PMHSA R&D Forum
Gas Transmission Key Challenges

David Chittick
June 24, 2009
Pipeline Safety

- Pipeline safety is the pipeline industry's number one priority.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fatalities per 100,000 US Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline</td>
<td>0.004</td>
</tr>
<tr>
<td>Transit</td>
<td>0.080</td>
</tr>
<tr>
<td>Rail</td>
<td>0.300</td>
</tr>
<tr>
<td>Air</td>
<td>0.240</td>
</tr>
</tbody>
</table>

Source: Bureau of Transportation Statistics
Critical issues will shape the future of natural gas transportation:

- Shifting natural gas supply sources will require **infrastructure expansion** to continue.
- U.S. energy policy is likely to be even more tightly integrated with environmental and security policies leading to comprehensive plans for **reducing greenhouse gas emissions** and developing alternative fuels.
- The legal framework for pipeline rate regulation remains premised on the assumption that pipelines are monopolies.

Source: INGAA Strategic Plan, Dec. 2008
The interstate pipeline industry will remain subject to multiple regulators that do not necessarily share a common vision.

The relative lack of common vision across elements of the natural gas value chain may continue to drive distinct and sometimes inconsistent messaging.

A changing economic environment will affect corporations that own pipeline assets.

Source: INGAA Strategic Plan, Dec. 2008
New Pipeline Construction Challenges

- Numerous new pipeline projects in recent years
- Numerous pipeline incidents
- PHMSA Engagement
  - New Construction Workshop (April 23, 2009)
  - Potential Low Yield Advisory Bulletin (May 21, 2009)
- INGAA Engagement
  - Workshop of Building Better Pipelines (March 25/26, 2009)
  - Pipe Quality Summit (June 11, 2009)
    - INGAA 10 Point Action Plan
    - Shared with PHMSA (June 18, 2009)
**Greenhouse Gas Emissions – Game Changer**

- The anticipated reductions in GHG required to meet proposed regulations will have significant affect on the natural gas industry
- Natural gas contributes 16% of US GHG emissions
- Natural gas industry contributes 3% of US GHG emissions
- No easy means to reduce GHG’s
- New Technologies will be needed
- Natural Gas is partly a solution to GHG’s, and
- Natural Gas is a contributor to GHG’s
Gas Transmission R&D Priorities

Corrosion
- SCC threat assessment
- Reliability-based integrity management

Design, Materials & Construction
- Fitness for service; repair avoidance
- Evaluation method for dents

Operations & Integrity
- Adapt existing Fitness for service methods to pipelines
- More efficient monitoring of ROW

Compressor & Pump Stations
- GHG mitigation

Source: PRCI Needs, Opportunity, Threats & Industry Drivers for the 2010 Annual Research Program
Challenges & Opportunities

- PHMSA/Operator collaboration
- Design & Construction
  - 80 % SMYS
  - Strain Based/Reliability Based, AIV
- Technology advances will assist in enhancing the safety of pipelines
  - New/Improved inspection tools
  - New/Improved Processes
- Technology advances will assist in enabling more efficient and effective operations of pipelines
  - Regulations, Standards, Processes
  - 80 % SMYS
  - Performance based vs prescriptive based IM
Thank You