

# PIPELINE SAFETY UPDATE

## SAFETY OF GAS TRANSMISSION PIPELINES: MAOP RECONFIRMATION, EXPANSION OF ASSESSMENT REQUIREMENTS, AND OTHER RELATED AMENDMENTS

Docket No. PHMSA - 2011-0023; Amdt Nos. 191-26; 192-125

*This rule went in to effect July 1, 2020*

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PHMSA is revising part 192 to address congressional mandates, NTSB recommendations and public input. The “mega” rule has been broken into three phases and as such this final rule is specific to Phase One. Although planned publication was for 2020, the subsequent phases have not yet been published.

Incidents have always influenced rulemaking and as such, this rule is no different. Two incidents are referenced throughout: PG&E - San Bruno, CA on September 9, 2010 (killed 8, injured 51, destroyed 38 homes and damaged another 70) and Columbia Gas – Sissonville, WV on December 11, 2012 (no fatalities, 3 homes destroyed, others damaged, gas igniting, and fire damage shut down I77 in both directions for 19 hours).

The first incident impacts traceable, verifiable, and complete (TVC) records and integrity management requirements. The second impacts the new definition of Moderate Consequence Area (MCA) to include arterial roads and highways.

The intent of Phase 1 is to address requirements for transmission pipelines; however, in some sections gathering has been explicitly exempted and in other sections, the rule stayed silent.

**The PHMSA rulemaking addresses many risk factors by making changes in the following areas:**

1. ADMINISTRATIVE & REPORTING

2. TRAINING & QUALIFICATION

3. TVC & MAOP

4. OPERATIONS & MAINTENANCE

5. INTEGRITY MANAGEMENT

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Red Indicates newly developed section

## 1. ADMINISTRATIVE AND REPORTING

### **§ 191.23 Reporting safety-related conditions.**

- This requirement is for operators to report each exceedance of MAOP that exceeds the margin (build-up) allowed for operation of pressure-limiting or control devices as a safety related condition.

### **§ 191.25 Filing safety-related condition reports.**

- Operators are to report each exceedance of the MAOP that exceeds the margin (build-up) allowed for operation of pressure-limiting or control devices and comply with the mandatory 5-day reporting deadline.

### **§ 192.3 Definitions.**

- Proposed definition of “Moderate consequence area.” This change will define this term as it is used throughout part 192. This threshold for buildings intended for human occupancy located within the potential impact radius is lowered from 20 to 5, and identified sites are excluded. This definition also includes locations where interstate highways, freeways, expressways, and other principal 4-or-more-lane arterial roadways are located within the potential impact radius. Right-of-ways are not included but shoulders are.
- PHMSA is also adopting a definition of an “engineering critical assessment,” as that term will be used in §§ 192.624 and 192.632. ECA is a documented analytical procedure that operators can use to determine the maximum tolerable size for pipeline imperfections based on the MAOP of the pipeline segment. Operators can use an ECA in conjunction with an ILI inspection as one of the methods to reconfirm MAOP, if required.

### **§ 192.5 Class locations.**

- This final rule adds a new paragraph, § 192.5(d), to require each operator of transmission pipelines to maintain records documenting the current class location of each pipeline segment and demonstrating how an operator determined each current class location in accordance with this section.

### **§ 192.7 What documents are incorporated by reference partly or wholly in this part?**

- Section 192.7 lists documents that are incorporated by reference in part 192. PHMSA is amending § 192.7 in the rule text to reflect other changes adopted in this final rule.

### **§ 192.9 What requirements apply to gathering lines?**

- This final rule codifies new standards for gas transmission pipelines, most of which are not intended to be applied to gas gathering pipelines. PHMSA is amending § 192.9 to clarify which provisions apply only to gas transmission pipelines and not to gas gathering pipelines. Type A gathering is treated as gas transmission except for the requirements in §§ 192.150, 192.285(e), 192.493, 192.506, 192.607, 192.619(e), 192.624, 192.710, 192.712, and in subpart O of this part.

### **§ 192.18 How to notify PHMSA.**

- PHMSA is adding a new section in subpart A that contains the procedure for submitting notifications for any pipeline segment. This is outside the special permit process.

### **§ 192.517 Records: Tests.**

- An operator must make and retain for the useful life of pipeline, a record for each test performed under §§192.505, 192.506, and 192.507.

### **§ 192.949 How does an operator notify PHMSA? (Removed and Reserved)**

- PHMSA is adding a new § 192.18 that contains the procedure for submitting notifications. As such, § 192.949 is no longer needed and is being removed and reserved.

## 2. TRAINING + QUALIFICATION

### **§ 192.227 Qualification of welders.**

- This final rule adds a new paragraph, § 192.227(c), to require each operator of gas transmission pipelines to make and retain records demonstrating each individual welder's qualification in accordance with this section for a minimum of 5 years following construction. This requirement will apply to pipelines installed after July 1, 2021.

### **§ 192.285 Plastic pipe: Qualifying persons to make joints.**

- This final rule adds a new paragraph, § 192.285(e), to require each operator of gas transmission pipelines to make and retain records demonstrating a person's plastic pipe joining qualifications in accordance with this section for a minimum of 5 years following construction. This requirement will apply to pipelines installed after July 1, 2021.

### **192.805 Qualification Program**

The new § 192.18 provides instructions for submitting notifications to PHMSA whenever required by part 192. PHMSA is making changes to § 192.805 to refer to the new § 192.18.

## 3. TRACEABLE, VERIFIABLE, COMPLETE AND MAOP

### **§ 192.67 Records: Material properties.**

- PHMSA has determined that compliance requires that pipeline material properties records are complete and accurate. This section requires each operator of gas transmission pipelines installed after the effective date of this final rule to collect or make, and retain for the life of the pipeline, records that document the physical characteristics of the pipeline, including tests, inspections, and attributes required by the manufacturing specification in effect at the time the pipe was manufactured. The physical characteristics an operator must keep documented include diameter, yield strength, ultimate tensile strength, wall thickness, seam type, and chemical composition. These requirements also apply to any new materials or components that are put on existing pipelines. For pipelines installed prior to July 1, 2020, operators are required to retain for the life of the pipeline all such records in their possession as of July 1, 2020. These recordkeeping requirements apply to offshore gathering lines and Type A gathering lines in accordance with § 192.9.

### **§ 192.127 Records: Pipe design.**

- For pipelines installed after July 1, 2020, this final rule adds a new § 192.127 to require each operator of gas transmission pipelines to collect or make, and retain for the life of the pipeline, records documenting pipe design to withstand anticipated external pressures and determination of design pressure for steel pipe. For pipelines installed prior to the July 1, 2020, operators are required to retain for the life of the pipeline all such records in their possession as of the effective date of this final rule.

### **§ 192.205 Records: Pipeline components.**

- PHMSA has determined that compliance requires that pipeline component records are complete and accurate. For pipelines installed after July 1, 2020, this section requires each operator of gas transmission pipelines to collect or make, and retain for the operational life of the component, records documenting manufacturing and testing information for valves and other pipeline components. For pipelines installed prior to July 1, 2020, operators are required to retain for the life of the pipeline all such records in their possession as of the July 1, 2020.

### **§ 192.506 Transmission lines: Spike hydrostatic pressure test.**

- A pressure test that incorporates a short duration "spike" pressure is a proven means to confirm the strength of pipe with known or suspected threats of cracks or crack-like defects (e.g., stress corrosion cracking, longitudinal seam defects, etc.). This new section includes the minimum standards for performing spike hydrostatic pressure tests when operators are required to, or elect to, use this assessment method. Under the spike hydrostatic pressure test requirements, an operator may use other technologies or processes equivalent to a spike hydrostatic pressure test with justification and notification in accordance with § 192.18.

### **§ 192.607 Verification of pipeline material properties and attributes: Onshore steel transmission pipelines.**

- Require operators of gas transmission pipelines in Class 3 and Class 4 locations and Class 1 and Class 2 locations in HCAs to verify records to ensure the records accurately reflect the physical and operational characteristics of the pipelines and confirm the MAOP of the pipelines established by the operator. This new section contains the procedure for verifying and documenting pipeline physical properties and attributes that are not documented in traceable, verifiable, and complete records and to establish standards for performing these actions.

- The new material properties verification requirements include the scope of information needed and the methodology for verifying material properties and attributes of pipelines. The most difficult information to obtain, from a technical perspective, is the strength of the pipeline's steel. This section specifies that operators can take advantage of opportunities when the pipeline is already being exposed, such as maintenance activities and when anomaly repairs are being made, to verify material properties that are not documented in traceable, verifiable, and complete records. Over time, pipeline operators will develop a substantial set of traceable, verifiable, and complete material properties data, which will provide assurance that material properties are reliably known for the population of segments that did not have pipeline physical properties and attributes documented in traceable, verifiable, and complete records previously. This section specifies the number of excavations required for operators to achieve this level of confidence.
- Operators may use an alternative sampling approach that differs from the sampling approach specified in the requirements if they notify PHMSA in advance of using an alternative sampling approach in accordance with § 192.18.
- Operators are required to document the results of the material properties verification process in records that must be retained for the life of the pipeline.

**§ 192.619 Maximum allowable operating pressure: Steel or plastic pipelines.**

- PHMSA amended its regulations so that manufacturing- and construction-related defects can only be considered "stable" if a gas pipeline has been subjected to a post-construction hydrostatic pressure test of at least 1.25 times the MAOP. This final rule revises the test pressure factors in § 192.619(a)(2)(ii) to correspond to at least 1.25 times MAOP for pipelines installed after July 1, 2020. This is a change from 1.1 times the MAOP.

**§ 192.624 Maximum allowable operating pressure reconfirmation: Onshore steel transmission pipelines.**

- Requires the verification of records for pipe in Class 3 and Class 4 locations, and high-consequence areas in Class 1 and Class 2 locations, to ensure they accurately reflect the physical and operational characteristics of the pipelines and reconfirm the established MAOP. PHMSA requires previously untested (grandfathered) pipeline segments located in HCAs or MCAs (if MCA can accommodate smart pig) and operating at greater than 30 percent SMYS be tested to confirm the material strength of the pipelines.
- The acceptable methods to reconfirm MAOP are specified and as follows:
  - Method 1 – Pressure test. Operators choosing to pressure test must also verify material property records in accordance with § 192.607.
  - Method 2 – Pressure reduction. Reduce pressure so that the MAOP is limited to less than the historical actual sustained operating pressure by using a pressure test safety factor of 0.80 (for Class 1 and Class 2 locations) or 0.67 (for Class 3 and Class 4 locations)
  - Method 3 – Engineering critical assessment. Using technical analysis with acceptance criteria to establish a safety margin equivalency in accordance with § 192.632.
  - Method 4 – Pipe replacement. Replacement of the pipe, which would require a new pressure test that conforms with subpart J before the pipe is placed into service.
  - Method 5 – Pressure reduction for pipeline segments with small potential impact radius. For pipeline segments with a potential impact radius of less than or equal to 150 feet, a pressure reduction using a safety factor of 0.90 times the sustained operating pressure is allowed (equivalent to a pressure test of 1.11 times MAOP), supplemented with additional specified preventive and mitigative measures.
  - Method 6 – Alternative technology. Other technology that the operator demonstrates provides an equivalent or greater level of safety, provided PHMSA is notified in advance in accordance with § 192.18.
  - Lastly, this section includes a new paragraph, § 192.624(f), to clearly specify that records created while reconfirming MAOP must be retained for the life of the pipeline.

**§ 192.632 Engineering critical assessment for maximum allowable operating pressure reconfirmation: Onshore steel transmission pipelines.**

- The requirements for reconfirming MAOP in the new § 192.624 include an option for operators to perform an engineering critical assessment, or ECA, in lieu of pressure testing and the other methods provided.

**§ 192.712 Analysis of predicted failure pressure.**

- The new requirements for reconfirming MAOP in the new § 192.624 include an option for operators to perform an engineering critical assessment, or ECA, in lieu of pressure testing and the other methods provided. A key aspect of ECA analysis is the detailed analysis of the remaining strength of pipe with known or assumed defects. The current 192, subparts I and O refer to methods for predicting the failure pressure for pipe with corrosion metal loss defects. However, the regulations are silent on performing such analysis for pipe with cracks (including crack-like defects such as selective seam weld corrosion). This new section is to address techniques and procedures for analyzing the predicted failure pressures for pipe with corrosion metal loss and cracks or crack-like defects.

## 4. OPERATIONS AND MAINTENANCE GENERAL

### **§ 192.493 In-line inspection of pipelines.**

- Presently, part 192 is silent on the technical standards or guidelines for performing ILI assessments or implementing these requirements. Three related standards have since been published and are now included in regulatory language. This new section requires compliance with the three consensus standards discussed below when conducting ILI of pipelines.
  - API STD 1163-2013, “In-Line Inspection Systems Qualification Standard.”
  - NACE Standard Practice, NACE SP0102-2010, “In-line Inspection of Pipelines.”
  - ANSI/ASNT ILI-PQ-2005 (2010), “In-line Inspection Personnel Qualification and Certification.”

### **§ 192.69 Storage and handling of plastic pipe and associated components.**

- Previous § 192.67, titled “Storage and handling of plastic pipe and associated components,” was created as a part of the Plastic Pipe rule. PHMSA is redesignating that section in this final rule to a new § 192.69. No other changes have been made to the section.

### **§ 192.150 Passage of internal inspection devices.**

- The incorporation of NACE Standard Practice SP0102-2010, section 7 into part 192 at § 192.150 will promote a higher level of safety by establishing consistent standards for the design and construction of pipelines to accommodate in-line inspection devices.

### **§ 192.710 Transmission lines: Assessments outside of high consequence areas.**

- This section is about expanding IM requirements beyond HCAs. Through this final rule, operators are required to periodically assess Class 3 locations, Class 4 locations, and MCAs that can accommodate inspection by means of an instrumented inline inspection tool. The periodic assessment requirements under this section apply to pipelines in these locations with MAOPs greater than or equal to 30 percent of SMYS.
- Industry has typically assessed portions of pipelines in non-HCA segments coincidentally with integrity assessments of HCA pipeline segments. In keeping with Industry’s stance, the language has been modified to reflect that operators are to periodically assess certain gas transmission pipelines outside of HCAs to monitor for, detect, and remediate pipeline defects and anomalies. Additionally, to achieve the desired outcome of performing assessments in areas where people live, work, or congregate, while minimizing the cost of identifying such locations. MCAs assume a similar process used for identifying HCAs, with the exception that the threshold for buildings intended for human occupancy located within the potential impact circle is reduced from 20 to 5.
- Where an operator has conducted a prior assessment of both HCA and non-HCA (MCA) pipeline segments, PHMSA is allowing operators to count those prior assessments as compliant with the new § 192.710 if those assessments were conducted, and threats remediated, in conjunction with an integrity assessment required by subpart O.
- The assessment required by this new § 192.710 must be conducted using the same methods as adopted for HCAs (see § 192.921). Operators may use “other technology” as an assessment method, provided the operator notifies PHMSA in accordance with § 192.18.

### **§ 192.750 Launcher and receiver safety.**

- The natural gas rules have remained silent on launcher and receiver safety. The current regulations for hazardous liquid pipelines at 49 CFR part 195 contain safety requirements for scraper and sphere facilities (§ 195.426). This section of the final rule requires a suitable means to relieve pressure in the barrel and either a means to indicate the pressure in the barrel or a means to prevent opening if pressure has not been relieved.

## 5. INTEGRITY MANAGEMENT

### **§ 192.909 How can an operator change its integrity management program?**

- A new § 192.18 provides instructions for submitting notifications to PHMSA whenever required by part 192. PHMSA is changing § 192.909 to refer to the new § 192.18.

### **§ 192.917 How does an operator identify potential threats to pipeline integrity and use the threat identification in its integrity program?**

- As with the new liquid rules which requires operators to consider seismicity when evaluating threats, PHMSA is revising § 192.917(a)(3) to include seismicity of the area in evaluating the threat of outside force damage. PHMSA is also revising the criteria in § 192.917(e)(3) for addressing the threat of manufacturing and construction defects by requiring that a pipeline segment must have been pressure tested to a minimum of 1.25 times MAOP to conclude latent defects are stable. Section 192.917(e)(4) has additional requirements for the assessment of low-frequency ERW pipe with seam failures. It now requires usage of the appropriate technology to assess low-frequency ERW pipe, including seam cracking and selective seam weld corrosion. Pipe with seam cracks must be evaluated using fracture mechanics modeling for failure stress pressures and cyclic fatigue crack growth analysis to estimate the remaining life of the pipe in accordance with § 192.712.
- Lastly, the integrity management requirements to address specific threats in § 192.917(e) include requirements for the major causes of pipeline incidents, such as corrosion, third-party damage, cyclic fatigue, manufacturing and construction defects, and electric resistance welded pipe. However, § 192.917(e) does not address cracks and crack-like defects. Therefore, PHMSA is adding a new paragraph, § 192.917(e)(6), to include specific IM requirements for addressing the threat of cracks and crack-like defects (including, but not limited to, stress corrosion cracking or other environmentally assisted cracking, seam defects, selective seam weld corrosion, girth weld cracks, hook cracks, and fatigue cracks) comparable to the other types of threats addressed in § 192.917(e).

### **§ 192.921 How is the baseline assessment to be conducted?**

- Section 192.921 requires that pipelines subject to the IM regulations have an integrity assessment. The current regulations allow operators to use ILI tools; pressure testing in accordance with subpart J; direct assessment for the threats of external corrosion, internal corrosion, and stress corrosion cracking; and other technology that the operator demonstrates provides an equivalent level of understanding of the condition of the pipeline. Because of San Bruno, direct assessment will only be allowed to assess the threats for which the specific direct assessment process is appropriate.
- Three additional assessment methods have been added for operators to use: (1) a “spike” hydrostatic pressure test, to address time-dependent threats, such as stress corrosion cracking and other cracking or crack-like defects that can include manufacturing- and construction-related defects; (2) guided wave ultrasonic testing (GWUT), which is particularly appropriate in cases where short pipeline segments, such as road or railroad crossings, are difficult to assess; and (3) excavation with direct in situ examination. Based upon the threat assessed, examples of appropriate non-destructive examination methods for in situ examination can include ultrasonic testing, phased array ultrasonic testing, inverse wave field extrapolation, radiography, or magnetic particle inspection.
- The paragraph § 192.921(a)(1) has been revised to require compliance with § 192.493 instead of ASME B31.8S for baseline ILI assessments for covered segments.
- ASME B31.8S, section 6.1, describes both excavation and direct in situ examination as specialized integrity assessment methods applicable to particular circumstances. Excavation and direct in situ examination are an acceptable assessment method as clarified by PHMSA.

### **§ 192.933 What actions must be taken to address integrity issues?**

- PHMSA is revising part 192 to include a new § 192.18 that provides instructions for submitting notifications to PHMSA. The modified section § 192.933 refers to the new § 192.18.

### **§ 192.935 What additional preventive and mitigative measures must an operator take?**

- PHMSA is revising § 192.935(b)(2) to include seismicity of the area when evaluating preventive and mitigative measures with respect to the threat of outside force damage.

**§ 192.937 What is a continual process of evaluation and assessment to maintain a pipeline's integrity?**

- This section requires that operators continue to periodically assess HCA pipeline segments and periodically evaluate the integrity of each covered pipeline segment. Reassessments must use the same assessment methods specified in § 192.921. Operators wishing to use “other technology” differing from the prescribed acceptable assessment methods must notify PHMSA in accordance with § 192.18.

**§ 192.939 What are the required reassessment intervals?**

- This section spells out reassessment intervals for pipelines subject to IM requirements at a minimum of once every 7 calendar years. An additional 6 months grace period may be granted if the operator submits written notice utilizing the guidelines published in the new § 192.18, demonstrating that the extension does not pose a safety risk.

**Appendix F to Part 192– Criteria for Conducting Integrity Assessments Using Guided Wave Ultrasonic Testing (GWUT)**

- As discussed under § 192.921 above, a new Appendix F to part 192 is needed to provide specific requirements and acceptance criteria for the use of GWUT as an integrity assessment method. Operators must apply all 18 criteria defined in Appendix F to use GWUT as an integrity assessment method. If an operator applies GWUT technology in a manner that does not conform with the guidelines in Appendix F, it would be considered “other technology” for the purposes of §§ 192.710, 192.921, and 192.937.



Erin McKay formed Evergreen Compliance Systems LLC following 25+ years working directly for pipeline operators. This included nearly 20 years with the Trans Alaska Pipeline System (TAPS), primarily in compliance oversight roles. Erin wanted to be able to use what she'd learned over the years to support a broader audience of pipeline operators and those that support them, and established Evergreen Compliance Systems to do just that.

Erin developed Evergreen:AIR to be the most comprehensive pipeline program research tool on the market to allow users to “search the way you think” to find data and gain insight much faster than other available methods.

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## **SAFETY OF GAS TRANSMISSION PIPELINES: MAOP RECONFIRMATION, EXPANSION OF ASSESSMENT REQUIREMENTS, AND OTHER RELATED AMENDMENTS**

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### **ACTIVITIES FOR CONSIDERATION**

#### **ADMINISTRATIVE**

Review HCA analysis to determine if MCAs should be same, housed within IMP or elsewhere-determine advantages/disadvantages for business purposes

Modify procedures

The reporting of exceedances of MAOP

Modify Gas O&M to reflect reporting changes for safety related conditions, exceedance of MAOP, and notification guidelines (§ 192.18)

Modify O&M to reflect class location changes to include current and determination must be documented/retained

Review paperwork for class location changes – must be complete, accurate, demonstrate how class location determined, and current

Modify programs to include references to all new documents incorporated by reference

Modify programs to include all new regulatory language

Assist with ensuring new compliance deadlines are captured

Adjust workflow and or processes as necessary dependent on who owns the changes

Consider a glossary for all the new definitions

Access to the newly referenced standards and documents (there are 3 industry standards just for ILI assessments)

#### **TRAINING & QUALIFICATION**

Welder qualifications must be maintained for 5 years following construction

Plastic pipe and qualifying persons to make joints – qualifications must be maintained for 5 years following construction

Create and develop training for various stakeholders

#### **TRACEABLE VERIFIABLE & COMPLETE**

Reconfirm MAOPs where applicable and retain associated paperwork

Create an acceptable TVC process for the company, one you are willing to live with

Ensure TVC so that material properties verification is not necessary

Record management for life of pipe

Reconfirm the maximum allowable operating pressure of previously untested natural gas transmission pipelines and pipelines lacking certain material records where applicable

Pipeline component records – retain for operational life of component – add to job books, where applicable

TVC records review & analysis – identify gaps

## OPERATIONS & MAINTENANCE GENERAL

**Install safety features on in-line inspection launchers and receivers or confirm that they are already in place**

**Create road/highway database for every state in which you operate**

**Identify MCAs**

**The periodic assessment of pipelines in “Moderate Consequence Areas” areas not designated as “high consequence areas,” to include arterial roads and highways**

**Review what applies to gathering, watching cross references to ensure no unintended consequences (§ 192.67 applies to Type A gathering for material properties and record keeping)**

**Review where there is plastic pipe, ensuring there is only gathering in gas service, records for pipe design retain for life of pipe**

## INTEGRITY MANAGEMENT

**New integrity management requirements (such as: consideration of seismicity as a risk factor plus preventive & mitigative measures, engineering analysis)**

**QC/QA spatial data for repository**

**ILI assessments and the newly referenced standards provide details that need to be addressed in the IMP, such as use of tethered or remote-controlled ILI tools, qualifications and certification requirements, and specific details of ILI inspections**

**IMP process development**

**6-month grace period for 7-calendar-year integrity management reassessment intervals, related recordkeeping, and operator must ask permission**

**Risk matrix developed and reviewed, integrating new information**

**Identify gaps with definitive timelines for closure, given informational analysis and integration of data, knowns and unknowns.**

**Assess all applicable pipelines for inclusion into IMP and setting into place deadlines and compliance activities.**