elpaso Pipeline Group

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Identifying/Managing the Manufacturing Threat

PHMSA Workshop

Chris Whitney
El Paso Pipeline Group

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D E P E N D A B L E N A T U R A L G A S

Our Purpose: What We do

El Paso provides natural gas and related energy products in a safe, efficient, and dependable manner

Our Operational Excellence Vision & Values

the place to work

Employees
Safety

the neighbor to have

Compliance
Facility Integrity

the company to own

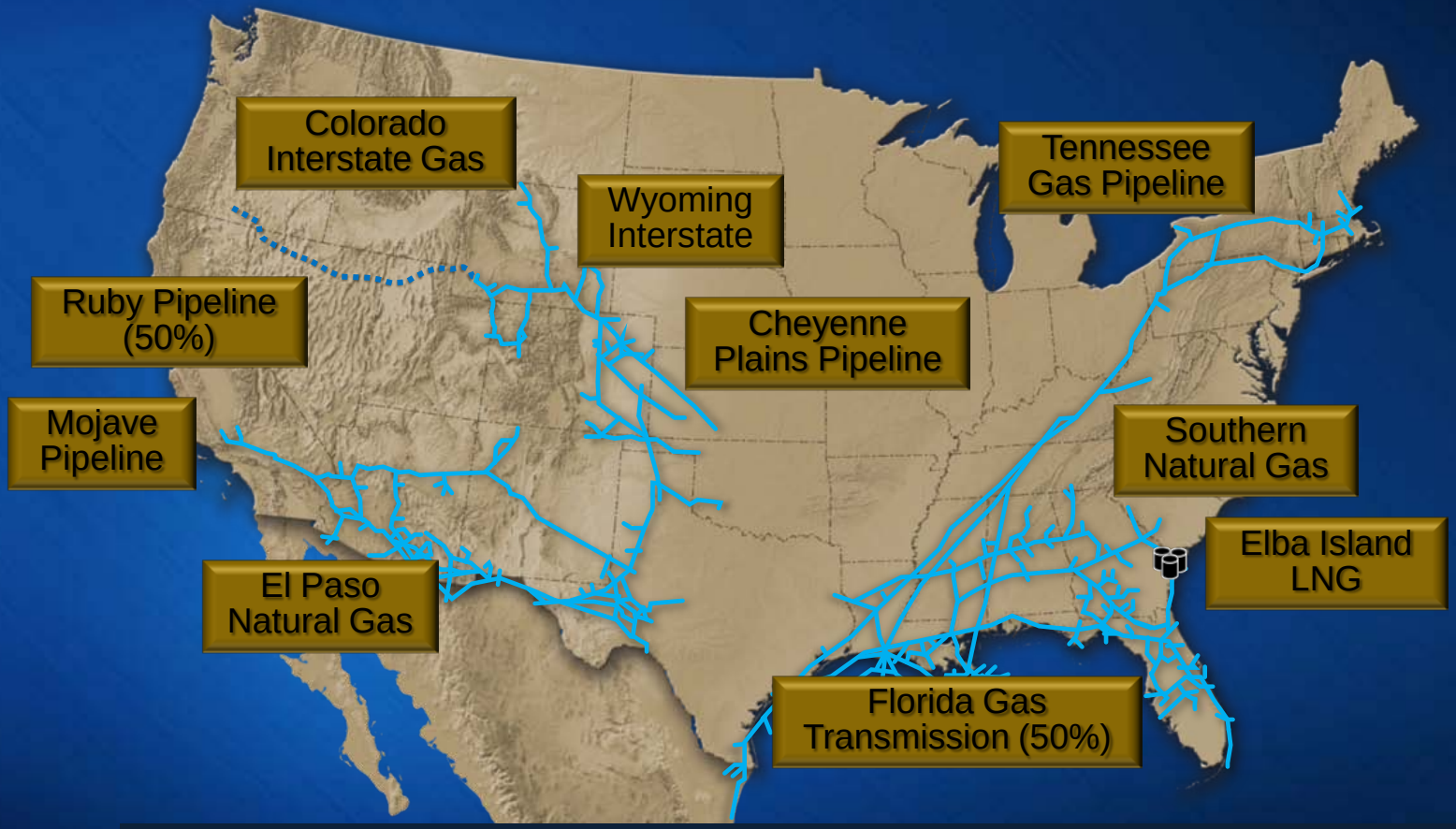
Reliability
Profitability
Customer Service

Identifying/Managing the Manufacturing Threat

Agenda

- El Paso System
- IMP Methodology
- Assessment experience
- Current Activity – Case Study
- Next Steps

Our Pipeline Systems



- 19% of total U.S. interstate pipeline mileage
- 26 Bcf/d capacity (15% of total U.S.)
- 19 Bcf/d throughput (30% of gas delivered to U.S. consumers)

EP's Pipeline Infrastructure

- **Pipeline Infrastructure**
  - **37,454 miles**
    - ***31,117 mi under ILI Program on track to be inspected by 2012***
  - **32,499 miles capable of being inspected by ILI**

- **Vintage Analysis**
  - Pre- 40's 758 mi
  - 40's 4,418 mi
  - 50's 13,914 mi
  - 60's 5,847 mi
  - 70's 3,104 mi
  - 80's 2,588 mi
  - 90's 3,016 mi
  - 2000 3,809 mi
- **Diameter Analysis**
  - 4" or less 945 mi
  - > 4 thru 10" 4,218 mi
  - >10" thru 20" 9,582 mi
  - >20 thru 28" 10,045 mi
  - > 28" 12,664 mi

El Paso Pipeline Group HCAs

Total for EPPG – 978.5 miles of pipe / 1,555 HCAs (5/16/11)

	CIG	EPNG	SNG	TGP
# of HCAs	100	326	396	733
HCA Mileage	74.45	230.15	219.96	453.93

IMP Methodology – Manufacturing Threat

- Pipe Manufacturer & Seam Type
  - Incident history – Company and Industry
  - Increased risk factor based on data
- History of Incidents in/near HCA
  - Previous Pressure Test?
  - Land stability?
- Pre-1970 ERW, Flash weld (Pipe w/history)
  - Previous Pressure Test?
  - Land Stability?

IMP Methodology – Manufacturing Threat

- Integrity Assessments
  - Pressure Tests (2004-2010)
    - 64 tests - 115 HCAs
    - 264 miles (65 HCA miles)
  - Other Technology – Direct Inspection
    - Used 5 times – one repair
  - Limited ILI – Circumferential MFL
    - 1 pipeline segment

Current Manufacturing Processes

- Steel Quality Control
  - Approved Manufacturing procedure and QC plan
- Pipe Mill Quality control
  - 100% UT Seam Inspection
  - Mill Test – 100% SMYS 5 sec or 10 sec
  - Mechanical Testing
    - Transverse and longitudinal tensile tests
    - Pipe body and weld metal Charpy impact
    - Drop weight tear and weld microhardness

Current Activity – Case Study

- 20” Pipeline Incident
  - 1947 ERW Pipe – axial crack in HAZ
  - Crack Growth – hydrogen stress crack
  - Previously Hydrotested to 101% in 1968
- Hydrotests
  - 2 segments – 2 failures > 105% SMYS
- Evaluating ILI technology for use
  - 4 segments – 250 miles

Next Steps

- Follow ILI technology development in this area
  - Leverage existing infrastructure
  - Utilize Circ . MFL for repeat inspections where appropriate
- Continue to monitor for changing conditions
  - Quarterly review of Operating reports and activities