



# **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





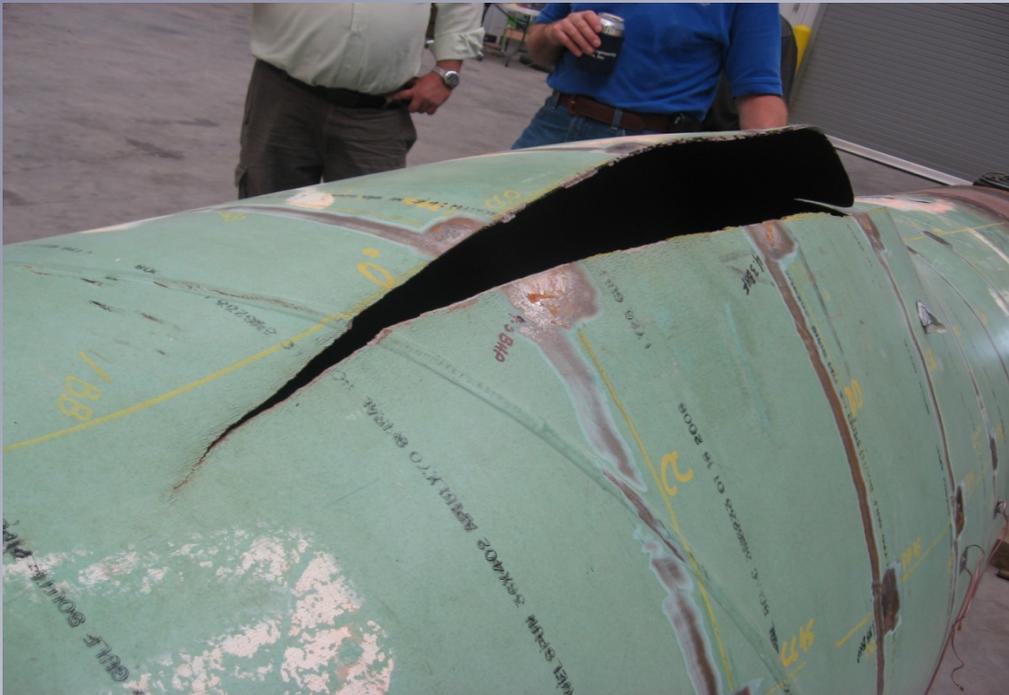
# Materials - pipe

- **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

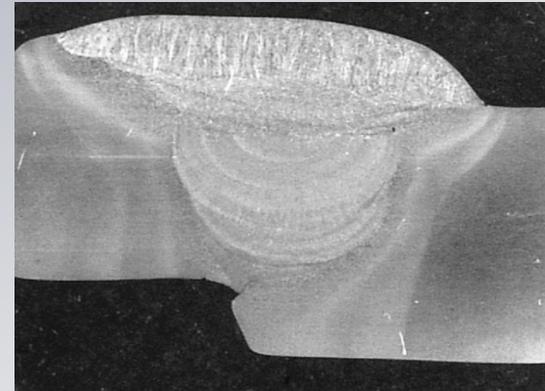
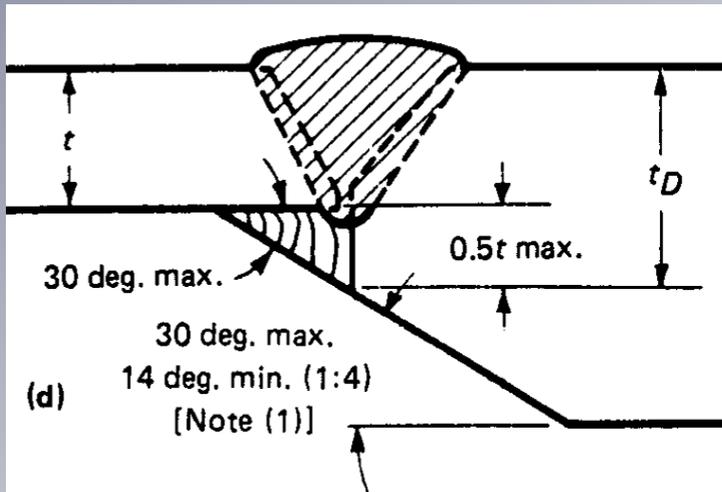
- **Weld misalignment (high-low)**





# Materials – pipe alignment

- Weld Transitions





# 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**

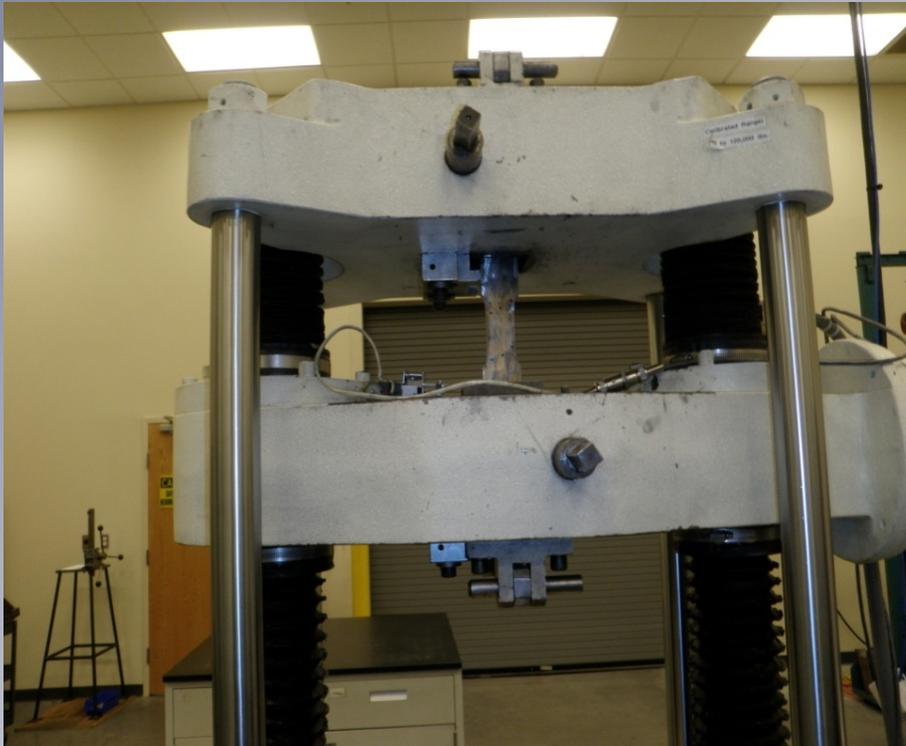


# API 5L - modifications

- **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**
  - <http://phmsa.dot.gov/pipeline/regs/advisory-bulletin>
- **Pipeline Safety Guidance – Advisory Bulletins, Low Strength Pipe Guidelines, MAOP Rule FAQs**
  - <http://www.phmsa.dot.gov/pipeline/guidance>
- **Construction Workshop**
  - <http://primis.phmsa.dot.gov/construction/index.htm>



# Thank you