



System Overview & Regulations

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System Facts

- 200 miles of transmission pipe and 13,025 miles of distribution pipe
- 34 Gate Stations
- 12 Pressure Monitoring Stations
- 2 Propane-Air Peakshaving Plants
- 3 Gas Conditioning Facilities
- 480 District Regulator Stations
- 1,038 Non-District Regulator Stations

Sizes and Type of Pipe



Typical pipe sizes range from 0.5" for services to 30" for transmission system

Common types of pipe:

- Medium density plastic
- High density plastic
- Coated steel
- Cast Iron

Operating Pressures

- System Operating Pressures:
 - Transmission system 100 psig to 750 psig
 - Distribution systems:
 - 7.8 inches w.c. (design minimum 5.0 inch w.c.)
 - 20 psig (design minimum 7 psig)
 - 30 psig (design minimum 12 psig)
 - 55 psig (design minimum 17 psig)

Natural Gas Industry Regulations

- Department of Transportation, Part 191 and 192
 - Part 191
 - Annual Reports, Incident Reports and Safety-Related Condition Reports
 - Part 192
 - Transportation of Natural Gas and Other Gas by Pipeline
 - Minimum Federal Safety Standards
 - DOT 191 & 192 is used in conjunction with “Guide for Transmission and Distribution Piping Systems” as well as various other standards, such as ASTM, ASME, ANSI, API, etc.

Natural Gas Industry Regulations



- Department of Transportation, Part 191
 - Annual Reports
 - Incident Reports
 - Safety-Related Condition Reports
 - Drug & Alcohol Programs

Natural Gas Industry Regulations



- Department of Transportation, Part 192
 - Design: Materials, Pipe Design, Design of Pipeline Components, Welding of Steel in Pipelines, Joining of Materials Other than by Welding
 - Construction: General Construction Requirements for Transmission Lines and Mains, Test Requirements
 - Operation & Maintenance: Requirements for Corrosion Control, Qualification of Pipeline Personnel (OQ), Gas Transmission Pipeline Integrity Management, Gas Distribution Pipeline Management

TIMP – Transmission Integrity Management



- Program began 2003 – 2004
- Covers DOT Transmission Pipe ($\geq 20\%$ SMYS)
 - 200 miles of Transmission
- Determine Potential Impact Radius (PIR); then Potential Impact Circle (PIC)
- Find High Consequence Areas (HCA)
 - Approx. 50% in HCA's
- Determine method of Baseline Assessment
 - Internal Inspection by Smart Pigging; hydrostatic testing ; direct assessment, such as ECDA & ICDA
- Perform and report inspections
- Complete first cycle by December 12, 2012

TIMP – Baseline Assessment Methods



- Hydrostatic Test
- In Line Inspection
- Direct Assessment (ECDA / ICDA)



TIMP - ECDA - Indirect Assessment

- Typical Tools We Have Used
 - Close Interval Potential Survey (CIS)
 - Direct Current Voltage Gradient Surveys (DCVG)
 - Pipeline Current Mapper Survey (PCM)



TIMP - ECDA - Direct Assessment



■ Excavations and Data Collection

- SCC, MIC
- Soil and water sampling
- pH, potential, resistivity

■ Measurements of Coating Damage

- Coating type, condition, adhesion
- Identify corrosion products, defects

■ Measurement of Any Pipe Damage

- Wall thickness / Ultrasonic measurements
- Pitting depth, configuration, corroded area
- Cracking (magnetic particle, dye penetrant)



A minimum of 3 digs for per Region plus one
(1) additional control dig

TIMP Impact

- Consolidation of Pipeline Documentation and Recordkeeping
- Direct assessment/ECDA has identified external damages, corrosion and coating anomalies.
- TIMP has improved safety and public awareness.
- Enhanced existing cathodic protection levels.
- Pre-survey has made ECDA more effective in locating anomalies with higher risk.



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