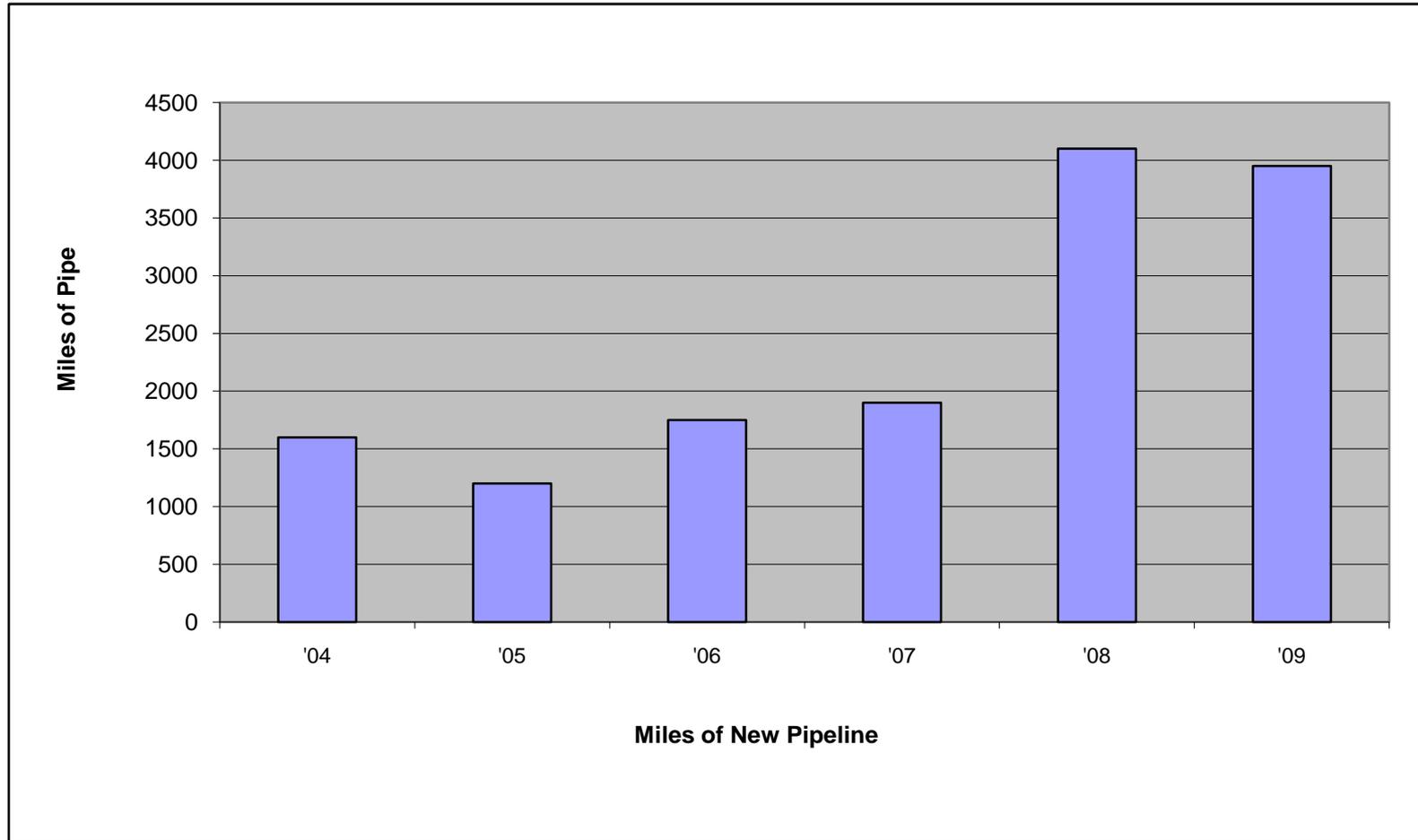


**Energy Pipelines
Pipe Quality Action Plan
INGAA Stakeholder Conference
October 13, 2009**

**Dan Martin
Sr. Vice President, Operations
El Paso Pipeline Group**

**Chairman, INGAA Operations, Safety and Environmental
Committee**

Background—Miles of New Pipeline Added Each Year



PHMSA Observations

Regarding Increased Construction Activity

- What went wrong?
 - Low and variable strength “yield” pipe
 - Pipe chemical composition
 - Bevels on end of pipe
 - Welding issues
 - Pipe coating
 - Construction staffing knowledge issues
- What went right?
 - Parallel construction
 - Finding low yield pipe
 - Mitigating welding issues
 - Corrosion surveys finding coating damage
- Industry reaction was that these are isolated issues that need further understanding



PHMSA Advisory May 21, 2009

- Low and Variable Yield and Tensile Strength and Chemical Properties
- Pertains to Grade X-70 and higher strength pipe
- Recent construction
- Need to Investigate
 - Review manufacturing procedure specifications and test results (steel and coil)
 - Review pipe specifications and technical documentation review (pipe production test results, hydrostatic test results)
 - Based on knowledge and findings, consider using deformation tool to detect expansion



Recent History of Related Meetings and Notices

June 2008	INGAA Foundation Workshops: Bevels & Construction Quality Assurance/Control
March 2009	INGAA Foundation Workshop on Building Better Pipelines
April 2009	PHMSA Construction Workshop on New Pipeline Construction
May 2009	PHMSA Advisory Bulletin – Potential Low and Variable Yield and Tensile Strength and Chemical Composition Properties in High Strength Line Pipe
June 2009	INGAA Foundation Pipe Quality Summit
October 2009	INGAA Foundation Construction Quality Summit



PHMSA Challenge to Trade Associations

- How can industry and PHMSA credibly define the precise nature and extent of problems identified during the recent new pipeline construction projects?
- Which underlying standards or regulations need to be examined or changed to help improve pipeline fabrication and construction quality control?
- What other ideas to improve overall fabrication and construction quality control does the industry believe warrant additional attention?
- For example, does your association and membership see value in developing a more comprehensive quality management system standard to make these improvements? If so, which system elements would you see as needed?
- At a minimum, which testing and quality control requirements do you believe need to be incorporated into all new pipeline construction projects to ensure their fitness for purpose prior to commissioning?
- Lastly though process and technology improvements may be needed, we also welcome your ideas on how we can both ensure that workers employed in these fast-paced and challenging construction projects are fully trained and qualified to carry out their duties competently?



INGAA Pipe Quality Summit

- 120 participants from all aspects of supply chain
- Developed 8 Action Plans
 - Implementation of Advisory Bulletin
 - Evaluation of Enhancements to API 5L Pipe Manufacturer Specifications
 - Methods to understand pipe expansion; implications on coatings, implications to B31.8S
- Shared plans with PHMSA



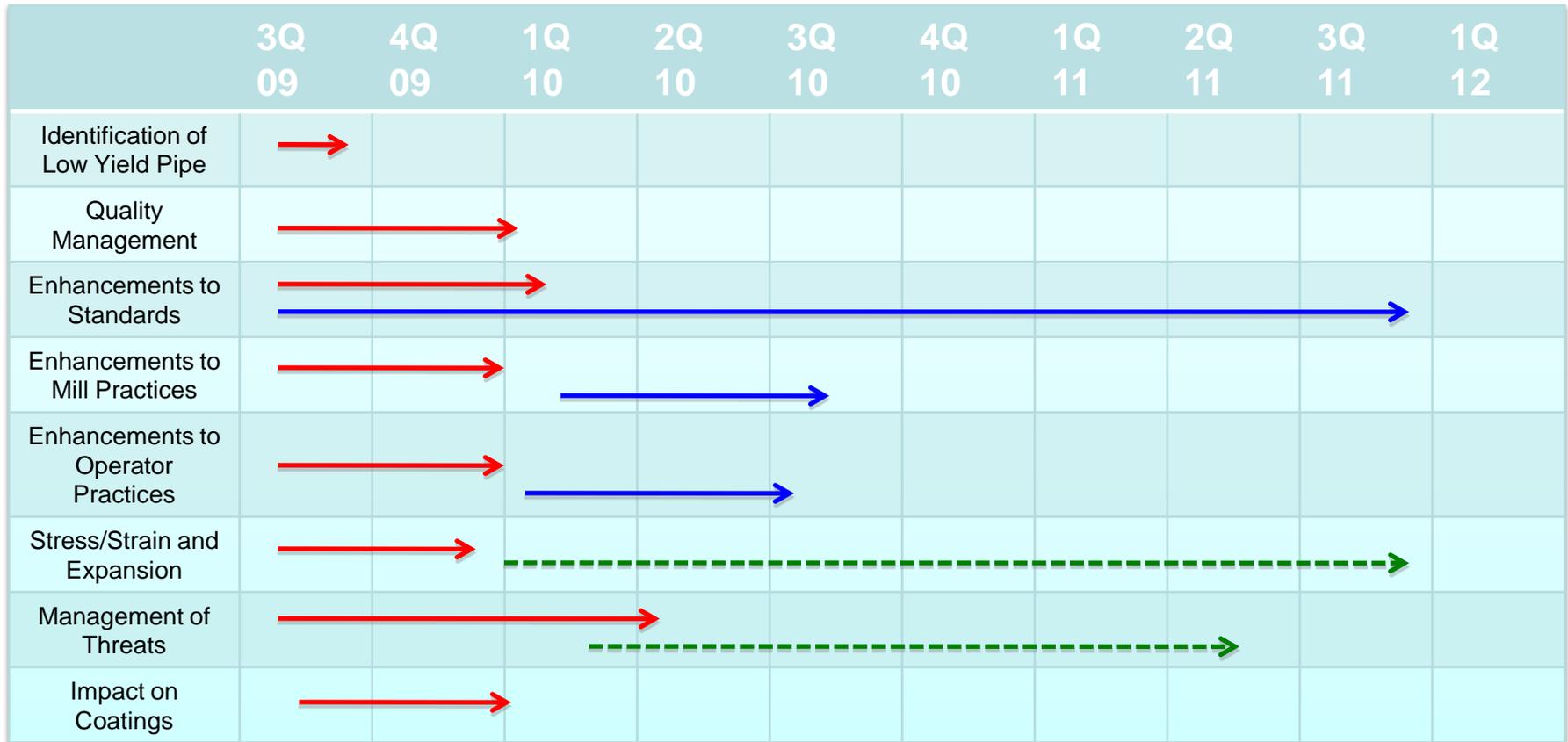
Energy Pipelines

Pipe Quality Action Plan

1. Identification of Low and Variable Yield Strengths in High Strength Low Alloy Line Pipe Steel
2. Line Pipe Quality Management
3. Evaluation of Enhancements to American Petroleum Institute (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



Timeline for Action Plans



Quick-Hit White Papers



Longer-Term Work Efforts Culminating in Standards



Research



Action Plan Status

- Advisory Response Process developed by **Work Group 1**
 - White Paper – *Identification of Pipe with Low and Variable Mechanical Properties in High Strength, Low Alloy Steels, INGAA Foundation*
 - Mill test to at least 95% SMYS
 - Measurement of pipe body diameter at multiple equally spaced locations
 - May be research opportunity – jump start laser or caliper technology to be applied on each pipe in the mill
- Ensure that steelmakers, steel processors and pipe manufacturers use quality management systems
 - API Monogram Program enhancing anonymous reporting
 - **Work Group 2** modified to provide oversight by Pipe Quality Leadership Team



Action Plan Status

- Revisions to API 5L – **Work Group 3**
 - Revisions to API 5L drafted in work group
 - To be balloted at January 2010 meeting in New Orleans
- Enhancements to Pipeline Operator Specifications – **Work Group 4**
 - Best Practices Workshop – November 2009
 - White Paper on Procurement and Inspection Best Practices – December 30, 2009
- Enhancements to Pipe Manufacturing Specifications and Inspection and Testing Plans – **Work Group 5**
 - Work group reviewing practices to anticipate changes in API 5L
 - Coordinating with Work Group 4 to anticipate response to best practices



Action Plan Status

- Understanding stress strain behavior of high strength, low alloy steel – **Work Group 6**
 - Are there changes to the way in which we use pressure information that can help identify yielding?
 - What is the expected variability in yield and tensile?
 - Meeting to review modeling approach on Oct 12
- Developing an acceptable level of strain – **Work Group 7**
 - White paper developed and will be reviewed with Work Group on Oct 12
- What are the implications to coatings? Do coatings become a limiting factor? – **Work Group 8**
 - Operator and coating supplier testing indicates crazing and cracking in excess of 6% strain
 - Will reaffirm relationship between bend tests and strain level in pipe
 - Tensile test matrix has been developed and will be conducted at several mills



Pipe Expansions - In Context

- A pressure test verifies that a pipeline can operate at a pressure significantly above the operating pressure (safety factor) by not leaking or failing during the test
- Excessive pipe expansion is a rare event caused by the yielding of lower strength steel material that occurs during a pressure test used to verify the safety factor of the pipeline
- Yielding of pipeline material, per se, does not threaten the integrity of the pipeline
- We have a group of experts defining an acceptable level of expansion for pipeline integrity purposes
- This is one among other possible threats we manage in a pipeline integrity program with defined criteria
- **Pipe expansion as a result of a successful pressure test does not pose an immediate threat to the safety or integrity of the pipeline.**



Questions?

