U. S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

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Pipeline and Hazardous Materials Safety Administration

Gas Transmission Pipeline Safety Seminar

Royal Sonesta Hotel

July 7, 2009

Joe Mataich

U.S. DOT/PHMSA Southern Region

Presentation Outline

- Casing Assessment
- Pipeline Coatings

U.S. Department of Transportation

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Casings and Assessments

PHMSA Workshop
July 15-16, 2008
Chicago

Casings and Assessments
Regulatory Requirements

- 192 Subpart O Requires Assessment in HCA's
  - §192.901 – Limited to Gas Transmission
  - §192.919(b) – Assessment Methods must align with threats
  - §192.921 – Requires one of four Assessment Methods
    - *PT, ILI, DA, Other Technology*
  - §192.925 – Refers to NACE RP0502-2002 for ECDA

How does NACE RP0502-2002 address Casings?

- Section 3: Pre-Assessment
  - Casings require separate ECDA region (Table 1)
  - May preclude use of some indirect inspection tools (Table 1)
  - Additional tools and other assessment activities may be required (Table 1)
  - Other methods may be needed for casings as per section 3.3.2

How does NACE RP0502-2002 address Casings?

- Table 2: ECDA Tool Selection Matrix
  - indirect inspection tools for casings require special engineering considerations (Footnote 3)
  - “3 = Not Applicable: Not applicable to this tool or not applicable to this tool without additional considerations”
  - NACE TG 041 proposing to change: “3 = Applicable with an engineering assessment ...”
- May 18, 2007 NACE issues letter clarifying intent of Footnote 3

How does NACE RP0502-2002 address Casings?

- Tools must be selected to reliably detect corrosion activity and/or coating holidays *(Section 3.4.1.1)*
- Strengths of one complement weaknesses of other *(Section 3.4.1.2)*
- Must obtain readings along the entire length of pipe *(Sections 1.2.2.2, 4.1.2 ,4.2.1.1 and 4.2.2)*
- Must align, compare, and classify indications from two tools *(Sections 4.1.2.2, 4.3.2)*

Casings and Assessments

PHMSA Letter of October 25, 2007 (to AGA)

- Recognized acceptable to classify casings as low risk pipe
- Acknowledged HCA mileage could be reported as completed without casings
- Recognized NACE clarification of ECDA application with properly supported engineering and implementation plans per §192.925(b)(1)(ii)

Casings and Assessments

PHMSA Letter of April, 2008 (to AGA)

- Agreed - nothing explicit in rule requiring use of Guided Wave as an indirect inspection tool for assessing casings
- Highlighted rule did not allow risk assessment in lieu of assessing pipe in an HCA
- Highlighted PHMSA efforts for developing guided wave technology
- Suggested workshop for all stakeholders

Casings and Assessments

- PHMSA held workshop July 2008
  - Presentations/Reports available at PHMSA website (Stakeholder Communications)
- PHMSA reached out to Industry and Industry Associations for specific proposals
- PHMSA met w/AGA to form Joint Technical Committee
  - Cased Pipeline Quality Action Team (CASQAT)
  - *NAPSR, Operators, Service Providers, PHMSA*

Casings and Assessments

- CASQAT met in February, March and April
  - Minutes posted on PHMSA Gas IMP site.
- PHMSA supplied the CASQAT task group with several Key Documents:
  - Suggested methodology to combine similar casings into regions using NACE RP 0502
  - Guidance on maximizing time between assessments of casings
  - Suggested methodology to remove threat of external corrosion from properly filled casings *(but still could have internal and SCC threats)*

Casings and Assessments

- Draft Guidance due June 1, 2009
- 2nd Workshop (Sept.?)

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Pipeline Coatings

Pipeline Coatings

- First Line of Defense against Corrosion
- Must be properly Applied
- Must be properly Inspected
- PHMSA has seen numerous coating problems on new construction projects

§ 192.461 External corrosion control: Protective coating

- (a) Each external protective coating, whether conductive or insulating, applied for the purpose of external corrosion control must—
- (1) Be applied on a properly prepared surface;
- Specify by Industry Standards (SSPC & NACE)

Surface Prep. Standards

- SSPC-SP 1 Solvent Cleaning
- SSPC-SP 2 Hand Tool Cleaning
- SSPC-SP 3 Power Tool Cleaning
- SSPC-SP 10/NACE No. 2 Near White Blast Cleaning
- SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning
- SSPC SP 11 Power Tool Cleaning to Bare Metal

§ 192.461 External corrosion control: Protective coating

- (a) Each external protective coating, whether conductive or insulating, applied for the purpose of external corrosion control must—
- (2) Have sufficient adhesion to the metal surface to effectively resist underfilm migration of moisture;
- (3) Be sufficiently ductile to resist cracking;

§ 192.461 External corrosion control: Protective coating

- (4) Have sufficient strength to resist damage due to handling and soil stress; and
- (5) Have properties compatible with any supplemental cathodic protection.
- (5)(b) Each external protective coating which is an electrically insulating type must also have low moisture absorption and high electrical resistance.

Coating Procedures

- **§ 192.605(a)** Each operator shall prepare and follow ...a manual of written procedures for;

  (2) Controlling corrosion in accordance with the...requirements of **subpart I**
- Coating Procedures need to List Approved Coating Materials (Manufacturer & Product #)
- Operator should be able to justify requirements of § 192.461(a)(1-5) and (b)

Coating Procedures

- Surface Preparation Requirements
  - Specify by Industry Standards (SSPC & NACE)
- Application Method
  - Spray, Brush or Roller?
- Application Conditions
  - Air & Surface Temperature
  - Pre-Heat Requirements (FBE)
  - Relative Humidity & Dew Point (Epoxies & Urethanes)

Coating Procedures

- Thickness Requirements
  - Dry Fill Thickness (mils) per Coat for Liquid/Powder Coatings
- Overlap Requirements
  - Tape Coating & Shrink Sleeves
  - Minimum Overlap of Consecutive Wraps
  - Minimum Overlap of Existing Coatings
- Cure Time prior to Recoating or Burying

§ 192.307 Inspection of materials.

- Each length of pipe and each other component must be visually inspected at the site of installation to ensure that it has not sustained any **visually determinable damage** that could impair its serviceability.

§ 192.461 External corrosion control: Protective coating

(c) Each external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired.

Coating Inspection

- Visual
  - Runs, Drips, Blisters, Foreign Inclusions
  - Areas of Coating Damage
  - Wrinkles and Insufficient Overlap in Tape & Shrink Sleeves
- Thickness Measurement
  - Critical for Liquid Applied Coatings
- Holiday Testing (jeeping)
  - Electrical Test for Small Defects

§ 192.319 Installation of pipe in a ditch

- (a) ... each transmission line ...must be installed so that the pipe fits the ditch so as to minimize stresses and protect the pipe coating from damage.
- (b) .. must be backfilled in a manner that:
- (1) Provides firm support under the pipe;
- (2) Prevents damage to the pipe and pipe coating from equipment or from the backfill material.

Bored Crossing – Failed Hydrotest

Joint Coating Applied over Dirt/Debris

Construction Damage
Section of Pipe was Replaced
found by DCVG Survey-Line was in Service

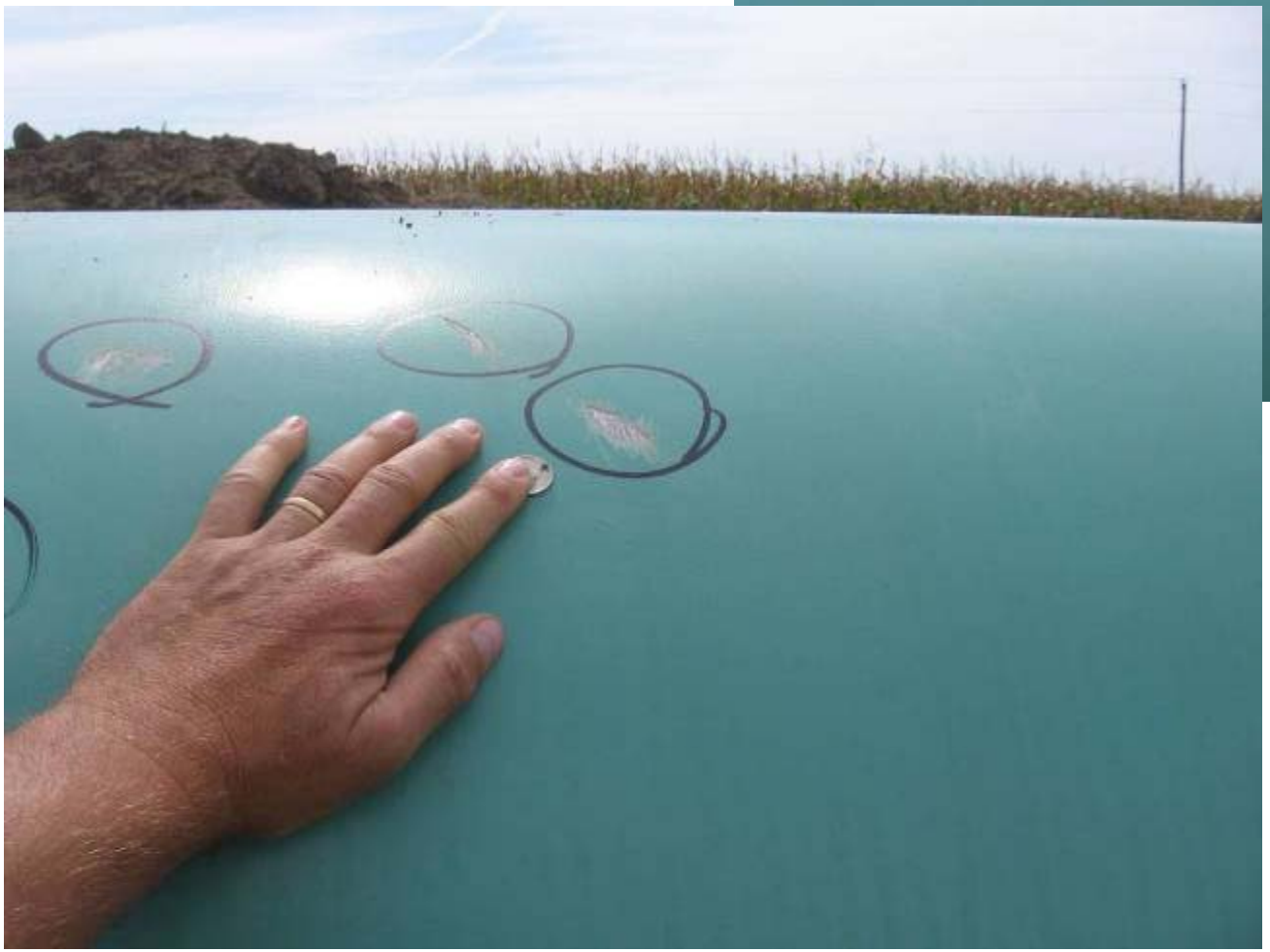
Corrosion Found
Less than I Year of Service

Gouge in Pipe

found by DCVG Survey-Line was in Service

Manufacturer’s procedures for patch stick application must be followed.

Patch Sticks are only for pinhole or abrasion repair. 2 part epoxy should have been used.



Inappropriate Bundling of Patch Sticks
Use One Only-Small Areas

Excessively Large Patch Stick Application
Use for Pinholes Only

A bent jeep spring can miss coating holidays

Tape on Pipe Preventing Proper Holiday Detection

Rocks against pipe
(No screening for over 1 mile)

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For Additional Information

https://phmsa.dot.gov

https://primis.phmsa.dot.gov/meetings

http://primis.phmsa.dot.gov/gasimp

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Thank You

Questions

joseph.mataich@dot.gov

404-832-1159