Safety Considerations for Natural Gas Pipeline Construction, Operation, and Maintenance

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Garfield County Energy Advisory Board Meeting
March 2nd, 2017
Pipelines in Garfield County
Summit Midstream Pipelines in Garfield County
Who is Summit Midstream in Garfield County?
Holmes Mesa Compressor Station
Valve Yard and Pigging Stations
Pipeline 101- Why do we need pipelines?
Pipeline 101 – How Does the Pipeline Network Work?
Pipeline Regulation

- Department of Homeland Security
- Office of Pipeline Safety
- Pipeline and Hazardous Materials Safety Administration (PHMSA)
- Federal Energy Regulatory Commission (FERC)
- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- Bureau of Land Management (BLM)
- US Forest Service
- Colorado Oil and Gas Conservation Commission (COGCC)
- Colorado Department of Public Health and Environment (CDPHE)
- Colorado Public Utility Commission (CPUC)
- Colorado Department of Transportation (CDOT)
- County Requirements
- Town or City Requirements
Pipeline Process Summary

- Identify need for pipeline
  - Route Selection & Site Review
  - Land, Permitting & Surveying
  - Environmental Survey & Impact Studies
- Design & Engineering
  - Material Selection
  - Inspection & Contractor Selection
  - Procedure Selection
- Risk Assessments & Safety Requirements
- Project Walk Through & Onsite Reviews
  - Notifications
- Construction Starts
  - Stormwater Controls, Traffic Controls, Land Owner Controls
  - Project Oversight & Compliance
- Pipeline Integrity (material handling, line locating, potholing, x-ray, as-built surveys, cathodic protection)
- Reclamation & Revegetation
Need for Pipeline

- Production or new development
- Integrity of existing pipelines
- Upsizing due to volume requirements
- Changes in the industry

- Route Selection & Site Review
- Land, Permitting & Surveying
- Environmental Survey & Impact Studies
TypicalRight of Way (ROW)

20’  5’  8’  4’  8’  18’  12’

TOP SOIL
SUB SOIL
24” BLUESTONE
12” 8HEP
6” SM
PIPE STAGING
TRENCH
TRENCH

LOWER IN 12” AND 8” FIRST, THEN USE THIS AREA FOR 24” PIPE SOIL
18” CONSTRUCTION LANE DISTURBED AREA VEGETATION REMOVED
12” PASSING LANE VEGETATION MAY BE CRUSHED NOT ALWAYS REMOVED

INSTALL STRAW WATTLE EROSION LOCS ON DOWNSLOPE SIDE OF RIGHT-OF-WAY (ON CROSS SLOPES <XXX%)
Design & Engineering

• Design Factors
  • Class & Location designation (rural, residential, commercial, road crossings, etc.)
  • Size, type, wall thickness, grade, coating, etc.
  • Specified Minimum Yield Strength (SMYS)
  • Crossings, waterways, highways, etc.
  • Maximum Allowable Operating Pressure (MAOP)
    • Design MAOP and Actual MAOP
  • Elevation & Elevation Change
  • Pressure Test Requirements

• Material
  • Fittings & valves – designed to meet or exceed MAOP of proposed pipeline
  • Pipe – API 5L, PSL2, ERW, Fusion Bond Epoxy (FBE), Abrasion Resistant Overcoating (ARO)
Material Requirements
High Quality Fusion Bond Coating
Pipe Inspection Prior to Use
Inspection and Contractor Selection
Always call before you dig.
Locating & Clearing
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Welding Procedures

- 49 CFR 192 – Transportation of Natural and Other Gas by Pipeline
- American Petroleum Institute (API)
  - API Standard 1104 – Pipeline
  - Twenty-First Edition, September 2013
- American Society of Mechanical Engineers (ASME)
  - ASME B31.3 – Process Piping
  - ASME B31.4 – Pipeline Transportation Systems for Liquids and Slurries
  - ASME B31.8 – Gas Transmission and Distribution Piping Systems
- Summit Welding Manual & Welding Procedures
- Welder Testing & Qualifications
- Non-destructive Testing (NDT)
  - Summit requires 100% x-ray on all pipeline welds
  - Industry Standard is 10%
Welding Process
Welding Process
Coat the pipe to prevent corrosion
How welds are taped and primed
Cathodic Protection Inspection
Ditch Care
Pipe padded with pad dirt - No rocks on pipe
Trench Breakers
Rocks....
Safety
Safety
ROW Reclamation and Revegetation
Cathodic Protection - Summit has 11 in Garco

The rectifier drives the corrosion current to "simulate" the anode corroding.
Corrosion Control
No Cathodic Protection....
How to test Cathodic Protection on a Pipeline

COPPER/COPPER
SULPHATE REFERENCE
ELECTRODE

VOLTMETER

TEST STATION
LINE MARKER

TEST CABLE

PIPELINE

1 M
How To Test Cathodic Protection on a Pipeline
Pigging
Pigging
Pigging
Pipeline Locator
Marks and flags
Pipeline Marker
Pipeline Patrol- Aerial and Visual
Protect MAOP- (Maximum Allowable Operating Pressure) – Relief Valves
Protect MAOP- Summit Operations Control Center