Major Gas Transmission Safety Rules Issued

On Tuesday, October 1, 2019, Pipeline Hazardous Material Safety Administration (PHMSA) revised the Federal Pipeline Safety Regulations to improve the safety of onshore gas transmission pipelines. The new regulation, “PHMSA-2011-0023 Pipeline Safety: Safety of Gas Transmission Pipelines: MAOP Reconfirmation, Expansion of Assessment Requirements, and Other Related Amendments,” addresses the congressional mandates of the Protecting or Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2016, National Transportation Safety Board (NTSB) mandates, and public comments. Exponent has identified the following key changes:

§192.607 Verification of Pipeline Material Properties and Attributes

- PHMSA strongly believes physical properties and attributes (mechanical and chemical properties) are essential for a modern integrity management (IM) program.
- The material properties verification process only applies to pertinent properties needed to achieve the goals of the activity such as Maximum Allowable Operating Pressure (MAOP) reverification or IM assessments.
- Opportunistic testing using non-destructive evaluation (NDE) methods.
- Toughness testing is required only where data is needed.
- Alternative sample programs can be requested through PHMSA.
  - Approach must meet 95% confidence level.
  - Records must be Traceable Verifiable and Complete (TVC) and kept for the life of the pipe but are not required retroactively.

§192.624, §192.632 MAOP Reconfirmation

- Required for pipe without TVC documentation for establishment of MAOP in high-consequence areas (HCAs) and Class 3 or 4 locations.
- Required for grandfathered pipe operating above 30% specified minimum yield strength (SMYS), HCAs, Class 3 & 4, piggable moderate consequence areas (MCAs).
- MAOP reconfirmation completion in 15 year (50% completion in 8 years), 4 year deadline for newly identified segments meeting the definition of segments requiring reconfirmation.
- Methods
  - Strength Test (no spike test)
  - Spike required for cases with crack or crack like defects, 100% SMYS or 1.5 MAOP for 15 minutes
  - Pressure Reduction with a 5-year look back pressure history period.
  - Engineering Critical Analysis.
    - Fracture mechanics moved to stand alone section §192.712
- Pressure Reduction for low-pressure pipelines, applicability based on potential impact radius (PIR) of 150 ft.
- Alternative Technologies, 90 days submittal, requires approval from PHMSA.
- Legacy construction/techniques terms removed.
§192.3, §192.710 Assessing Areas Outside HCAs
- MCA definition: threshold for number of buildings in PIR is 5 and identified sites are excluded. Includes locations where interstate highways, freeways, and other 4 or more lane arterial road ways are in the PIR.
- Assessments are now required on pipe above 30% SMYS, AND in a Class 3 or 4, or a piggable MCA (definition of piggable is a free swimming, commercially available technology, without permanent modification to the pipe segment).
- Initial assessment required 14 years after effective date, then every 10 years.
- Can use MAOP reverification techniques as IM assessment.

§192.712 Fracture Mechanics
- Stand-alone segment, the process by which operator must perform fracture mechanics as required by other parts of §192.
- Must retain records for analysis.

§192.917 Seismicity and other Integrity Management Clarifications
- Monitor for pressure data for cyclic fatigue at least once every 7 calendar years (not to exceed 90 months).

§192.939 6-Month Grace period for 7-Calendar Year Reassessment intervals

§192.750 In-Line Inspection (ILI) Launcher and Receiver Safety
- Clarified pressure relief device language from “pressure relief valve.”

§191.23, §191.25 MAOP Exceedance Reporting
- Only applies to transmission lines.

§192.150, §192.493, §192.921, §192.937, Appendix F: Strengthening Assessment Requirements

§192.150, §192.493 Industry Standards for ILI
- Incorporates National Association of Corrosion Engineers (NACE) SP0102-2010 into 192.150; recommendations are not mandatory requirements.

§192.921(a), §192.937(c) Expand Assessment Methods Allowed for IM
- Operators should select appropriate assessment methods based on threat (direct assessment is allowed for appropriate threats).
- 90 days alternative sample approach; notification objection procedure.
- Appendix F GWUT is added.

Records
- Definition of TVC record is located in the 2012 PHMSA Advisory Bulletin.
- TVC criteria can be fully met by single record to establish MAOP.
- Enhanced record requirements for pipeline (not retroactive):
  - §192.5 Class Location
  - §192.67 Material Records
  - §192.127 Pipe Design Record
  - §192.205 Pipeline Component Records
  - §192.227 Welder Qualification
  - §192.285 Plastic Joint Qualification
  - §192.517 Test Records
  - §192.607 Material Verification
  - §192.609 §192.624 MAOP Verification

How can Exponent Help?

Data Management Solutions: Enabling utilities to effectively manage the growing influx of data into their enterprise systems.
- IT Data Management Solution: “One source of truth” across all business units; Centralized, cloud-based, mobile offline connectivity; Data analytics & Reporting
- As-Built Records and Data Management: program management of as-built construction documentation review, data translation, and subsequent upload to GIS mapping solutions.
- MAOP Validation: Development of an overall MAOP validation program strategy, from conception through production to conclusion; expertise includes oversight and best-practice process development in all aspects of MAOP validation.

Integrity Management: Ensuring an asset can perform its required function effectively and efficiently while protecting health, safety, and the environment and providing the means of ensuring that the people, systems, processes, and resources that deliver integrity are in place, in use, and will perform when required over the whole life cycle of the asset.
- Integrity Management: Experience in gas transmission and distribution pipeline and facilities integrity management; assists our clients in the review and improvement of work practices and procedures and in standing up integrity management programs.
- Asset Management: Experience with management of assets for both gas transmission and distribution systems. Develop and integrate asset management principles into their work processes and develop decision models to drive the life cycle of major systems and components.
- Risk Assessment: Various types of process safety and risk assessment to support client decision making.
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Rate Case Support: Exponent provides rate case support for many types of programs and assists our clients with development of rate case basis, preparation of testimony, and expert witness services. Examples of experience include rate case support for:

- Installation of a new control room
- Corrosion related activities on gas pipelines
- Facilities related activities for the gas system

Fracture Mechanics: Ability to assess the structural integrity and susceptibility to failure of pipeline components with cracks or crack-like defects.

- Analysis methodologies include leveraging ILI or pressure test data to characterize crack-like defect geometry and locations and subsequently selecting an applicable fracture mechanics model based on material property data to predict failure pressures.
- Expertise in metallurgy that aids in assessment of material properties related to a materials' resistance to fracture, e.g., Charpy V-notch toughness, and understanding material conditions for brittle and ductile fracture behavior in both base and weld metal.

- Experience using various fracture mechanics analysis approaches, including the Newman-Raju model, API-579 Level II, and Modified Log-Secant.
- Generalized computational fracture mechanics that uses finite element analysis for more detailed stress characterization and crack driving forces.
- Crack growth prediction based on cyclic fatigue or stress-corrosion crack growth models.

Materials Validation: Exponent provides a variety of services to help clients capture, characterize, and defend the utilization of nondestructively attained material properties for the purpose of MAOP verification, including:

- Materials Data Collection Program Development and Support
- Materials Data Integration and Analysis
- Laboratory Test Protocols and Specification
- NDT Technology Tool Evaluation and Enhancement

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