Pipeline and Hazardous
Materials Safety Administration

PHMSA Advisory Bulletin
Low Strength Line Pipe

NAPCA Workshop

August 20, 2009
Houston, Texas
Steve Nanney

Pipeline and Hazardous Materials Safety Administration

Background:

- Pipe expansion on multiple projects 80% SMYS MAOP special permits in 2008
- Hydrostatic tested to 100% to 104% SMYS
- Hydrostatic test failures in some situations
- Deformation tool runs confirmed pipe expansion
- Pipe mechanical tests – confirmed variable strength below API Grade for yield and tensile strength

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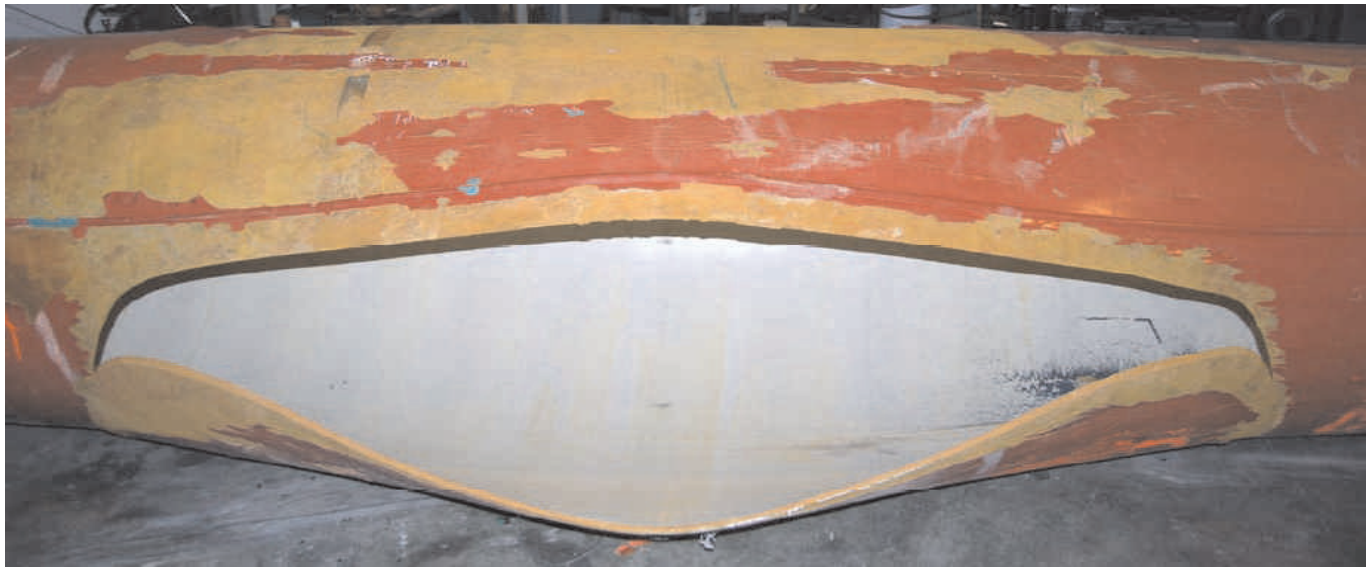
Pipe Manufacturing

LOW YIELD STRENGTH

- Yield Strength <62Ksi for X70 pipe
- Maximum ID: 109% of normal
- Not an isolated project concern



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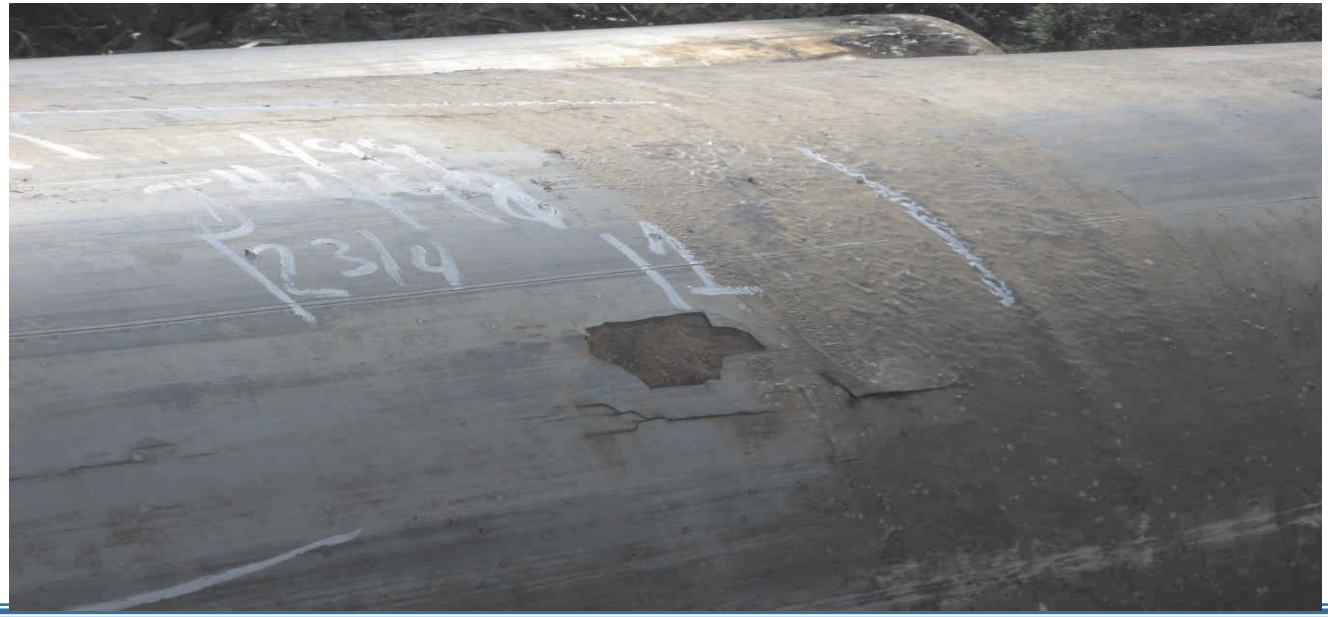

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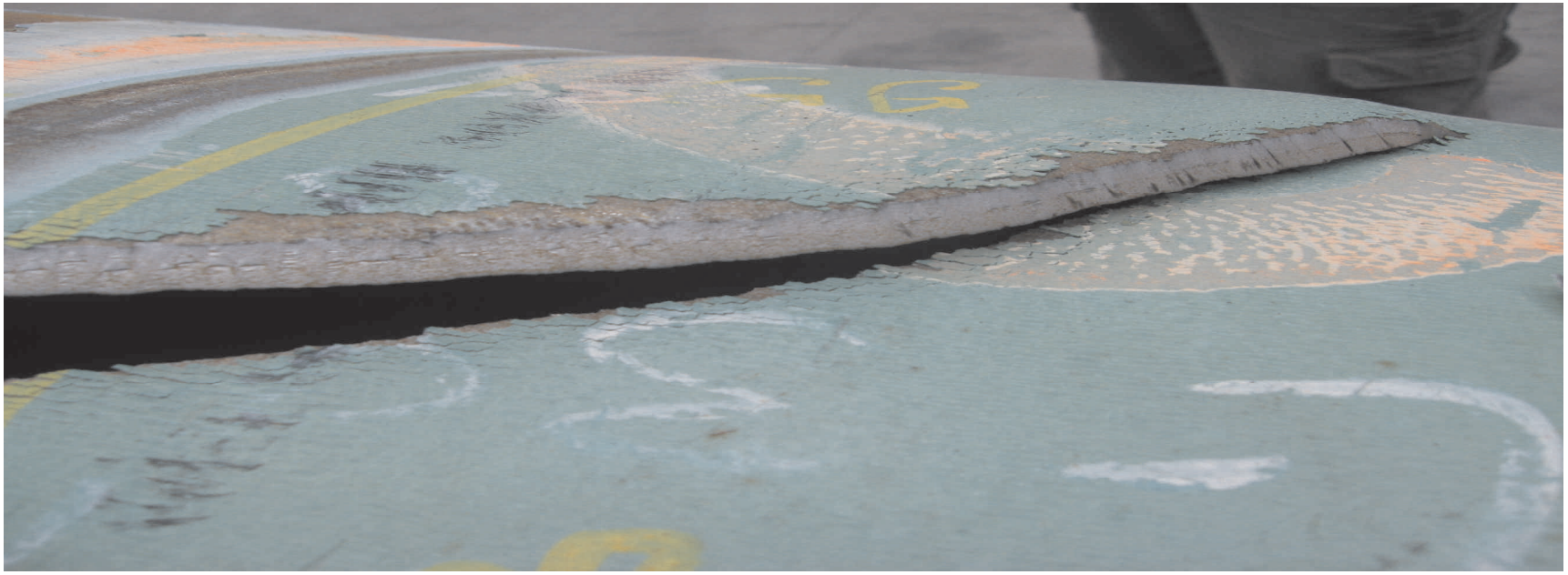
Pipe Manufacturing

- **Low Strength Pipe**
- **Coating Adhesion**



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Possible Factors for low and variable yield strength pipe

- Incorrect steel chemistry for pipe grade
- Improper plate/coil rolling and cooling process temperatures
- Validation – chemistry, rolling and cooling processes
- Plate/coil switch at steel or pipe mill
- Pipe test locations for yield/ultimate tensile strengths at steel and pipe mills

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Elements of a Pipe QA & QC Program:

Quality assurance program must include process validation and evaluations:

a. **QC plans and manufacturing procedure specifications**
b. **Equipment maintenance and records of conformance**
c. **Procedures for controls on superheat and casting speeds, steel rolling temperatures, and cooling temperature**
d. **Properties validation tests based upon chemistry, steel grade, plate or coil, and selected based upon patterns of property variability**
e. **Verification of yield and tensile strength losses that may occur in steel making process of coils and plate and pipe rolling processes**
f. **Coils and plate with casting and rolling process deviations that may affect steel properties must have a re-verification of mechanical and chemical properties on the pipe heat**
g. **Pipe supplier must notify customer of all heats that do not meet the above prior to supplying pipe to customer**

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Follow Up Actions:

- Resolving issue with operators
- INGAA Safety Culture Workshop, March 25
- PHMSA Construction Workshop, April 23
- Advisory Bulletin, May 14 – Federal Register
  - Docket # PHMSA-2009-0148 on regulations.gov
- Industry Pipe Summit, June 11
- API Standards Conference, June 22
- R & D Forum, June 24-25
- Working with Industry Task Groups

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Future Actions:

- **PHMSA may update ADB in the future as more facts are learned**
- **Take action to limit operating pressures to address material issues impacting safety factors, where needed**
- **Engage standards bodies to improve reference standards**
- **Revise regulations to ensure public safety, where needed**

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Construction

Welding Issues – API 1104 and 5L

- Pipe end tolerance - high/low
- Pipe end - flat spots
- Preheat prior to welding – initial and repair
- Improper usage or understanding of API 1104, Appendix A
- Improper communications between AUT crew and weld repair crew

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Construction

- **Pipe bevel ends – high/low**

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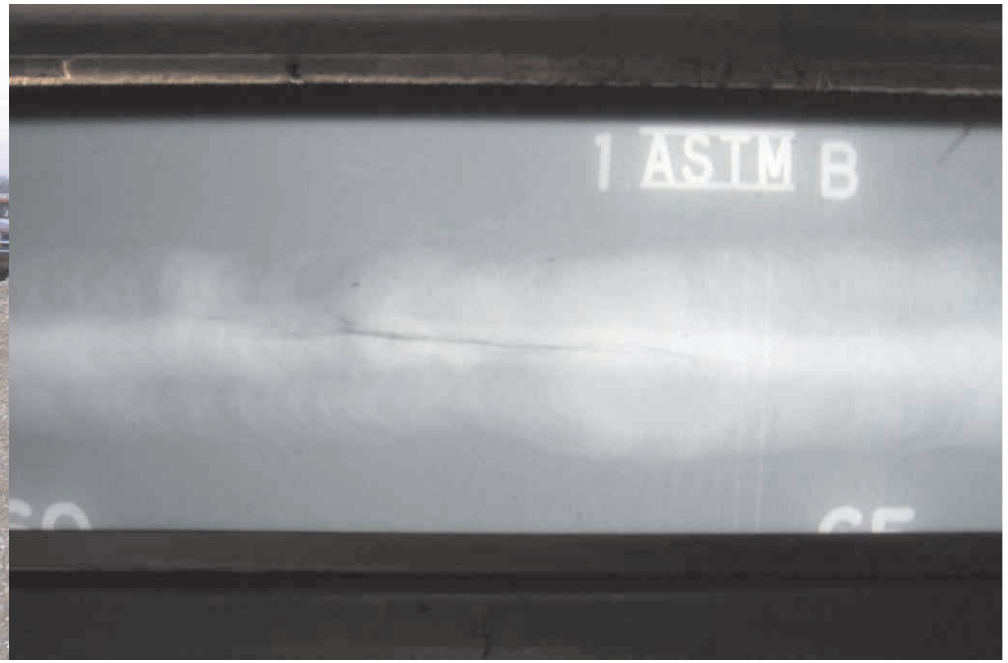
Construction

- **Repair Weld Cracking Issues**



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Questions

Thank you