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Gas Company



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WORKING GROUP #3

ITEM 2: DIFFICULT TO INSPECT PIPELINES

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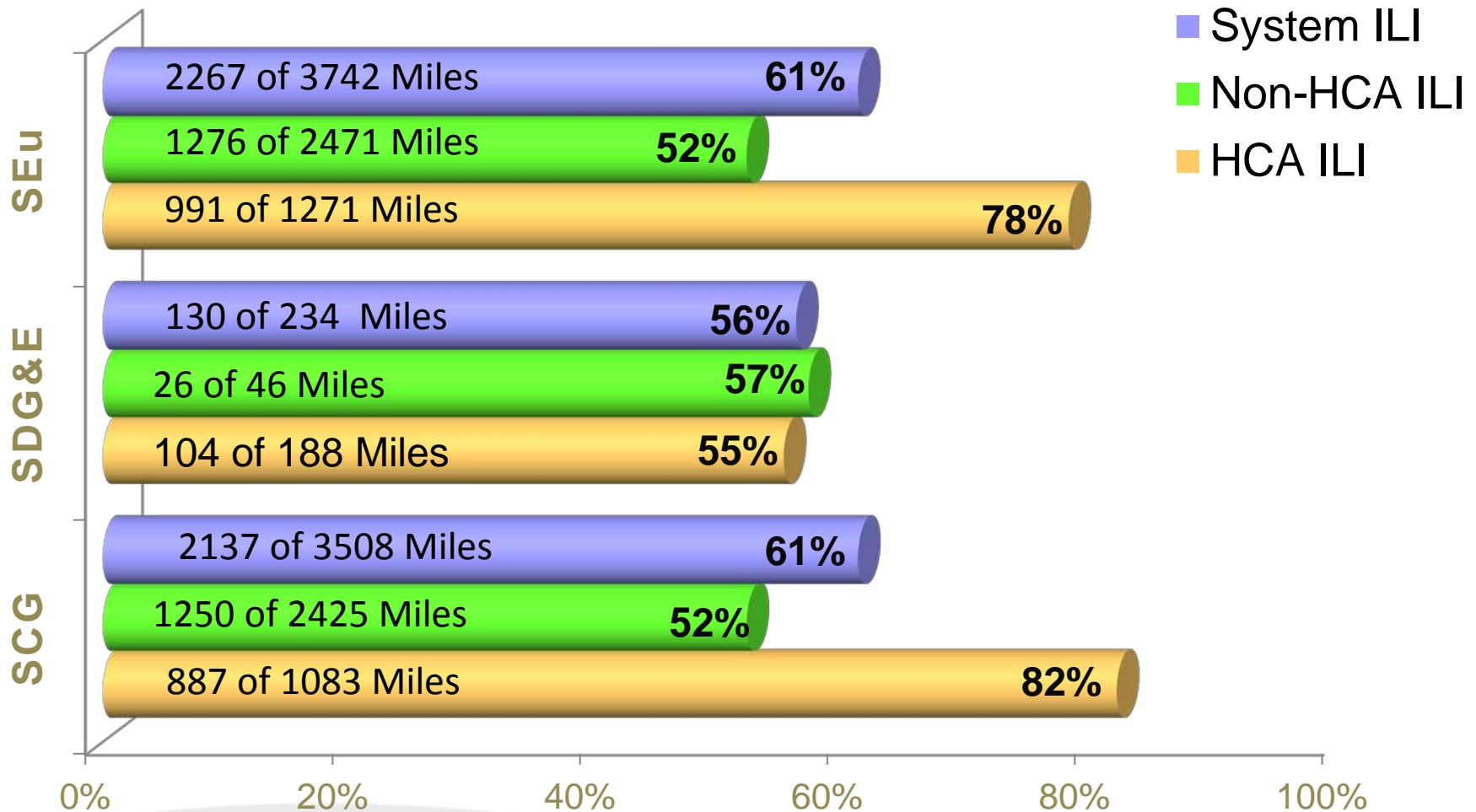
Session Presenter – Item 2

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Transmission System Summary | ILI & High Consequence Areas



What pipe is “difficult-to-inspect”?

For the purpose of discussion during this forum:

- » Pipe that cannot be inspected using commercially available in-line inspection tools that use pressure differential for propulsion
- » Typically includes one or more of the following:
 - Smaller and/or Multi Diameter
 - Low Flow
 - Short length

Significant development and experience over past 5 years

Our understanding of the challenges for difficult to inspect pipelines continues to develop:

1. Inspection reliability
2. Inspection range
3. Propulsion
4. Ingress/egress
5. Threats addressed

Industry has seen rapid growth in available technologies:

- » Tethered tools,
- » Self propelled robotic smart pigs / sensors
- » Screening/ remote methods: GWUT, camera/video

Implementation Experience

Like other operators, SoCalGas and SDG&E have successfully applied various technologies to provide valuable information about “difficult-to-inspect” pipe:

- » Robotic ILI – Seven projects; 2.98 miles
- » GWUT
- » Tethered ILI

Work is also underway to expand and grow the application of these technologies, e.g. – opportunistic retrofitting of pipelines to allow future robotic ILI access points.

LOOKING AHEAD - MACRO FACTORS FOCUS ON PREVENTION

- » Change to HCA Definition (Method 2)
- » Pipe Failure Consequence (PIR)(DIMP)
- » Pipeline Threats
- » Inspection Technologies
- » Vehicle Technology
- » Time to implementation (phases)
- » Perform with pipe in-service or out-of-service

Development Theme 1: Expanding Vehicle Capabilities

- » Broader range of diameters and configurations
 - Telescoping diameters
 - Thick wall piping systems
- » Longer inspection distances
 - Improved power systems - range factor
 - Lighter weight tools
- » Pipe cleaning and debris

Development Theme 2: Expanding Inspection Capabilities

- » Expanding the threats that can be detected
 - Most existing capabilities are wall loss related – i.e. MFL
 - Crack detection, denting, and mechanical damage are all areas for development and improved sensing
- » Challenging features
 - Long seams
 - Pipe bends
 - Wrinkle bends
 - Construction Error/ non-conforming pipe
- » Expansion into coating condition and cathodic protection measurement?

Development Theme 3: Non-In-Line Technologies

Screening of pipelines for wall loss from above ground or from a distance could help address challenging segments

- » Past efforts to develop methods have had marginal success
- » Reliable above ground wall loss detection prior to excavation remains a large gap
- » Remote screening from a single access point is an area of focus for improvement

Emerging Challenge: Technologies to Verify Pipe Material

- » Modification of inspection techniques to measure non-traditional features (fingerprints/tell-tales) to provide:
 - Affirmative identification of legacy pipe
 - Demonstration of conformance to specification/standard
- » Consideration includes re-examination of existing technology to provide supplemental data
 - Adaptation of available techniques
 - Non-traditional data sets – low field magnetization
- » Development of programs, standards, specifications to manage the application of these emerging methods