

# Long Term Issues

## Introduction

# Long Term Casing Issues

- API, AOPL and hazardous liquid operators are highly interested in solving long term issues that cased pipe presents
  - Our baseline assessment deadlines are past (March 31, 2008)
  - While integrity assessments for liquid operators are generally easier (ILI), remediation of findings within casings are no less difficult
  - Liquid operators generally have a lot more casings in HCA could affect pipeline segments.

# Long Term Casing Issues

- We see three basic long term issues:
  - We need to stop installing new casings when not needed as demonstrated by engineering analysis
  - We need to develop consensus for removing existing casings whenever possible
  - We need to develop/update industry standards/best practices for inspecting, maintaining, and repairing existing casings.

# Long Term Casing Issues

- The purpose of this section is to develop a path forward for longer term issues surrounding casings
  - Identify and attempt to reach consensus on important long term issues
  - Refine definition of issues and identify challenges
  - Identify potential paths forward for solving these issues
- These issues won't be solved today – however it is important to identify a roadmap for solving them tomorrow.

# Long Term Issues

Issue #1: We need to stop installing new casings when engineering analysis demonstrate that they are not needed.

But outdated Highway and Railroad casing requirements (or the perception thereof) exist

# Some Highway Agencies Require casings

- Currently, the Federal Highway Administration (FHWA) has no guidance documented for cased crossings, but previous guidance supported cased crossings (circa ~1960).
- States have latitude in making judgments concerning need for casings
  - States are only required to have utility accommodation policies approved by FHWA once – not for each project
  - A change in state policy regarding casing requirements would require new accommodation policy approval from FHWA – an extra process for states to complete.

# Some Highway Agencies Require casings

- Problem
  - States are not under any impetus to change casing requirements without documented guidance from FHWA.

# AREMA standard requires casings for flammable liquids

- The 2001 version of the AREMA Manual for Railway of Engineering treats liquid pipelines and gas pipelines differently.
  - Casings are required for all liquid crossings (some isolated exceptions are allowed)
  - Casings for flammable gas are NOT required or recommended
  - Casings ARE required for non flammable lines (water, steam, et al.)
- Problem
  - AREMA standard has unsubstantiated differential requirements for casings.



# Need for casing should be determined by Engineering

- Pipeline manufacturing, engineering, construction and Integrity Management has advanced significantly since casing requirements were enacted.
  - Improved steelmaking (higher yields, cleaner chemistry)
  - Improved pipemaking (HF ERW seams, NDE, etc)
  - Better design of crossings (Spangler, API 1102, HDD)
  - More reliable construction and welding (SMAW, GMAW, weld NDE)
  - Better coatings
  - Implementation of Cathodic Protection Systems
  - Damage Prevention Practices

# Need for casing should be determined by Engineering

## ■ Potential Solutions

- Convince FHWA, AASHTO, and states that uncased crossings are safer designs for pipeline crossings of roads
- Dispel myths about liquid pipeline failure modes and influence FRA and AREMA to change requirements for liquid pipelines.

## ■ Possible Path Forward

- Convene workgroup (JIP?, API/AOPL/AGA/INGAA?) that includes pipeline operators, PHMSA, FHWA, AASHTO, FRA, and AREMA representatives.
- Participation from gas industry most welcome

# Long Term Issues

Issue #2: We need to develop industry consensus for removing existing casings whenever possible

In many ways, this issue is tied to the previous one

# Removing Existing Casings

- Reasons for removing existing casings
  - The removal of cased crossings makes sense in certain situations from a risk / threat reduction standpoint.
  - Continual settlement issues is a big driver for casing removal
  - Assessment difficulties
  - Not needed because of road relocation or railroad abandonment
  - Targets of opportunity

# Removing Existing Casings

## ■ Challenges

- Highway and Railroad requirements must be updated first
- Permitting
- Cost / Benefit
- External corrosion threat may be mitigated by filling casing with wax
- Risk reduction gained by casing removal not well defined in some risk models or scenarios
- Industry consensus on risk of casings vs. uncased pipe is unclear.
- Uninformed parties may resist removal of existing casing.

# Removing Existing Casings

## ■ Potential Solutions

- Incorporate guidelines for casing removal into existing pertinent industry standard
- Survey gas and liquid operators for their current practices
- Develop a recommended practice or publication that outlines the issue and provides justification, guidelines or best practices for when to remove a casing.

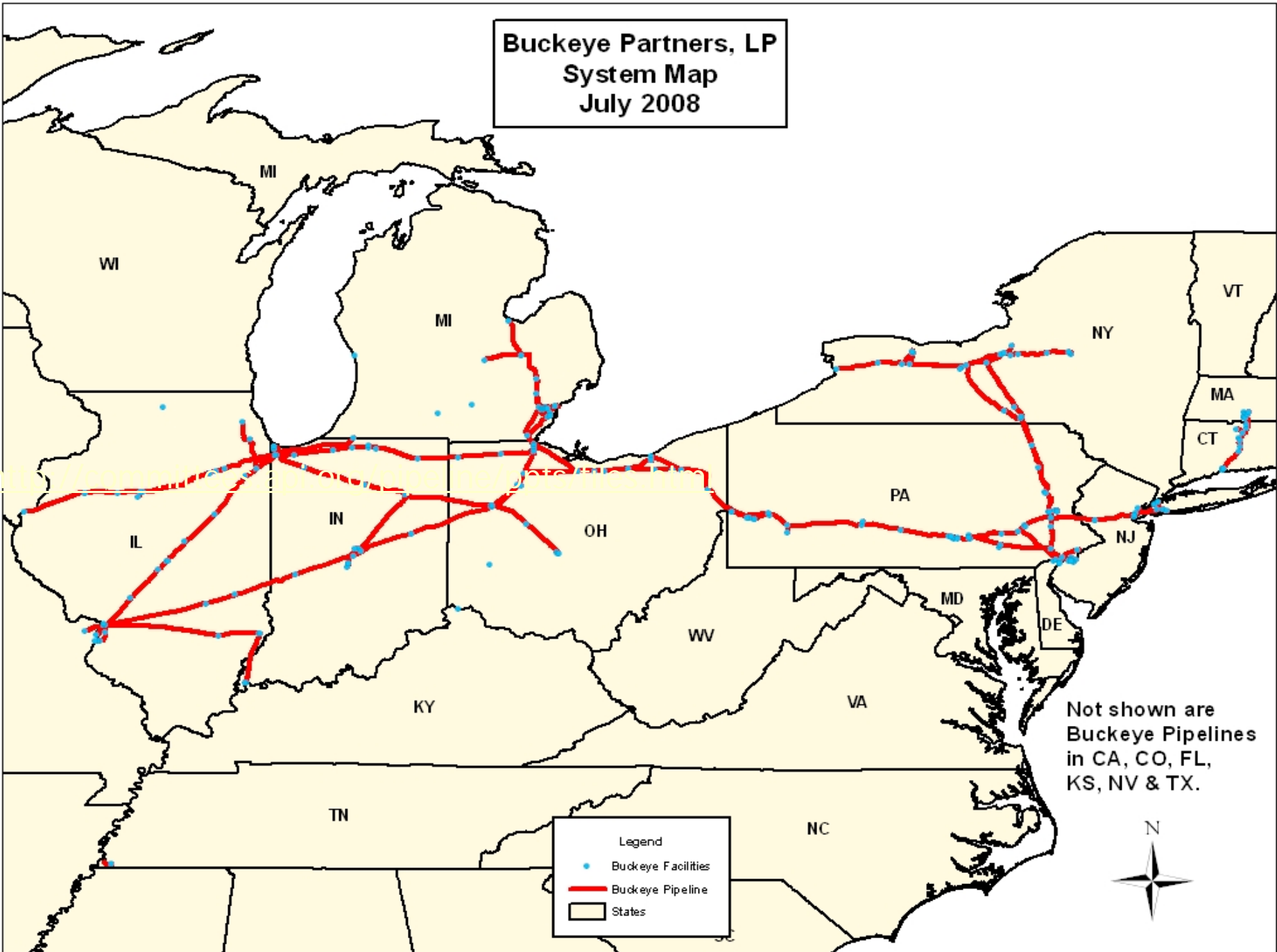
## ■ Possible Path Forward

- Introduce new work items into the appropriate standards' revision process
- Add issue to workgroup developed to tackle previous issue.

# Long Term O&M Issues

Casings Present Ongoing  
Challenges to Monitoring,  
Maintenance and Repair

**Buckeye Partners, LP  
System Map  
July 2008**



Legend

- Buckeye Facilities
- Buckeye Pipeline
- States

Not shown are  
Buckeye Pipelines  
in CA, CO, FL,  
KS, NV & TX.





# Buckeye Partners System

- 6300 Miles Operated
- 4700 Miles HCA Could Affect (75%)
- 8350 Casings
- 6250 HCA Casings

Above Numbers Are Approximate

# IMP Assessments by ILI and Pressure Testing

- Over 99% of Casings Assessed by ILI and/or Pressure testing
- DA Implemented on Remainder
  - i.e. Guided Wave Ultrasonic Testing

# Susceptible Casings Removed or Mitigated

- Removal Is Preferred Option
- Shorted Casings Cleared
- Fill Annular Space  
with Wax
- Improve CP



# Barriers To EC Mitigation

- Permitting For Excavation or Removal
- Unknown Construction of Acquired Systems



# Monitoring of Casings

- ILI and Pressure Testing Provide Valuable Information
- Corrosion Rates May Be Established
- More Frequent Assessment a Viable Option

# Path Forward

- In many ways, these three issues are interlinked
- Although these issues are pressing to the liquid industry, their solution should involve the gas industry.
- Possible Path Forward
  - Convene workgroup (JIP?, API/AOPL/AGA) that includes pipeline operators, PHMSA, FHWA, FRA, and AREMA representatives to tackle the issue of unwarranted casing requirements.
  - Approach Standards Body (API?, NACE?) to have a “casing integrity standard” developed or added to an existing standard.

# Other Issues

- What other potential solutions exist?
- What other long term issues are out there?