

Chapter 10 - Uprating Maximum Allowable Operating Pressure

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1.0 SCOPE [[192.551](#)]

This chapter describes DENC and DESC 's minimum requirements for uprating pipelines to increase the current established *maximum allowable operating pressure* (MAOP) to a new, higher MAOP.

2.0 REGULATORY REFERENCES

49 CFR Part 192 §§ [192.241](#), [192.551](#), [192.553](#), [192.555](#), [192.557](#), [192.619](#), [Subpart K](#)

3.0 PROCEDURE

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3.1 General requirements [[192.553](#)] [[192.241](#)] [[Subpart K](#)] [[192.619](#)]

(a) General

- (1) Any uprate *must* be performed in accordance with [49 CFR Subpart K](#).

- (2) A new/revised **MAOP** resulting from an uprate process **may** not exceed the MAOP of new **pipe** constructed of the same materials in that same location.
- (3) A new/revised MAOP cannot exceed that which would be allowed under [192.619](#).

(b) Required Pressure Tests

- (1) If a pipeline does not have an adequate pressure test record to substantiate the desired MAOP, then the pipeline must be tested consistent with the higher MAOP. This test can be completed as part of the procedure or it may be tested as part of a separate procedure. If completed as part of the uprate procedure through increases in pipeline operating pressure, the pressure must be incremented to the new test pressure.
- (2) Unless approved by **engineering**, pressure tests conducted as part of an uprate **should** be conducted consistent with test procedures for newly constructed pipelines.

NOTE: A pressure test can be: 1) any previously performed test including original post-construction tests or prior retests completed as part of a separate procedure; 2) a test conducted as part of the uprate procedure; or 3) where approved by engineering, a historical operating pressure that suffices as a pressure test.

(c) Pressure Increases by Increments:

- (1) In general, it is preferred to increase the operating pressure in a pipeline as part of an uprate procedure in increments whether a pressure test is being conducted or not.
- (2) Whenever increments are required as part of an uprate procedure, the pressure must be increased gradually at a rate that can be controlled and at the end of each increase the pressure must be held constant while the entire segment of line is checked for leaks. Each **leak** detected must be repaired before further increasing pressure, except that leaks not determined to be potentially hazardous may be monitored.
- (3) The line should be checked for leaks by monitoring pressures and by instrumented leakage survey/or unless otherwise approved by engineering.
- (4) DENC and DESC leak response procedures as prescribed in [Chapter 12-B Leak Response, Leak Classification, and Gas Emergencies](#) **shall** be followed when grading or working with leaks.
- (5) Increments are not required in the following situations:
 - (i) when increasing a current MAOP to a revised, higher MAOP that is also substantiated by test and design records review; or
 - (ii) when lines are tested as part of the uprate procedure.

(d) Uprate Planning

- (1) A written plan is required when uprating a pipeline. The Director of Engineering & Construction shall be responsible for approving job-specific uprating procedures for each job. These job-specific procedures shall meet the minimum requirements of this procedure and should include the following:
 - (i) A step-by-step procedure/checklist of the steps to be completed in sequence during the field portion of the actual uprate, including prescribed pressure increases, use of increments, procedures for checking for leaks, over pressure protection, and pressure monitoring of the pipe section(s) being uprated and adjacent line segments to ensure they are properly isolated.

(ii) A review of the design, operating and maintenance history of the pipeline to be sure that the proposed increase will be safe. Items to be reviewed may include:

- (A) Records concerning previous pressure tests
- (B) MAOP determination
- (C) Class locations
- (D) Rights-of-way and properties near the pipeline
- (E) Pressure-temperature ratings of materials added to the system during maintenance
- (F) Leak records or any other record needed to assess the integrity of the system
- (G) Records of other inspections, maintenance, or repairs
- (H) The need to isolate the pipeline from any adjacent segment(s) that will continue to be operated at the lower pressure. This may include installation of valves, regulating stations, or physical disconnections
- (I) Review of existing regulating stations, locations, and operating history
- (J) Verification that existing regulators and relief/pressure control devices on the uprated pipeline will have adequate capacity at the new MAOP.
- (K) Evaluate the location, configuration, and placement of any pressure regulator equipment, control lines, and relief valves in regards to the uprate strategy / plan
- (L) Ensure the replacement, repair, alteration, or upgrades to ensure safe operation of the system at the increased pressure.
- (M) Ensure consideration is given to pipe segments potentially requiring reinforcement, including exposed piping sections, bends, segments joined by couplings, etc.
- (N) Evaluate the need to determine the percent of Specified Minimum Yield Strength (*SMYS*) for the hoop stress exerted by the new MAOP. This will determine the more specific requirements for the uprate as well as help identify the need to modify any inspections or maintenance consistent with the new MAOP.

(2) The plan should also address what records will be compiled and retained for the life of the pipeline.

NOTE: A pipeline not x-rayed per [192.241](#) cannot be uprated to an MAOP that is $\geq 20\%$ of SMYS. Any non-grandfather clause pipeline must be x-rayed if operating at 20% or more of SMYS

- (e) Determine the MAOP for an identical pipeline installed in the same location. The revised MAOP may not exceed the MAOP of new pipe of same materials in that location.
- (f) If a pipeline is to be uprated to a pressure greater than that allowed by its previous testing, it must be successfully re-tested, with the exception listed in [3.2](#) below, in accordance with O&M [Chapter 9 - Pressure Test Requirements](#).

- (g) If the pipeline pressure is to be increased to a pressure that meets the criteria listed above, determine the percent of Specified Minimum Yield Strength (SMYS) for the hoop stress exerted by the new pressure and initiate the appropriate procedure below.
- (h) Verify that existing regulators and relief/pressure control devices on the uprated pipeline will have adequate capacity at the new MAOP.
- (i) Make any replacements, repairs or alterations to upgrades to ensure safe operation of the system at the increased pressure.

3.2 Uprating to a pressure that will produce a hoop stress of 30 percent or more of SMYS in steel pipelines [[192.555](#)]

Unless the pipeline has a previous test commensurate with the new MAOP or if the line is not tested as part of the uprate procedure, the pressure must be increased in increments equal to:

- (1) 10% of pressure before uprating

- Or -

- (2) 25% of total pressure increase

whichever produces the fewest number of increments.

3.3 Uprating Steel pipelines to a pressure that will produce a hoop stress less than 30 percent of SMYS [[192.557](#)]

- (a) If it has been more than 1 year from the previous leak survey, a leak survey shall be conducted. All Grade 1 and potentially hazardous leaks shall be repaired before initiating the uprate procedure. If the leak is determined not to be potentially hazardous, the leak shall be monitored throughout the uprate procedure.
- (b) After complying with the above steps, the pipeline may be uprated. Gradually increase the MAOP in increments equal to 10 psi or 25 percent of the total pressure increase, whichever produces the fewer number of increments.
- (c) When uprating a low pressure system and new service regulators are installed as part of the uprating procedure, at least two equal pressure increases shall be made.

4.0 TRAINING/QUALIFICATIONS

None at this time.

5.0 DOCUMENTATION/FORMS

All records documenting the uprating of any pipeline shall be maintained for the life of the pipeline. These records may include:

- Job-specific uprating procedure
- Leak survey and repair records
- Pressure test charts
- As-built diagrams and maps
- Material replacements
- Work performed during uprating

Pressure test documentation shall follow the requirements of [Chapter 9 - Pressure Test Requirements, 5.0 Documentation/Forms](#).

System specific forms should be used where applicable.

6.0 RELATED DOCUMENTS

None at this time.

7.0 APPENDICES

None at this time.

(UNCONTROLLED IF PRINTED)