

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

Subpart K**Uprating****§ 192.551 Scope**

This subpart prescribes minimum requirements for increasing maximum allowable operating pressures (uprating) for pipelines.

ESI RESPONSE TO § 192.551

Minimum requirements for uprating pipelines to higher MAOP'S are outlined in section 8.4.5 Uprating in ESI's "Gas Transmission Pipelines Plant Engineering Specification".

§ 192.553 General Requirements

- (a) *Pressure increases.* Whenever the requirements of this subpart require that an increase in operating pressure be made in increments, the pressure must be increased gradually, at a rate that can be controlled, and in accordance with the following:

Approved: Signature on file Date:
Manager, Safety, Health, and Environmental

Approved: Signature on file Date:
Environmental Manager

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (1) At the end of each incremental increase, the pressure must be held constant while the entire segment of the pipeline that is affected is checked for leaks.
 - (2) Each leak detected must be repaired before a further pressure increase is made, except that a leak determined not to be potentially hazardous need not be repaired, if it is monitored during the pressure increase and it does not become potentially hazardous.
- (b) *Records.* Each operator who uprates a segment of pipeline shall retain for the life of the segment a record of each investigation required by this subpart, of all work performed, and of each pressure test conducted, in connection with the uprating.
- (c) *Written plan.* Each operator who uprates a segment of pipeline shall establish a written procedure that will ensure that each applicable requirement of this subpart is complied with.
- (d) *Limitation on increase in maximum allowable operating pressure.* Except as provided in § 192.555(c), a new maximum allowable operating pressure established under this subpart may not exceed the maximum that would be allowed under this part for a new segment of pipeline constructed of the same materials in the same location. However, when uprating a steel pipeline, 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).

§ 192.555 Uprating to a Pressure that Will Produce a Hoop Stress of 30% or More of SMYS in Steel Pipelines

ESI RESPONSE TO § 192.555

Minimum requirements for uprating pipelines to higher MAOP'S are outlined in section 8.4.5 Uprating, 8.4.5.1 General, and 8.4.5.2 Uprating Steel Pipelines to a Pressure That Will Produce a Hoop Stress of 30% or More of SMYS in ESI's "Gas Transmission Pipelines Plant Engineering Specification" DOT-006.

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (a) Unless the requirements of this section have been met, no person may subject any segment of a steel pipeline to an operating pressure that will produce a hoop stress of 30% or more of SMYS and that is above the established maximum allowable operating pressure.
- (b) Before increasing operating pressure above the previously established maximum allowable operating pressure the operator shall:
 - (1) Review the design, operating, and maintenance history and previous testing of the segment of pipeline and determine whether the proposed increase is safe and consistent with the requirements of this part; and
 - (2) Make any repairs, replacements, or alterations in the segment of pipeline that are necessary for safe operation at the increased pressure.
- (c) After complying with paragraph (b) of this section, an operator may increase the maximum allowable operating pressure of a segment of pipeline constructed before September 12, 1970, to the highest pressure that is permitted under § 192.619, using as test pressure the highest pressure to which the segment of pipeline was previously subjected (either in a strength test or in actual operation).
- (d) After complying with paragraph (b) of this section, an operator that does not qualify under paragraph (c) of this section may increase the previously established maximum allowable operating pressure if at least one of the following requirements is met:
 - (1) The segment of pipeline is successfully tested in accordance with the requirements of this part for a new line of the same material in the same location.
 - (2) An increased maximum allowable operating pressure may be established for a segment of pipeline in a Class 1 location if the line has not previously been tested, and if:

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (i) It is impractical to test it in accordance with the requirements of this part.
 - (ii) The new maximum operating pressure does not exceed 80% of that allowed for a new line of the same design in the same location; and
 - (iii) The operator determines that the new maximum allowable operating pressure is consistent with the condition of the segment of pipeline and the design requirements of this part;
- (e) Where a segment of pipeline is uprated in accordance with paragraph (c) or (d)(2) of this section, the increase in pressure must be made in increments that are equal to:
 - (1) 10% of the pressure before the uprating; or
 - (2) 25% of the total pressure increase, whichever produces the fewer number of increments.

ESI RESPONSE TO § 192.555

The following list contains items which an operator should consider prior to increasing operating pressure.

DESIGN REVIEW:

- (a) **Present class location.**
- (b) **Adequacy of the original design and of any change made to the original design during or subsequent to the original installation for service at the proposed maximum allowable operating pressure. Particular attention should be paid to the following:**
 - (1) **Materials identification as shown on company records.**

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (2) Use of mill or other material analysis, inspection reports or field inspections to resolve discrepancies and determine unknown values.
- (3) Pressure/temperature ratings of components, especially rated pressure at the limiting temperature of valves, regulators, etc.
- (4) Longitudinal joint factor (E) of pipe (§ 192.113)
- (5) End closures
- (6) Flexibility of piping arrangements.
- (c) Present right-of-way conditions such as the following:
 - (1) Buried pipelines which have become exposed.
 - (2) Pipeline segments crossing or within the right-of-way of public roads.
 - (3) Crossings exposed to heavy vehicular traffic.
 - (4) Pipeline segments subject to additional mechanical stress due to support settlement or other factors.
- (d) Adequacy of mill tests on pipe which has not been tested after installation to at least 118% of the proposed maximum allowable operating pressure.
- (e) Characteristics at the proposed maximum allowable operating pressure of existing regulators, flow controllers and other instruments.
- (f) Evaluate the need for additional flow control, pressure limiting or shutoff components at the proposed maximum allowable operating pressure.
- (g) Adequacy of connected service facilities.

OPERATING HISTORY REVIEW:

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (a) Date of original construction (before or after September 12, 1970).
- (b) Operating pressures and temperature experienced by the pipeline segment.
- (c) For segments of pipeline constructed before September 12, 1970, records of an operating pressure appropriate for use as a test pressure as permitted under §192.555(c).
- (d) Leakage history records.
- (e) Corrosion records.
- (f) Cathodic protection.
 - (1) Date installed.
 - (2) Level maintained.
 - (3) Substantial changes in cathodic protection requirements.
- (g) Unusual operating conditions.
- (h) Failure and emergency reports including the possibility of recurrence because of the increased pressure.

MAINTENANCE HISTORY REVIEW:

- (a) Existing unrepaired leaks.
- (b) Repairs made to leaks, damaged pipe and welds.
- (c) Pipe inspection, leakage survey and cathodic protection reports for condition of pipe and coating.

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

TESTING HISTORY REVIEW:

- (a) Segments of pipeline constructed on or after September 12, 1970.
 - (1) Test pressure, test media and test duration.
 - (2) Date test accepted.
 - (3) Cause of any test failure (if known).
 - (4) Repairs made to leaks, damaged pipe and welds.
- (b) Segments of pipeline constructed before September 12, 1970.
 - (1) Highest pressure to which each test segment was strength tested or in lieu thereof, pressure of a strength test sufficient to serve as an acceptable test pressure for the proposed maximum allowable operating pressure.
 - (2) Approximate date of test.
 - (3) Cause of any test failure (if known)
 - (4) Repairs made to leaks, damaged pipe and welds.

§ 192.557 Upgrading: Steel Pipelines to a Pressure That Will Produce A Hoop Stress Less Than 30% of SMYS: Plastic, Iron, and Ductile Iron Pipelines

- (a) Unless the requirements of this section have been met, no person may subject:
 - (1) A segment of steel pipeline to an operating pressure that will produce a hoop stress less than 30% of SMYS and that is above the previously established maximum allowable operating pressure; or

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

ESI RESPONSE TO § 192.557

Reference section 8.4.5.2 ‘Uprating Steel Pipelines to a Pressure That Will Produce a Hoop Stress of 30% or More SMYS’, in ESI’s “Gas Transmission Pipelines Plant Engineering Specification” DOT-006.

- (2) A plastic, cast iron, or ductile iron pipeline segment to an operating pressure that is above the previously established maximum allowable operating pressure.

NOT APPLICABLE. ESI DOES NOT USE PLASTIC, IRON, OR DUCTILE IRON FOR DOT PIPELINES.

- (b) Before increasing operating pressure above the previously established maximum allowable operating pressure, the operator shall:
 - (1) Review the design, operating, and maintenance history of the segment of pipeline;
 - (2) Make a leakage survey (if it has been more than 1 year since the last survey) and repair any leaks that are found, except that a leak determined not to be potentially hazardous need not be repaired, if it is monitored during the pressure increase and it does not become potentially hazardous;
 - (3) Make any repairs, replacements, or alterations in the segment of pipeline that are necessary for safe operation at the increased pressure;
 - (4) Reinforce or anchor offsets, bends and dead ends in pipe joined by compression couplings or bell spigot joints to prevent failure of the pipe joint, if the offset, bend, or dead end is exposed in an excavation;
 - (5) Isolate the segment of pipeline in which the pressure is to be increased from any adjacent segment that will continue to be operated at a lower pressure; and

**NATURAL GAS
PART 192****GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

- (6) If the pressure in mains or service lines, or both, is to be higher than the pressure delivered to the customer, install a service regulator on each service line and test each regulator to determine that it is functioning. Pressure may be increased as necessary to test each regulator, after a regulator has been installed on each pipeline subject to the increased pressure.
- (c) After complying with paragraph (b) of this section, the increase in maximum allowable operating pressure must be made in increments that are equal to 10 p.s.i.g. or 25% of the total pressure increase, whichever produces the fewer number of increments. Whenever the requirements of paragraph (b)(6) of this section apply, there must be at least two approximately equal incremental increases.
- (d) If records for cast iron or ductile iron pipeline facilities are not complete enough to determine stresses produced by internal pressure, trench loading, rolling loads, beam stresses, and other bending loads, in evaluating the level of safety of the pipeline when operating at the proposed increased pressure, the following procedures must be followed:
- (1) In estimating the stress, if the original laying conditions cannot be ascertained, the operator shall assume that cast iron pipe was supported on blocks with tamped backfill and that ductile iron pipe was laid without blocks with tamped backfill.
 - (2) Unless the actual maximum cover depth is known, the operator shall measure the actual cover in at least three places where the cover is most likely to be greatest and shall use the greatest cover measured.
 - (3) Unless the actual nominal wall thickness is known, the operator shall determine the wall thickness by cutting and measuring coupons from at least three separate pipe lengths. The coupons must be cut from pipe lengths in areas where the cover depth is most likely to be the greatest. The average of all measurements taken must be increased by the allowance indicated in the following table:

**NATURAL GAS
PART 192**
**GAS PIPELINE TRANSMISSION
OPERATION AND MAINTENANCE
MANUAL**

Pipe size (inches)	Allowance (inches)		Ductile iron pipe
	Cast iron pipe		
	Pit cast pipe	Centrifugally cast pipe	
3 to 8....	0.075	0.065	0.065
10 to 12..	0.08	0.07	0.070
14 to 24..	0.08	0.08	0.075
30 to 42..	0.09	0.09	0.075
48	0.09	0.09	0.080
54 to 60..	0.09		

- (4) For cast iron pipe, unless the pipe manufacturing process is known, the operator shall assume that the pipe is pit cast pipe with a bursting tensile strength of 11,000 p.s.i. and a modulus of rupture of 31,000 p.s.i.