



U.S. Department
of Transportation

Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Avenue SE
Washington DC 20590

SEP 27 2018

Mr. Thomas M. Stemrich
Pipeline Safety Program Manager
Public Service Commission of Wisconsin
610 N. Whitney Way
P.O. Box 7854
Madison, WI 53707

Dear Mr. Stemrich:

In a March 7, 2018, letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA), you requested an interpretation of 49 Code of Federal Regulations (CFR) Part 192. Specifically, you requested an interpretation to clarify if a pressure test (using natural gas as the test medium) conducted for purpose of uprating maximum allowable operating pressure (MAOP) in accordance with 49 CFR Part 192, subpart K could be a flowing gas test, or if the regulations require a static pressure test. You expressed an opinion that the pressure test required under § 192.619(a)(2)(ii) should be a static pressure test that holds the pressure constant so that all potentially hazardous leaks can be detected.

You stated that you have a case where an operator, Xcel Energy, is planning to uprate a steel pipeline from an MAOP of 316 psig to 400 pounds per square inch gauge (psig)¹ and provided the following additional information:

- The operator would like to perform a flowing gas pressure test to 1.5 times the desired MAOP (i.e., the test pressure would be 600 psig).
- The operator would raise the MAOP in four equal increments.
- The pressure would be held constant for one hour at each interval while a leak survey of the entire system is conducted.
- Once the pressure reached 600 psig, a final leak survey would be conducted, and the pressure would be allowed to drop to 400 psig through normal system load demand, or by flaring the gas.
- A follow-up leak survey would be conducted a week after the line had been running at 400 psig.

Through supplemental communication, you provided the following additional information:

- The pipeline was constructed in 1992.
- Most of the segment to be uprated is located in class 1 locations, but some portions are in classes 2 and 3.

¹ Xcel Energy requested similar interpretation but withdrew the request.

- PHMSA comment: The proposed test pressure would need to be in compliance with § 192.619(a)(2) for class 3 pipe (1.5 times proposed MAOP).
- The maximum test pressure would be less than 30 percent of the pipe specified minimum yield strength (SMYS).
 - PHMSA comment: This would be in compliance with § 192.503(c), although PHMSA notes that any test pressure excursion above 30% of SMYS would not comply with § 192.503(c) and would not be allowed].
- You stated that the operator might not have pressure test records or complete material records available to confirm the current MAOP of portions of the pipeline segment to be uprated (therefore, there may be specific attributes that were not provided because they are unknown).

For the circumstance described above, a number of conditions and requirements apply which might preclude the use of a flowing gas test to uprate MAOP, depending on the circumstance. The information provided is insufficient to make a definitive conclusion for the situation you describe. Some of these requirements and potential impediments to the use of a flowing gas test are discussed below. This is not an exhaustive list of requirements that might preclude use of a flowing gas test.

For a steel pipeline operated at 100 psig or more and below 30% SMYS, the applicable technical requirements of subpart K are contained in §§ 192.553 and 192.557. Operators must follow all requirements in §§ 192.553 and 192.557. In addition, pressure tests must comply with subpart J and § 192.619(a). With respect to the acceptability of a flowing gas pressure test to uprate MAOP, PHMSA points out the following:

Limitation of §192.553(d)

Section 192.553(d) has a limitation on uprating. The uprated MAOP may not exceed the MAOP that would be allowed under §§ 192.619 and 192.621 for a new segment of pipeline constructed of the same materials in the same location. Thus, the operator would have to ensure that an uprated MAOP does not exceed the lowest of the four pressures determined in accordance with §192.619(a)(1), (a)(2), (a)(3), and (a)(4). The pressure test itself would satisfy paragraph (a)(2). Paragraph (a)(3) is not applicable because the pipeline was constructed after 1970. Paragraph (a)(4) could be satisfied by the review required in §192.557(b). Section 192.619(a)(1) would require the following:

- However, for steel pipe in pipelines being uprated under subpart K, §192.553(d) emphasizes that *“if any variable necessary to determine the design pressure under the design formula (§192.105) is unknown, the MAOP may be increased as provided in §192.619(a)(1).”* In accordance with §192.619(a)(1), if any variable necessary to determine the design pressure of the weakest element in the segment (determined in accordance with subparts C and D) is unknown, 192.619(a)(1) requires that one of the following be used as the design pressure:
 - (i) Eighty percent of the first test pressure that produces yield under section N5 of Appendix N of ASME B31.8 (incorporated by reference, *see* §192.7), reduced by the appropriate factor in paragraph (a)(2)(ii) of this section; or

(ii) If the pipe is 12¾ inches (324 mm) or less in outside diameter and is not tested to yield under this paragraph, 200 p.s.i. (1379 kPa).

In order to uprate to a higher MAOP, the operator must know the pipeline material attributes required in §§ 192.619(a)(1) and 192.105, including diameter, wall thickness, yield strength (grade), seam type, and other component pressure ratings (valves, flanges and fittings). For the circumstance described above in which some attributes are not known, a flowing gas test (which is limited to 30% of SMYS in accordance with 192.503(c)) would not produce yield and would be insufficient to establish the design pressure for pipe segments with unknown design properties. A hydrostatic test to yield would be required (if the pipe is 12¾ inches or less in outside diameter and is not tested to yield, the MAOP would be limited to no more than 200 psig).

In this circumstance (i.e., if any pressure containing material variables necessary to determine the design pressure under the design formula (§ 192.105) are unknown), a flowing gas pressure test could not be performed because §§ 192.105 and 192.503 requirements would not be verified to uprate the MAOP of the segment with natural gas. If material records needed for MAOP verification are not available, an operator would need to work with the appropriate 49 CFR Part 192 Regulating Agency to determine the required material verification activities and any required special permit (waiver) actions needed to be performed prior to uprating this pipeline segment.

Isolation of adjacent segments

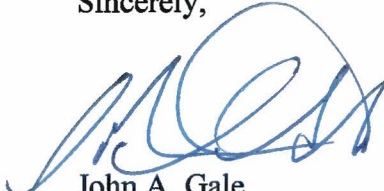
Adjacent pipeline segments that are not being updated and/or have an MAOP less than the maximum test pressure must be isolated from the segment being upgraded (§ 192.557(b)(5)). Therefore, the operator may not continue to flow gas during the uprating process to a pipeline segment operated at a lower pressure and with an MAOP lower than the maximum test pressure. This requirement might preclude the use of a flowing gas test, depending on the circumstances and the effect of isolating adjacent segments.

- In order to perform a flowing gas pressure test, the adjacent pipeline segment with the lower pressure (MAOP) would either need to be isolated or protected by pressure-control regulators and with overpressure control and mainline valves for shut-off to prevent over-pressurization.

In addition, the operator must take appropriate safety measures to prevent any potential hazardous situations should the line leak or fail during the test, including conducting all Code required leak surveys and repairs. This is especially a concern for uprating segments where the operator does not have the pressure test records available to confirm the current MAOP or the pipeline material properties and component (fittings, flanges or valve) records to confirm the design pressure of the pipelines' weakest link in accordance with § 192.619(a)(1).

If we can be of further assistance, please contact Tewabe Asebe at 202-366-5523.

Sincerely,



John A. Gale
Director, Office of Standards
and Rulemaking

Request for interpretation- Uprating pressure test.

Gentlemen,

We would like your interpretation regarding 192.619(a)(2)(ii) and 192.557. We have a case where an operator is planning to uprate a steel pipeline from 316 to 400 psi. The majority of the line was constructed in 1992. In order to meet class 3 design standards, the operator would like to raise the MAOP of the pipeline from 316 to 400 PSIG in 4 equal increments to 600 psig (1.5 times the new MAOP). Gas would be flowing to all the customers along the line in question, during this process. The pressure would be held constant for one hour at each interval while a leak survey of the entire system is conducted. Once the pressure has reached 600 psig a final leak survey would be conducted and the pressure would be allowed to drop to 400 psig through normal system load demand, or by flaring the gas. A follow-up leak survey would be conducted a week after the line had been running at 400 psig.

It is the contention of PSCW staff that the pressure test required under 192.619(a)(2)(ii) should be a static pressure test that holds the pressure constant so that all potentially hazardous leaks can be detected. Having gas flowing during the test, in our opinion, would not ensure the discovery of all potentially hazardous leaks. We are also concerned that should the line fail during this test it could create a hazardous situation, depending on where the failure would occur. It should also be noted that the operator does not have the pressure test records available to confirm the current MAOP of portions of the pipeline to be uprated.

We would appreciate your interpretation on this matter.

Thomas M Stemrich

Pipeline Safety Program Manager

Public Service Commission of Wisconsin