American Metal Market

4th Steel Tube and Pipe Conference

Pipeline Material Safety

PHMSA
March 22, 2011
Pipeline Material Safety

- Pipeline Materials – Quality Issues
- Overview – Joint Actions
- Materials – Quality Management
- Records Management
- Looking Ahead
Pipeline Materials

- Pipe - low and variable strength
- Fitting Strength – low strength
- Pipe - wall thickness transitions and ovality
- Pipe – cutting of hot bends
- Welding – repairs, alignment & procedures
- Coating Quality – field joints and plant applications
Materials - fittings strength

- Coating is cracking due to expansion of fitting during testing
Materials - pipe

- Low strength pipe
  - Inconsistent mechanical properties
  - PHMSA Advisory Bulletin (PHMSA 2009-1048)
Materials - pipe

- Low strength pipe
Materials - coatings

- Poor Factory Application of Fusion Bonded Epoxy (FBE) coating
- 199 jeeps on pipe joint
Materials - pipe

- Coating Disbondment
Materials - pipe alignment

- Weld misalignment (high-low)
Materials - pipe alignment

• Weld Transitions

- 30 deg. max.
- 0.5t max.
- t
- t
- 30 deg. max.
- 14 deg. min. (1:4)
- (d)

[Note (1)]
Overview - Joint Actions

- Workshops
- Advisory Bulletins
- Pipe Quality Work Groups - INGAA
- API 5L Standard Update – in process
PHMSA – Advisory Bulletins

• ADB-11-01 – Risk Management – 01-04-11
  – Establishing MAOP or MOP using record evidence, and integrity management risk identification, assessment, prevention, and mitigation.

• ADB-10-03 – Girth Weld Quality – 05-24-10
  – Girth weld quality issues due to improper transitioning, misalignment, and welding practices of large diameter pipe.

• ADB-09-01 – Low Strength Pipe – 05-21-09
  – Low and variable yield /tensile strength and chemical composition properties in high strength line pipe.
Pipe Quality Action Plan - INGAA

1. Identification of Low and Variable Yield Strengths in High Strength, Low Allow Line Pipe Steel
2. Line Pipe Quality Management
3. Evaluation of Enhancements to API Pipe Standards
4. Evaluation of Enhancements to Operator Specifications and Practices
5. Evaluation of Enhancements to Pipe Manufacturer Specifications and Practices
6. Understanding Steel Stress Strain Behavior and Pipe Expansion
7. Development of Methods to Understand Implications of Expansions on Stress and Strain and Implications to Each Threat in ASME B31.8S
8. Evaluate Implications of Expansions on Pipe Coatings
API 5L - modifications

- API 5L – proposed changes for “low strength” pipe
  - QA management system for the supplying steel and rolling mill
  - Standard sampling locations along plate or coil length according to documented procedures
  - Modifications to retest procedures
  - Manufacturing Procedure Specification
  - Inspection and Test Plan
  - Manufacturing Procedure Qualification Tests – mechanical tests
  - Qualification consider assessment of coil/plate tensile property variability and coil/plate to pipe strength changes
Materials - Quality Management

• What procedures and standards are being used?
  – Manufacturers
  – Industry
    • API, ASTM, MSS, etc.
  – Operators

• Is it a DOT Code referenced standard?
Records Management

- What are the first items looked at if a pipeline has an incident? **Records!**
  - **Material Records** – pipe, fittings & fabrications, etc.
  - **QA and QC**
    - Standards – API, ASME, ANSI, MSS, and ASTM
    - Tests – mechanical & chemical properties, welding, NDE, and hydrotest
  - **Design and Construction Records**
  - **Operations and Maintenance Records**
  - **Integrity Management Records**
Looking Ahead

- Quality – focus on
  - Pipe, fittings, fabrications and coatings
  - Field Construction – welding, coatings, backfill, & inspection
  - QA and QC – on-site inspection

- May need to explore other options:
  - More effective regulations and standards
  - Operator qualification for construction personnel

- PHMSA inspection focus on quality will continue
PHMSA – links

- Safety - Advisory Bulletins

- Pipeline Safety Guidance – Advisory Bulletins, Low Strength Pipe Guidelines, MAOP Rule FAQs

- Construction Workshop
Thank you