for NDE Contractors (effective 4/1/2014 and submitted to CPUC on 4/11/14)**
- **Applied LLNL “Comprehensive Analysis” recommended alternative (3/13/2014) for statistical basis for the number of field inspections necessary to have an adequate statistical sampling to determine extent of TCI weld inspection quality condition.**
- **Determined that this is a weld inspection quality issue and there has been no indication that this is a weld safety issue.**



Lessons Learned

- **LLNL concluded that random or selective digging cannot verify compliance of past inspections.**
- **Though it isn't possible to conclusively address compliance of past inspections, PG&E can still evaluate safety through certain short term and routine practices, and reduce risk from potentially non-compliant post-1961 girth welds.**
- **Welds that were inspected, even if not in a fully compliant manner, do not pose a higher risk than uninspected welds.**



Proposed integrity action plan (IAP)

Integrity Action Plan

➤ “Expand the existing corrective action plan to **systematically** address the full extent of noncompliance of nondestructive testing. The corrective action plan **must be based on risk management principles**, addressing the highest safety risk areas first.”

➤ LLNL concluded that random field inspections cannot verify NDE compliance nor improve pipeline safety.

➤ Focused on long-term risk reduction through prioritized integrity management practices.



IAP Uses Risk Management Principles

- **IAP target for special consideration post-1961 construction having all of the following factors:**
 - Potential for non-compliant radiographic weld inspection exists
 - Potential for external conditions that could cause welds to fail exists
 - The hazard to the public is greatest.



IAP - Risk Factors Used

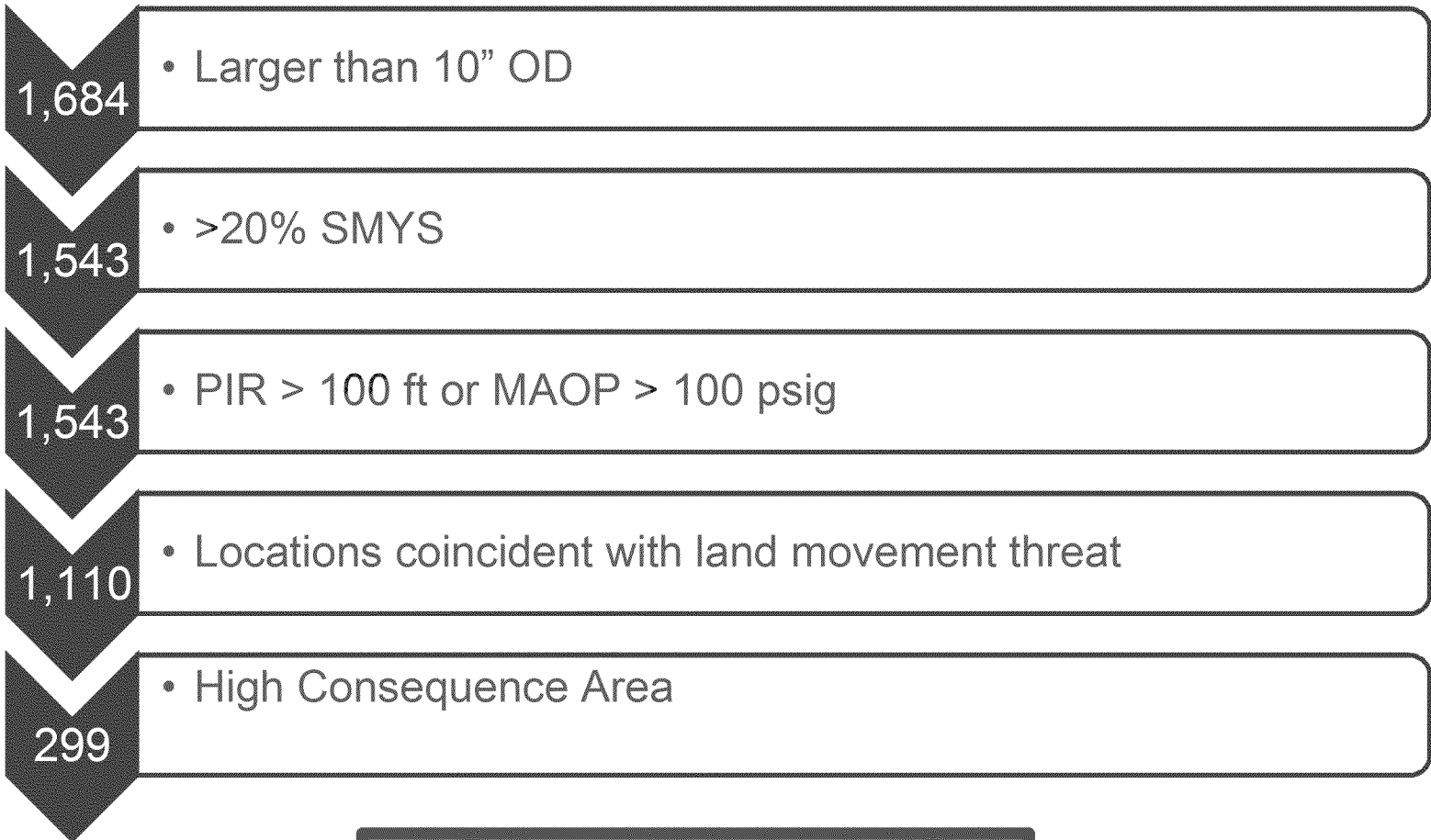
<u>Target attribute</u>	<u>Why?</u>
Larger than 10" OD	Smaller diameter pipe and girth welds are more forgiving of bending strains.
Greater than 20% SMYS	Less stringent regulations concerning welder qualification and welding inspection apply below this threshold.
PIR > 100 ft or MAOP > 100 psig	Larger pipe or higher pressures increase the potential hazard associated with a weld break.
Locations coincident with land movement threat	In service girth welds typically require a large external load or movement to fail under normal operating pressures.
High Consequence Area	More people present increases risk.

- All 5 factors must be present to qualify for special consideration



Miles in IAP Using Risk Factors

2,736 miles of post-1961 construction



299 miles in IAP



Applying Risk Factors to History

- **PG&E has conducted extensive leak surveys.**
 - No leak has ever been reported from a post-1961 girth weld.

- **PG&E has conducted ILI of 1,437 transmission miles since 2001.**
 - 12 of 49 girth weld anomalies in “Risk Factor” locations
 - Represents 0.01% of post-1961 welds inspected.



IAP – Systematic ILI Assessment of Girth Welds

- **Systematic integrity verification of target girth welds going forward will rely on:**
 - MFL ILI where feasible
 - provides the best option for locating girth welds that require remediation based on risk and condition
 - “Opportunistic” digs where ILI is not feasible
 - takes advantage of DA, hydrotests, other maintenance work that exposes welds in target systems
 - not based on indicated condition, so these will confirm by NDE whether welding was performed correctly



Next steps

- **Development of Specific technical processes, including:**
 - Decision process for selecting assessment method,
 - Criteria for field investigation based on ILI,
 - Repair criteria,
 - Plan performance measures,
 - Process for reporting to CPUC



Closure of CPUC Citation 13-003

➤ Recall SED's directive to PG&E:

- “Expand the existing corrective action plan to systematically address the full extent of noncompliance of nondestructive testing. The corrective action plan must be based on risk management principles, addressing the highest safety risk areas first.”

➤ PG&E's IAP will accomplish this through

- Understanding and acting on LLNL's work
- Prioritizing welds for special consideration by risk
- Applying historical condition assessment (past ILI)
- Planning for systematic future condition assessment