PHMSA RESEARCH & TECHNICAL PERSPECTIVES

Working Group 5 – Addressing Legacy Materials Challenges
Gov/Industry Pipeline R&D Forum

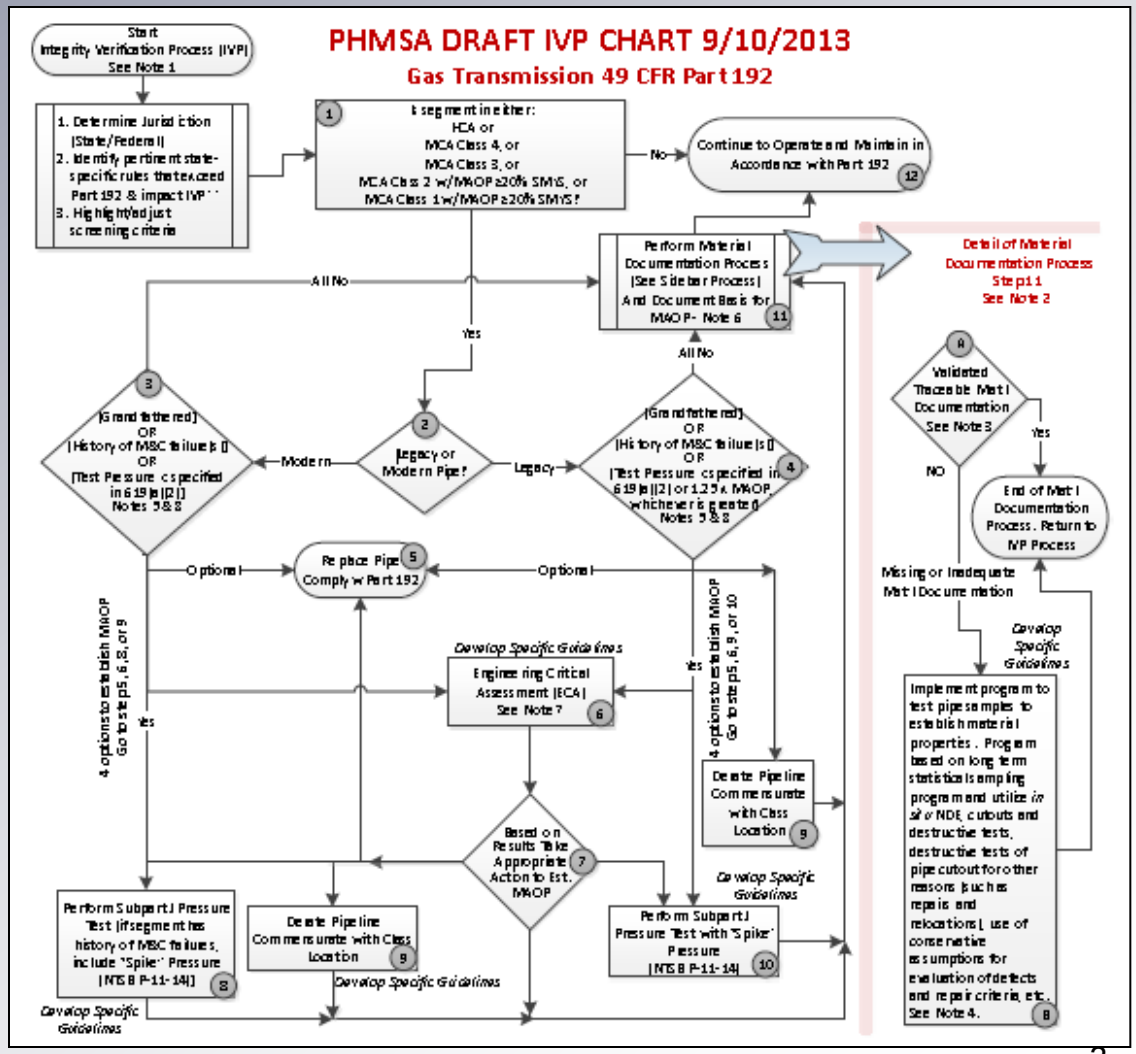
August 6-7, 2014

Legacy Materials Challenges

- **Historically not an R&D focus area**
- **R&D Program would group Cast Iron and pre-1970 or grandfathered systems into a common focus area**
- **PHMSA has awarded new research only in the past 6-8 months –** see ahead in current research
- **Seeking new research ideas in support of the proposed Integrity Verification Process**

Solutions in Support of IVP

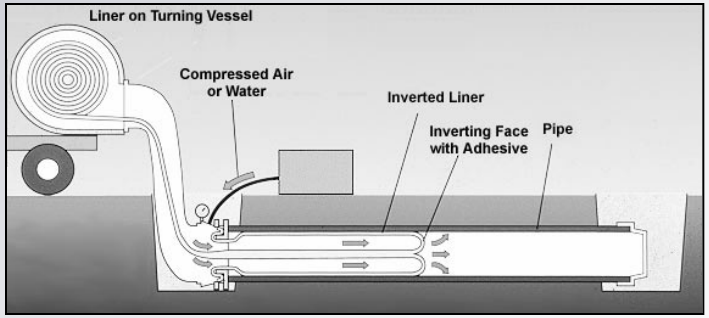
- **Can we develop NDE/NDT or destructive methods to learn more about pipe properties?**
- **WG#5 - what the sensors need to sense, and how to interpret the signals for integrity**
- **WG#3 - signals & sensors**



Current Research

Technology Transfer, Demonstrations and Post-Mortem Testing of Cast Iron and Steel Pipe Lined with Cured-in-Place Pipe Liners

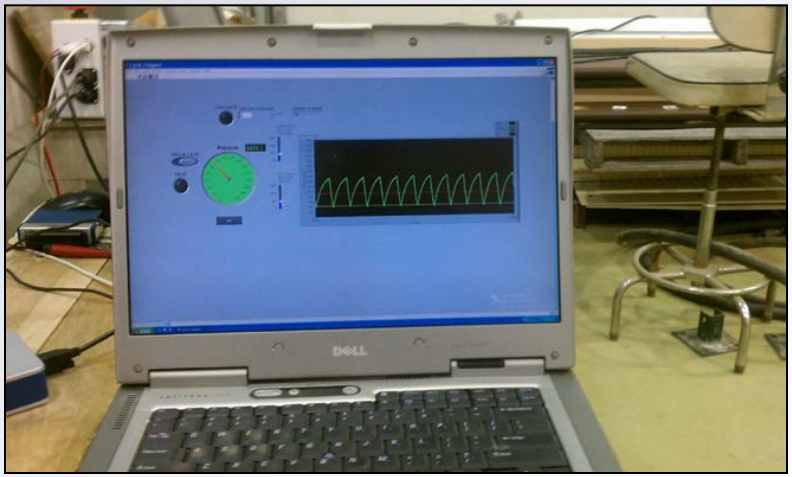
- Advance a broad understanding of cured-in-place pipe (CIPP) liners as they interact with host steel or cast iron pipe.
- CIPP lined pipe will be removed after years of gas service and tested using a solid foundation of protocols by Cornell University; an independent expert with a long history in testing of infrastructure.
- Gas company demonstration of re-conditioning using CIPP liners will be performed and added to past test and usage information.



Current Research

Evaluation of Structural Liners for the Rehabilitation of Liquid and Natural Gas Piping Systems

- Assessment of structural liners and interaction with host pipe
- Determine characteristics required for the liners to carry the internal and external loads of a degraded host pipe.
- Focus on systems installed using trenchless technologies which can provide remediation to the pipe and its appurtenances (e.g., fittings, flanges, and couplings).



Current Research

Comprehensive Study to Understand Longitudinal ERW Seam Failures

- Assist PHMSA in favorably closing NTSB Recommendation P-09-1 arising from the Carmichael MS pipeline rupture involving an ERW seam,
- Directed that PHMSA conduct study of ERW pipe properties and the means to assure that they do not fail in service.
- Addressed characteristics of ERW seams that make them susceptible to failure, and identified factors that pipeline operators must consider in evaluating seam anomalies.

Current Research

Repair/Replacement Considerations for Pre-Regulation Pipe

- Develop a standardized process for making repair/replace decisions for pre-regulation pipelines.
- Create guidelines for implementing and executing a pre-regulation pipeline repair/replace program.
- Guidelines for liquid, gas transmission and distribution pipelines

Gaps from a PHMSA Perspective

- **In-Line Inspection**
  - **Seam cracks – detection and sizing**
- **In-the-Ditch Tools**
  - **Seam cracks – detection and sizing**
- **Pressure test – spike test**
- **Usage of data – methodology**
- **Pipe Properties**
  - **Toughness – weld seams**
  - **In-situ mechanical properties**