

STATE OF NEW HAMPSHIRE

CHAIRMAN
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Kathryn M. Bailey

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Debra A. Howland



PUBLIC UTILITIES COMMISSION

21 S. Fruit St., Suite 10
Concord, N.H. 03301-2429

TDD Access: Relay NH
1-800-735-2964

Tel. (603) 271-2431

FAX No. 271-3878

Website:
www.puc.nh.gov

January 27, 2016

Mr. Thomas Meissner
Chief Operating Officer
Northern Utilities
6 Liberty Lane
Hampton, NH 03842

Re: Northern Utilities, New Hampshire Gas Division
Notice of Probable Violations of Natural Gas Pipeline Safety Act
Control# PS1602NU
Pipelines Affected: Dover-Durham High Pressure System (99 psig MAOP)

Dear Mr. Meissner:

Pursuant to the Natural Gas Pipeline Safety Act, 49 U.S.C. §60101 *et seq.*, applicable state law as set forth at RSA 370:2, and the relevant regulations of the New Hampshire Public Utilities Commission (Commission), N.H. Code Admin. Rules Part Puc 511, the Commission hereby serves upon Northern Utilities (Unitil) this formal Notice of Probable Violation pursuant to Puc 511.05 for conditions relating to operations that incorrectly established the maximum allowable operating pressure (MAOP) for a single gas pipeline distribution system and documentation of records. The gas pipeline system was identified as the System #24 Dover-Durham 99 psig MAOP High Pressure system ("the pipeline") that transports natural gas from the Hawthorne Street district regulator stations in Dover to primarily feed the Durham area and in particular UNH. This system was uprated in 1996, but not in accordance with minimum federal and state standards. To be more specific, Unitil did not uprate the Dover-Durham pipeline in accordance with Part 192 Subpart K and thus resulted in operations being out of compliance with Part 192 Subpart L.

This notice arises from a series of related records inspections, on October 2, 2015 and November 3, 2015, by the Safety Division of Unitil's record keeping associated with the 1996 uprate to 99 psig MAOP of the Dover-Durham system, hereinafter referred to as "pipeline". Unitil was unable to provide documentation to substantiate compliance with various aspects of 49 CFR Part 192.

The Safety Division alleges that Unitil violated 49 CFR §§ 192.553(b), 192.553(c), 192.553(d), 192.557(a) and 192.557(c), for inadequately pressure testing and operating pipeline segments at pressure levels inconsistent with Unitil's self-established 99 psig MAOP of the pipeline. Main and Service records provided by Unitil and reviewed by the Safety Division, confirmed that the pipeline was not adequately uprated for plastic mains and services. Pressure test levels, pressure increments used, and retention of leak survey results for each of the pressure increments, were not recorded in accordance with the requirements for uprating, as defined in Subpart K.

In addition, probable violations of §§192.603, 192.605, and 192.619 occurred when the subsequent operations of the pipeline were not in accordance with the operational requirements of Subpart L. The Safety Division alleges that Unitil's Operations and Maintenance procedure used for uprating, was not followed. Additionally, the Safety Division alleges that Unitil has been operating the pipeline at pressure above the MAOP allowed by Subpart L and established by Subpart K.

Please note that this notice alleges a series of probable violations.

Probable Violation No. 1

49 CFR §192.553 General requirements [of Subpart K – Uprating]

(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:

(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 §§ 192.619 and 192.621 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).

The Safety Division alleges that Unitil did not uprate the Dover-Durham system in 1996 in accordance with §§192.553(b), 192.553(c) nor 192.553(d) to be able to eventually operate it at desired 99 psig.

Unitil could not provide documentation of the the required leakage surveys as required by §192.553(b) for multiple segments of the pipeline. In fact, Unitil could not provide documentation of leak surveys during the uprate, anywhere along the pipeline. Requirements call for these records to be retained by the operator for the life of the pipeline. Unitil has stated that it cannot locate any of these required records.

Unitil's 1995 version of its Operations & Maintenance Manual ("O&M") included a procedure for uprating distribution mains and services. The procedure, located in Section 4.06 of the O&M, was titled "Uprating Mains and Services to Higher Operating Procedures". The Safety Division finds that Section 4.06 of Unitil's O&M was not written to address the pressure test requirements of Subpart K,

required for uprating to achieve the desired MAOP. Unitil was unable to provide adequate documentation to the Safety Division that demonstrated its uprating procedure met the requirements of §192.553(c).

In addition, §192.553(d) requires for pipeline systems that contain plastic, the pressure test needs to be at 1.5 times the desired maximum allowable operating pressure. This is referenced within §192.553(d). For cases where a new maximum allowable operating pressure is to be established (such as the pipeline referenced in this notice) the new MAOP cannot exceed the pressure levels that would be allowed under §§ 192.619(a)(2)(i) and 192.621 for a new segment of pipeline constructed of the same materials in the same location. Thus for segments where plastic pipe is part of the uprate, the MAOP is limited to the pressure test divided by 1.5 or in this case 99 psig/1.5 (approximately 66 psig). Unitil has been operating the pipeline at pressures exceeding 66 psig. The Safety Division alleges Unitil did not limit the MAOP to 66 psig and incorrectly self – established the MAOP as 99 psig.

Probable Violation No. 2

§192.557 Uprating Steel pipelines to a pressure that will produce a hoop stress less than 30 percent of SMYS

(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 percent of SMYS and that is above the previously established maximum allowable operating pressure; or

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

(6) If the pressure in main 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. (69 kPa) gage or 25 percent 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 of pipeline s. 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: Table Not Shown for brevity

(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, p.s.i. (76 MPa) gage and a modulus of rupture of 31,000 p.s.i. (214 MPa) gage.

The Safety Division alleges that Unutil did not uprate the pipeline in the stepped increments, as specified by §192.557(c). For streets along the Dover-Durham system that contained polyethylene mains, namely Central Ave, Stark Ave, Woodland Rd, Longmeadow Rd, Renaud Ave, Shamrock Lane and Birchwood Place, all of which comprised many segments of the pipeline in Dover, records of pressure uprate testing was confirmed to have been conducted in only two of the required four stepped increments. Services that were connected to the main were part of the same pressure uprate. Staff alleges the following services along these segments of the pipeline in Dover were uprated simultaneous with the main, but were not incrementally increased in a consistent manner with the required stepped, 25% increments:

Stark Avenue	#55, #60, #65, #66, #71, #73, #90, #93
Long Meadow Rd	#12
Woodland Rd	#2, #3, #5, #7, #9
Renaud Avenue	#2, #6, #9
Birchwood Pl	#1, #5, #9, #14
Shamrock Ln	#1
Central Avenue	#57
Sub Total (7 streets)	23 services

Unutil's records indicate that pressure tests performed by the Company on September 30, 1996 first stepped the pressure up from approximately 60 psig to 75 psig, and then the pressure was stepped up from 75 psig to 100 psig. The first pressure test increment was an increase of 25% above

the approximate 60 psig level, an increment increase of 15 psig. The next increase in pressure increment was 25 psig above the 75 psig first step, bringing the pipeline to the 100 psig level.

Even if the ultimate pressure test level required was 100 psig, the two stepped increments, as reflected in Company records, fall well short of the requirements of 192.553(d) and 192.557(c) where the pressure testing would need to be raised in 4 equal steps of 25% in order to reach the Company's chosen 40 psig total increase. Using this method of uprating, the Company would still be required to perform pressure tests and leak surveys at each 25% step increment.

In order for the Company to be able to operate the Dover-Durham system at 100 psig, the Safety Division interprets the code to require pressure testing to be the desired MAOP of 100 psig multiplied times 1.5, or 150 psig. The total pressure testing increase from the pre-uprate MAOP of 60 psig should have been 90 psig. Therefore, the pressure test should have been equally divided into 4 stepped increments of 22.5 psig each. The Safety Division would expect at a minimum, a pressure chart to display sustained pressures of approximately 60 psig, 82.5 psig, 105 psig, 127.5 psig and finally ending at 150 psig to verify the pressure uprate was performed in accordance with §192.557 (c).

The Safety Division further alleges that since the complete requirements of section §192.557 have not been met, Unifil should not have operated the plastic pipeline segments of the pipeline to an operating pressure that is above the previously established maximum allowable operating pressure of 60 psig. Based on Safety Division observations, Unifil, has been operating the pipeline clearly above 60 psig in violation of §192.557(a)(2).

Probable Violation No. 3

49 CFR §192.605 Procedural manual for operations, maintenance, and emergencies

Each operator shall include the following in its operating and maintenance plan:

(a) General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response. For transmission lines, the manual must also include procedures for handling abnormal operations. This manual must be reviewed and updated by the operator at intervals not exceeding 15 months, but at least one each calendar year. This manual must be prepared before operations of a pipeline system commence. Appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.

(b) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following, if applicable, to provide safety during maintenance and operations.

(1) Operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this subpart and Subpart M of this part.

(2) Controlling corrosion in accordance with the operations and maintenance requirements of Subpart I of this part.

(3) Making construction records, maps, and operating history available to appropriate operating personnel.

(4) Gathering of data needed for reporting incidents under Part 191 of this chapter in a timely

and effective manner.

(5) Starting up and shutting down any part of the pipeline in a manner designed to assure operation within the MAOP limits prescribed by this part, plus the build-up allowed for operation of pressure-limiting and control devices.

(6) Maintaining compressor stations, including provisions for isolating units or sections of pipe and for purging before returning to service.

(7) Starting, operating and shutting down gas compressor units.

(8) Periodically reviewing the work done by operator personnel to determine the effectiveness and adequacy of the procedures used in normal operation and maintenance and modifying the procedure when deficiencies are found.

(9) Taking adequate precautions in excavated trenches to protect personnel from the hazards of unsafe accumulations of vapor or gas, and making available when needed at the excavation, emergency rescue equipment, including a breathing apparatus and, a rescue harness and line.

(10) Systematic and routine testing and inspection of pipe-type or bottle-type holders including -

(i) Provision for detecting external corrosion before the strength of the container has been impaired;

(ii) Periodic sampling and testing of gas in storage to determine the dew point of vapors contained in the stored gas which, if condensed, might cause internal corrosion or interfere with the safe operation of the storage plant; and,

(iii) Periodic inspection and testing of pressure limiting equipment to determine that it is in safe operating condition and has adequate capacity.

(11) Responding promptly to a report of a gas odor inside or near a building, unless the operator's emergency procedures under §192.615(a) (3) specifically apply to these reports.

(12) Implementing the applicable control room management procedures required by § 192.631.

The Safety Division alleges that Unitil violated §192.605(a) in that it did not follow the entirety of its 1995 O&M procedure Section 4.06 when uprating.

Probable Violation No. 4

49 CFR §192.619 Maximum allowable operating pressure - Steel or plastic pipelines

(a) No person may operate a segment of steel or plastic pipeline at a pressure that exceeds a maximum allowable operating pressure determined under paragraph (c) or (d) of this section, or the lowest of the following:

(1) The design pressure of the weakest element in the segment, determined in accordance with subparts C and D of this part. However, for steel pipe in pipelines being converted under §192.14 or uprated under subpart K of this part, if any variable necessary to determine the design pressure under the design formula (§192.105) is unknown, one of the following pressures is to be used as 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) gage.

(2) The pressure obtained by dividing the pressure to which the segment was tested after construction as follows:

- (i) For plastic pipe in all locations, the test pressure is divided by a factor of 1.5.
- (ii) For steel pipe operated at 100 p.s.i. (689 kPa) gage or more, the test pressure is divided by a factor determined in accordance with the following table:

Factors (see Note)

Class location	Segment Installed Before Nov. 12, 1970	Segment Installed After Nov. 11, 1970	Segment Converted under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

(3) The highest actual operating pressure to which the segment was subjected during the 5 years preceding the applicable date in the second column. This pressure restriction applies unless the segment was tested according to the requirements in paragraph

(a)(2) of this section after the applicable date in the third column or the segment was updated according to the requirements in subpart K of this part:

Pipeline segment	Pressure date	Test date
-Onshore gathering line that first became subject to this part (other than §192.612) after April 13, 2006.	March 15, 2006, or date line becomes subject to this part, whichever is later.	5 years preceding applicable date in second column.
-Onshore transmission line that was a gathering line not subject to this part before March 15, 2006.		
Offshore gathering lines.	July 1, 1976.	July 1, 1971.
All other pipelines.	July 1, 1970	July 1, 1965

(4) The pressure determined by the operator to be the maximum safe pressure after considering the history of the segment, particularly known corrosion and the actual operating pressure.

(b) No person may operate a segment to which paragraph (a)(4) of this section is applicable, unless overpressure protective devices are installed on the segment in a manner that will prevent the maximum allowable operating pressure from being exceeded, in accordance

with §192.195.

(c) The requirements on pressure restrictions in this section do not apply in the following instance. An operator may operate a segment of pipeline found to be in satisfactory condition, considering its operating and maintenance history, at the highest actual operating pressure to which the segment was subjected during the 5 years preceding the applicable date in the second column of the table in paragraph (a)(3) of this section. An operator must still comply with §192.611.

(d) The operator of a pipeline segment of steel pipeline meeting the conditions prescribed in § 192.620(b) may elect to operate the segment at a maximum allowable operating pressure determined under § 192.620(a)

The Safety Division alleges that Unitil has been operating both steel and plastic segments of the pipeline at a pressure that exceeded an established maximum allowable operating pressure. Based on the Safety Division interpretation of the code, this is a violation of §192.619(a)(2)(i).

Probable Violation No.5

49 CFR §192.603 General provisions [of Subpart L – Operations]

(a) No person may operate a segment of pipeline unless it is operated in accordance with this subpart.

(b) Each operator shall keep records necessary to administer the procedures established under §192.605.

The Safety Division alleges that Unitil has been operating segments of the pipeline in violation of §§192.619 and 192.605, both of which are requirements identified within Subpart L. By default, if any of the requirements of Subpart L are not met, then the Company is in violation of the general provisions of §192.603.

Probable Violation No. 6

49 CFR §192.13 General Requirements applying to pipelines regulated under this part

(a) No person may operate a segment of pipeline that is readied for service listed in the first column that is readied for service after the date in the second column, unless:

(1) The pipeline has been designed, installed, constructed; initially inspected, and initially tested in accordance with this part; or

(2) The pipeline qualifies for use under this part according to the requirements in §192.14.

Pipeline	Date
Offshore gathering line.	July 31, 1977
Regulated onshore gathering line to which this part did not apply until April 14, 2006.	March 15 2007
All other pipelines.	March 12, 1971.

(b) No person may operate a segment of pipeline listed in the first column that is replaced, relocated, or otherwise changed after the date in the second column, unless that replacement, relocation, or change has

been made in accordance with this part.

Pipeline	Date
Offshore gathering line.	July 31, 1977
Regulated onshore gathering line to which this part did not apply until April 14, 2006.	March 15 2007
All other pipelines.	March 12, 1970.

(c) Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part.

Part §192 is comprised of subparts A through P. The Safety Division alleges that Unitil violated §§192.13(b) and 192.13(c). The Safety Division asserts that to be operating in accordance with the provisions of Part §192, Unitil must also operate in accordance with all applicable sub parts. Unitil did not operate in accordance with all applicable subparts. Unitil established but did not follow its uprating procedures and following the programs required for operating a pipeline. This is a violation of Subparts K and Subparts L and thus a violation of §192.13.

Safety Division proposed conditions in addition to civil penalties

1) Within 60 days of signing the consent order, provide electronic copies of main and service installation and/or repair records and other applicable records such as purchase orders for the remainder (downstream of and including 45 Central Avenue, Dover) for the Dover-Durham system that have not been forwarded to the Safety Division. Unitil should review such records and inform the Safety Division of discrepancies with the Unitil self-declared 99 psig MAOP of the Dover Durham system.

2) The Safety Division requires Unitil to submit within 120 days of signing the consent order a plan that summarizes all options considered to correct or remediate the MAOP exceedance of the Dover-Durham system including suggested recommendation (s). The plan should include a schedule, description of customer impacts, a description of work involved, cost estimate of each option considered and final recommendation(s). The plan should address any expectations and justifications of any cost recovery applied to rate payers. Upon execution and implementation of any final plan Unitil shall provide project tracking accounts including work orders used, dates and final costs.

Safety Division proposed civil penalties

RSA 374:7-a, III and Puc 511.06 (b) (5) require the Safety Division to set forth the factors it relied upon in determining civil penalties. The factors are similar to the factors the federal Office of Pipeline Safety relies upon in assessing similar penalties under the Natural Gas Pipeline Safety Act. The Safety Division considered the severity of the potential consequences of not following multiple Subparts, the company's inability to follow company written procedures, and possible negative effects of overpressurization of the high pressure system. Consideration was given to the effects and proximity to customers along the affected pipelines, possible impacts to non-customers, associated safety hazards, and the review of uprating documentation performed by Unitil. The Safety Division also considered the prior history of offenses, the nature and

circumstances of the above violations, Unutil' s response to the offenses, as well as the effect the civil penalties will have on Unutil' s ability to continue operations.

The respondent is fully culpable for this violation. In light of the identified factors, the Safety Division proposes civil penalties as follows:

Probable Violation No. 1 (Non-compliance with 49 CFR § 192.553, General requirements of Subpart K Uprating)	\$ 30,000
Probable Violation No. 2 (Non-compliance with 49 CFR § 192.557, Uprating Steel pipelines to a pressure that will produce a hoop stress less than 30 percent of SMYS)	\$ 10,000
Probable Violation No. 3 (Non-compliance with 49 CFR § 192.605, Procedural manual for operations, maintenance, and emergencies)	\$ 5,000
Probable Violation No. 4 (Non-compliance with 49 CFR § 192.619, Maximum allowable operating pressure - Steel or plastic pipeline)	\$ 15,000
Probable Violation No. 5 (Non-compliance with 49 CFR § 192.603, General requirements of Subpart L Operations)	\$ 2,500
Probable Violation No. 6 (Non-compliance with 49 CFR § 192.13, General requirements applicable to Part§ 192)	\$ 1,500
TOTAL CIVIL PENALTIES	\$ 64,000

Pursuant to RSA 374:7-a, the Company has the right to seek compromise of these penalties. Puc 511.06 requires the company to take one of the following steps:

- (a) Upon receipt of the NOPV the respondent shall either:
 - (1) Submit to the commission within 30 days, in writing, evidence refuting the probable violation referenced in the NOPV;
 - (2) Submit to the commission within 30 days, a written plan of action outlining action the respondent will take to correct the violations, including a schedule and the date when compliance is anticipated¹;
 - (3) Execute a consent agreement with the commission resolving the

¹ This option may not apply to violations that are written after the violation has occurred. It usually applies only to forward looking violations.

probable violation and remit the civil penalty; or

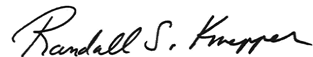
(4) Request in writing within 30 days, an informal conference with the commission staff to examine the basis of the probable violation.

(b) Any utility involved in the NOPV shall provide a representative for any informal conference or hearing scheduled relative to that NOPV.

Enclosed is a Consent Agreement that would resolve the civil penalty without need for an informal conference or a hearing. Unitil may execute the Consent Agreement and remit a check or money order payable to the State of New Hampshire in the amount of \$64,000. Responses and payments relevant to this notice should reference "PS1602NU Dover Durham Uprate," and be directed to the Safety Division Director at the Public Utilities Commission.

Alternately, Unitil may file with the Executive Director a request for an informal conference with the Commission Staff within 30 days of receipt of this Notice of Probable Violation in accordance with Puc 511.06.

Sincerely,

A handwritten signature in black ink that reads "Randall S. Knepper". The signature is written in a cursive style.

Randall S. Knepper
Director, Safety Division

cc: Chris Leblanc, Unitil
Enclosure

CHAIRMAN
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COMMISSIONERS
Robert R. Scott
Kathryn M. Bailey

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STATE OF NEW HAMPSHIRE



PUBLIC UTILITIES COMMISSION

21 S. Fruit St., Suite 10
Concord, N.H. 03301-2429

TDD Access: Relay NH
1-800-735-2964

Tel. (603) 271-2431

FAX No. 271-3878

Website:
www.puc.nh.gov

January 13, 2016

Mr. Thomas Meissner
Chief Operating Officer
Northern Utilities
6 Liberty Lane
Hampton, NH 03842

Re: Northern Utilities, New Hampshire Gas Division
Notice of Probable Violations of Natural Gas Pipeline Safety Act and
NH Code of Administrative Rules Part 500
Control# PS1601NU
Pipelines Affected: 2 services on the Dover-Durham High Pressure System
(99 psig) MAOP,
1) 1 Woodland Avenue, Dover
2) 69 Stark Avenue, Dover

Dear Mr. Meissner:

Pursuant to the Natural Gas Pipeline Safety Act, 49 U.S.C. §60101 *et seq.*, applicable state law as set forth at RSA 370:2, and the relevant regulations of the New Hampshire Public Utilities Commission (Commission), N.H. Code Admin. Rules Part Puc 511, the Commission hereby serves upon Northern Utilities (Unitil) this formal Notice of Probable Violation pursuant to Puc 511.05 for conditions relating to operations that exceeded the maximum allowable operating pressure (MAOP) for a single gas pipeline distribution system. The gas pipeline system was identified as the System #24 Dover to Durham 99 psig MAOP High Pressure system that transports natural gas from the Hawthorne Street district regulator stations in Dover to primarily feed the Durham area and in particular UNH. According to Unitil this system was uprated in 1996 from 56 psig MAOP to 99 psig MAOP. Whether the MAOP was correctly established is the subject of a separate compliance action, PS1602NU.

This notice arises from a related records inspection conducted November 3, 2015, by the Safety Division of Unitil's record keeping associated with the 1996 uprate to 99 psig MAOP of the Dover to Durham pipeline system. The records inspection was conducted after inconsistencies of the Dover to Durham pressure testing, operating procedures, and documentation of the associated uprate became apparent to the Safety Division.

This notice alleges a series of probable violations. The Safety Division alleges that Unitil violated 49 CFR §§ 192.13, 192.503, 192.513, 192.603, 192.605, and 192.619. The Safety Division alleges Unitil did not adequately pressure test all services installed after Unitil performed a system uprate in 1996. Unitil has self-declared the MAOP of the pressure system

is 99 psig. Service records provided by Unitil and reviewed by the Safety Division confirmed that the 99 psig (MAOP) Dover-Durham system had at least 2 services installed after the pressure uprate was performed in 1996 that did not have pressure tests consistent with those required by its operations and maintenance manual and those required by regulations. The Safety Division in this Notice does not confirm that a system uprate was indeed performed in accordance with federal regulations and leaves that issue the subject of a separate compliance action, PS1602NU.

The Safety Division only reviewed a portion of the services on the above mentioned pressure system, primarily plastic services supplied from plastic mains in Dover. The Safety Division, as a result of examining these records may expand the records review to include all services supplied from coated steel lines in Dover, Madbury and Durham and all services supplied from plastic and steel mains in Durham.

The Safety Division alleges that Unitil allowed the plastic service located at 69 Stark Avenue, Dover to be operated at pressures up to 99 psig. The plastic service for 69 Stark Avenue was installed on April 8, 1997 after the MAOP for pressure system #24 (Dover to Durham) was uprated on September 30, 1996 from 56 psig MAOP to 99 psig MAOP. The service card record lists the pressure test performed on 4/8/1997 at a level of 100 psig for 15 minutes. The MAOP for the service at 69 Stark Avenue can only be 66.6 psig [100/1.5]. This is inconsistent with the MAOP of the 8 inch diameter main that supplies the service if the main is 99 psig MAOP as contended by Unitil. The service card record also lists the 0.50 diameter plastic service as polyethylene for "intermediate pressure" service supplied from an 8 inch diameter polyethylene main. It does not list this service as being high density polyethylene or medium density polyethylene although it is presumed by the Safety Division to be high density polyethylene.

The Safety Division alleges that Unitil allowed the plastic service located at 1 Woodland Avenue, Dover to be operated at pressures up to 99 psig. The plastic service for 1 Woodland Avenue was installed on or around September 7, 2003 long after the MAOP for pressure system #24 uprated on September 30, 1996 from 56 psig MAOP to 99 psig MAOP. The service card record lists the pressure test performed on or around 9/7/2003 at a level of 100 psig for 25 minutes. The MAOP for the service at 1 Woodland Avenue can only be 66.6 psig [100/1.5]. This is inconsistent with the MAOP of the 2 inch diameter main that supplies the service if the main is 99 psig MAOP as contended by Unitil. The service card record also lists the 0.50 diameter plastic service as polyethylene for "intermediate pressure" service supplied from a 2 inch diameter polyethylene main. It does not list this service as being high density polyethylene or medium density polyethylene although it is presumed by the Safety Division to be high density polyethylene.

Probable Violation No.1

49 CFR §192.513 Test requirements for plastic pipelines.

(a) Each segment of a plastic pipeline must be tested in accordance with this section.

(b) The test procedure must insure discovery of all potentially hazardous leaks in the segment being tested.

(c) The test pressure must be at least 150 percent of the maximum operating pressure or 50 p.s.i. (345 kPa) gage, whichever is greater. However, the maximum test pressure may not be more than three times the pressure determined under §192.121, at a temperature not less than the pipe temperature during the test.

(d) During the test, the temperature of thermoplastic material may not be more than 100(F (38(C), or the temperature at which the material's long-term hydrostatic strength has been determined under the listed specification, whichever is greater.

192.513 is contained within Subpart J- Test Requirements. The Safety Division alleges that Unitil violated 192.513 (a) and 192.513(c). The Safety Division alleges that Unitil did test to 1.5 times the previous established maximum operating pressure 56 psig (MAOP) that was in place prior to 1996 but did not test to 1.5 times the maximum operating pressure that has been in place since 1996 (99 psig MAOP). A 99 psig MAOP requires an approximate 150 psig pressure test). The Safety Division found that Unitil tested at least two services (69 Stark Avenue and 1 Woodland Avenue) to only 100 psig. The Safety Division alleges these are segments of a plastic pipeline that were not tested in accordance with section 192.513 (c) and hence 192.513 (a).

Probable Violation No.2

49 CFR §192.503 General Requirements [of Subpart J Test Requirements]

(a) No person may operate a new segment of pipeline, or return to service a segment of pipeline that has been relocated or replaced, until-

(1) It has been tested in accordance with this subpart and §192.619 to substantiate the maximum allowable operating pressure.

The Safety Division alleges that Unitil violated 192.503(a) (1). The Safety Division alleges that Unitil operated at least 2 services (69 Stark Avenue, Dover and 1 Woodland Avenue, Dover) as new segments of a pipeline that were not tested in accordance with both Subpart J to substantiate the MAOP of 99 psig in which the services are connected and supplied with gas. The Safety Division also alleges these same 2 services are not in accordance with 192.619 which is the subject of Probable Violation No3.

Probable Violation No. 3

49 CFR §192.619. Maximum allowable operating pressure - Steel or plastic pipelines

(a) No person may operate a segment of steel or plastic pipeline at a pressure that exceeds a maximum allowable operating pressure determined under paragraph (c) or (d) of this section, or the lowest of the following:

(1) The design pressure of the weakest element in the segment, determined in accordance with subparts C and D of this part. However, for steel pipe in pipelines being converted under §192.14 or uprated under subpart K of this part, if any variable necessary to determine the design pressure under the design formula (§192.105) is unknown, one of the following pressures is to be used as 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) gage.

(2) The pressure obtained by dividing the pressure to which the segment was tested after construction as follows:

(i) For plastic pipe in all locations, the test pressure is divided by a factor of 1.5.

(ii) For steel pipe operated at 100 p.s.i. (689 kPa) gage or more, the test pressure is divided by a factor determined in accordance with the following table:

Factors (see Note)

Class location	Segment Installed Before Nov. 12, 1970	Segment Installed After Nov. 11, 1970	Segment Converted under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

(3) The highest actual operating pressure to which the segment was subjected during the 5 years preceding the applicable date in the second column. This pressure restriction applies unless the segment was tested according to the requirements in paragraph (a)(2) of this section after the applicable date in the third column or the segment was uprated according to the requirements in subpart K of this part:

Pipeline segment	Pressure date	Test date
-Onshore gathering line that first became subject to this part (other than §192.612) after April 13, 2006.	March 15, 2006, or date line becomes subject to this part, whichever is later.	5 years preceding applicable date in second column.
-Onshore transmission line that was a gathering line not subject to this part before March 15, 2006.		
Offshore gathering lines.	July 1, 1976.	July 1, 1971.
All other pipelines.	July 1, 1970	July 1, 1965

(4) The pressure determined by the operator to be the maximum safe pressure after considering the history of the segment, particularly known corrosion and the actual operating pressure.

(b) No person may operate a segment to which paragraph (a)(4) of this section is applicable, unless overpressure protective devices are installed on

the segment in a manner that will prevent the maximum allowable operating pressure from being exceeded, in accordance with §192.195.

(c) The requirements on pressure restrictions in this section do not apply in the following instance. An operator may operate a segment of pipeline found to be in satisfactory condition, considering its operating and maintenance history, at the highest actual operating pressure to which the segment was subjected during the 5 years preceding the applicable date in the second column of the table in paragraph (a)(3) of this section. An operator must still comply with §192.611.

(d) The operator of a pipeline segment of steel pipeline meeting the conditions prescribed in § 192.620(b) may elect to operate the segment at a maximum allowable operating pressure determined under § 192.620(a)

The Safety Division alleges that Unitil violated 192.619 (a) (2) (i). The Safety Division alleges that Unitil operated 2 segments above the MAOP established by the pressure test conducted ($100 \text{ psig}/1.5 = 66 \text{ psig}$ MAOP). The Safety Division alleges both segments were plastic and pressure tested to 100 psig. Unitil did not test to 1.5 times the maximum operating pressure that has been in place since 1996 of the main in which the segments are connected. A properly established 99 psig MAOP requires an approximate pressure test of at least 150 psig). Even if the segments were not plastic and were steel, 192.619 (a) (2) (ii) would not have been met as Central Avenue, Woodland Avenue, Stark Avenue portion of the city are considered as a Class 3 location. Unitil has operated a least 2 plastic segments of a pipeline above the MAOP. The Safety Division alleges the segments had been improperly operating since their installation in 1997 and 2003, nearly 18 years and 12 years ago, respectively.

Probable Violation No. 4

49 CFR §192.605. Procedural manual for operations, maintenance, and emergencies

Each operator shall include the following in its operating and maintenance plan:

(a) General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response. For transmission lines, the manual must also include procedures for handling abnormal operations. This manual must be reviewed and updated by the operator at intervals not exceeding 15 months, but at least one each calendar year. This manual must be prepared before operations of a pipeline system commence. Appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.

(b) Maintenance and normal operations. The manual required by paragraph

(a) of this section must include procedures for the following, if applicable, to provide safety during maintenance and operations.

(1) Operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this subpart and Subpart M of this part.

- (2) Controlling corrosion in accordance with the operations and maintenance requirements of Subpart I of this part.**
- (3) Making construction records, maps, and operating history available to appropriate operating personnel.**
- (4) Gathering of data needed for reporting incidents under Part 191 of this chapter in a timely and effective manner.**
- (5) Starting up and shutting down any part of the pipeline in a manner designed to assure operation within the MAOP limits prescribed by this part, plus the build-up allowed for operation of pressure-limiting and control devices.**
- (6) Maintaining compressor stations, including provisions for isolating units or sections of pipe and for purging before returning to service.**
- (7) Starting, operating and shutting down gas compressor units.**
- (8) Periodically reviewing the work done by operator personnel to determine the effectiveness and adequacy of the procedures used in normal operation and maintenance and modifying the procedure when deficiencies are found.**
- (9) Taking adequate precautions in excavated trenches to protect personnel from the hazards of unsafe accumulations of vapor or gas, and making available when needed at the excavation, emergency rescue equipment, including a breathing apparatus and, a rescue harness and line.**
- (10) Systematic and routine testing and inspection of pipe-type or bottle-type holders including -**
 - (i) Provision for detecting external corrosion before the strength of the container has been impaired;**
 - (ii) Periodic sampling and testing of gas in storage to determine the dew point of vapors contained in the stored gas which, if condensed, might cause internal corrosion or interfere with the safe operation of the storage plant; and,**
 - (iii) Periodic inspection and testing of pressure limiting equipment to determine that it is in safe operating condition and has adequate capacity.**
- (11) Responding promptly to a report of a gas odor inside or near a building, unless the operator's emergency procedures under §192.615(a) (3) specifically apply to these reports.**
- (12) Implementing the applicable control room management procedures required by § 192.631.**

The Safety Division alleges in 1997 and 2003 that the Operating and Maintenance Procedures in effect contained in Section 5.11 a Procedure titled "Leak-Test Requirements for Gas Service Lines". It was a 2 page procedure with 9 steps. It states in step 1 "Install a pressure

gauge and pressure test the service pipe with air and/or inert gas according to the test pressure and duration requirements on page 2 before tapping or connecting to the main. With plastic services the test pressure must be 1.5 times the maximum operating pressure or 90 psig, whichever is greater. This applies to all plastic services including those in low pressure systems". Page 2 listed a 15 minute duration requirement for new service lines. The Safety Division alleges that the duration requirement was met but not the pressure test level required for 69 Stark Avenue, Dover and 1 Woodland Avenue, Dover. Thus Unitil did not follow an operation and maintenance procedure and violated 192.605 (a).

Probable Violation No. 5 49 CFR §192.603. General Requirements [of Subpart L Operations]

- (a) No person may operate a segment of pipeline unless it is operated in accordance with this subpart.
- (b) Each operator shall keep records necessary to administer the procedures established under §192.605.

192.619 and 192.605 are contained in Subpart L – Operations. The Safety Division alleges that Unitil operated for almost 12 years and 18 years respectively at least two segments of the Dover –Durham pipeline system that was in violation of 192.619 and thus not in accordance with Subpart L. This included services at 69 Stark Avenue and 1 Woodland Avenue. By not following procedures as required in 192.605 these actions were not in accordance with Subpart L. The Safety Division alleges that this is a violation of 192.603 (a).

Probable Violation No.6 49 CFR §192.13 General Requirements applying to pipelines regulated under this part

- (a) No person may operate a segment of pipeline that is readied for service listed in the first column that is readied for service after the date in the second column, unless:
- (1) The pipeline has been designed, installed, constructed; initially inspected, and initially tested in accordance with this part; or
 - (2) The pipeline qualifies for use under this part according to the requirements in §192.14.

Pipeline	Date
Offshore gathering line.	July 31, 1977
Regulated onshore gathering line to which this part did not apply until April 14, 2006.	March 15 2007
All other pipelines.	March 12, 1971.

- (b) No person may operate a segment of pipeline listed in the first column that is replaced, relocated, or otherwise changed after the date in the second column, unless that replacement, relocation, or change has been made in accordance with this part.

Pipeline	Date
Offshore gathering line.	July 31, 1977
Regulated onshore gathering line to which this part did not apply until	March 15 2007

April 14, 2006.	
All other pipelines.	March 12, 1970.

(c) Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part.

Part 192 is comprised of subparts A through P. The Safety Division alleges that Unitil violated 192.13 (a) and 192.13 (c). The Safety Division alleges that to be in accordance with Part 192, Unitil must also operate in accordance with all applicable sub parts and that Unitil did not operate in accordance with all applicable subparts. The Safety Division alleges that Unitil established but did not follow its construction, installation and pressure testing procedures at the time for the pressure testing of services and operating segments at levels above the MAOP. This is a violation of Subparts J and Subparts L and thus a violation of 192.13.

Safety Division proposed conditions in addition to civil penalties

In researching Unitil's Dover to Durham uprate and finding services that either do not meet the MAOP of the main or are not performed in accordance with construction, installation and testing procedures the Safety Division would also impose the following conditions:

- 1) Provide electronic copies of service records installations for the remainder of the Dover- Durham 99 psig system that have not been forwarded to the Safety Division. These would include services that are located downstream of 54 Central Avenue, Dover (including 54 Central Avenue, Dover. Unitil should review such records and inform the Safety Division of discrepancies with the Unitil declared 99 psig MAOP of the Dover Durham system.
- 2) Re-pressure test 69 Stark Avenue and 1 Woodland Avenue to the desired amount and record on the pressure test record the reason for the pressure test and results. Such pressure test shall be conducted at a time that is convenient for the customer but no later than 60 days after the effective date of this Notice of Probable Violation.
- 3) Electronic copies of service records for pressure test required shall be forwarded to the Safety Division upon completion.
- 4) The threat of missing, incomplete records or past installation and pressure testing practices that are inadequate shall be described, highlighted and elevated within Unitil's Distribution Integrity Management Plan and updated no later than 60 days after the effective date of this Notice of Probable Violation.
- 5) Prepare a list of all pressure systems in which their current MAOP is established by uprating and include the year in which the uprate occurred, the previous MAOP level and current MAOP level and the number of services supplied by each of the uprated pressure system. This list shall be supplied to the Safety Division within 30 days of the effective date of the signed Consent Agreement.

Safety Division proposed civil penalties

RSA 374:7-a, III and Puc 511.08(b) (2) require the Safety Division to set forth the factors it relied upon in determining civil penalties. The factors are similar to the factors the federal Office of Pipeline Safety relies upon in assessing similar penalties under the Natural Gas Pipeline Safety Act. The Safety Division considered the severity of the potential consequences of not following Commission rules, the company's inability to follow company written procedures, and possible negative effects of inadequate pressure testing of the intermediate pressure system. Consideration was given to the effects and proximity to customers along the affected pipelines, possible impacts to non-customers, associated safety hazards, and the records review conducted by Unitil. The Safety Division also considered the prior history of offenses, the nature and circumstances of the above violations, Unitil's response to the offenses, as well as the effect the civil penalties will have on Unitil's ability to continue operations.

The respondent is fully culpable for this violation. In light of the identified factors, the Safety Division proposes civil penalties as follows:

Probable Violation No. 1 **\$ 10,000**
(Non-compliance with 49 CFR §192.513, Test requirements for plastic pipelines)

Probable Violation No. 2 **\$ 5,000**
(Non-compliance with 49 CFR §192.503, General Requirements for Pressure Testing)

Probable Violation No. 3 **\$ 15,000**
(Non-compliance with 49 CFR §192.619, Maximum allowable operating pressure - Steel or plastic pipelines)

Probable Violation No. 4 **\$ 5,000**
(Non-compliance with 49 CFR §192.605, Procedural manual for operations, maintenance, and emergencies)

Probable Violation No. 5 **\$ 1,500**
(Non-compliance with 49 CFR §192.603, General Requirements)

Probable Violation No. 6 **\$ 1,500**
(Non-compliance with 49 CFR §192.13, General Requirements applying to pipelines regulated under this part)

TOTAL CIVIL PENALTIES **\$38,000**

Pursuant to RSA 374:7-a, the company has the right to seek compromise of these penalties. Puc 511.06 requires the company to take one of the following steps:

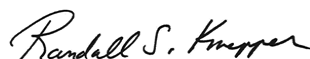
- (a) Upon receipt of the NOPV the respondent shall either:

- (1) Submit to the commission within 30 days, in writing, evidence refuting the probable violation referenced in the NOPV;
 - (2) Submit to the commission within 30 days, a written plan of action outlining action the respondent will take to correct the violations, including a schedule and the date when compliance is anticipated¹;
 - (3) Execute a consent agreement with the commission resolving the probable violation and remit the civil penalty; or
 - (4) Request in writing within 30 days, an informal conference with the commission staff to examine the basis of the probable violation.
- (b) Any utility involved in the NOPV shall provide a representative for any informal conference or hearing scheduled relative to that NOPV.

Enclosed is a Consent Agreement that would resolve the civil penalty without need for an informal conference or a hearing. Unitil may execute the Consent Agreement and remit a check or money order payable to the State of New Hampshire in the amount of \$38,000. Responses and payments relevant to this notice should reference "PS1601NU Stark Avenue and Woodland Avenue," and be directed to the Safety Division Director at the Public Utilities Commission.

Alternately, Unitil may file with the Executive Director a request for an informal conference with the Commission Staff within 30 days of receipt of this Notice of Probable Violation in accordance with Puc 511.06.

Sincerely,



Randall S. Knepper
Director, Safety Division

cc: Chris Leblanc, Unitil
Enclosure

¹ This option may not apply to violations that are written after the violation has occurred. It usually applies only to forward looking violations.



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

AUG 18 2009

Mr. Paul Cabot
GPTC Secretary
Gas Piping Technology Committee (GPTC)
American Gas Association
400 North Capitol Street, NW
Suite 450
Washington, DC 20001

Dear Mr. Cabot:

In a letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA) dated October 19, 2006, you requested an interpretation of the applicability of the Federal pipeline safety regulations in 49 CFR Part 192 to plastic natural gas pipelines. Specifically, you requested an interpretation of 49 CFR §§ 192.513(c), 192.557(c), and 192.619(a)(2)(i) as they relate to uprating polyethylene (PE) pipelines. You used the example of a 4-inch PE pipeline with a design pressure rating of 100 psig, tested to 75 psig at the time of construction, with a maximum allowable operating pressure (MAOP) of 50 psig. You suggested an approach to uprating such a line to 60 psig in increments without testing the pressure and asked whether your approach would be permissible under current regulations.

You correctly noted that § 192.557(c) permits uprating a pipeline by increasing line pressure in increments. You referenced a November 14, 1973, Office of Pipeline Safety interpretation for steel pipelines that permitted incremental uprating of steel pipelines without a pretest. You stated your belief that if this interpretation were applied to plastic pipelines, uprating incrementally in accordance with § 192.557(c) would be acceptable without testing the pressure. You expressed your view that it would be acceptable to incrementally increase the pressure to the new MAOP without testing it to 1.5 times the new MAOP.

As the regulatory agency with primary responsibility for pipeline safety in the U.S., PHMSA is obligated to ensure the pipeline safety requirements provide an adequate margin of safety. In carrying out our responsibilities, we appreciate receiving input and views from all stakeholders and particularly appreciate the views of the GPTC. In this case, however, we can not agree that the above referenced interpretation can be applied to plastic pipelines. Under § 192.619 the MAOP requirements for steel and plastic pipelines are not the same. For plastic pipelines § 192.619(a)(2)(i) requires the following:

The Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety provides written clarifications of the Regulations (49 CFR Parts 190-199) in the form of interpretation letters. These letters reflect the agency's current application of the regulations to the specific facts presented by the person requesting the clarification. Interpretations do not create legally-enforceable rights or obligations and are provided to help the public understand how to comply with the regulations.

§ 192.619 - (a) Except as provided in paragraph (c) of this section, no person may operate a segment of steel or plastic pipeline at a pressure that exceeds the lowest of the following:

- (1) ...
- (2) The pressure obtained by dividing the pressure to which the segment was tested after construction as follows:
 - (i) For plastic pipe in all locations, the test pressure is divided by a factor of 1.5.

We agree that § 192.557 allows the uprating of PE pipelines. However, § 192.619 (a)(2)(i) requires the operator to increase the uprating test pressure to 1.5 times the new MAOP in order to meet the lowest limiting factor for the new MAOP. Therefore, in order for the operator to increase the MAOP from 50 psig to 60 psig, a pressure test to 1.5 times the new MAOP (90 psig) must be conducted to comply with the § 192.619 (a)(2)(i) requirements.¹ In addition, other applicable requirements must be met including:

- Following procedures prior to uprating (§ 192.557(b)(1));
- Checking rating of applicable appurtenances for the test pressure; and
- Meeting and maintaining operating conditions to ensure pressure increments as required by the uprating (§ 192.553(a)).

I hope that this information is helpful to you. If I can be of further assistance, please contact me at (202) 366-4046.

Sincerely,



John A. Gale
Director, Office of Regulations

¹ Note that § 192.553 was amended on September 15, 2003, [68 FR 53895] to make direct reference to § 192.619 and clarify the uprating requirements. This amendment addressed the concern that the previous language referring to "this part" was potentially being applied differently among the States. This was a key focus of the work done under the State Industry Regulatory Review Committee (SIRRC) II in recognizing the principal differences between strength test vs. leak test. The SIRRC II formulated the proposed language to state these would be subjected to incremental pressure increases to the desired new MAOP with an additional leak survey to be performed no sooner than 10 days and no later than 30 days after the date the last pressure increase is achieved.



Paul Cabot
GPTC Secretary
(202) 824-7312
Fax (202) 824-9122
pcabot@aga.org

October 19, 2006

Richard D. Huriaux
Manager Regulations
Office of Pipeline Safety (DPS -10), RSPA
U.S. Department of Transportation
400 Seventh Street, SW Room 7128
Washington, DC 20590-001

Re: Uprating plastic pipelines to 100 psi or below does not require additional testing

Dear Mr. Huriaux:

The Gas Piping Technology Committee (GPTC) consists of about 80 members with technical expertise in natural gas distribution, transmission, and gathering systems. Its membership is balanced between gas distribution operators, gas transmission operators, manufacturers, and general interest personnel such as federal and state regulators. The GPTC is an Independent technical committee and has been an American National Standards Institute (ANSI) accredited committee since 1992 and has the ANSI committee designation of ANSI/GPTC Z380. The American Gas Association (AGA) has been the Secretariat to this committee since 1990.

The GPTC respectfully requests an interpretation on the application of several sections of Title 49, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifically Sections 192.513(c), 192.557(c) and Section 192.619(a)(2)(i) as these relate to uprating PE pipelines.

Given the example:

A 4" PE pipeline, with a design pressure rating of 100 psig, was initially tested at the time of construction to 75 psig in accordance with Section 192.513(c). This gave the pipeline an MAOP of 50 psig as defined in 192.619(a)(2)(i).

Now, going forward, an operator has interest in uprating the above referenced pipeline to a higher MAOP of 60 psig.

The new MAOP of 60 psig can be approached and established by increasing line pressure in increments up to the 60-psig limit. The GPTC considers the above uprating procedure to be acceptable based on the interpretation of referenced code sections. Further, the GPTC is aware OPS previously provided a similar interpretation dated November 14, 1973 for steel pipelines operating below 100 psig. In that interpretation under question 3, OPS stated, "Section 192.557(c) requires only that the new MAOP be approached in increments. In uprating, the pretest to 90 psig would not be required." This interpretation is attached as a reference.

Therefore, the GPTC respectfully requests OPS to affirm the above interpretation is also applicable for plastic pipelines operating at 100 psig or below. The affirmation would confirm that Section 192.557(c) does not require the total pressure increase to be 1.5 times the proposed MAOP, instead the total pressure would be increased up to the proposed MAOP in increments. Your prompt consideration would be appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Cabot". The signature is fluid and cursive, with the first name "Paul" and last name "Cabot" clearly distinguishable.

Paul Cabot
GPTC Secretary
American Gas Association

cc: Marek
Frantz
Slagle

attachment: 11/14/73 OPS Interpretation

November 14, 1973

Mr. John Searcy
Tennessee Public Service Commission
Cordell Hull Building
Nashville, TN 37219

Dear Mr. Searcy:

In your letter of October 3, 1973, you requested interpretations of various sections of Part 192, Title 49, CFR, that related to maximum allowable operating pressures (MAOP), certain test requirements, and uprating. Your specific questions and the Office of Pipeline Safety (OPS) answers are:

Question 1: Re: Maximum allowable operating pressures

"192.619(a)(2) requires that test pressure values be used as criteria for determining maximum allowable operating pressures; however, it applies only to steel operating at or above 100 psi and plastic.

"192.621 covers all materials including cast iron and ductile iron; however, it does not require that test pressure values be used as criteria for determining maximum allowable operating pressures.

"Therefore, I conclude that, for steel operating below 100 psi and for cast iron and ductile iron operating at any pressure, test pressure values are not required criteria for determining maximum allowable operating pressures. Is this your interpretation?"

Questions 2: Re: Test requirements

"192.507(b) provides test requirements for pipelines of all materials operating at or above 100 psi and less than 30% SMYS and requires test pressure values between 100 psi and those required to produce 20% SMYS. However, it does not specify what the values will be. 192.619 would determine the test pressure values within this range for steel and plastic by relating them to maximum allowable operating pressure. However, 192.619 does not apply to cast iron and ductile iron.

"192.509 covers pipelines of all materials operating at or below 100 psi, and requires 10 psi or 90 psi as test pressures.

"The conclusion here would be that values of test pressures can be established in any pressure range for steel and plastic, and for cast iron and ductile iron operating at or below 100 psi; however, there is no required test pressure value for cast iron and ductile iron operating above 100 psi. Is this the proper interpretation?"

Answer to Questions 1 & 2

Test requirements for pipelines to operate at or below 100 psig is established by Section 192.509 based upon the intended MAOP and is applicable with the exception of service lines and plastic pipe. Cast iron and ductile iron pipelines would be included under this section if the intended MAOP is 100 psig or less.

For pipelines to operate at a hoop stress of less than 30 percent SMYS but more than 100 psig, Section 192.507 is applicable, with limitations on the MAOP for steel and plastic pipelines being set by Section 192.619.

Your interpretation is correct. There is no specific test pressure required for cast iron and ductile iron operating above 100 psig and up to 30 percent of SMYS. However, the operator must comply with the requirements of Sections 192.507 and 192.53.

Question 3: Re: Uprating

"192.557(c) provides that an increase in maximum allowable operating pressure must be made in increments. However, the following questions arise:

- "(1) If the maximum allowable operating pressure it to be increased within the 1 psi to 100 psi range, and no test records are available, must it be tested to 90 psi first, in accordance with 192.509, and if so, must the test pressure be approached in the increments specified in 192.557(c)?
- "(2) Or, does 192.557(c) require only that the new maximum allowable operating pressure itself be approached in the increments required?

Answer to Question 3

Section 192.557(c) requires only that the new MAOP be approached in increments. In uprating, the pretest to 90 psig would not be required.

If we may assist further, please let us know.

Sincerely,

/signed/ Cesar De Leon

Joseph C. Caldwell
Director
Office of Pipeline Safety

STATE OF NEW HAMPSHIRE

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Douglas L. Patch
COMMISSIONERS
Bruce B. Ellsworth
Susan S. Geiger



PUBLIC UTILITIES COMMISSION
8 Old Suncook Road
Concord, N.H. 03301-7319

EXECUTIVE DIRECTOR
AND SECRETARY
Sarah P. Voll
TDD Access: Relay NH
1-800-735-2964
Tel. (603) 271-2431
FAX No. 271-3878

April 24, 1995

Mr. Edward Wencis
Northern Utilities
325 West Rd., PO Box 508
Portsmouth, New Hampshire 03801

Dear Mr. Wencis:

This office is conducting inspections related to the Maximum Allowable Operating Pressure (MAOP) of gas systems operating in the State of New Hampshire. Experience has shown that certain information specific to each system is necessary in order to determine compliance with federal regulations. Therefore, this office is requesting that operators establish specific files for each individual system. The files should include, at a minimum:

- a map showing the location of the system with the boundaries clearly identified
- a description of the system listing known pipe material, size, date of installation in general

(note: the description need not be specific for older systems, a statement such as predominantly cast iron with wrought iron services installed in the late 1920's is an acceptable statement. For this purpose we are not concerned with short sections of replacement main and the date installed)

- the MAOP established for that system
- the Maximum Actual Operating Pressure (MOP) historically for the system with supporting records
- a description and location of the devices used to control pressure and provide over-pressure protection on the system.
- location and Company designation of the key valves which isolate the system from other systems. (may be included on map if appropriate)

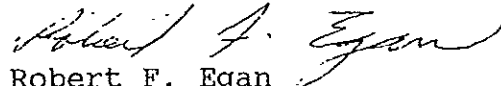
MAOP
page -2-

- the methodology which the Company has, or will employ to establish the MAOP; i.e initial pressure test, 5 year historical pressure, system limitation component, etc.
- all records necessary to support the method used to establish the MAOP

For scheduling purposes, this office is requesting that the information be compiled as noted above and available for review no later than July 1, 1995.

If you have any questions regarding this request please feel free to contact me. Thank You.

Respectfully yours,

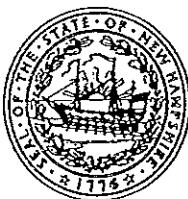

Robert F. Egan
Utility Analyst

RFE/jc

96056

STATE OF NEW HAMPSHIRE

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PUBLIC UTILITIES COMMISSION
8 Old Suncook Road
Concord, N.H. 03301-7319

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Sarah P. Voll
TDD Access: Relay NH
1-800-735-2964
Tel. (603) 271-2431
FAX No. 271-3878

February 7, 1996

Mr. John Snow
Vice President Northern Utilities
P.O. Box 508, 325 West Rd.
Portsmouth, New Hampshire 03801

Dear Mr. Snow:

On December 4, 1995, inspections were made of Northern Utilities records that indicates probable violations of state/federal regulations regarding the maximum allowable operating pressures (MAOP) throughout your system.

It was found that several systems did not have the proper records to support the established MAOP as required and are probably in violation of:

CFR Part 192.619

Maximum allowable operating
pressure : steel or plastic
pipelines.

According to Rules and Regulations for Gas Part PUC 511, you have thirty (30) days from the time you receive this notice to respond to the Safety Division of the above cited probable violations.

If you have any questions, please call me.

Sincerely,

A handwritten signature in dark ink, appearing to read "R.G. Marini".

Richard G. Marini, P.E.
Administrator
Safety Division

RGM/jc
cc: Michael D. Cannata, Jr.



Northern Utilities, Inc.

March 4, 1996

Mr. Richard G. Marini, P.E.
Administrator
Safety Division
Public Utilities Commission
8 Old Suncook Road
Concord, N.H. 03301-7319

RE: Notice of Probable Violation - CFR Part 192.619 (MAOP)

Dear Mr. Marini:

As you know, many local natural gas distribution companies have limited technical documentation proving the maximum allowable operating pressure (MAOP) for certain distribution systems within their given franchise area. The major reason for the lack of sufficient test documentation has been the strong trend of consolidation among operating companies. Initially, municipal gas and electric facilities were sold to private utility companies. Later, many of the combination gas and electric utility companies were forced to divest their natural gas assets. More recently, smaller gas companies have been consolidated under larger holding companies. Through this evolution, many original records were misplaced or inadvertently destroyed. The history of Northern Utilities is typical of the gas industry's evolution.

The New Hampshire Division of Northern Utilities, based on guidelines set forth by the N.H.P.U.C. Safety Division, has conducted an extensive research and data collection effort in order to more formally establish MAOP throughout its natural gas distribution systems. Typical data collected for each of the distribution systems were: six year corrosion leak history relative to mains and services, the current operating pressure, the six year operating pressure range, total length of main and the mix of material type, the percentage of the system with pressure test records, the number of district regulators supplying the system, the number of critical valves and any known pipe failures.

Northern Utilities has been evaluating the data and has developed an ongoing program to establish MAOP throughout its distribution systems.

Northern looks forward to working with you and other members of the Safety Division.

Sincerely,

John R. Snow Jr.
Vice President, Northern Utilities

NORTHERN UTILITIES INC.

COPY

MAXIMUM ALLOWABLE OPERATING PRESSURE

(MAOP)

Final Report

September 6, 1996

NORTHERN UTILITIES, INC

SYSTEM	PSIG	METHOD
Salem IP	60	uprate 1994
Forest Ave. Plaistow IP	60	pressure test
E. Kingston/Kensington/Seabrook HP	125	Historical 5 year MOP
Hampton/Seabrook IP	45	Historical 5 year MOP
Plaistow IP	60	uprate 1992
Dover Pt., Dover IP	60	uprate 1993
Route 151, Greenland IP	60	Historical 5 year MOP
Panaway IP	40	Historical 5 year MOP
Granite St. Portsmouth IP	25	Historical 5 year MOP
Portsmouth IP	60	Historical 5 year MOP
Bellamy Ln., Dover IP	60	uprate 1993
Applevale IP	60	Historical 5 year MOP
Gulf Rd., Dover IP	60	uprate 1991
Somersworth IP	50	Historical 5 year MOP
Gonic IP	60	Pressure test
Rochester IP	45	Historical 5 year MOP
Route 16B, Rochester IP		
Company recommends 60		
Staff recommends 20	20	Historical 5 year MOP
Somersworth/Rochester HP	150	Historical 5 year MOP
Route 88 Exeter IP	50	Historical 5 year MOP
Exeter/Hampton HP	150	Historical 5 year MOP
Exeter IP	60	Historical 5 year MOP
Gosling Rd. HP	500	Pressure test
Northern Utilities 500 line	500	Pressure test

Northern Utilities Inc. MAOP

On March 31, 1995 this office conducted an inspection pertinent to the provisions of 49 USC 60101 Parts 192.619, 621, and 623 which delineate the Operator's responsibilities with respect to the Maximum Allowable Operating Pressure of a natural gas system. During the course of the inspection it became evident that the necessary records to be reviewed which document compliance covered long term time intervals and were filed in a manner which was inexpedient to review. Recognizing the difficulties involved, this office, on April 21, 1995, notified all companies that this office would conduct a comprehensive evaluation of the Company's documentation related to the MAOP of each system within their service territory. The companies were directed to compile specific information and be prepared for inspection by July 1, 1995. (see attached letter) Northern requested and was granted an extension until January 1, 1996. Inspections were conducted at Northern's headquarters on the following dates: 12/18/95, 2/9/96, 6/11/96. A Notice of Probable Violation (NOPV) No GS96002 was issued on February 7, 1996. In addition to the headquarters inspections, this office conducted on-site regulator station inspections for each station in the service territory during calendar year 1995. The following delineates the difficulties observed in the course of the investigation, an analysis of the information provided by the Company, and recommendations for establishing the MAOP for each system.

Northern, like most New England Utilities, has systems which vary significantly in age and materials. Northern still has pipe in service which dates back to the late 1800's. Not surprisingly, it is impossible to document materials or pressure tests on many of the systems. In addition, the company does not have in its possession any documentation that the Company established system MAOP's in accordance with the provisions of 192.619(c).

Consequently, Northern could not establish MAOP's in accordance with the Natural Gas Pipeline Safety Act and was issued the NOPV.

Notwithstanding the above, Northern is obligated to provide service to its 29,000 existing customers. The dilemma therefore, was how to comply with federal law and continue to provide service at a safe level. To accomplish this task this office initiated a program designed to accomplish the maximum level of safety which could be achieved with existing information. The final objective being, to establish an MAOP for each system by a date certain which would continue forward until legal or other actions precipitate a change. Once established, the operator would not be prohibited from uprating in accordance with 192.551, nor would the operator be exempt from any obligation to lower the MAOP should conditions warrant. The criteria developed to establish the MAOP included:

- an analysis of available pipe material to identify specific limitations due to design of pipeline components,
- inspection of regulator stations
- review of regulator and relief capacities
- review of leak records for the most recent 5 year period
- review of Maximum Actual Operating Pressure (MOP) for most recent 5 year period

The company has identified 23 distinct systems and developed folders for each system. The information contained includes: main material list, service material list, system maps, leak reports, regulator and relief calculations and historical pressure charts. For the purposes of validating each system MAOP, all the material in each module was reviewed. A table indicating the system and method for establishing the MAOP is included in this document. Northern has supplied a cover sheet for each system (attached) and retains the detailed information at their offices in Portsmouth.

The Company exerted considerable effort to document the MAOP of each system. During the investigation of the material, staff developed questions where more clarification was necessary. The Company conducted further research and was able to answer the questions to the satisfaction of staff. It should be noted that the Company has had considerable difficulties in organizing data in a manner which can validate MAOP. Of particular concern is maintaining records of pressure tests, and being able to identify where medium vs. high density plastic pipe is installed. The Company recognizes this problem and is taking steps to correct it. This office should monitor the Company's progress in this area and closely evaluate any future uprating proposals. The Company, with the support of this office, is currently involved in a major bare steel replacement program due to general corrosion problems. However, an evaluation of leak data supports the current operating pressures. The Company did not report any particular problems with specific pipeline components which would require the lowering of the MAOP or replacement of components.

Notwithstanding the above, there are two areas which need to be examined as they relate to the establishment of MAOP for all of Northern's System, and one item which suggests inappropriate operating procedures. They are as follows:

- 1) The company has been operating the Route 16B, Rochester

IP system at 20 psi. The system totally comprised of plastic pipe and was installed in phases in 1986 and 1992. The company is recommending a MAOP of 60 psig.

The company was unable to document 100% of the pressure test records for sections installed in 1986 and 1992.

This is not a situation of old records and staff believes the company has failed demonstrate that it has complied with 192.513 (a) which states: (a) Each segment of a plastic pipeline must be tested in accordance with this section. As a result, it is impossible to determine the MAOP in accordance with 192.619(a)(2)(i). Based on the preceding; staff recommends that the MAOP of this system be established at the historical MOP of 20 psig.

- 2) The Northern Utilities 500 PSI line may be a transmission line due to the fact that some sections of the pipe have a .188 wall thickness. This needs to be examined in order to determine how to proceed.
- 3) Northern has specified that there are 0 critical valves for the following systems: Salem IP, Forest Ave., Plaistow IP, Granite St. Portsmouth IP, Route 16B Rochester IP, and Route 88 Exeter IP. If in fact this is the case the Company would be in violation of Part 192.181(a) which states: "Each high-pressure distribution system must have valves spaced so as to shut down a section of main in an emergency. The valve spacing is determined by the operating pressure, the size of the mains, and the local physical conditions". If in fact the company does have critical valves installed the report raises questions as to the maintenance of those valve.

Therefore, based on the comprehensive review of the information supplied, and the preceding concerns, a final report on this

issue cannot be completed. However, with the exception of the items noted, and in accordance with the criteria established, the proposed MAOP of the other systems are commensurate with their use.

CRITICAL VALVES IN NEW HAMPSHIRE

Dover

Regulator Stations:

- ♦ Applevale (corner of Middle)
- ♦ Cocheco St. on Cocheco 4" inlet to station
- ♦ Pulmory Cove (G.S.) inside station.
- ♦ Gulf Rd. (not shown on map) (inside station)
- ♦ Locust St.
- ♦ Sixth St.

Bridge Crossings:

- ♦ Bellamy Rd. - crossing over river to High School (1)
- ♦ Cataract Ave. - crossing Spaulding Turnpike (2)
- ♦ Central Ave. - crossing Cocheco River (1) 1 at First, 1 at 83 Dover Place
- ♦ Littleworth Rd. - crossing B&M railroad (1)
- ♦ Oak St. - crossing B&M railroad (not shown on map)
- ♦ New Bellamy Lane - 2 at Spaulding Bridge

Isolating Valves:

- ♦ Stark Ave. at Middlebrook Rd.
- ♦ Dover Point Rd. at Dover Point Office Park

East Kingston

Regulator Stations:

- ♦ E. Kingston (G.S.)

Bridge Crossings:

- ♦ None

Isolating Valves:

- ♦ None

East Rochester

Regulator Stations:

- ♦ None

Bridge Crossings:

- ♦ None

Isolating Valves:

- ♦ Portland St. at Salmon Falls Rd.

Exeter

Regulator Stations:

- ♦ Exeter West (G.S.)
- ♦ Newfield Station I (G.S.)
- ♦ Newfield Station II (G.S.)
- ♦ Pine St. in curb
- ♦ Rt. 88 and High St.
- ♦ Water St.

Bridge Crossing:

- ♦ Front St. - crossing Little River at Westside Dr. (2)
- ♦ High St. - crossing Squamscott River (2 on each side)
- ♦ String Bridge Ave. - 1 valve 2" above ground

Isolating Valves:

- ♦ None

Gonic

Regulator Stations:

- ♦ Gear Rd.

Bridge Crossings:

- ♦ Flagg Rd. - bridge to Intercoastal Development (one way feed) (valve at beginning of Development Road)
- ♦ Main St. - crossing Cocheco River (2)

Isolating Valves:

- ♦ None

Greenland

Regulator Stations:

- ♦ Ocean Rd. (G.S.)
- ♦ Rt. 151 (G.S.)

Bridge Crossings:

- ♦ Ocean Rd. either side at Cuzzin Richies - verify both sides - East side and 1 at Nike driveway

Isolating Valves:

- ♦ None

Hampton

Regulator Stations:

- ♦ Hampton Vault

Bridge Crossings:

- ♦ Exeter Rd., Rt. 101C - crossing bridge over B&M railroad (1)
- ♦ Hampton Beach - Seabrook Beach - Rt. 1-A crossing Hampton River bridge (2)
- ♦ Lafayette Rd., Route 1 - crossing over B&M railroad (2)
- ♦ Route 101C - crossing over I-95 (1 on I-95 side beyond Timber Swamp Rd. in front of 382)
- ♦ Route 101C - crossing over Rt. 51 (3 on Rt. 51 side) (in front of #242 Exeter Rd.?)

Isolating Valves:

- ♦ Rt. 1-A crossing Hampton river bridge and Hampton Vault- will only separate Hampton from Seabrook
- ♦ Winnacunnet Rd. at Ocean Blvd. - 6" Kerotest Gate Valve

Newington

Regulator Stations:

- ♦ Gosling Rd. (G.S.) inside station
- ♦ Newington Station (G.S.) 6" in front of Rockingham Electric

Bridge Crossings:

- ♦ None

Isolating Valves:

- ♦ None

Plaistow

Regulator Stations:

- ♦ Forest Ave. (G.S.) inside station
- ♦ Sweethill Rd. (G.S.) outside station

Bridge Crossings:

- ♦ Rt. 125 - 1 on each side

Isolating Valves:

- ♦ Elm St. at Stanwood Ave.
- ♦ Greenough Rd.

Portsmouth

Regulator Stations:

- ♦ Barberry Ln. (valves not shown on map)
- ♦ Deer St.
- ♦ Granite St.
- ♦ Islington St.
- ♦ Marcy St.
- ♦ Panaway (G.S.) new valves (2)
- ♦ Pease Air Force Base Boilers (G.S.) 6" valve inside fence Portsmouth Ave. at boiler room
- ♦ Willard Ave.

Bridge Crossings:

- ♦ Cottage St. crossing Rt. 1
- ♦ Greenland Rd. - at Borthwick Ave. (foot bridge) (1)
- ♦ Islington St. - crossing Rt. 1 (1 on downtown side)
- ♦ Kearsage Way - crossing railroad (1)
- ♦ Marcy St. - crossing river (1 valve on LP, 0 valves on HP)
- ♦ Middle Rd. - crossing Rt. 1 (1 on each side)

Isolating Valves:

- ♦ Woodbury Ave. at Echo Ave. 4" PE valve along with Gosling Rd. Station and Newington Station

Rochester

Regulator Stations:

- ♦ Rt. 16 B
- ♦ Rt. 125

Bridge Crossings:

- ♦ Rt. 125 - crossing river near junction of Rt. 125 and Brock St. (2)
- ♦ Route 125 - crossing Axehandle Brook north of Petrolane Plant (2)

Isolating Valves:

- ♦ None

Seabrook

Regulator Stations:

- ♦ New Zealand Rd.

Bridge Crossings:

- ♦ Blackwater Rd., Route 286 - crossing Blackwater River near Rt. 286 (2)

Isolating Valves:

- ♦ Rt. 286 crossing Blackwater River along with Hampton River Crossing - separates Seabrook beach from Hampton and rest of system in Seabrook

Somersworth

Regulator Stations:

- ♦ Bartlett St.
- ♦ Bartlett St. (Dog House)
- ♦ High St.
- ♦ Market St.

Bridge Crossings:

- ♦ Roberts Shoe - crossing railroad at intersection of Main St. and Prospect St. (not shown on map) see Market St. reg. for valve before service) (1)

Isolating Valves:

- ♦ High St. at Indigo Hill Rd. - separates Somersworth and Dover north end. Normally closed.

Note: The numbers in parentheses represent the number of valves.

Applevale Intermediate Pressure Distribution System

System Summary

Current operating pressure: 55 psi

6 year operating pressure range: 52 - 58 psi

Total length of pipe in distribution system: 129,757 ft.

Distribution pipe material: 84.2% plastic, 14.9% bare steel, 0.9% coated steel

Percentage of distribution pipe with pressure test records: 70.1%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 2

of critical valves in distribution system: 7

of corrosion leaks on the main in 6 years: 6

of corrosion leaks on services in 6 years: 4

Other pipe failures: 1

MAOP Recommendation

This system has a relatively small percentage of bare steel main which has not had a significant corrosion problem. The bare steel continues to be evaluated yearly and is replaced as necessary. Most of the system is plastic (a large portion of pressure test records are available) and has been operating between 52 psi and 58 psi with no operational problems. The component defect occurred in 1992 when a 2" plastic butt fusion joint separated. The joint was found to be contaminated at the time of installation resulting in an improper fusion. This seems to have been an isolated incident since we have not experienced this problem in this system before or since. No other component defects have been found which would require a reduction in the operating pressure.

For the sake of standardizing system operating pressures and because the past operating pressure has been so close to 60 psi, it is recommended that the Maximum Allowable Operating Pressure (MAOP) of the Applevale intermediate pressure distribution system be established at 60 psi.

Bellamy Ln., Dover Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 30 - 60 psi

Total length of pipe in distribution system: 5,800 ft.

Distribution pipe material: 98.3% plastic, 1.7% bare steel

Percentage of distribution pipe with pressure test records: 89.7%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 1

of corrosion leaks on the main in 6 years: 7

of corrosion leaks on services in 6 years: 2

Other pipe failures: 0

MAOP Recommendation

This system was uprated from 30 psi to 60 psi in October of 1993 according to CFR part 192.553 and 192.557 (subpart K). The section of main on which all the leaks since 1990 occurred, was replaced in July of 1995.

Dover Pt. Rd., Dover Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 50 - 60 psi

Total length of pipe in distribution system: 2,300 ft.

Distribution pipe material: 100% plastic

Percentage of distribution pipe with pressure test records: 100%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 1

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

This system was uprated from 50 psi to 60 psi in October of 1993 according to CFR part 192.553 and 192.557 (subpart K).

Gulf Rd., Dover Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 45 - 60 psi

Total length of pipe in distribution system: 80,993 ft.

Distribution pipe material: 44.3% plastic, 24.9% bare steel, 30.8% coated steel

Percentage of distribution pipe with pressure test records: 61.5%

of district regulators supplying the system: 2

of district regulators distribution system supplies: 2

of critical valves in distribution system: 5

of corrosion leaks on the main in 6 years: 31

of corrosion leaks on services in 6 years: 5

Other pipe failures: 0

MAOP Recommendation

This system was uprated from 45 psi to 60 psi in July of 1991 according to CFR part 192.553 and 192.557 (subpart K).

The MAOP of the Gulf Rd., Dover intermediate distribution system is 60 psi.

Exeter Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 60 psi

Total length of pipe in distribution system: 111,166 ft.

Distribution pipe material: 70.9% plastic, 18.9% bare steel, 10.2% coated steel

Percentage of distribution pipe with pressure test records: 58.9%

of district regulators supplying the system: 2

of district regulators distribution system supplies: 2

of critical valves in distribution system: 6

of corrosion leaks on the main in 6 years: 40

of corrosion leaks on services in 6 years: 19

Other pipe failures: 1

MAOP Recommendation

This system has operated at 60 psi for several years. A large portion of the system was installed in 1990 during the town sewer installation project when the low pressure cast iron main was replaced with medium density plastic and tied into the intermediate pressure system. The existing bare steel main is evaluated yearly and replaced as necessary. The worst segments of bare steel were replaced back 1991 and 1992. The leak history has dropped considerably since then. A defective O-ring was discovered in a 2"x1/2" plastic service tee in 1991. The tee was not installed and a check of all 2"x1/2" service tees in inventory was conducted. One additional tee was found to have a defective O-ring. To date no service tees have been discovered in the field with this problem. No other component defects or other problems have been found which would require a reduction in the operating pressure.

It is recommended that the MAOP of the Exeter intermediate pressure distribution system be established at 60 psi.

Route 88, Exeter Intermediate Pressure Distribution System

System Summary

Current operating pressure: 50 psi

6 year operating pressure range: 50 psi

Total length of pipe in distribution system: 23,346 ft.

Distribution pipe material: 76.0% plastic, 24.0% coated steel

Percentage of distribution pipe with pressure test records: 53.6%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 0

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

This system was originally installed in 1979 with coated steel. It has since been expanded using medium density plastic. It has operated at 50 psi for several years with no leak history the past 6 years. There have been no component defects or other problems found which would require that the operating pressure of the system be reduced.

It is recommended that the MAOP of the Route 88, Exeter intermediate pressure distribution system be established at 50 psi.

Exeter/Hampton High Pressure Distribution System

System Summary

Current operating pressure: 150 psi

6 year operating pressure range: 100 - 150 psi

Total length of pipe in distribution system: 56,119 ft.

Distribution pipe material: 100% coated steel

Percentage of distribution pipe with pressure test records: 77.7%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 3

of critical valves in distribution system: 4

of corrosion leaks on the main in 6 years: 5

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

This system has been operating at 150 psi for several years without any significant problems. The pressure is sometimes reduced in the summer which explains the wide range of operating pressures over the past six years. As of October 1995 the system is 100% coated steel, the earliest segment was installed in 1976. All leaks which are shown in the leak history table occurred on bare steel mains which have since been replaced. No component defects or other problems have been found which would require a reduction in the operating pressure of the system.

It is recommended that the MAOP of the Exeter/Hampton high pressure distribution system be established at 150 psi.

E. Kingston/Kensington/Seabrook High Pressure Distribution System

System Summary

Current operating pressure: 125 psi

6 year operating pressure range: 100 - 125 psi

Total length of pipe in distribution system: 42,820 ft.

Distribution pipe material: 52.7% bare steel, 47.3% coated steel

Percentage of distribution pipe with pressure test records: 39.6%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 1

of critical valves in distribution system: 2

of corrosion leaks on the main in 6 years: 36

of corrosion leaks on services in 6 years: 4

Other pipe failures: 0

MAOP Recommendation

This system has been operating at 125 psi for several years without any significant problems. The pressure is sometimes reduced in the summer which explains the wide range of operating pressures over the past six years. There has been problems with corrosion along the 4" bare steel in the past and the worst segments have been replaced. The remainder of the bare steel is scheduled for replacement over the next several years until the entire system is coated steel. 5000 feet of 4" bare steel will be replaced during the 1996 construction season. No component defects or other problems have been found which would require a reduction in the operating pressure of the system.

It is recommended that the MAOP of the E. Kingston/Kensington/Seabrook high pressure distribution system be established at 125 psi.

Gonic Intermediate Pressure Distribution System

System Summary

Current operating pressure: 58 psi

6 year operating pressure range: 45 - 58 psi

Total length of pipe in distribution system: 9,532 ft.

Distribution pipe material: 99.1% plastic, 0.9% coated steel

Percentage of distribution pipe with pressure test records: 100%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 1

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

The MAOP of this system was established during construction in 1990. All records of pressure tests are available. The type of plastic installed was medium density polyethylene which is rated for 60 psi. All material installed in this system is rated for at least 60 psi. Pressure test records show that all main was tested at 100 psi.

The MAOP of the Gonic distribution system is 60 psi.

Route 151, Greenland Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 48 - 60 psi

Total length of pipe in distribution system: 3,670 ft.

Distribution pipe material: 100% plastic

Percentage of distribution pipe with pressure test records: 90.5%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 1

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

This system is 100% medium density plastic installed in 1988 and 1990. There is one small section of pipe which is missing the pressure test record. There has never been a leak repaired in this system and it has been operating at 60 psi for the past few years. No component defects or other problems have been found which would require a reduction in the operating pressure.

It is recommended that the MAOP of the Route 151, Greenland intermediate pressure system be established at 60 psi.

Hampton/Seabrook Intermediate Pressure Distribution System

System Summary

Current operating pressure: 45 psi

6 year operating pressure range: 45 - 50 psi

Total length of pipe in distribution system: 361,760 ft.

Distribution pipe material: 47.8% plastic, 45.1% bare steel, 7.1% coated steel

Percentage of distribution pipe with pressure test records: 40.0%

of district regulators supplying the system: 2

of district regulators distribution system supplies: 0

of critical valves in distribution system: 8

of corrosion leaks on the main in 6 years: 164

of corrosion leaks on services in 6 years: 160

Other pipe failures: 0

MAOP Recommendation

This system has operated between 45 and 50 psi for several years. Most of the existing bare steel was installed in the 1960's. The Seabrook side of the system is mostly plastic due to the Seabrook sewer project which has been on going since 1993. The bare steel is evaluated yearly and replaced as necessary. The leaks repaired has dropped considerably in 1995 considering the amount of bare steel in the system. No component defects or other problems have been found which would require a reduction in the operating pressure.

It is recommended that the MAOP of the Hampton/Seabrook intermediate pressure system be established at 45 psi.

Forest Ave., Plaistow Intermediate Pressure Distribution System

System Summary

Current operating pressure: 45 psi

6 year operating pressure range: 25 - 45 psi

Total length of pipe in distribution system: 2,160 ft.

Distribution pipe material: 100% plastic

Percentage of distribution pipe with pressure test records: 100%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 0

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

The MAOP of this system was established during construction in 1987. All records of pressure tests are available. The type of plastic installed was medium density polyethylene which is rated for 60 psi. All material installed in this system is rated for at least 60 psi. Pressure test records show that all main was tested at 90 psi.

The MAOP of the Forest Ave, Plaistow distribution system is 60 psi.

Plaistow Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 45 - 60 psi

Total length of pipe in distribution system: 84,602 ft.

Distribution pipe material: 79.5% plastic, 20.4% bare steel, 0.1% coated steel

Percentage of distribution pipe with pressure test records: 68.3%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 4

of corrosion leaks on the main in 6 years: 1

of corrosion leaks on services in 6 years: 6

Other pipe failures: 1

MAOP Recommendation

A component defect was discovered during the uprate of the system when a 1/2" plastic mechanical coupling on a service failed. This was an isolated incident and has not occurred since the uprate.

This system was uprated from 45 psi to 60 psi in August of 1992 according to CFR part 192.553 and 192.557 (subpart K).

Granite St., Portsmouth Intermediate Pressure Distribution System

System Summary

Current operating pressure: 24 psi

6 year operating pressure range: 23 - 25 psi

Total length of pipe in distribution system: 6,100 ft.

Distribution pipe material: 100% bare steel

Percentage of distribution pipe with pressure test records: 0%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 0

of corrosion leaks on the main in 6 years: 1

of corrosion leaks on services in 6 years: 8

Other pipe failures: 1

MAOP Recommendation

This system is 100% bare steel installed in 1942 and serves the housing project formerly known as Mariners Village. The development is currently under reconstruction and bare steel main is being replaced with plastic as the construction moves along. Most of the remaining bare steel is scheduled to be replaced in the next year or so. The bare steel is being evaluated yearly and is replaced for performance as the need arises. The worst sections of the distribution system have already been replaced. A component defect may have been observed in 1995 when a 1 1/4" plastic service was squeezed off and some discoloration of the pipe was observed at the edges of the squeeze-off tool. The section of pipe was cut out. This problem has not been noticed before or since. No other component defects or other problems have been found which would require a reduction in the operating pressure.

It is recommended that the MAOP of the Granite St., Portsmouth intermediate pressure system be established at 25 psi.

Panaway Intermediate Pressure Distribution System

System Summary

Current operating pressure: 40 psi

6 year operating pressure range: 40 psi

Total length of pipe in distribution system: 13,886 ft.

Distribution pipe material: 70% plastic, 29.2% bare steel, 0.8% coated steel

Percentage of distribution pipe with pressure test records: 62.1%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 2

of corrosion leaks on the main in 6 years: 14

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

Much of the bare steel main in this system was replaced in 1992. There has been only one corrosion leak since then. The remaining bare steel is evaluated yearly and replaced as necessary. There have been no component defects or other problems in the system which would require a reduction in the operating pressure.

It is recommended that the MAOP of the Panaway intermediate distribution system be established at 40 psi.

Portsmouth Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 60 psi

Total length of pipe in distribution system: 229,348 ft.

Distribution pipe material: 57.4% plastic, 16.0% bare steel, 26.6% coated steel

Percentage of distribution pipe with pressure test records: 41.0%

of district regulators supplying the system: 5

of district regulators distribution system supplies: 6

of critical valves in distribution system: 15

of corrosion leaks on the main in 6 years: 40

of corrosion leaks on services in 6 years: 31

Other pipe failures: 1

MAOP Recommendation

This system has been operating at 60 psi for several years without any significant problems. The percentage of bare steel is relatively low considering the size of the system. The existing bare steel is evaluated yearly and is replaced as necessary. The component defect found was a service tee cap which split possibly due to frost movement. This was an isolated incident and no other component defects have been found which would require a reduction in the current operating pressure.

It is recommended that the MAOP of the Portsmouth intermediate distribution system be established at 60 psi.

Route 16B, Rochester Intermediate Pressure Distribution System

System Summary

Current operating pressure: 20 psi

6 year operating pressure range: 20 psi

Total length of pipe in distribution system: 4,886 ft.

Distribution pipe material: 100% plastic

Percentage of distribution pipe with pressure test records: 33%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 0

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 0

Other pipe failures: 0

MAOP Recommendation

This distribution system was installed in two phases, the first phase was in 1986 and the second phase occurred in 1992. 100% of the pipe installed is medium density polyethelene. Pressure test records for approximately half of the segment installed in 1986 are missing, although all the pipe was installed at the same time. Therefore, we can assume that a pressure test was conducted on the segment which is missing the records. Also, the phase installed in 1992 is missing the pressure test records but current operating practice has been especially careful to pressure test all pipe installed which leads us to believe that the main was pressure tested but the records were misplaced.

Given that there has never been a problem with leaks or material failure it is recommended that the MAOP of the Route 16B, Rochester intermediate pressure system be established at 60 psi.

Somersworth Intermediate Pressure Distribution System

System Summary

Current operating pressure: 50 psi

6 year operating pressure range: 48 - 50 psi

Total length of pipe in distribution system: 30,315 ft.

Distribution pipe material: 76.5% plastic, 23.5% bare steel

Percentage of distribution pipe with pressure test records: 58%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 1

of critical valves in distribution system: 4

of corrosion leaks on the main in 6 years: 5

of corrosion leaks on services in 6 years: 7

Other pipe failures: 0

MAOP Recommendation

This system has been operating at or close to 50 psi for several years without any significant problems. The system has a relatively low percentage of bare steel main which does not have an extensive corrosion history. All bare steel main is evaluated yearly and replaced as necessary. There have been no component defects found in this system which would require a reduction in the operating pressure.

It is recommended that the Maximum Allowable Operating Pressure (MAOP) of the Somersworth intermediate pressure distribution system be established at 50 psi.

Rochester Intermediate Pressure Distribution System

System Summary

Current operating pressure: 45 psi

6 year operating pressure range: 45 - 52 psi

Total length of pipe in distribution system: 181,775 ft.

Distribution pipe material: 50.8% plastic, 48.6% bare steel, 0.6% coated steel

Percentage of distribution pipe with pressure test records: 29%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 4

of corrosion leaks on the main in 6 years: 99

of corrosion leaks on services in 6 years: 46

Other pipe failures: 1

MAOP Recommendation

This system has been operating at or slightly above 45 psi for several years without any significant problems. The system has a relatively large percentage of bare steel main which has had problems with corrosion in the past. The worst sections of bare steel have been replaced in recent years and the remaining bare steel main is evaluated yearly and replaced as necessary. The frequency of corrosion leaks has stabilized to a manageable level and should continue to decrease as more bare steel is replaced in the future. The component defect occurred during a service installation when a Lyco coupling split along its seam. There was no gas in the line at the time and the coupling was replaced. This was an isolated incident and has not been a recurring problem. There has been no further evidence found which would require a reduction in the current operating pressure of the system.

It is recommended that the Maximum Allowable Operating Pressure (MAOP) of the Rochester intermediate pressure distribution system be established at 45 psi.

Salem Intermediate Pressure Distribution System

System Summary

Current operating pressure: 60 psi

6 year operating pressure range: 25 - 60 psi

Total length of pipe in distribution system: 96,473 ft.

Distribution pipe material: 77.5% plastic, 22.5% coated steel

Percentage of distribution pipe with pressure test records: 93.1%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 0

of critical valves in distribution system: 0

of corrosion leaks on the main in 6 years: 0

of corrosion leaks on services in 6 years: 1

Other pipe failures: 0

MAOP Recommendation

There is no bare steel pipe in the Salem distribution system. The only test records which are missing belong to the original propane system.

This system was uprated from 25 psi to 60 psi in July of 1994 according to CFR part 192.553 and 192.557 (subpart K).

Somersworth/Rochester High Pressure Distribution System

System Summary

Current operating pressure: 150 psi

6 year operating pressure range: 110 - 150 psi

Total length of pipe in distribution system: 61,404 ft.

Distribution pipe material: 86.5% coated steel, 13.5% bare steel

Percentage of distribution pipe with pressure test records: 67.5%

of district regulators supplying the system: 1

of district regulators distribution system supplies: 4

of critical valves in distribution system: 5

of corrosion leaks on the main in 6 years: 6

of corrosion leaks on services in 6 years: 2

Other pipe failures: 0

MAOP Recommendation

This system has been operating at 150 psi for several years without any significant problems. The pressure is sometimes reduced in the summer which explains the wide range of operating pressures over the past six years. There is only 8300' of bare steel main left in this system and 6000' of it is scheduled for replaced during the 1996 construction season. The remaining bare steel is evaluated yearly and will be replaced as necessary. No component defects or other problems have been found which would require a reduction in the operating pressure of the system.

It is recommended that the MAOP of the Exeter/Hampton high pressure distribution system be established at 150 psi.

Gosling Rd. high pressure line

System Summary

Current operating pressure: 500 psi

4 year operating pressure range: 300 - 500 psi

Total length of pipe in distribution system: 6024 ft.

Distribution pipe material: 100% coated steel

Percentage of distribution pipe with pressure test records: 100%

of district regulators supplying the system: NA

of district regulators distribution system supplies: 1

of critical valves in distribution system: 1

of corrosion leaks on the main in 4 years: 0

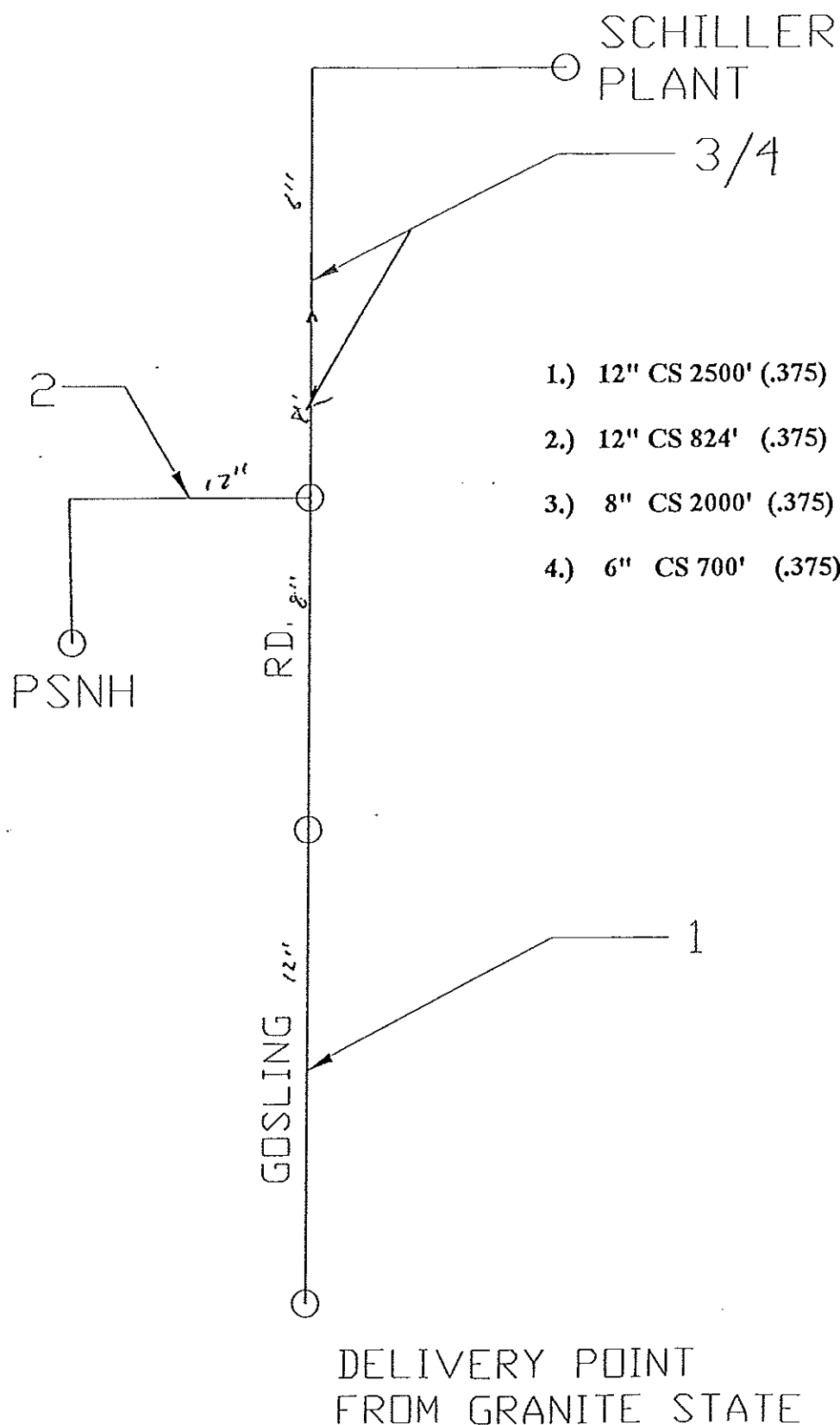
of corrosion leaks on services in 4 years: 0

Other pipe failures: 0

MAOP Recommendation

In 1992 2500' of 8" CS on Gosling Rd was replaced with 12" CS, and 854' of 12" CS was installed to supply PSHN off Gosling Rd. The 12" CS segments were pressure tested at 1200 psi and 1100 psi (*respectively*). The remaining 8" CS and 6" CS was uprated to 625 psi on 11/09/92. There have been no component defects or other problems in the system which would require a reduction in operating pressure. It is recommended that the MAOP of the Northern Utilities Gosling Rd. highline be established at 500 psi..

GOSLING ROAD HIGH PRESSURE LINE



- 1.) 12" CS 2500' (.375) 07/15/92 = 1200 PSI
- 2.) 12" CS 824' (.375) 04/09/92 = 1100 PSI
- 3.) 8" CS 2000' (.375) 11/09/92 = 625 PSI
- 4.) 6" CS 700' (.375) 11/09/92 = 625 PSI

April 24, 1997

Mr. Richard G. Marini, P.E.
Administrator-Safety Division
State of New Hampshire
Public Utilities Commission
8 Old Suncook Rd.
Concord, NH 03301-5185

RE: MAOP - New Hampshire Division

Dear Mr. Marini:

The issue of MAOP, for the various intermediate and high pressure distribution systems within the New Hampshire division, was considered during the past eighteen months as a result of your insight relative to federal and state regulatory initiatives. Research such as operating pressure and leak history as well as the type, size and installation date of gas piping was performed on each distribution system. Through our joint effort, the results of the distribution system analysis were reviewed and a MAOP was established for each distribution system.

The following is a list of distribution systems and corresponding MAOP:

Distribution System	MAOP
New Bellamy Ln., Dover	60#
Granite Street, Portsmouth	25#
Applevale, Dover	55#
Charles Street, Dover	55#
Route 16B, Rochester	20#
E. Kingston/Seabrook High Pressure	125#
Somersworth/Rochester High Pressure	150#
Rochester Intermediate Pressure	45#
Gulf Road, Dover	60#
Route 151 Greenland	60#
Exeter Intermediate Pressure	60#
Hampton/Seabrook Intermediate Pressure	45#
Exeter/Hampton High Pressure	150#
Dover/Somersworth High Pressure	500#

Distribution System	MAOP
Panaway Intermediate Pressure	40#
Dover Point Rd., Dover	60#
Portsmouth Intermediate Pressure	60#
Somersworth Intermediate Pressure	50#
Gonic Intermediate Pressure	60#
Route 88, Exeter	50#
Gosling Road, Newington	500#
Plaistow Intermediate Pressure	60#
Salem Intermediate Pressure	60#

Please confirm that the above information is correct and call at (508) 836-7287 if you have any questions or concerns.

Sincerely,

Edward Wencis
Senior Engineer

STATE OF NEW HAMPSHIRE



CHAIRMAN

glas L. Patch

MISSIONERS

Bruce B. Ellsworth

Susan S. Geiger

PUBLIC UTILITIES COMMISSION

8 Old Suncook Road

Concord, N.H. 03301-7319

EXECUTIVE DIRECTOR

AND SECRETARY

Thomas B. Getz

TDD Access: Relay NH

1-800-735-2964

Tel. (603) 271-2431

FAX No. 271-3878

April 28, 1997

Mr. John Snow
Northern Utilities
325 West Rd., P.O. Box 508
Portsmouth, New Hampshire 03802-0508

RE: MAOP - New Hampshire Division

Dear Mr. Snow:

The New Hampshire Division of Northern Utilities, based on guidelines set forth by the NHPUC Safety Division, did extensive research and data collection to formally establish MAOP. This research resulted in a report that stated the pressures for the various intermediate and high pressure distribution systems and how they corresponded to the federal and state regulatory initiatives.

As a result of the inspections done to ensure proper MAOP and your efforts to comply, based on pressures listed in Northern's letter dated April 24, 1997, we shall consider this issue closed.

Thank you for your cooperation in this matter.

Sincerely,

Jody Carmody for

Richard G. Marini, P.E.
Administrator, Safety Division

RGM/jc

*Ed -
Congratulations on finally
resolving this to Rick Marini's
satisfaction - Paul*