STATE OF NEW HAMPSHIRE

PUBLIC UTILITIES COMMISSION

DG 20-152

In the Matter of:
Liberty Utilities (EnergyNorth Natural Gas) Corp., d/b/a Liberty Utilities-Keene
2020-2021 Winter Cost of Gas

Direct Testimony

of

Randall S. Knepper
Safety and Security Director of the Safety Division

October 15, 2020

New Hampshire Public Utilities Commission

Liberty Utilities (EnergyNorth Natural Gas) Corp., d/b/a Liberty Utilities

Liberty-Keene Cost of Gas

DG 20-152

Testimony of
Randall S. Knepper

Q. Please state your name, occupation and business address.

A. My name is Randall S. Knepper. I am employed as the Safety and Security Director of the Safety Division for the New Hampshire Public Utilities Commission. My business address is 21 S. Fruit Street, Suite 10, Concord, New Hampshire 03301.

Q. Please summarize your education and professional work experience.

A. I received a Bachelor of Science in Mechanical Engineering from the University of Rochester and a Master of Science in Civil Engineering from the University of Massachusetts. I am a licensed Professional Engineer in the State of New Hampshire, License No. 9272. For continuing education, I have completed 21 Technical Training Courses and 23 Online Training Sessions provided by the Training and Qualification Center of the Pipeline and Hazardous Materials Safety Administration (PHMSA). See Attachment RSK-3.

I have been the Director of Safety for the New Hampshire Public Utilities Commission since December 2004. I have testified in numerous proceedings before the Commission. See Attachment RSK-4 for a summary of previous dockets. Prior to that I was an Environmental

Consultant and Business Development Manager at The Smart Associates, Environmental Consultants, Inc., located in Concord, New Hampshire. For 16 years I was employed at a local gas distribution company. My previous work experience included a number of Business and Operations roles at Keyspan Energy Delivery New England (Keyspan) and EnergyNorth Natural Gas Inc. (EnergyNorth), including Key Account Executive, Commercial & Industrial Sales Manager, Sales Engineer, Senior Engineer, Staff Engineer, and CAD Supervisor. For many of those years, I designed natural gas distribution systems, recommended capital improvement projects, recommended system expansions, wrote Operations and Maintenance procedures, and oversaw construction projects. While performing the duties of each of these occupations I was responsible for compliance related to applicable local, state, and federal codes. Prior to my utility experience I worked at Westinghouse Electric designing high voltage transmission lines as a Project Engineer.

In addition, I have served as Staff Engineer for the New Hampshire Site Evaluation Committee prior to its most recent reorganization in 2014 and currently serve as subject matter expert for the New Hampshire Advisory Council on Emergency Preparedness and Security. My professional work experience spans more than 30 years.

Q. Are you affiliated with any professional organizations?

A. Yes. I am a member of the Association of Energy Engineers (AEE). I serve on multiple committees of the National Association of Pipeline Safety Representatives (NAPSR), including prior positions as Chair and Past Chair. I have served as editor of all of the past editions of NAPSR's *Compendium of State Pipeline Safety Requirements & Initiatives Providing Increased Public Safety Levels Compared to Code of Federal Regulations*. I currently chair the Staff

Pipeline Safety Subcommittee of the National Association of Regulatory Commissioners (NARUC); I serve on the Common Ground Alliance Technology Committee; I am appointed as a member of the Gas Technology Institute's Public Interest Advisory Committee; and I am a board member of the New Hampshire Public Works Standards and Training Council. Finally, I have testified before the United States Congress on pipeline safety issues.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to describe the Safety Division's observation regarding Liberty Utilities and Liberty-Keene (Liberty)'s processes used in meeting the safety requirements set forth in Order 26,065.

Q. Did the Safety Division's Adequacy Assessment Report in Docket DG 17-068, regarding safety issues associated with CNG conversion in Keene, recommend to the Commission that any or all costs incurred by Liberty (including the demand costs associated with the XNG CNG supply contract) for the Keene conversion be considered prudent?

A. No. The Safety Division's report containing safety recommendations, issued on October 3, 2018, intentionally does not address prudency. The report did bring to light the significant amount of costs that would be involved in the proposed system conversion.[1] For example, the Safety Division recommended installing a single turbine meter for the propane/air system although Liberty ultimately chose a more expensive ultrasonic meter with flange pressure ratings that were unnecessarily high, which led to excessive costs, in Staff's view. The report mentioned that the customer conversion costs associated with end use gas appliances (either replacement or reconfigured) downstream of the customer meter appeared to be shifted to

[1] *See* **Attachment RSK-1:** Staff Assessment, Section III p. 58, Section IV, pp. 59 and 60, See Section V p. 62, (17-068)available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-068/LETTERS-MEMOS-TARIFFS/17-068_2018-10-05_STAFF_ADEQUACY_REVIEW.PDF

other customers and this is a topic that the Commission should take up later. The significant conversion costs that were being contemplated by Liberty were included in the report to give context to Liberty's conversion proposal, and to show that Liberty's conversion proposal was not merely minor or routine in nature. The entire conversion of a gas distribution system from propane/ air to CNG would be an expensive proposition requiring, in my view, careful project management to achieve a thorough understanding of the CNG implementation impacts, close scrutiny of cost control measures, complete systematic planning and individual customer planning, and examination of the multitude of details required throughout the project without sacrificing necessary safety requirements.

Q. To your knowledge, has Liberty prepared a comprehensive project management plan for conversion of the entire Keene distribution system of that nature and depth?

A. No. The Safety Division is still waiting a detailed comprehensive plan for phases identified as 1 through 5.

Q. Was the Safety Division's October 3, 2018 Adequacy Assessment's primary objective to examine the costs of the Keene conversion from propane/air to CNG?

A. No. The Safety Division's report containing safety recommendations issued on October 3, 2018 was primarily done in order to methodically review and examine the safety ramifications of what Liberty was proposing. The report identified more than 180 areas in Liberty's initial submission that were conflicting, lacking details, or required updating.

Q. Please comment on Liberty's testimony BP 09 "This was the first time that Liberty or the Staff had been involved with connecting CNG to the Company's distribution system and there were unknown obstacles and delays involved with getting the installation finalized to the satisfaction of all parties."

A. Liberty response to Staff data request 1-4 in this docket (attached to Stephen Frink's

testimony as SFP-3) attempts to add clarity to this statement but instead unfortunately depicts safety issues as "obstacles and delays." Webster's dictionary defines an "obstacle" as something that impedes progress or achievement. Liberty response to Staff data request 1-4 suggests that Liberty's impediment was somehow the result of Staff's delays and the Commission's delays. These statements are incorrect and unfounded.

Q. What parts of Liberty Response to Staff data request 1-4 do you consider incorrect and unfounded?

A. Liberty response to Staff 1-4, see SPF-3 states the following:

> The Company submitted its documentation consistent with ASME B31.3, which is the code governing the supplier of the CNG skid and is what that company used in its other installations of CNG unloading facilities, including those that feed into utility transmission and distribution piping, throughout the country. As part of that documentation, the demarcation point between the applicability of ASME B31.3 and 49 CFR Part 192 would be the outlet flange after the decompression was complete. The Safety Division, while acknowledging that "[t]here is no single applicable safety standard used within New Hampshire, nor nationwide, for CNG trailers,"… applied 49 CFR Part 192 to the installation as part of its assessment of the CNG installation, which meant that the demarcation point was the hose that connects the decompression facility to the trailers. **This interpretation was not expected by the Company and resulted in the entire CNG skid having to be modified** to meet the different standards, and also necessitated significant revisions to the Company's documentation, including the documentation of the owner of the CNG skid. [Emphasis added]

The Safety Division from the onset, and repeatedly during discussions with Liberty operations personnel, unequivocally stated that the demarcation point for transfer of product was at the outlet flange of the CNG trailer. The demarcation point is where operational, maintenance and emergency responsibilities must lie totally with the operator of the Keene distribution system, i.e. Liberty. There should have been no surprise to Liberty regarding this

demarcation point and its significance. Liberty could not outsource functions --such as shutting down supply to customers--to a third party. Liberty could not outsource regulator equipment checks to a third party. Because of the demarcation point, Liberty could not downshift responsibilities on material selections, piping wall thickness, remote monitoring of pressures, required maintenance, emergency response duties, public awareness plans, pressure testing and many other standard duties that come with operating a source of supply and providing gas service *as a utility*. Unfortunately, Liberty had prematurely signed a contract for supply with a supplier (XNG) that overlooked the importance of the demarcation point or did not account for it.

Q. Why should Liberty reasonably have expected that the demarcation point was the outlet flange of the CNG trailer i.e. why is the location of the demarcation point not subject to interpretation ?

A. First, the outlet of the flange of the mobile storage tank is similar to the demarcation point Liberty uses with its existing propane deliveries in Manchester, Nashua and Tilton. It is also similar to the demarcation point for Liberty's liquefied natural gas (LNG) deliveries in Manchester, Concord and Tilton. Liberty should have been very familiar and, not surprised with, the similar demarcation point at the outlet of the CNG trailer identified by Staff.

Second, Administrative Rule Puc 506.01 Pipeline Safety Standards clearly delineates in section (a) the following:

> (a) All utilities including those with propane storage facilities shall comply with those pipeline safety regulations established by the United States Department of Transportation which are set forth in 49 C.F.R. Part 192 including future amendments thereto.

This C.F.R., 49 C.F.R. Part 192, does not incorporate by reference an ASME B31.3 Process Piping Standard. Pursuant to the 49 C.F.R. Part 192.7, Liberty is not allowed to use or

substitute any standard that is not incorporated by reference. Moreover, ASME B31.3 contains requirements for piping typically found in petroleum refineries; chemical, pharmaceutical, textile, paper, semiconductor, and cryogenic plants; and related processing plants and terminals. It is for this very reason, the ASME B31.3 standard is not the correct application or standard for gas distribution systems where gas piping *enters residential and business structures and is located in close proximity to the general public and gas consuming appliances.* It is fundamental that standards must be referenced in the C.F.R. (*See* 49 C.R.F. Part 192.7, listing allowed standards).

Lastly, during the Safety Division assessment, the Safety Division informed Liberty of a July 26, 2014, order from the New York Public Service Commission (NYPSC) that essentially says the same thing. The NYPSC order evens go further and instructs the utility how equipment and supply costs will be categorized and treated for rate making purposes. A copy of the NYPSC order is attached as RSK-2. Liberty's own research ought to have led it to the New York Public Service Commission order months and months before Liberty sent out an RFP for CNG supply, let alone signed a CNG supply contract in October of 2016, and subsequently submitted its plans to the Safety Division for assessment.

Q. Why was Liberty's proposed use of the B31.3 process piping standard, and not the requirements contained in 49 CFR Part 192, a problem?

A. Both standards allow similar materials to be used for piping, but B31.3 allows for thinner wall thickness to be used which can lead to higher stresses in the piping. It also allows lower incremental factors for pressure testing. **This results in lower safety margins** for the distribution system and **does not result in an equivalent level of safety for the public and end use customers, who are vulnerable because they have no knowledge of the product unlike an industrial worker employed in a chemical plant who would be more**

knowledgeable of equipment ratings. There are also many other requirements that are in 49CFR Part 192 that are not in B31.3 process piping standard that are relevant and significant to protect the general public, including operational restrictions, maintenance restrictions, personnel qualification restrictions, greater emergency response requirements, and public awareness implications. All of these topics complimented with marketing, financial, and executive oversight become elements of a comprehensive conversion strategy for CNG conversion.

Q. What does the phrase "[t]here is no single applicable safety standard used within New Hampshire, nor nationwide, for CNG *trailers*," (emphasis added) mean and where was it used?

A. This statement is taken directly from page 7 of the October 3, 2018 Staff Adequacy Assessment which identified over 180 areas Liberty needed improvements. The key word that should be emphasized in the above phrase is **"**trailer.**"** The trailer is the mobile storage vessel used to transport CNG over the highways and is also left onsite until the "trailer" gas volume is depleted. Once on site at the utility's property, the trailer no longer functions as a mobile device but functions as more of a traditional storage tank: in this instance the trailer contains highly pressurized fuel. The full context of the statement within the Safety Division's Adequacy Assessment is:

> There is no single applicable safety standard used within New Hampshire, nor nationwide, for CNG trailers [used as storage for CNG]. The National Fire Protection Association (NFPA) has produced Standard 55, Compressed Gases and Cryogenics Code, but that standard focuses on filling station applications used for vehicle refueling systems rather than bulk supply systems.

Because the Safety Division correctly defined the demarcation point as the outlet flange of the CNG trailer, the appropriate standard for demarcation was indisputably the standard contained in 49 C.F.R 192.

The Safety Division also stated on page 7 in the Assessment, to illustrate the lack of an applicable safety standard for *trailers used as storage* and the broad authority the Commission could assert in the future:

> The on-road regulations of a CNG trailer are governed by the Federal Motor Carriers Safety Administration and are not jurisdictional to the Safety Division. Once driven onto and parked on Liberty premises, the trailers become a component of the Liberty supply system and are considered NHPUC-jurisdictional with respect to safety governance, pursuant to the terms of RSA 374:1,374:4, and allied statutes. The Safety Division requires that Liberty ensure that all operational conditions on its property and/or connected to the provision of utility service, be conducted safely, as required by RSA 374:1. Liberty does not [and cannot] cede this independent responsibility by leasing equipment from XNG. For instance, without limitation, Liberty must ensure that physical security, pavement conditions and traffic safety controls, personnel training, equipment maintenance, fire prevention protocols, and all other aspects of its readiness to accept XNG supply trailers at the Keene Installation are safe and adequate, as determined by the Safety Division pursuant to applicable federal and state safety regulations.

This quoted portion merely indicates that the Commission is well within its authority to regulate the onsite trailer once it is stationary on site and used as a storage device. The Safety Division while having the authority, avoided exercising that authority during discussions with Liberty to simplify the review process. The Safety Division's distinction between the trailer when "on road" and when parked, and the demarcation point as defined results in a cleaner, well defined and pragmatic result. It avoids multiple review of the ever-changing characteristics of storage trailers that will be brought to Liberty's Production Avenue site and left there. If potential future events such as a fire involving the trailer, pressure releases, security breaches or other issues arise, the Commission, through its Safety Division, may elect to address the issue, exercise its authority, and impose conditions as warranted.

Liberty in its response to Staff data request 1-4, Attachment to Stephen Frink's Testimony, SPF-3, conflates the statement about the trailers with the Safety Division's identified demarcation point. Had Liberty taken reasonable steps to educate itself, it would have expected and addressed the "unexpected conditions" before the Safety Division had to assess

and recommend changes, and before the Commission had to impose the Safety Division's recommended changes to preserve safety. The Safety Division disagrees with Liberty's representation of the situation.

Q. What measures could have been taken by Liberty or the Staff to reduce the time of review?

A. 1) From October 2016 to November 2017, Liberty could have devoted more resources to the project, designated an overall project manager from the onset that could oversee the immediate project and future phases, and internally performed the review that the Safety Division undertook before they even submitted their documents.

2) Liberty submitted over 1,800 pages of documents and they were originally not Bates Page stamped, which slowed down the Safety Division's review because there were multiple pages taken from manufacturer's specification that had same numbering. It was so cumbersome the Safety Division requested Liberty to resubmit with proper Bates page numbering so that references to pages could be easily made and avoid any future miscommunications.

3) Liberty submitted nearly 470 pages of irrelevant information that was not applicable to the Keene Site. The Safety Division had to review these pages to determine if they contained technical information or instructions that needed review. Filtering out irrelevant material fell upon the Safety Division which lengthened the amount of time to review.

4) A project's documentation is reflective of the quality assurance process used in the design, selection, installation and operation of the project. To ensure a project is completed safely, and to ensure public safety is considered in every step within those processes, reviews should be thorough and comprehensive, and inaccuracies should be eliminated. Liberty employed no quality assurance process which would have helped minimize delays.

5) Staff provided Liberty results of deficiencies as they were identified. This gave Liberty the

opportunity to keep up with required amendments as Staff completed its review. This did not have to occur, but Staff provided this courtesy as a way of enabling Liberty to pre-position itself to be ready to quickly respond to the Adequacy Report.

6) Liberty was allowed to continue to make field changes throughout the process. It was only not allowed to flow gas until all engineering reviews, procedure manuals were updated, training provided, and controls put in place. For example, Liberty was allowed to conduct a pressure test but not flow the gas. While Liberty did not pressure test according to its own procedures and skipped 17 steps in its internal procedure, the Safety Division still allowed the pressure test to occur which needed to be scheduled to accommodate equipment rentals. This is an example of the Safety Division's efforts to reduce delays.

Q. **Has the discovery process been completed?**

A. No. In this expedited COG docket, Liberty has not responded to the October 6, 2020, Technical Session Data Requests (issued October 8, 2020), and I reserve the right to revise my testimony in light of additional information the Company may provide.

Q. Does that conclude your testimony?

A. Yes.

DG 17-068
NHPUC Safety Division
Adequacy Assessment of the
Proposed Compressed Natural Gas Installation by
Liberty Utilities - Keene, NH Division
October 3, 2018

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Summary and Staff Recommendations

As required by Order No. 26,065 the Safety Division conducted a review of the proposed CNG facility that will serve portions of the existing EnergyNorth Natural Gas d/b/a Liberty Utilities (Liberty) gas distribution systems in Keene (Keene Installation). Staff completed a review of facility design documentation provided by Liberty and a physical inspection of the proposed CNG facility on November 8, 2017, and on April 13, 2018. The Commission order required the Safety Division to file a report based on the following two directives:

1) Completion of a final walk-through (physical inspection) of the CNG pipeline facility prior to gas flowing into the gas distribution system, and
2) Assessment of the adequacy of Liberty's submitted final plans regarding:

    - Engineering and System Schematics,
    - Construction and Installation,
    - Pressure Testing,
    - Operations Procedures,
    - Public Awareness plan,
    - Maintenance Procedures,
    - Emergency Response plan, and
    - Operator Qualifications and Training.

Staff comments and recommendations, based on its review of several draft efforts and a finalized document submitted by Liberty, are summarized in the tables inserted in each review section of this report. Numerous inconsistencies and recommended corrections are noted. The majority of comments are placed in tables that are highlighted and refer back to submissions. If all noted issues are addressed by Liberty, Staff would likely conclude that the CNG decompression skid and distribution system configuration for Phase 1 of the Keene Installation is consistent with 49 CFR Part 192 code regulations and Puc 500 rule requirements. However, the CNG skid cannot be operated and maintained consistent with 49 CFR Part 192 and Puc 500 requirements without Liberty formally incorporating and adopting certain procedures, using qualified personnel, and making other necessary enhancements as identified by the Safety Division in this report. Therefore, Staff recommends that the Commission condition its acceptance of Liberty's plans for Phase 1 of the Keene Installation on Liberty's fully integrating the Safety Division's proposed enhancements. The Safety Division recommends that the Commission adopt these conditions in any Order issued for this initial phase of the Keene Installation. The Safety Division also urges the Commission to review this Report carefully, as it goes into great technical detail regarding the engineering and safety enhancements currently identified as necessary for Phase 1. Furthermore, there may be open questions regarding Commission jurisdiction and approvals necessary under RSA Chapters 362 and 374 in connection with the Keene Installation that must be considered.

The Safety Division has completed its assessment of the plans submitted by Liberty plans dated November 13, 2017. The assessment identifies changes that are necessary to the documents as submitted. The Safety Division believes Liberty should make all changes to the pertinent sections as indicated in this Report. Furthermore, the Safety Division has concluded that a final assessment of the proposed Phases (2 through 5.) of the Keene Installation would be premature at the present time, as sufficient planning or review have not taken place for these subsequent Phases.

The Safety Division recommends as a condition of Liberty moving forward with Phase 1 of the Keene Installation that the Commission accept this report and require Liberty to provide a response to the Commission that addresses each item identified. The Safety Division proposes reviewing each Liberty response to verify that each issue is resolved and will file supplemental recommendations as needed. The Safety Division may potentially recommend that the investigation be closed as it pertains to Phase 1 if responses are deemed adequate. As Liberty fully develops plans and schedules for subsequent phases of the Keene Installation the Safety Division would proceed with a review of the ensuing phases.

Purpose

On October 20, 2017, the New Hampshire Public Utilities Commission (NHPUC, PUC, or Commission) directed the Safety Division to undertake a comprehensive review of the proposed installation of a compressed natural gas (CNG) facility serving portions of the Energy North Natural Gas Corp. d/b/a Liberty Utilities (Liberty) gas distribution systems in Keene. Liberty proposed and began installing a CNG facility on a parcel of land that Liberty owns at the cul de sac of Production Avenue in Keene. The proposed CNG facility is set up to receives deliveries of CNG at 4,000 psig from an XNG-supplied trailer and is recognized as the first ever facility of its kind to be connected to a gas distribution system in New Hampshire. With respect to operating pressure, the 4,000 psig pipeline segment of the decompression skid easily surpasses the next highest pressure of any gas pipeline in New Hampshire, including interstate pipelines that operate at a maximum of 1,440 psig. Liberty's next highest pressurized pipeline within New Hampshire operates at 750 psig, directly serving an independent power producer. The 4,000 psig system segment is relatively short in length, as it is located only in the vicinity of the trailer and decompression skid. Nonetheless, this segment is technically treated with careful consideration for this non-traditional method of supplying a gas distribution system.

As required by Order No. 26,065, the Safety Division conducted a review of documentation submitted by Liberty and completed a physical inspection of the CNG facility on November 8, 2017, prior to pressure testing, and again on April 13, 2018, post pressure testing. The Commission directed the Safety Division to file a report to include two requirements:

- Completion of a final walk-through (physical inspection) of the CNG pipeline facility[1] prior to gas flowing into the gas distribution system, and
- Assessment of the adequacy of Liberty's submitted final plans, which covered the following elements:

  (1) Engineering and System Schematics,
  (2) Construction and Installation,
  (3) Pressure Testing,
  (4) Operations Procedures,
  (5) Public Awareness Plan,

[1] The term pipeline facility here is consistent with the definition of 49 CFR Part 192.3 definition of "pipeline facility" meaning *new and existing pipelines, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.*"

(6) Maintenance Procedures,
(7) Emergency Response Plan, and
(8) Operator Qualifications and Training.

In addition to the requirements of the Commission, this report serves as a summary of various inspection reports, fulfilling requirements regarding the above technical subjects contained within the certification granted to the NHPUC by the federal agency charged with pipeline safety oversight, the Pipeline and Hazardous Material Safety Administration (PHMSA).[2] The Safety Division generally understood the Commission's directive to include a review of compliance with applicable state and federal regulations.

[2] PHMSA is one of ten agencies organized under the US Department of Transportation. PHMSA consists of two separate offices: the Office of Pipeline Safety and the Office of Hazardous Materials. The NHPUC has an annual certification on file with PHMSA's Office of Pipeline Safety.

The Safety Division's review consisted of:

- Physical inspections of the new CNG installation located at Production Avenue in Keene;
- Phone conferences with Liberty personnel;
- Safety Division comments on Liberty's submittals prior to the Company's submission of final plans;
- Multiple email exchanges with Liberty project team members;
- Review of Liberty responses to questions from the Safety Division;
- Completion of state inspection reports; and
- Research of applicable codes and safety regulations including gas piping classifications.

Keene Propane/Air System Background Description

Liberty currently has two propane/air distribution pressure systems within the City of Keene. One distribution system consists of 26.8 miles of main with 818 service lines operating at a maximum allowable operating pressure (MAOP) of 13.5 inches water column (w.c.)[3] supplying approximately 1,122 customers. The other distribution system consists of 3.3 miles of main with 56 service lines operating at approximately 3.5 psig (5 psig MAOP). This second system feeds the Monadnock Marketplace area, an additional 74 commercial, and 25 residential customers. Currently a propane/air mixture is supplied to both distribution systems from the existing propane/air plant located at 207 Emerald Street in Keene, which consists of a 60,000 gallon and a 30,000 gallon propane storage container, vaporizers, air blowers, and mixing equipment. The figure in Appendix 1-A depicts an overview of both existing Liberty propane/air distribution systems. The figure in Appendix 1-B depicts the Production Avenue location, Monadnock Marketplace, and the initial phase of the proposed natural gas distribution for Keene. Appendix 1-C shows all 5 natural gas conversion phases that Liberty's latest proposal envisions, as understood by the Safety Division.[4]

Liberty's Proposed Plan for Modification to the Existing Propane/Air Distribution System

The Safety Division's review of Liberty's proposed alterations to the existing distribution system centered on five elements:

I. Addition of a new natural gas supply source;
II. Sectionalization of portions of the existing system and gas quality measuring;
III. Alteration of pressure configurations;
IV. Conversion of existing customers from propane/air to natural gas; and
V. Expansion plans.

Liberty's plan to add a new natural gas supply source for Keene has been evolving over the past four years through many different variations derived from conceptual outlines, eventually translating into tangible physical equipment installed at a fixed location. Various proposals have been discussed during the five years since Liberty Utilities purchased New Hampshire Gas in 2013. In Staff's experience, Liberty often presents the plans as "temporary" solutions rather than engaging in detailed planning from the onset that encompasses study of all the ramifications of integrating a new supply source into an existing propane/air system.

[3] 13.5 inches w.c. is approximately equivalent to 0.5 pounds per square inch gauge (psig).
[4] Liberty prepared supplemental response to Staff (suppt. response to Staff 2-41) dated 10/31/2017 to Staff inquiry in the DG 17-048 rate case. A copy of the response is attached to this report in Appendix 3.

The accidental injection of higher than normal Btu[5] gas into the propane/air system in December of 2015 triggered an emergency response and subsequently prompted Liberty to assess and repair the air injection system redundancy. Liberty decided to man the propane/air plant 24 hours per day, seven days per week in December 2015, which was an expensive proposition because of the associated man hours and the low probability of a reoccurring sequence of events. In the months following, Liberty focused on strategies aimed at reducing quantities of propane/air production from the existing plant and introducing a second source of supply. For the 2016/2017 winter season, Liberty proposed sectionalizing the distribution system with a "temporary" CNG installation to be located behind a commercial building at the Monadnock Marketplace. The proposed depressurization skid location in the Monadnock Marketplace would have been in close proximity to existing buildings. The location and contents of the skid had physical limitations and lacked detailed planning. Eventually the proposed skid facility was abandoned as a possible location. Liberty's rushed preparation to install a temporary CNG supply source behind the Price Chopper at the Monadnock Marketplace focused more upon seeking arrangements for permission with the building owner and completing installation before the 2016/2017 winter season rather than providing a comprehensive, thoughtful, and detailed plan. This proposed installation did not come to fruition and was fraught with many siting difficulties. An alternate location was considered for the winter season (2017/2018).

In March 2017, Liberty finalized a proposal for locating the proposed CNG depressurization skid at the south end of Production Avenue, which is classified as an industrial zone with limited public access. Liberty assigned an internal project manager to the CNG installation effort and continued communications with the City of Keene, recognizing that approvals of local boards would be required. Liberty relied on vendors and outside engineering firms to assist in developing site plans that are typically required by local planning and zoning boards. Such plans in turn were reviewed by various local government departments, including fire departments, for compliance with local standards and ordinances. Liberty often refers to this installation location as "temporary" although no final details on "final" installation locations have been presented. The Safety Division considers a temporary installation to be one that typically is in place for 30 days or less and almost never exceeds the duration of a construction season. Liberty's connotations of "temporary" and "permanent" are unusual for the industry. The Safety Division reviews all installations as if they will be designed and constructed on a permanent basis. A summary of the engineering review and associated review of impacts of the proposed CNG decompression unit and distribution system piping is provided in *Section I. Adding a new natural gas supply source Engineering Review.*

In the recent Liberty distribution service rate case docket, DG 17-048, Staff requested in June 2017 an overall comprehensive business plan for the Keene Division with a detailed description of plans and costs to convert Keene customers from propane/air service to natural gas service. In October 2017, Liberty responded again by describing briefly, with minimal detail, the conversion process for Phase 1 only, including customers along Production Avenue and the Monadnock Mall taking service from a temporary CNG facility during the summer of 2017. Liberty described Phase 2 merely as an extension of a high pressure main from the existing "high line" to serve businesses along Key Road and an extension on Winchester Street south of Route 101 during the Spring of 2019. Phase 3 was described only as continuing across Main Street and down Marlboro Street as well as Optical Avenue beginning in spring of 2020. Phase 4 would begin an extension north along Route 9 during the spring of 2020. Phase 5 would extend service further north and is expected to begin in spring of 2021. The Phases are illustrated on the plan attached in Appendix 1-C. No details have been provided with respect to how existing low pressure propane/air system customers would be converted in Phases 2, 3, 4 or 5.

[5] Btu is short for British Thermal Unit, 1 Btu is equivalent to the amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Engineering Review

Liberty provided design information in regard to the proposed CNG decompression skid, piping, components, and site development in Keene that indicates that the CNG decompression skid is configured to deliver natural gas at a maximum flow rate of up to 40,000 standard cubic feet per hour (SCFH). The limiting capacity component is the heat exchanger capability within the decompression skid. The skid is supplied using very high pressure CNG delivered at 4,000 psig from a portable trailer. The extreme amount of pressure allows the maximum volume of natural gas to be stored on-site and minimizes the number of portable trailers required to supply the system.

The trailer remains on site until emptied and acts as a storage vessel while connected to the pipeline system. In the initial phase of the Keene distribution system, there will be periods in which the intervals may be weeks and months before a new trailer is required. The gas is preheated prior to being directed through a series of pressure regulators. The decompression skid is capable of delivering discharge pressures between 50-100 psig at discharge temperatures between 35-75 degrees F. Liberty has chosen 55 psig as the normal operating pressure with 60 psig MAOP) for the design parameters in which natural gas will be transported within the Keene distribution system. Natural gas will be measured through a newly installed flow meter prior to entering the distribution system. The decompression skid was fabricated by Xpress Natural Gas (XNG) of Andover, MA.

The Engineering Review by the Safety Division consisted of the following:

Review of System Placement for the Surrounding Geographical Area and Population Density

- Were compatible components selected for the applicable pipeline class location?
- What engineering standards did Liberty incorporate with the addition of a new source of supply?
- Are the jurisdictional boundaries identified and properly included with the applicable plans?

Review of Design Pressure Rating of Piping and Components

- Were appropriate materials selected?
- Were appropriate wall thickness and ratings of all components properly selected?
- Were pressure settings of components appropriate?
- Was proper over-pressure protection provided?

From a federal code of regulatory and state law perspective, Liberty is subject to overlapping elements of federal and State of New Hampshire (NHPUC) jurisdiction and compliance requirements. For the purposes of federal pipeline safety regulations, the jurisdiction of the new source configuration begins at the CNG trailer and includes associated piping components and ancillary facilities.[6] A CNG trailer, decompression skid, and associated facilities become jurisdictional when they are physically connected to a distribution system. Early presentations and documentation provided by Liberty to the Safety Division did not appropriately consider the applicable jurisdiction. This is a fundamental and key factor that affects the engineering design applying to remainder of the system. The majority of CNG installations throughout the United States are not connected directly to an existing distribution system, some although have been used on a limited temporary basis (i.e., weeks) for applications such as transmission pipeline maintenance. Single customer installations, such as the one currently used at the Cheshire Medical facility in Keene and other industrial/commercial facilities in New Hampshire, do not require the equivalent margins of safety that are required for those of state and federal

[6] Reference 49 CFR Part 192.1 The New York Public Service Commission rendered a similar conclusion in Declaratory Ruling Case 14-G-0019 dated July 1, 2014.

regulated systems that supply multiple customers. Individual systems scattered throughout the state have differing applicable codes and standards, and typically are installed in accordance with local municipal fire requirements. In terms of pressurized gas piping, local fire requirements are typically less stringent than the Commission's inspection requirements. The Safety Division is certified annually under delegated federal authority for inspection and enforcement of intrastate pipelines. For the purposes of state pipeline safety regulations, the jurisdiction of the new source configuration begins at the property line (considered as "plant") in which overall safety of any facility is subject to the Commission's general statutory authority.

The Safety Division informed Liberty early during the initial discussion stages that the outlet flange on the trailer would be considered the demarcation point where the PUC would exercise compliance requirements under ***federal*** regulations. Technically, the storage trailer could also be included as jurisdictional equipment but the Safety Division chose the outlet of the flange as a clean demarcation line since the trailers will be parked on site intermittently. The number of individual portable trailers on site may vary as the storage tanks become emptied and replacement trailers replenish depleted ones.

Liberty has initially proposed that between 1 and 3 trailers would be on site at any one time. However, as discussed below, there could be a question regarding whether XNG would be acting as a "public utility" under RSA Chapter 362, and whether the Commission must review the leasing arrangement between XNG and Liberty under RSA 374:30.

The on-road regulations of a CNG trailer are governed by the Federal Motor Carriers Safety Administration and are not jurisdictional to the Safety Division. Once driven onto and parked on Liberty premises, the trailers become a component of the Liberty supply system and are considered NHPUC-jurisdictional with respect to safety governance, pursuant to the terms of RSA 374:1, 374:4, and allied statutes. The Safety Division requires that Liberty ensure that all operational conditions on its property and/or connected to the provision of utility service, be conducted safely, as required by RSA 374:1. Liberty does not cede this independent responsibility by leasing equipment from XNG. For instance, without limitation, Liberty must ensure that physical security, pavement conditions and traffic safety controls, personnel training, equipment maintenance, fire prevention protocols, and all other aspects of its readiness to accept XNG supply trailers at the Keene Installation are safe and adequate, as determined by the Safety Division pursuant to applicable federal and state safety regulations.

The trailers used by Liberty are supplied by XNG and include compressed gas storage Type IV cylinders manufactured by Hexagon Lincoln of Lincoln, Nebraska. The Type IV cylinders are constructed of a high density polyethylene liner wrapped in filament-wound composite (epoxy-carbon) outer shell. The cylinders in the TITAN® module are 42.5 inches in diameter by 38.5 feet long. Each cylinder contains a small amount of metal located at the connection point.

There is no single applicable safety standard used within New Hampshire, nor nationwide, for CNG trailers. The National Fire Protection Association (NFPA) has produced Standard 55, Compressed Gases and Cryogenics Code, but that standard focuses on filling station applications used for vehicle refueling systems rather than bulk supply systems. The standard applied by the Safety Division was 49 CFR Part 192, which was initial derived from the ASME B31.8 Gas Transmission and Distribution Piping Systems Standard. 49 CFR Part 192 has been amended multiple times since its inaugural publication. 49 CFR Part 192 is specifically required by Puc 506.01 for gas distribution public utilities.

Many of the initial documents supplied by Liberty inappropriately referenced the ASME B31.3 Process Piping Standard used for chemical plants, refineries, and other process piping applications. ASME B31.3 requires

different material selection and pressure testing requirements that are more suitable for the above mentioned single site locations. ASME B31.3 is not appropriate for the Production Avenue CNG facility.

Liberty complicated the applicable jurisdictional boundary circumstances of the CNG installation by leasing the decompression skid from XNG and requiring XNG to maintain the skid rather than purchasing the skid outright.[7] This financial arrangement does not relieve Liberty from providing operations, maintenance, and emergency response support as required by RSA 374:1, Puc 500 rules, and past Commission orders. Yet in its draft plans submitted to the Safety Division, Liberty initially had XNG providing emergency response and maintaining the components within the decompression skid. The Safety Division requires Liberty to operate and maintain the skid, which includes periodic inspections, recording inspection results, maintaining records, and using qualified personnel who are subject to Liberty's operational maintenance and emergency procedures to perform required activities, in accordance with RSA 374:1.

The financing of equipment, including the acquisition of equipment through gas supply arrangements using crafted accounting mechanisms, does not relieve prerequisite safety obligations required of public utilities under RSA 374:1. The Safety Division considers the decompression skid as equivalent to an installed gate station from a transmission pipeline with Liberty receiving contracted supply. Currently, all existing gate stations, including the equipment inside each station, are owned, operated and capitalized by Liberty. All operations and maintenance activities are recovered in rates through examination of test-year expenses and subsequent approval by the Commission. This CNG installation is not a supplemental gas supply production site where gas is blended into an existing flow stream as is done in other locations in Tilton, Manchester, and Nashua where Liberty has sited production plants. This CNG installation will operate more like the gate station example where interruption of supply will interrupt distribution flows and cause customer disruptions. It will never be blended in with the existing propane/air system and is considered a separate distribution system. See the section "Converting Existing Customers from Propane Air to Natural Gas and Character of Service" within this report for further discussion on important differences between propane/air and natural gas.

Under RSA 374:30, "Any public utility may transfer or lease its franchise, works, or system, or any part of such franchise, works or system, exercised or located in this state, or contract for the operation of its works and system located in this state, when the commission shall find that it will be for the public good and shall make an order assenting thereto, but not otherwise." The Safety Division reads this statutory language as potentially requiring Commission approval of the leasing arrangement with XNG for the trailers and decompression skid, as it is a part of the proposed Keene Installation and will be providing utility service through Liberty's physical plant.

Liberty originally did not consider class location when selecting a design. This resulted in cascading negative repercussions for the design and future operations of the facility. Liberty did not customize and specify to XNG its requirements for CNG components but, rather, accepted the generic installation specifications supplied by XNG with its contract. The Safety Division insisted that the distribution systems be designed for Class 3 and Class 4 locations as there are no locations within Liberty's franchise territories designed to a Class 1 or 2 location.[8] Liberty had not performed any previous class location studies and it was clearly evident that the

[7] Confidential Technical Session Response DG 17-141 Tech 1-1.2 Liberty incurs a mobilization cost, an annual demand charge, an indexed commodity charge and a delivery charge over a specified number of years. XNG to provide maintenance of skid.
[8] Liberty's own Operational and Maintenance Manual, Chapter 9 Test Requirements, Section 6 Procedures, Subsection 6.1 General Requirements, Item C states "there are no Class 1 or Class 2 facilities in New Hampshire" and "Facilities in New Hampshire and Massachusetts **may** be designed and tested to Class 4 criteria". Liberty's own Operational and Maintenance Manual Chapter 1-D Class Location Section 6 Class Location states "Facilities in New Hampshire and Massachusetts **may** be designed to Class 4 criteria unless otherwise approved."

Monadnock Marketplace was within 1 mile of the CNG location on Production Avenue. By definition, any location that has pipeline locations within 300 feet of a building up to 1 mile downstream and is occupied by 20 or more persons at least 5 days a week for 10 weeks in any 12 month period is a class 3 location.[9] See Appendix 1 –D for the Class 3 areas that needed to be considered for the Liberty CNG facility on Production Avenue. For a period of time Liberty's engineering department was attempting to achieve compliance within a class 1 or 2 location, which ultimately would have resulted in lower safety margins being used for engineering design. The correct class location factors affect yield strength, operating stress levels, and pressure testing requirements of selected piping and components. Liberty eventually agreed that Keene CNG was a Class 3 location. This required pipeline wall thicknesses to be increased for the stainless steel tubing delivered in the generic XNG decompression skid. Liberty subsequently re-piped, at additional cost, much of the interior and exterior stainless steel tubing to meet the requirements of 49 CFR Part 192.

Pressure Test Document Appendix B Calculations Engineers Letter Test Limit									
A269 is welded steel (lower cost)	SST A269 =30000								
Seamless steel tube meets weld steel spec.	MAOP = 4250								
Seamless allows 20% greater working pressure	Pressure = 2 * S * t/ D * F**E*T								
Bates Pages 1391 -1394									
		SCH10	SCH 40	SCH80	SCH 160	SCH 160	SCH 160	SCH 160	SCH 160
Outside diameter, wall thickness		1.25", .109	1.25", .140	1.25", .191	1.25", .250				
Design Pressure	P	2616	3360	4584	6000				
Resulting Stress if use MAOP Pressure	S resultant	24,369	18,973	13,907	10,625				
	Percent SMYS	81.2%	63.2%	46.4%	35.4%				
Outside diameter, wall thickness		1", .156	1", .188	1", .250	1", .313				
Design Pressure	P	4680	5640	7500	9390				
Resulting Stress if use MAOP Pressure	S resultant	13,622	11,303	8,500	6,789				
	Percent SMYS	45.4%	37.7%	28.3%	22.6%				
Outside diameter, wall thickness		.75", .120	.75", .134	.75", .156	.75", .188	.75", .250			
Design Pressure	P	4800	5360	6240	7520	10000			
Resulting Stress if use MAOP Pressure	S resultant	13,281	11,894	10,216	8,477	6,375			
	Percent SMYS	44.3%	39.6%	34.1%	28.3%	21.3%			
Outside diameter, wall thickness		.5", .083	.5", .109	.5", .120	.5", .134	.5", .156	.5", .188		
Design Pressure	P	4980	6540	7200	8040	9360	11280		
Resulting Stress if use MAOP Pressure	S resultant	12,801	9,748	8,854	7,929	6,811	5,652		
	Percent SMYS	42.7%	32.5%	29.5%	26.4%	22.7%	18.8%		
Outside diameter, wall thickness		.375", .065	.375", .083	.375", .095	.375", .109	.375", .120	.375", .134	.375", .188	.375", .250
Design Pressure	P	5200	6640	7600	8720	9600	10720	15040	20000
Resulting Stress if use MAOP Pressure	S resultant	12,260	9,601	8,388	7,311	6,641	5,947	4,239	3,188
	Percent SMYS	40.9%	32.0%	28.0%	24.4%	22.1%	19.8%	14.1%	10.6%

Once the stainless steel tubing modifications were made at the behest of the Safety Division, the fittings and components could be verified by manufacturers' specifications for material selection, stress design levels, and compatibility.

Over-pressure protection was provided with a working monitor setup and relief valve installation for each of three pressure levels. The over-pressure protection and regulator control is accomplished with two types of regulators: spring-loaded, general purpose, and dome-loaded pressure reducing regulators. The dome-loaded pressure regulators are fed with an integral operated pilot regulator. Both of these are Swagelok regulators and not used by Liberty personnel elsewhere. Technicians will be experiencing the performance of these regulators for the first time and will require some training and familiarization. The engineering design provides for redundancy so that continuous flow can always be provided when maintenance is required or performed.

[9] Reference 49 CFR Part 192.5 (b) (3) (ii)

The boiler and glycol heat exchanger also has redundancy built in, minimizing the likelihood of a disruption.

A newly purchased backup generator fueled by natural gas from the CNG skid is in place, in the event power is lost. Power is used for the electrical controls, boilers, security systems, and on-site lighting.

The site is secured with fencing and has methane and flame detection alarms that are connected to the Keene Fire Department and Liberty's Control Room in Londonderry. A remote emergency shut down switch at the fence will deactivate the CNG facility in case of fire.

Overall, the Safety Division was able to verify compliance with 49 CFR Parts 192.5, 192.53, 192.55, 192.63, 192.105, 192.107, 192.111, 192.115, 192.144, 192.145,192.147 192.159,192.161, 192.181, 192.195, 192.199, 192.201, and 192.203.

System Schematics Review

The system schematics review consisted of:

- verifying components installed in the field correlated with those shown on schematics;
- verifying that the schematics accurately reflect the proper components based on manufacturers' specifications;
- analyzing whether schematics contained proper identification, references, notations, and depiction for use in pressure testing, operations, emergency, maintenance, and other procedures; and
- reviewing instrumentation and piping configurations, including flow, material, sizing, and pressure information.

The following four components of the engineering and system schematics were provided by Liberty to the Safety Division:

1.1 - Mechanical and Electrical "ASBUILTS" developed by Sanborn Head Associates of Concord, NH,
1.2 - Piping & Instrumentation Diagrams of the Decompression Skid and CNG Skid Component Book developed by APEX Engineering of Falmouth, ME,
1.3 - A Gas Meter Calibration Record, and
1.4 - CNG Trailer Operations and Inspection Manual developed by Hexagon Lincoln, Inc. of Lincoln, NE

Staff reviewed the following piping and instrumentation schematics developed for the design and construction of the CNG depressurization unit and provided the noted comments:

1.1 Mechanical and Electrical "ASBUILTS"
The set of drawings labeled Mechanical and Electrical "ASBUILTS" prepared by Sanborn Head Associates., dated 11/13/2017 consisted of the following 9 documents to be reviewed.

(1) PID 1 – Piping and Instrumentation Diagram (Outside of CNG Decompression Skid)
(2) M1 – Piping Arrangement
(3) E1 – Electrical One Line Diagram
(4) E2 – Electrical Installation
(5) E4 – Electrical Area Classification
(6) E5 – Electrical Details
(7) E7 – Instrument and Controls Termination Drawing
(8) E8 – Instrument and Controls Termination Drawing
(9) SS1 – Site Safety and Security Equipment Plan

The Safety Division made 5 recommendations and comments regarding the 9 drawings and listed them as follows in Table 1.1.:

1.1 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.1 Mechanical and Electrical ASBUILTS prepared by SANBORN HEAD					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Diagram No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	Piping and Instrumentation Diagram PID1	PID1	Insulated Flange identified and located directly on top of Service Valve feeding the Natural Gas Generator was noticed in the field as well as recorded on Main Field Record for 8/30/2017. None is shown on this drawing after V133 and before the excess flow valve. This should be corrected.	BP 0002	No
2	Piping and Instrumentation Diagram PID1	PID1	8 inch and 6 inch piping incorrectly shown as API 5L GrB on drawing. The field crews installed API 5XL52 and API 5XL42 for 8" and 6". Staff recommends that Liberty verify the pipe material that was actually used in the field to what is specified for 2", 4" and 6" diameter piping of PID1. Exact piping material records is essential to establishing properly documented MAOPs.	BP 0002	No
3	Piping and Instrumentation Diagram PID1	PID1	Note Top Run of Monitor Regulator shows setting of 50 psig which is inconsistent with 55 psig shown on BP 1622	BP 0002 BP 1622	No
4	Piping and Instrumentation Diagram PID1	PID1	Note Bottom Run of Monitor Regulator shows setting of 50 psig which is inconsistent with 55 psig shown on BP 1624	BP 0002 BP 1624	No
5	Piping Arrangement M1	M2 and M3	Liberty did not provide Sanborn Head drawing M2 and M3 so components could not be verified for pressure ratings and appropriateness as well as field verification. Safety Division requires submittal of finalized drawings before gas flows.	BP 0003	No

Section 1.2 Piping & Instrumentation Diagrams of the Decompression Skid and CNG Skid Component Book

This is referred to as the Low Flow Skid Component Book 2017 and was prepared by APEX Engineering 10/20/2017 (1,316 pages). This was a lengthy review of material containing many manufacturers technical specifications, catalogues and cut sheets.

The Low Flow Skid Component Book is comprised of 5 parts – a main section and 4 attachments labeled A, B, C, and D. The Safety Division requested that Liberty submit Bates Page copies after beginning preliminary reviews of technical specifications. The combination from various manufacturer's catalogs and specification sheets with duplicative page numbering, and missing page numbering made review difficult with unnecessary complexity.

The Main Section of the Low Flow Skid Component Book 2017 was located on BP 13 through BP 14
Attachment A was located on BP 15 through BP 24
Attachment B was located on BP 25 through BP 42
Attachment C was located on BP 43 through BP 1022
Attachment D was located on BP 1023 through BP 1326

1.2 Main Section

The main section is a modified version of a previously developed Skid Design Book that APEX and XNG had used at other customer locations. The Safety Division had previously reviewed an earlier version and found much of what was presented was not applicable to the Keene CNG installation.

The Safety Division made 5 recommendations or comments regarding the two-page main section and listed them as follows:

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	Table of Contents	1	Attachments are mislabeled Section 16. There are no other sections labeled after 6.	BP 0012	YES
2	Scope	1	AMSE B1.8 should be deleted	BP 0013	YES
3	Applicable Codes and Standards	1	ASME B31.8-2016 is a standard not adopted by PUC nor federal government (PHMSA) except for very specific instances. Version 2007 is adopted but only for 2 sections which are not applicable to this installation. These sections are required for Alternative Maximum Allowable Operating Pressure (MAOP) designs 192.112 (b) and conversions of pipelines or uprating 192.619 (a). It is unclear why Liberty is incorporating and referencing ASME 31.8 -2016 edition.	BP 0013	YES
4	Applicable Codes and Standards	1	"Transmission" should be replaced with "Transportation" in 49 CFR part 192 reference	BP 0013	YES
5	Attachment A Drawing P-003	1	Venting is not shown as installed in the field for Unloading Station A and B.	BP 0021	YES

1.2 Attachment A – General Arrangements and P&ID's.

Staff noted the following 22 items that required modifications or editing:

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering Attachment A General Arrangements and P&ID's					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	P-003	1	General Notes for TS30 on APEX drawing P-003 state test pressure 1.25% for hydraulic test, or 5313 psig, which is inconsistent with the regulation requirement of 49 CFR Part 192.505 for steel pipelines operating at greater than 30% SMYS. BP 1391 does correctly show the requirement as Calculations for Engineers Test Limit. Requirement is for 1.5 for hydraulic test or 6375 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0021 BP 1391 BP 1383	YES
2	P-003	1	General Notes for TS31 on APEX drawing P-003 state operating pressure is 500 psig, which is inconsistent with the set pressures of 600 psig on top run and 700 psig of bottom run and set to open pressure of 400 psig of bypass run as shown on P-004. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0021 BP 0022 BP 1383	YES
3	P-003	1	General Notes for TS35 on APEX drawing P-003 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0021 BP 0002 BP 1383	YES
4	P-003	1	General Notes for FB30 on APEX drawing P-003 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0021 BP 0002 BP 1383	YES
5	P-004	1	General Notes for TS30 on APEX drawing P-004 state Test pressure 1.25% for hydraulic test, or 5313 psig, which is inconsistent with the regulation requirement of 49 CFR Part 192.505 for steel pipelines operating at greater than 30% SMYS. BP 1391 does correctly show the requirement as Calculations for Engineers Test Limit. Requirement is for 1.5 for hydraulic test or 6375 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0022 BP 1391 BP 1384	YES
6	P-004	1	General Notes for TS31 on APEX drawing P-004 states Operating pressure is 500 psig, which is inconsistent with the set pressures of 600 psig on top run and 700 psig of bottom run and set to open pressure of 400 psig of bypass run as shown on P-004. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0022 BP 0022 BP 1384	YES
7	P-004	1	General Notes for TS35 on APEX drawing P-004 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0022 BP 0002 BP 1384	YES
8	P-004	1	General Notes for FB30 on APEX drawing P-004 states operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0022 BP 0002 BP 1384	YES

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering Attachment A General Arrangements and P&ID's					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
9	P-005	1	General Notes for TS30 on APEX drawing P-005 states test pressure 1.25% for hydraulic test, or 5313 psig, which is inconsistent with the regulation requirement of 49 CFR Part 192.505 for steel pipelines operating at greater than 30% SMYS. BP 1391 does correctly show the requirement as Calculations for Engineers Test Limit. Requirement is for 1.5 for hydraulic test or 6375 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0023 BP 1391 BP 1385	YES
10	P-005	1	General Notes for TS31 on APEX drawing P-005 state operating pressure is 500 psig, which is inconsistent with the set pressures of 600 psig on top run and 700 psig of bottom run and set to open pressure of 400 psig of bypass run as shown on P-004. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0023 BP 0022 BP 1385	YES
11	P-005	1	General Notes for TS35 on APEX drawing P-005 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0023 BP 0002 BP 1385	YES
12	P-005	1	General Notes for FB30 on APEX drawing P-005 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0023 BP 0002 BP 1385	YES
13	P-006	1	General Notes for TS30 on APEX drawing P-006 state Test pressure 1.25% for hydraulic test, or 5313 psig which is inconsistent with the regulation requirement of 49 CFR Part 192.505 for steel pipelines operating at greater than 30% SMYS. BP 1391 does correctly show the requirement as Calculations for Engineers Test Limit. Requirement is for 1.5 for hydraulic test or 6375 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0024 BP 1391 BP 1386	YES
14	P-006	1	General Notes for TS31 on APEX drawing P-006 state operating pressure is 500 psig, which is inconsistent with the set pressures of 600 psig on top run and 700 psig of bottom run and set to open pressure of 400 psig of bypass run as shown on P-004. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0024 BP 0022 BP 1386	YES
15	P-006	1	General Notes for TS35 on APEX drawing P-006 states Operating pressure is 55 psig which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0024 BP 0002 BP 1386	YES
16	P-006	1	General Notes for FB30 on APEX drawing P-006 state operating pressure is 55 psig, which is inconsistent with the set pressures of 45 psig on top run and 40 psig of bottom run PID1 This is also in consistent with P-005 which states the set pressure is 75 psig. Safety Division notes General Notes for BP 1383, 1384, 1385, 1386 are also incorrectly shown.	BP 0024 BP 0002 BP 1386	YES

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering Attachment A General Arrangements and P&ID's					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
17	P-003	1	P-003 indicates 1.5 inch diameter copper tubing is used for inlet and outlet of coiled heat exchanger containing propylene glycol. BP0027 item 18 specifies 1.0 inch diameter general purpose copper tubing. BP0028 indicates the tubing is item 35 which does not correspond to BM and BP 0029 lists the heat exchanger manifold supply and manifold return as 1 inch diameter. These are Part no IS-XNG-20K-CUT1-001 sheets 1 through 4. The field inspection revealed that 1 inch diameter copper tubing was used	BP 0003 BP 0026 BP 0027 BP 0028 BP 0029	NO
18	P-003	1	Unloading Station A and B show vent piping as not entering Gas Regulator Room. Field installation indicates penetration into Gas Regulator Room.	BP 0003 BP 0026 BP 0027 BP 0028 BP 0029	NO
19	P-003	1	Unloading Station A indicates that a different type of flexible hose will be used for Unloading Station A and B. Unloading Station B indicates 1-H-100B which corresponds to BP 0046 and BP 0047 but Unloading Station A states 1-H-A, which has no corresponding hose literature to verify the pressure rating.	BP 0003 BP 0046 BP 0047	NO
20	P-005	1	P-005 has Pressure Reducing Valve PRV 222B mislabeled as PCV 222B. There are no PCV valves identified as listed on P001, thus it must be mislabeled. There are FCV valves (flow control valves -OASIS manufacturer) but not shown on diagram	BP 0023	NO
21	P-006	1	P-006 indicates Gas Regulator Room is Class 1 Div 1 and Hydronic Heating Portion is Unclassified. This is not consistent with the description on BP 0014. The Safety Division would have considered the entire Decompression Skid as Class 1 Div 2 and not as depicted on P-006	BP 0024 BP 0014 BP006	NO
22	-	-	It is critical to incorporate over pressure protection protection schemes based on maximum allowable operating pressures (MAOP). Liberty should clearly delineate at the decompression skid with signage or labeling that all qualified personnel understand that the lower 4200 psig is specified by Liberty and not the standard PRV setting of XNG of 4500 psig.	None	NO

Liberty incorporated a note that XNG is to "**ensure**" that the CNG mobile trailer, which is equipped with a 4,500 psi pressure relief valve, will not operate at a pressure exceeding 4,200 psig. This was suggested earlier by the Safety Division to Liberty since the maximum allowable operating pressure (MAOP) for the downstream Stage 1 piping is listed as having an MAOP of 4,250 psig. Liberty did not specify how this would be accomplished but all control room alarms (Liberty's and XNG's) should be set to incorporate this limitation into the control system.

1.2 Attachment B – Swagelok Module Drawings & Equipment Selection.

Staff noted a single recommendation:

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering Attachment B Swagelok Module Drawings & Equipment Selections					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	IS XNG 20K -CUT 1-001	Sheet 3	Identification corresponds with Annotated (Red Lined) Bill of Material up to Number 23 but Number 25 and Number 35 are called out with no corresponding Bill of Material description	BP 0028	NO

The submittal correctly noted where Swagelok tubing wall thickness field changes were completed on October 19, 2017 prior to conducting the system pressure testing. These wall thickness changes were recommended by the Safety Division because the tubing selections made by Liberty and APEX would not have been sufficient to meet CFR Part 192 operating pressures and pressure test requirements. During vendor selection, Liberty did not specify when initially going out for bids that designs were to meet CFR Part 192 requirements and merely accepted the standard ASME B31.3 pressure requirements that XNG uses at many non-regulated locations. This resulted in extra cost and effort in reconfiguring the stainless steel tubing selections at the decompression skid. Liberty's decompression skid plans transitioned to becoming a customized unique, design in order to meet local requirements of the Keene Fire Department and minimum safety requirements that the Safety Division insisted upon.

1.2 Attachment C – Process Gas Equipment Data Sheets (not including Swagelok Modules)

This title of the Attachment is somewhat misleading. This section does include Swagelok valves, regulators, tubing, and fittings but does not include the preassembled heat exchanger, first cut pressure reduction, and motive gas (nitrogen) assemblies. These latter items are called Swagelok modules as they are preassembled and arrive on site as units.

Much of Attachment C was not necessary (429 pages), as Liberty submitted flow charts and technical specifications for components that will not be used at the Keene CNG facility. The Safety Division's review would have been more expedient if only the pertinent materials had been submitted to avoid the need to comb through the voluminous component catalogs. Liberty did add Identification Tags on the documentation of valves, strainers, flow control valves, meters, heat exchangers, and hydronic components so that a verification of strength of materials and capacities could be performed.

Staff noted the following 9 items that require modifications or editing:

1.2 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 1.2 Low Flow Skid Component Book by APEX Engineering Attachment C Process Gas Equipment Data Sheets (Non Swagelock Modules) although includes Swagelock valves, regulators and tubing					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Number of Pages**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	Swagelock Pressure Reducing Regulator Flow Curves	126 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0167 thru BP 0293 so that operating personnel do not mistakenly use.	BP 0167 thru BP 0293	NO
2	Swagelock Pressure Reducing Regulator Flow Curves	31 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0296 thru BP 0327 so that operating personnel do not mistakenly use.	BP 0296 thru BP 0327	NO
3	Swagelock Pressure Reducing Regulator Flow Curves	41 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0333 thru BP 0374 so that operating personnel do not mistakenly use.	BP 0333 thru BP 0374	NO
4	Swagelock Pressure Reducing Regulator Flow Curves	10 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0385 thru BP 0395so that operating personnel do not mistakenly use.	BP 0385 thru BP 0395	NO
5	Swagelock Pressure Reducing Regulator Flow Curves	105 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0404thru BP 0509so that operating personnel do not mistakenly use.	BP 0404 thru BP 0509	NO
6	Swagelock Pressure Regulators RHPS Series	38 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0524 thru BP 0562so that operating personnel do not mistakenly use.	BP 0524 thru BP 0562	NO
7	Swagelock Pressure Regulators RHPS Series	12 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0565 thru BP 0577so that operating personnel do not mistakenly use.	BP 0565 thru BP 0577	NO
8	Swagelock Pressure Regulators RHPS Series	6 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0579 thru BP 0585so that operating personnel do not mistakenly use.	BP 0579 thru BP 0585	NO
9	Swagelock Pressure Regulators RHPS Series	60 pages	Irrelevant to Keene CNG Installation and Specification. No need to include in Safety Review. Delete BP 0588 thru BP 0648so that operating personnel do not mistakenly use.	BP 0588 thru BP 0648	NO
10	Swagelok 40 G Series Ball Valve	-	P-004 correctly indicates Valve 217 A , Valve 217 B , Valve 203A and Valve 203 B are 0.25 in Swagelok valves while BP 693 incorrectly identifies this and states it's a 0.5 in Swagelok valve. It also incorrectly labels it as V 230	BP 0693	NO
11	Oasis 700 Series Ball Valve	-	P-004 indicates 1 inch Oasis ball valve208A and PSV 213 2" x 3" Anderson Greenwood (Emerson) Series 81 spring operated relief valve are upstream of the temperature and pressure transmitters. Field inspection revealed these are located downstream	BP 0694 BP 0022 BP 1385	NO
11	Oasis 700 Series Ball Valve	-	BP 694 incorrectly identifies this as V 212 A when it should be V 208A	BP 0694 BP 0695 BP 0696	NO
12	Swagelok 40 G Series Ball Valve	-	These pages are duplicative and misidentify V 230. V 230 doesn't exist on P-004 or P-005.	BP 0698 BP 0659	NO
13	Apollo 70-100 BC Series Ball Valve	-	Valve 249 not found on P-004 or P-005	BP 0992	NO
14	Apollo 70-100 BC Series Ball Valve	-	Valve 250 not found on P-004 or P-005	BP 0993	NO
15	Apollo 70-100 BC Series Ball Valve	-	Valve 251 not found on P-004 or P-005	BP 0994	NO

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1.2 Attachment D – Hydronic Heating Equipment Data Sheets

The Safety Division reviewed the Hydronic Heating Equipment Data Sheets and found no issues.

1.3 Gas Meter Calibration Record

Liberty provided a single page calibration certificate (BP 1327) dated 10/28/2013 for a newly installed Flow Meter Group FMR 11M rotary meter installed within the decompression skid. This newly installed 4-inch diameter meter has a capacity of 70 scfh to 11,000 scfh at 0.25 psig and up to 65,000 scfh at the 75 psig operating pressure. It is a flanged configuration with a bypass installed for maintenance purposes. It measures only the gas used, representing the total send out into the natural gas portion of the distribution system. A second meter is used for measuring the gas that is used in the boiler system that operates the heat exchanger within the decompression skid. The PUC has no regulations regarding the boiler system meter except that the accuracy must be within +/- 2 percent. The meter accuracy for the 11M is +0.4% at high flows and -1.28% at minimal flow. The meter is part of the control system that is remotely monitored in the Londonderry control room.

1.4 CNG Trailer Operations and Inspection Manual developed by Hexagon Lincoln, Inc. of Lincoln, NE

(BP 1328 to BP 1373) This manual is provided by the manufacturer of the "TITAN" trailer and contains detailed instructions on the filling and unloading of trailers. The trailer capacity is rated for 480,000 SCF but its actual volume is 400,000 SCF per trailer. This is equivalent to 400 MCF per trailer. Trailers shut off and switch over at 250 psig according to Liberty. The service life is 15 years. Detailed instructions with photo documentation are provided regarding filling and transfer operations. Appendices A, B, and C provide a filling procedure checklist, a pre transportation checklist and an unloading checklist.

The Safety Division reviewed the information provided and found no recommendations were required for Section 1.4.

Staff prepared the following analysis and recommendations with regard to the CNG decompression skid piping components and pressure test requirements:

(1) NH PUC 500 rules adopt Part 192. The Keene gas distribution system is subject to 49 CFR Part 192 as minimum code requirements and Puc 500 administrative rules when more stringent.
(2) Part 192.55(a)(2)(i) allows for steel pipe to be used if the steel pipe meets Appendix B section II materials.
(3) The stainless steel tubing used in the decompression skid is comprised of ASTM A269 Type 316 meets the requirements of Appendix B section II materials. (Tubing is considered pipe; see step 12 of analysis below.)
(4) The Safety Division jurisdictional demarcation point is considered at the outlet flange of the CNG truck, for simplicity and clearly distinguishable demarcation location. With this demarcation point established, the transfer hose and all downstream piping and appurtenances are considered jurisdictional. An argument could be made that the truck storage tanks are also jurisdictional but since trucks will be revolving in use and leaving the location, piping directly connected to the distribution system including piping within the decompression skid is subject to 49 CFR Part 192 requirements.
(5) Part 192.7 does not incorporate by reference the ASME B31.3 process piping code referenced in the design subpart. The ASME B31.3 is traditionally used in chemical plant and fluid processes rather than

gas distribution piping applications. Part 192 was originally based on the ASME B31.8 gas piping systems standard but Part 192 has evolved to include more specific regulations over time.

(6) Part 192.5 identifies class location units and class locations. Production Avenue and the piping system, including the piping in the decompression skid, is located in a Class 3 location per 192.5(b)(3)(ii) as buildings are located within 100 yards of the distribution system along the continuous 1 mile that is occupied by 20 or more people, 5 days a week for more than 10 weeks per year. The Monadnock Marketplace is within a mile of Production Avenue and includes businesses that meet these criteria.

(7) Part 192.105 requires a design pressure to be calculated for the system piping including the stainless steel tubing (SST). Concentrating on the section of piping in which the pressure will be as high as 4,250 psig. The design pressure must use F class location derating factor of .5, and E and T = 1. Given the 4 SST pipe sizes represented by APEX and Liberty as:

a. 1" diameter – 0.120 wt., the resulting P equates to 3,600 psig
b. ¾" diameter – 0.083 wt., the resulting P equates to 3,320 psig
c. ½" diameter – 0.065 wt., the resulting P equates to 3,900 psig
d. 3/8" diameter – 0.049 wt., the resulting P equates to 3,920 psig

The calculated design pressures are too low to operate at the desired 4,250 psig.

To address these issues the Safety Division recommended Liberty changing the stainless steel tubing t/D ratios to increase the allowable pressure.[10] The recommendations are summarized as follows.

- Where 1" diameter with 0.120 wt is used, it is recommended ¾'' diameter with 0.109 wt be used. This changes the t/D ratio from .12 to .145 thus increasing the P from 3,600 psig to 4,350 psig.
- Where ¾" diameter with 0.083 wt is used, it is recommended ¾" diameter with 0. 109 wt be used. This changes the t/D ratio from .110 to .145 thus increasing the P from 3,320 psig to 4,376 psig.
- Where 1/2" diameter 0.065 wt is used, it is recommended ¾" diameter with 0.109 wt be used. This changes the t/D ratio from .13 to .145 thus increasing the P from 3,900 psig to 4,350 psig.[11]
- Where 3/8" diameter with 0.049 wt is used it is recommended ¾" diameter with 0.109 wt be used. This changes the t/D ratio from .13 to .145 thus increasing the P from 3920 psig to 4,372 psig.[12][13]

(8) Part 192.619 also requires a MAOP pressure to be calculated for the SST tubing concentrating on the section of piping in which the pressure will be as high as 4,250 psig. The design pressure must use F class location derating factor of 192.105 (as established by 192.11) thus either the design pressure or the test pressure (divided by 1.5) must be used depending upon the lower value.

(9) Part 192.503 (b) allows pressure testing (strength testing) to be done with liquid, air, natural gas or inert gas based upon certain conditions. Liquid pressure testing (hydro testing) is the only method to be used for piping operating over 30% SMYS unless nearby building evacuation methods are implemented.

(10) Part 192.503 (c) requires keeping the hoop stress during the pressure test to less than 50% SMYS or 15,000 psi based on a 30,000 psi yield strength for A269 stainless steel if air or inert gas is used. There

[10] t/D is the ratio of wall thickness, "wt" also known as "t" to diameter (D)
[11] Alternatively ½" diameter with .083 wt could be used. This changes the t/D ratio from .13 to .19 thus increasing P from 3,900 psig to 5,570 psig.
[12] Alternatively 3/8" diameter with 0.065 wt could be used. This changes the t/D ratio from .13 to .173 thus increasing P from 3,920 psig to 5,225 psig.
[13] Alternatively ½" diameter with 0.083 wt could be used, This changes the t/D ratio from .13 to .19 thus increasing P from 3,920 psig to 5,730 psig.

is no such reduction required if a hydro test is performed. Thus the hydro test could allow hoop stress during the test to go up to yield stress or 30,000 psi. Using the alternatives of (7), above, the resulting hoop stress is less 75% SMYS, which is acceptable for a pressure test if it is completed as a hydro test.

(11) Part 192.143 (a) is not applicable to the piping or tubing. Components are considered flanges, valves, or fittings. The Safety Division does not agree with Liberty's interpretation that this code section is applicable. There may be an argument that this section applies to the built up heat exchanger, although the pipe configuration appears to be made up of 5 smaller heat exchangers coupled together.

(12) Tubing is considered pipe per the PHMSA glossary definition:
"Tubing is smaller diameter pipe (usually stainless steel or copper) with diameter usually less than 1/2 inch that is generally used as instrumentation or control piping, to sense pipeline conditions for instrumentation monitoring and control."

Liberty's engineers and outside consultants initially focused on selecting the appropriate "t/D" ratios that would accommodate and meet Part 192 design requirements but opted more for applying the ASME 31.3 process piping standard in their attempt to apply class location definitions. This resulted in shipping the depressurization skid to the site with the wrong stainless steel tubing size selections being installed.

Liberty eventually modified the depressurization skid piping configuration to accommodate the recommended Safety Division changes and the piping segments were pressure tested to 1.5 times the respective MAOP.

The Safety Division has one precaution regarding unintended consequences pertaining to operating pressures.

2.1 Liberty Utilities Keene Site and Decompression Skid Design for CNG Submittal Date 11/13/17 2.1 Pressure Test Documentation Keene CNG Piping Test Procedure					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	Apex Appendix B	TS-30	The Safety Division recommends that Liberty operate pressures in a manner such that Integrity Management Regulations per Subpart O Gas Transmission Pipeline Integrity Management provisions are not triggered by the Statinless Steel Tubing components that possibly operate above 20% SMYS. Following the review of actual operational pressure records, Liberty may have to request a waiver from PUC and PHMSA, if applicable, for those portions of the Subpart or other Subparts that may inadvertently be triggered by exceeding the 20% SMYS threshold. This should be determined by Liberty within 6 months of initial operations.	BP 1391	NO

System Construction and Installation Review

During the period from August 8, 2017, to November 14, 2017, Staff conducted a series of field inspections to monitor the construction and installation of the CNG decompression unit and associated piping. The inspections included the review of equipment technical specifications and field verification of CNG decompression equipment piping and components.

The site inspections included the review of the proposed unit start up, operation, and emergency shut down procedures. XNG demonstrated the sensing logic of the skid control programing, emergency shutdown devices (ESDs), and Liberty's and XNG's system remote monitoring capability. Liberty indicated that the Modbus communications link to the XNG control system is now online and that the Liberty control room can now recognize all system pressures and temperatures, including the individual tanker pressures.
Liberty requested permission to pressure test the decompression skid while XNG was on site and the Safety Division allowed pressure testing and gas operations to begin up to the fence line on Production Avenue. An underground critical valve was installed and remains closed, so at this point no gas is flowing into the system. Liberty indicated that gas is now inside the skid piping and that Keene technicians have conducted hose hookup procedure training. XNG demonstrated to Safety Division personnel the CNG transfer hose hook up and disconnect procedures.

The Safety Division recommended that Liberty personnel be present and on site during all transfer operations. XNG personnel are allowed to perform the transfer but they must perform the operation while a qualified Liberty technician is present. This is consistent with practices used at the current LNG peak shaving facilities located in Concord, Tilton, and Manchester. Since coordination for ordering new trailers must be performed and Liberty's Keene work center is less than a 5 minute drive from Production Avenue, the Safety Division recommended this practice.

A CNG tank truck was on site to facilitate the system operational testing and operator training.

XNG demonstrated the CNG tank connection procedure and explained various gas safety features associated with the CNG tank truck.

CNG unit Stage 1 regulators (red caps on right) and the Stage 2 regulators (red caps on left). The preheater for the Stage 1 pressure reduction are the stainless steel coils in the upper right. The first stage regulators control pressure from 4,250 psig to 1,100 psig.

The CNG decompression skid outlet meter is shown. Bypass piping (yellow) is shown above the meter.

The final stage regulators control distribution system pressure to approximately 45 psi.

Redundant glycol heating units are located in the southern portion of the skid.

Pressure Testing Review

Liberty developed pressure test procedures to be used for the natural gas portion of the CNG piping. The piping consists of stainless steel tubing inside the decompression skid, where the flowing gas is subject to a series of pressure reductions through pressure reduction valves (regulators) accompanied by shutoff valves, bypass valves, pressure gauges, and instrumentation devices. The piping eventually transitions to painted carbon steel piping within the decompression skid. The carbon steel piping then transitions to outside, above-ground piping that reduces line pressures to a final 60 psig MAOP. Lastly, a transition occurs below ground to a short section of coated steel piping within the Liberty fence line before finally transitioning to an underground polyethylene pipeline on Production Avenue. Liberty combined the *Liberty Operation & Maintenance (O&M) Manual* standard pressure testing procedures for distribution system piping outside the skid with customized procedures specifically written by APEX Engineering for the CNG piping located within the decompression skid. Liberty's standard pressure testing policies can be found in *Liberty's O&M Manual of Procedures, Chapter 9 Test Requirements, Section 6 Procedures*. APEX Engineering of Falmouth, ME produced the specific document to be used for Keene dated and titled *10/23/2017 revision 3 CNG Piping Test Procedure*.

Staff reviewed the *10/23/2017 revision 3 CNG Piping Test Procedure* developed by APEX Engineering, which included the following 14 Sections and 4 Appendices:

(1) Scope
(2) Reference Standards
(3) Definitions and Terminology
(4) Results
(5) Test Packages
(6) Pressure Test Documentation
(7) Data Recording Forms
(8) Exclusions
(9) Test Package Limits
(10) Test Package Formats
(11) Limitations
(12) Decompression Station Special Test Requirements
(13) Testing of Decompression Station Vents
(14) Post Pressure Test Conditions

Appendix A Highlighted Pressure and Instrumentation Diagrams (PIDs)
Appendix B Engineering Letter Test Limitations and Calculations
Appendix C Hydrostatic Test Procedure
Appendix D Pneumatic Test Procedure

Staff provided Liberty with the following 21 recommendations in regard to the pressure test procedures and documentation:

2.1 Liberty Utilities CNG Decompression CNG Piping Test Procedure Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number(s) 11/30/17**	**Liberty Notified**
1	2.0 Reference Standard	1	Section 2.1.3 references ASME B31.8 Gas Transmission and Distribution should be eliminated as previously recommended by Safety Division as B31.8 is not fully incorporated into Part 192 or Puc 500.	BP 1376	Yes 12/5/2017
2	5.0 Test Packages 6.0 Pressure Test Documentation	3	5.1 and 6.1 are duplicative. Valve 233A is supposed to be Carbon Steel according to BP 1385 and P-005. Installation is 2" SST. BP 1397 states 4250 MAWP. MAWP is not a term used in the Part 192 standards. BP 1399 incorrect pipe specifications in Test Section listed. BP 1397 and BP1399 do not match with physical inspection nor do they match with BP 1385 i.e. there is no 10 feet of 0 .5 in and 3 feet .375 in SST tubing after P 222A and also does not match with P-005 as shown on BP 1385 regarding TS 35.	BP 1378 BP 1385 BP 1397 BP 1399	Yes 12/5/2017
3	Final Page	6	The purpose of a Signature Page is to ensure that all parties have read and understood the test procedures prior to performing specialized pressure tests. Signature Page should have been completed prior to Pressure Tests being performed on 10/16/17, 10/17/17 and 10/19/17. The Signature Page is dated 10/23/17 and unsigned in the Submittal Date of 11/13/17. "Signature" is misspelled	BP 1381	Yes 12/5/2017
4	7.0 Data Recording Forms	3	The Date of Revision 3 of the CNG Piping Test Procedure is for 10/23/17.		Yes 12/5/2017
5	3.0 Definitions and Terminology	2	Section 3.8 Puc 506.02 (o) is the applicable standard of Documentation for Pressure test per 192.509 (not the federal minimum of 5 years).	BP 1377	Yes 12/5/2017
6	3.0 Definitions and Terminology	2	Section 3.4 sentence is not applicable to this pressure test at Production Avenue as stated but could be applicable to other sites. Since this is a specific test procedure for Liberty's CNG facility which is a Class 3 location, the 80% SMYS limit is not applicable for hydraulic tests at all and the 50% SMYS limitation is applicable only for the pneumatic pressure tests if conducted. (Note: TS30 for the SST portions that have an MAOP of 4250 psig would be operating at hoop stress levels exceeding 30% SMYS and will be conducted by a hydraulic test for 8 hours per 192.505.)	BP 1376	Yes 12/5/2017
7	3.0 Definitions and Terminology	2	Section 3.5 sentence is not applicable to this pressure test at Production Avenue as stated but could be applicable to other sites. Since this is a specific test procedure for Liberty's CNG facility which is a Class 3 location, the 80% SMYS limit is not applicable for hydraulic tests at all and the 50% SMYS limitation is applicable only for the pneumatic pressure test if conducted. (Note: TS31 for the SSTportions that have an MAOP of 1400 psig would be operating at hoop stress levels below 30% SMYS thus may be conducted using a pneumatic test if the pressure test lasting 1 hour produces a stress less than 50%. This is the case. This is per 192.507 which also calls for a leak test to be performed between 100 psi and at no more than 20% SMYS which is approximately 1440 psig. 1000 psig is called for in TS31. Note TS 35 and TS FB30 no leak test is required since pressure test is less than 20%)	BP 1376	Yes 12/5/2017
8	3.0 Definitions and Terminology	2	Section 3.8 Puc 506.02 (o) is the applicable standard of Documentation for Pressure test per 192.509 for the life of the pipeline (not the federal minimum of 5 years).	BP1377	Yes 12/5/2017
9	Test Packages	3	5.1 is missing Low Pressure section as stated in 4.12 and on the referenced drawings of Appendix A.	BP 1378	Yes 12/5/2017
10	Pressure Test Documentation	3	6.1 is missing Low Pressure section as stated in 4.12 and on the referenced drawings of Appendix A.	BP 1378	Yes 12/5/2017
11	Pressure Test Documentation	-	The Safety Division could not find any documentation or record for TS35 involving the 2 feet of Stainless Steel Tubing and associated fittings on P 004.	BP 1432 thru BP 1438	NO

2.1 Liberty Utilities CNG Decompression CNG Piping Test Procedure Submittal Date 11/13/17					
Safety Division Recommendation	Section	11/13/17 Submittal Page No.	Safety Division Comments	Corresponding Bates Page Number(s) 11/30/17	Liberty Notified
12	Appendix A Pressure Test	D-1	This page is mislabeled as "Appendix D Pneumatic Test Procedure". It should say "Appendix A Highlighted PIDs" and the page numberings should be A-1. See Bates Pages 1382. It appears this got inserted with wrong position and information contained on BP 1412.	BP 1382	Yes 12/5/2017
13	Appendix A Pressure Test	-	General Notes for TS35 and FB30 on APEX drawing P-003 state operating pressure is 55 psig which is inconsistent with P-005 which states PCV 222A and 222B are set at 75 psig. See BP 1383	BP 1383	Yes 12/5/2017
14	Appendix A Pressure Test	-	General Notes for TS35 and FB30 on APEX drawing P-004 state operating pressure is 55 psig which is inconsistent with P-005 which states PCV 222A and 222B are set at 75 psig. See BP 1384.	BP 1384	Yes 12/5/2017
15	Appendix A Pressure Test	-	General Notes for TS35 and FB30 on APEX drawing P-005 state operating pressure is 55 psig which is inconsistent with P-005 which states PCV 222A and 222B are set at 75 psig. See BP 1385.	BP 1385	Yes 12/5/2017
16	Appendix A Pressure Test	-	General Notes for TS35 and FB30 on APEX drawing P-006 state operating pressure is 55 psig which is inconsistent with P-005 which states PCV 222A and 222B are set at 75 psig. See BP 1386.	BP 1386	Yes 12/5/2017
17	Appendix A Pressure Test	-	Liberty did not supply in the Nov 13, 2017 submittal nor the Bates Page submittal the marked up Sanborn Head PID 1 in the Test Sequence diagram showing all end point of the low pressure test. This is required per CNG Test Procedure Section 10.1.3 and 10.1.7.	BP 1379 BP 0019	Yes 12/5/2017
18	Appendix B APEX Calculations and Engineer Letter	-	Bates Pate 1397 Pressure Test High Pressure Letter should say "4250 MAOP" not 4250 MAWP. Missing Approval Signature and Date. Lists Station Discharge at 55 psig, which contradicts Maintenance Forms and Sanborn Head PID 1 and APEX drawing P-005, which states PCV 222A and 222B are set at 75 psig. See BP 1385.	BP 1381 BP 1397 BP 1385	Yes 12/5/2017
19	Appendix B APEX Calculations and Engineer Letter	-	Bates Pate 1398 Pressure Test Medium Pressure Letter missing Approval Signature and Date. Lists Station Discharge at 55 psig, which contradicts Maintenance Forms and Sanborn Head PID 1 and APECX drawing P-005, which states PCV 222A and 222B are set at 75 psig. See BP 1385.	BP 1398 BP 1385	Yes 12/5/2017
20	Appendix B APEX Calculations and Engineer Letter	-	Bates Page 1399 Pressure Test Low Pressure Letter Missing Approval Signature and Date. Lists Station Discharge at 55 psig, which contradicts Maintenance Forms and Sanborn Head PID 1 and APECX drawing P-005, which states PCV 222A and 222B are set at 75 psig. See BP 1385. Pipe Specification listing is not correct- there is no 0.5 inch and no 0.375 SST Tubing. The box "Operates less than 100 psig" should be checked off since it is operating at either 100 psig or 75 psig or 55 psig depending upon which document Liberty is intending to reference.	BP 1399 BP 1385	Yes 12/5/2017
21	Appendix B APEX Calculations and Engineer Letter	-	Bates Pate 1400 Pressure Test Low Pressure Letter missing Approval Signature and Date. Lists Station Discharge at 55 psig, which contradicts Maintenance Forms and Sanborn Head PID 1 and APECX drawing P-005 which states PCV 222A and 222B are set at 75 psig. See BP 1385. The box "Operates less than 100 psig" should be checked off since it is operating at either 100 psig or 75 psig or 55 psig depending upon which document is referenced.	BP 1400 BP 1385	Yes 12/5/2017

The system pressure testing was conducted on four piping segments, consistent with 49 CFR Part 192 and Puc 500 Rules for Gas Service. The procedures specified pneumatic testing for piping systems operating at less than 1,400 psi and hydraulic testing for the one pipe segment that operates at a pressure greater than 1,400 psi. The segments that were pressure tested are further described as follows.

PT-101 High Pressure Natural Gas for TS-30 (for ASTM A269 Type 316 Stainless Steel Tubing comprised of 10 feet of 1 inch diameter with 0.156 wall and 10 feet of .75 inch diameter with .120 wall and 10 feet of .50

inch diameter with .083 wall and 3 feet of .375 inch diameter with .065 wall). This is highlighted on P-003 and P-004 as area in orange. Reference BP 0027, BP 0021, BP 0022, BP 0037.

- **Operating Pressure Maximum 4250 PSIG MAOP**
- Operating pressure anticipated 1100 psig to 4000 psig
- Test pressure 150% - Hydraulic Test
- Required Test pressure 6,375 psig
- 4,500 psig relief valve – located on trailer
- XNG to ensure Liberty personnel do not allow pressure to go over 4,250 psig
- Design Temperature: - 20 to 120 deg. F
- Operating Temperature: Ambient
- Test Duration: 8 hour
- Test pressure was temperature-compensated due to ambient air fluctuations over test period.

PT-100 Medium Pressure Natural Gas for TS -31 (for ASTM A269 Type 316 Stainless Steel Tubing comprised of 10 feet of 1 inch diameter with 0.120 inch wall and 5 feet of .75 inch diameter with 0.083 wall and 5 feet of .50 inch diameter with .065 inch wall and 3 feet of .375 inch diameter with .049 inch wall). This is highlighted on P-004 and P-005 as area in blue. Reference BP 0021, BP 0022, BP 0034, BP 0037.

- **Operating Pressure Maximum 1400 PSIG MAOP**
- Operating pressure anticipated - 500 psig
- Test pressure 150% - Pneumatic Test
- Required Test pressure - 2,100PSIG
- Intermediate Pressure Leak Test - 1,000 PSIG
- Relief 1,350 psig
- Design Temperature: - 20 to 120 deg. F
- Operating Temperature: Ambient
- Test Duration: 1 hour

PT-100 Low Pressure Natural Gas for TS-35 (for ASTM A269 Type 316 Stainless Steel Tubing comprised of 2 feet of 2 inch diameter piping with 0.188 inch wall and 10 feet of 0.5 diameter tubing with 0.065 wall and 3 feet of 0.375 inch diameter tubing with .049 wall). The test section is highlighted on P-005 as area in pink.

STAFF NOTED: THE PRESSURE TEST procedure for TS-35 does not match the field installation as there was no 0.5 inch and 0.375 inch stainless steel tubing installed in TS-35.

- **Operating Pressure Maximum 105 PSIG MAOP**
- Operating Pressure anticipated 75 psi
- Test pressure 150% - Pneumatic Test
- Test pressure-158 PSIG
- Intermediate Pressure Leak Test: None Required
- Relief 100 psig
- Design Temperature: - 20 to 120 deg. F
- Operating Temperature: 35 to 60 deg. F
- Test Duration: 1 hour

PT-100 Low Pressure Natural Gas for FB-30 (for ASTM A 106 Grade B Carbon Steel Pipe comprised of 5 feet of 4 inch diameter piping with 0.237 inch wall, 5 feet of 3 inch diameter vent piping with 0.216 wall, 10 feet of 2 inch diameter piping with 0.154 inch wall, 5 feet of 1.5 inch diameter piping with 0.145 inch wall, and 5 feet of 1 inch diameter piping with 0.133 wall). The test section is highlighted on P-005 and PID 1 as area in pink. Reference BP 0021, BP 0022, BP 0034, and BP 0037.

- **Operating Pressure Maximum 105 PSIG MAOP**
- Operating Pressure anticipated 75 psig
- Test pressure 150% -Pneumatic Test
- Test pressure-158 PSIG
- Intermediate Pressure Leak Test: None Required
- Relief 100 psig
- Design Temperature: -20-120F
- Operating Temperature: 35-60 deg. F
- Test Duration: 1 hour

Liberty used LU O&M Chapter 9 Section 6 Pressure Test Procedure for the portion of pipeline that consisted of ASTM A 106 Grade B Carbon Steel Pipe comprised of 82.5 feet of 1 inch diameter piping with 0.133 inch wall (schedule 40) used to supply the natural gas fueled emergency generator, 9.5 feet of 2 inch diameter API 5L X42 piping with 0.154 inch wall, 35 feet of 4 inch diameter API 5L X42 piping with 0.188 inch wall, 136 feet of 6 inch diameter API 5L X42 piping with 0.188 inch wall, and 76 feet of 8 inch diameter API 5L X52 piping with 0.322 inch wall). The test section was not highlighted on these drawings but portions are shown on Main Field Record dated Aug 30 2017, and portions shown on Sanborn Head drawing M1and M2. These comprised the above-ground dual regulator runs that are on the west side of the decompression skid along with the transition to 6 inch and 8 inch below ground steel piping that further transitions to 8 inch polyethylene Liberty's standard pressure testing policies for above ground and below ground piping were used.

Within O&M Procedure Chapter 9 Test Requirements, Section 6 Procedures.

Key Provisions are:

1) Sub Section 6.1 General requirements notes that there are **no** Class 1 or Class 2 locations within New Hampshire.
2) Sub Section 6.6 Test Durations requires 1 inch diameter through 8 inch diameter to be tested for a minimum of **one hour.**
3) Low Pressure Natural Gas for purposes of this pressure testing is not consistent with Chapter 9 Test Requirements Section 3.0 Definitions where LP is 13.5 in w.c. and HP is 60 psig MAOP.

- **Low Pressure Natural Gas**
- 60 PSIG MAOP
- Operating Pressure anticipated 55 psig
- Test pressure 150% - Pneumatic Test
- Test pressure - 90 psig
- Intermediate Pressure Leak Test: None Required
- Relief: 58 psig
- Design Temperature: -20 to 120 deg. F
- Operating Temperature: 35 to 60 deg. F
- Test Duration - 1 hour

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Pressure Test Observations: Staff was not present on site to witness each of the pressure tests conducted on various days between August 2017 and October 2017; therefore, Staff only reviewed the pressure test records and procedures provided by Liberty. Liberty indicated five pressure tests were conducted.

1) **Pressure test of 08/30/17** included the testing of 76 ft of 8"diameter coated steel and 136 ft of 6" diameter coated steel up to and including the 4" diameter regulator station piping using compressed air. The piping was tested to 95 psig for 75 minutes per Liberty Operations and Maintenance Manual Chapter 9 Test Requirements, Section 6 Procedures.
2) **Pressure test of 10/11/17** included the testing of 82.5 ft of 1" diameter wax tape coated ASTM A 106 Gr B steel piping for the standby generator. The piping was air tested to 100 psig for 90 minutes per Liberty Operations and Maintenance Manual Chapter 9 Test Requirements, Section 6 Procedures.
3) **Pressure test of 10/16/17** included testing 2 inch diameter painted steel API 5LX42 Pipe that is threaded from Valve 251 and Valve 254 within the decompression skid and 9.5 ft of 2 inch diameter API 5L Gr B painted steel and 35 feet of 4" diameter API 5L Grade Pipe painted steel including above ground piping of Regulators Piping as shown on Sanborn Head Piping and Instrumentation Drawing PID 1 [BP 02] and Sanborn Head Piping Arrangement Drawing M1[BP 03]) using air tested to 160 psig for 60 minutes using the APEX Pneumatic Pressure Test Procedure PT -100 labeled in Appendix D
4) **Pressure test of 10/17/17** included testing a segment of decompression skid stainless steel tubing. The segment was pressure tested to 2200 psig for 90 minutes using nitrogen. In addition this segment was leak tested at an interim step of 1000 psig before reaching the final 2200 psig. The test was conducted using the APEX Pneumatic Pressure Test Procedure PT -100 labeled in Appendix D and APEX drawings P-004 and P-005. The pressure chart of 10/17/17 shows that at 1000 psig the pressure was maintained for 20 minutes but there is no supplemental documentation stating that a check was performed as called for in PT-100 Section 4 and TS-31 and there were no leaks.
5) **Pressure test of 10/19/17** included hydro testing a segment of decompression skid stainless steel tubing at 6,300 psig for 21 hours. The test was conducted using an APEX Hydraulic Pressure Test Procedure PT-101 labeled in Appendix D and Apex drawings P-003 and P-004.

The Safety Division could not find any documentation or record for test section (TS) 35 involving the 2 feet of stainless steel tubing and associated fittings shown on drawing P004. Liberty is required to perform the 158 psig pressure test and to record the results in a document maintained for the life of the pipeline that includes this small segment. Staff notes that Puc 506.02(p) requires documentation of types of materials, lengths tested, test mediums, start and end points, MAOP, and normal operating pressures to be written on charts or logs.

Test records provided by Liberty indicate that pressure testing was not conducted consistent with the procedures developed by APEX; however, the test pressures were consistent with 49 CFR Part 192.505, 192.507, and 192.509 requirements. On December 29, 2017, the Safety Division issued Liberty a Notice of Probable Violation (NOPV) #PS1710LU for not following the APEX test procedures. 49 CFR Part 192.13 was cited for not following procedures the 17 separate steps. Liberty did not contest the violation. A copy of the NOPV is attached in Appendix 2 and is also available on the Safety Division website at *https://www.puc.nh.gov/Safety/Pipeline%20Safety%20Enforcement/CY%202017/PS1710LU.pdf*

Operating Procedures Review

Liberty developed the following operating procedures for the CNG decompression system:

(1) Site Decompression Skid Design Section 1.4 CNG Trailer Operations and Inspection Manual (See page 13 of this report.)
(2) Emergency Plan Section 3.6 - CNG Sequence of Operations - 43 Production Ave-Keene NH (See page 46 of this report.)
(3) OQ & O&M Requirements Section 4.2 - CNG Sequence of Operations - 43 Production Ave-Keene NH (See page 46 of this report.)
(4) Conversion Plan Standard Operating Procedure (SOP) Section 7.1-Keene Conversion (See page 33 of this report.)

The operating procedures affect and are affected by various other system parameters. These include the system design, emergency plan, personnel qualifications, and the conversion of customers. All are integral and embedded in one or more of the sections listed and found within this report. Staff notes Section 4.2 is a duplicate of Section 3.6. The Safety Division notes that Liberty did not present a finalized version and responded only with draft comments to the Safety Division's preliminary review.

Staff provided Liberty with the following 6 recommendations and comments in Table 4.2 and 7 recommendations in Table 3.6 regarding system operating procedures:

4.2-CNG Sequence of Operations Submittal Date 11/12/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	2. Says See 11-1 CNG Operating Procedures Appendices	1	This Operating Procedure has not been submitted nor is it on -line version available to Staff.	BP 1536	Yes 12/5/2017
2	Electronic Version Submitted does not Match the Paper Copy Submitted	1	Example is Trailer Connection D. is part of Hose Station Preparation and Vale Opening labeled Part E is now D.	BP 1536	Yes 12/5/2017
3	Trailer Arrival: a) Arrival	1	Liberty Does not Reference Phone # to Call Number or which Gas Operations Department to Call. (Gas Control, Production, Keene AWC). Liberty did not incorporate Safety Divisions previous suggestion.	BP 1536	Yes 12/5/2017
4	Trailer Arrival c) Hose Station Preparation	1	This section should Reference Drawing P-003 as earlier suggested	BP 1536	Yes 12/5/2017
5	System Re-pressurization	2	This section should Reference Drawing P-004 and P-005, P-006 as earlier suggested preferably next to each component	BP 1537	Yes 12/5/2017
6	System Re-pressurization	2	This section should Reference Drawing P-004 and P-005, P-006 as earlier suggested preferably next to each component	BP 1537	Yes 12/5/2017

3.6 XNG CNG Skid Operating Procedures Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	"2. Says See 11-1 CNG Operating Procedures Appendices"	1	Operating Procedure 11-1 has not been submitted nor is an on -line version available to Staff.	BP 1521	Yes 12/01/17
2	Throughout Section 3.6	1	Electronic version submitted does not match the paper copy submitted. An example is Trailer Connection D reference is part of Hose Station Preparation and Vale Opening labeled Part E is now Part D.	BP 1521	Yes 12/01/17
3	Trailer Arrival: a) Arrival	1	Liberty does not reference phone # for Call Number or which Gas Operations Department for Call. (Gas Control, Production, Keene AWC). Liberty did not incorporate Safety Divisions previous suggestion.	BP 1521	Yes 12/01/17
4	Trailer Arrival c) Hose Station Preparation	1	This section should reference Drawing P-003 as earlier suggested.	BP 1521	Yes 12/01/17
5	Trailer Preparation	1	Language should be inserted stating that the technician shall verify that the trailer pressure does not exceed 4,250 psi.	BP 1521	Yes 12/01/17
6	System Depressurization	2	This section should reference Drawing P-004, P-005, and P-006 as earlier suggested preferably next to each component.	BP 1522	Yes 12/01/17
7	Shut down Procedure	3	This section (4) is the is the critical piece needed for emergencies. The remaining sections are applicable for non-emergency situations.	BP 1523	Yes 12/01/17

Liberty has not provided documentation that these procedures have been modified or adopted for incorporation into their O&M Manual. Liberty indicated that the O&M Manual Section 11-I will be added to include procedures required for the operation and maintenance of the CNG depressurization skid. The Safety Division reviewed the contract between XNG and Liberty provided in Docket No. DG 17-141. See Appendix 4 of this report. The general contract terms appear to relieve Liberty of responsibility for operation and maintenance activities, including emergency response, associated with the decompression skid. The Safety Division has determined that Liberty is the appropriate party responsible for those activities and that associated procedural manuals should incorporate those functions. The CNG skid cannot be operated and maintained consistent with 49 CFR Part 192 requirements without adopted procedures once the gas starts to flow.

7.1 Conversion Plan Standard Operating Procedure (SOP) Keene Conversion

Liberty provided a customized conversion plan created on September 11, 2017, for a four-phase conversion to convert the Monadnock Marketplace (Ashbrook Road) and a segment of pipeline that crosses under New Hampshire Route 12 and terminates at Key Road. The SOP is a 15-step process that includes 4 conversion phases. A purge plan for each of the phases is provided, including an overall map of purge locations. Staff

recommends that the actual service and purge point locations in the vicinity of Chili's, Michaels, the NH Liquor Store, Dick's Sporting Goods, Target, and Planet Fitness be corrected on the purge plan prior to conducting the work.

The Safety Division made the following 22 recommendations in Tables 7.1, 7.2, 7.3, 7.4 and 8.2 as shown below:

7.1 Keene Conversion Standard Operating Procedure (SOP) Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Author	1	The status of the SOP says Approved yet the Header says Draft 2. This should be written as final if so.	BP 1693	Yes 12/01/17
2	SOP Details	1	System Pressure should be consistent with those.mentioned elsewhere Suggest adding MAOP to psig reference to avoid any potential conflict.	BP 1693	Yes 12/01/17

7.2 Keene CNG Conversion Proposed Purge Plan Sections 1, 2, 3, 4 Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Conversion Section 1 Sheet 1 of 4	1	Conversion Section 1 states "to be used in conjunction with all applicable sections of O&M". Liberty should specify the precise sections of the O&M Manual that are applicable. It states Flow Arrows indicated on Sketch although Safety Division could not find any. Instead of Sketch reference BP 1703 "Proposed Sectionalizing Plan" dated 9/12/2017	BP 1697	Yes 12/01/17
2	Conversion Section 1 Sheet 1 of 4	1	Step 10 is not specific as to which section of Liberty O&M Manual is referenced. Liberty has multiple places that establish within the O&M Manual. Reference BP 1790. A multiple pressure test may be required.	BP 1697	Yes 12/01/17
3	Conversion Section 2 Sheet 2 of 4	1	Conversion Section 2 states "to be used in conjunction with all applicable sections of O&M". Liberty should specify the precise sections of the O&M Manual that are applicable. It states Flow Arrows indicated on Sketch although Safety Division could not find any. Instead of Sketch reference BP 1703 "Proposed Sectionalizing Plan" dated 9/12/2017	BP 1698	Yes 12/01/17
4	Conversion Section 2 Sheet 2 of 4	1	Step 10 is not specific as to which section of Liberty O&M Manual is referenced. Liberty has multiple places that establish pressures within the O&M Manual. A single pressure test may be adequate.	BP 1698	Yes 12/01/17
5	Conversion Section 3 Sheet 3 of 4	1	Conversion Section 3 states "to be used in conjunction with all applicable sections of O&M". Liberty should specify the precise sections of the O&M Manual that are applicable. It states Flow Arrows indicated on Sketch although Safety Division could not find any. Instead of Sketch reference BP 1703 "Proposed Sectionalizing Plan" dated 9/12/2017	BP 1699	Yes 12/01/17
6	Conversion Section 3 Sheet 3 of 4	1	Step 10 is not specific as to which section of Liberty O&M Manual is referenced. Liberty has multiple places that establish pressures within the O&M Manual. Reference BP 1765, 1767 . A single pressure test may be adequate.	BP 1699	Yes 12/01/17
7	Conversion Section 4 Sheet 4 of 4	1	Conversion Section 4 states "to be used in conjunction with all applicable sections of O&M". Liberty should specify the precise sections of the O&M Manual that are applicable. It states Flow Arrows indicated on Sketch although Safety Division could not find any. Instead of Sketch reference BP 1703 "Proposed Sectionalizing Plan" dated 9/12/2017	BP 1700	Yes 12/01/17
8	Conversion Section 4 Sheet 4 of 4	1	Step 17 is not specific as to which section of Liberty O&M Manual is referenced. Liberty has multiple places that establish pressures within the O&M Manual. Reference BP 1765, 1767. A multiple pressure test may be required.	BP 1700	Yes 12/01/17

7.3 Keene CNG Conversion Proposed Purge Maps Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	PB- R6	1	No service is shown to Dicks Sporting Good #43.	BP 1703	Yes 12/01/17
2	PB- R6	1	Valve and service to Target #46 is not shown correctly.	BP 1703	Yes 12/01/17
3	PB- R6	1	Addressing on Production Avenue is incorrect. Noyes Volkswagen is #18 not #14. Autoparts International is #32 not #30.	BP 1702	Yes 12/01/17

7.4 Keene CNG Conversion Proposed PUC Requests Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	PB- R6	1	Mattress Giant is now Sleepy's Mattress see BP 1506. Suggest using the proper Addressing for future records	BP 1704	Yes 12/01/17

8.2 Keene Original Monadnock Plaza Installation Records Submittal Date 11/13/17					
Safety Division Recommendation	Section	Page No.	Safety Division Comments	Corresponding Bates Page Number 11/30/17	Liberty Notified
1	Main and Service Records of NH Gas Corp	1	The original records need to have a corresponding street address and a corresponding business name. Many of the existing records reference business names that have changed since the original installation of 2005. The GIS Mapping should have source information so that in an emergency the precise record is brought up that pertains to the exact pipeline location. Also since main and service information is available in trucks the original names recorded should tie to the current names of businesses.	BP 1706 through BP 1874	Yes 12/01/17
2	Service Records of NH Gas Corp	1	Excess Flow Valves - It is unclear which services Liberty intends to install an excess flow valve and if an existing Excess Flow Valve was installed at each service. Safety Division found an excess flow valve the former I Party (#14 Ashbrook Rd) store. Liberty has the option of putting in excess flow valves for businesses that exceed 1 MCFH meter size.	BP 1811	Yes 12/01/17
3	Main and Service Records of NH Gas Corp	1	Liberty's plan should state intentions regarding mains and services that were not originally pressure tested at levels required to establish 60 psig MAOP. Liberty's options are to Uprate per Part 192 Subpart K or reinstall new pipelines that will be pressure tested. Safety Division review **revealed 14 feet of 2 inch service feeding the former Circuit City (currently Planet Fitness) and 12 feet former Mattress Giant (currently Sleep's Mattress) along with 700 feet of 2 inch main** feeding those buildings may not be operated at 60 psig MAOP without reestablishing 60 psig MAOP per subpart J or K. compliance.	BP 1765 BP 1766	Yes 12/01/17
4	Main and Service Records of NH Gas Corp	1	Liberty's plan should state intentions regarding mains and services that were not originally pressure tested at levels required to establish 60 psig MAOP. Liberty's options are to Uprate per Part 192 Subpart K or reinstall new pipelines that will be pressure tested. Safety Division record review revealed **1400 feet of 4 inch main feeding the former Borders, Bed and Bath and Target buildings along with 150 feet of 2 inch main** feeding those buildings installed in 2004 may not be operated at 60 psig MAOP without reestablishing 60 psig MAOP per subpart J or K. compliance.	BP 1787	Yes 12/01/17
5	Main and Service Records of NH Gas Corp	1	Liberty's plan should state intentions regarding mains and services that were not originally pressure tested at levels required to establish 60 psig MAOP. Liberty's options are to Uprate per Part 192 Subpart K or reinstall new pipelines that will be pressure tested. **Safety Division review revealed 160 feet of 4 inch service feeding the Chili's restaurant** installed in 2004 may not be operated at 60 psig MAOP without reestablishing 60 psig MAOP per subpart J or K. compliance.	BP 1790	Yes 12/01/17
6	Main and Service Records of NH Gas Corp	1	Liberty's plan should state intentions regarding mains and services that were not originally pressure tested at levels required to establish 60 psig MAOP. Liberty's options are to Uprate per Part 192 Subpart K or reinstall new pipelines that will be pressure tested. **Safety Division review revealed 70 feet of 2 inch service feeding the former Olive Garden restaurant** installed in 2004 may not be operated at 60 psig MAOP without reestablishing 60 psig MAOP.	BP 1793	Yes 12/01/17
7	Main and Service Records of NH Gas Corp	1	Liberty's plan should state intentions regarding mains and services that were not originally pressure tested at levels required to establish 60 psig MAOP. Liberty's options are to Uprate per Part 192 Subpart K or reinstall new pipelines that will be pressure tested. **Safety Division review revealed 14 feet of 1 inch service between the former Olive Garden restaurant and Chili's** installed in 2005 used as a riser for a pressure chart but did not find a corresponding retirement record of the 1 inch diameter riser.	BP 1860 BP 1861 BP 1862	Yes 12/01/17
8	Main and Service Records of NH Gas Corp	1	On new pressure systems such as the proposed Keene 60 psig system fed with natural gas. Liberty should set up a document system that clearly identifies, verifies and traces the materials, pressure testing, location of pipeline for every foot of pipe and associated components so that MAOP records can be kept for the life of the pipeline system to ensure compliance with Part 192. Existing system seems to be hap hazard and may potentially lead to mis interpretation in the future. This would include Production Avenue, Ash Brook Rd, Key Rd and future expansions.	BP 1706 through BP 1874	Yes 12/01/17

Public Awareness Plan Review

Staff reviewed two documents associated with Liberty's Public Awareness Plan. Staff reviewed the October 20, 2017, Liberty Public Awareness Plan (CFID 2268) Revision 5.0. The plan was revised during 2017 to include modifications pertaining to public awareness required for the Keene CNG decompression unit and associated natural gas distribution system. Revision 5.0 became effective December 1, 2017. This plan includes the Keene pipeline facilities as part of the overall Public Awareness Plan that Liberty uses for its other three divisions. Six departments within Liberty's organization are responsible for various Public Awareness subject areas. These are: (1) Communications, (2) Damage Prevention, (3) Compliance, Quality and Emergency Maintenance, (4) Government and Community Relations, (5) Training, and (6) Mapping.

Liberty developed its Public Assessment Plan based on the December 8, 2014, generic Northeast Gas Association (NGA) Regional Public Awareness and Education Program for Gas Distribution and Transmission Pipelines, Revision B3. Liberty's specific modifications, supplements, and changes to the plan are included in the plan's Appendix C.

The NGA Program is intended to educate the public and key stakeholders on how to recognize possible leaks in gas pipelines. It seeks to raise public awareness of necessity to call the one call notification center before excavation and to raise the awareness of the affected public and key stakeholders of the presence of buried gas pipelines in the communities Liberty serves. A more informed public will also understand that they, too, have a significant role in helping to prevent third-party damage accidents. It helps excavators understand the steps that they should take to prevent third-party damage and to respond properly if they cause damage to Liberty's pipelines. It provides emergency response agencies and first responders the means to better understand the proper actions to take in response to a pipeline emergency. It identifies the means to assess the effectiveness of the communications used, and to improve effectiveness through time. A new stakeholder audience was added to Section 4 (see below), but the associated Message Content Documentation was not provided in Section 5 (see below).

The generic NGA plan is embedded within the Liberty Public Awareness Plan and includes the following 11 sections:

(1) Introduction
(2) Glossary of Terms
(3) Program Administration
(4) Stakeholder Audiences
(5) Message Type for Each Audience
(6) Baseline Delivery Frequency
(7) Baseline Delivery Methods
(8) Supplemental Program
(9) Program Implementation and Progress Tracking
(10) Program Evaluation
(11) Implementation of Continuous Improvement

The Liberty Public Awareness Plan is customized from the generic NGA plan through the inclusion of the following 8 Appendices:

A) Program Revision
B) Company Information

C) Company Additions, Modifications and Supplemental Activities
D) Baseline and Subsequent Evaluations,
E) Identification and Message Content Documentation for Affected Public,
F) Identification and Message Content Documentation for Emergency Officials,
G) Identification and Message Content Documentation for Local Public Officials,
H) Identification and Message Content Documentation for Excavators.

There were 8 Attachments to the Plan, including samples of: Letters to Various Audiences, Pipeline Safety Messages, Natural Gas Safety Scratch and Sniff Cards, and a Company President Support Letter.

Liberty routinely completes public awareness/educational mailings and data collection for emergency first responders and public officials. Liberty subcontracts public awareness/educational mailings and data collection for contractors and general public audiences. An annual compilation of outreach efforts is retained by Liberty. Staff provided 9 suggestions for the Public Awareness Plan based on the information reviewed. They are listed below:

6.2 Liberty Utilities Keene Public Awareness Plan Modifications for CNG Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	NGA 2.0 Glossary of Terms	-	Excavation Definition is listed twice. Suggest elimination of duplicate.	BP 1643	No
2	NGA 2.0 Glossary of Terms	-	MUST definition needs description of organization similar to CGA or Dig Safely. Recommend adding the URL for the MUST website with hyperlink as done in other definitions.	BP 1643	No
3	NGA 1.0 Company Information	-	Add Operator Identification 36773 for Amherst Propane system under OP ID 16667 to Table 1.1 Company Information.	BP 1642	Yes 10/27/2017
4	NGA 3.0 Program Administration	-	Section 3.4 Change OpId 16667 to 36773 for Amherst Propane system on first line of Table for Propane Pipeline Assets	BP 1646	Yes 10/27/2017
5	NGA 4.0 Stakeholder Audiences	-	Need to add 4.1.5 "Other" as a Stakeholder Audience since mentioned in Table 1 BP 1648.	BP 1646	Yes 10/27/2017
6	NGA 5.0 Message Type for Each Audience	-	Do emergency officials have a different phone number for Energy North? 855-242-1091? All others state 855-327-7758. Recommend verifying and institute change if incorrect.	BP 1651	Yes 10/27/2017
7	NGA 5.0 Message Type for Each Audience	-	Table 2 needs a column added for "Others" under Distribution Operators with applicable Messages identified.	BP 1649	No
8	NGA 5.0 Message Type for Each Audience	-	Message Content 5.2 should have a designation with associated description that has corresponding designation as in Table 2. For instance, there is no description for Pipeline Location Information, List of Pipeline Operators Potential Hazards, Additional Information , How to Obtain a Summary of Integrity Management Plans, Summary of Integrity Management, Continuing Liaison under Message Content 5.2 so this content description is missing or incomplete.	BP 1650	Yes 10/27/2017
9	Appendix C	-	"Public Awareness Summary" by S. Furey dated 11/11/17 is recommended to be added to bullet list or referenced as a Supplementary Activity Liberty utilities has implemented.	BP 1635 BP 1663	No

In addition, Liberty provided a "Public Awareness Summary" by S. Furey dated November 17, 2017 that detailed the following specific public awareness area that applies only to Keene and, specifically, the natural gas portion of the system. The summary addressed 4 areas of concern that the Safety Division had previously identified:

- Monadnock Marketplace customers
- Keene plumbing and heating contractors
- Production Avenue property owners
- Keene Fire Department

Liberty indicated that a natural gas sticker would be applied to all gas meters for customers to be converted to natural gas and that customers would be notified by mail of the fuel source change. Customer questions will be directed to the Keene office. Letters will be generated to the existing customers of Monadnock Marketplace, notifying them of planned service conversion dates.

Liberty will also compile a list of plumbing and heating contractors who will be notified of the fuel source change and informed that customers supplied with natural gas will have a natural gas sticker applied to their meters.

For Production Avenue property owners, public officials were given details of the conversion process at Planning Board and Zoning Board meetings that were broadcast to the public. Interviews were conducted with local media regarding plans. Easements were secured from the adjacent facility to allow for trailer turnarounds on Production Avenue. One customer (Bensonwood) has indicated a willingness to convert.

Liberty has worked with the Keene Fire Department during the system development process and will continue to assist the local fire department with training. The Keene Fire Department will be on site during the conversion process. Liberty will work with the Fire Department in regard to contractors applying for system conversion permits.

Overall, Liberty's public awareness program appears to comply with:

- 49 CFR Part 192.605(a) - requiring establishment of an emergency manual;
- 49 CFR Part 192.615 - requiring adequate communication with appropriate fire, police and other public officials; and
- 49 CFR Part 192.616 - requiring increased public awareness of four key stake holder groups.

Maintenance Procedures Review

Liberty provided an updated Maintenance Plan dated November 12, 2017, which is a separate Maintenance Guide specifically for the CNG system in Keene. This is a customized version of a standard XNG Maintenance Guide that incorporates many of the specific features of the Production Avenue setup so that 49 CFR Part 192 code requirements and Liberty maintenance intervals will be met.

The Safety Division reviewed the XNG plan which contains the following 7 sections:

(1) Introduction
(2) Purpose
(3) Maintenance Schedules
(4) Records and Documentation
(5) System Description
(6) Key Components
(7) Maintenance Items

The Safety Division recommends the following 12 changes summarized in the table below:

I. Addition of a new natural gas supply source
Maintenance Procedures Review

5.2 Liberty Keene Maintenance Guide Submittal Date 11/13/17					
Safety Division Recommendation	Section	11/13/17 Submittal Page No.	Safety Division Comments	Corresponding Bates Page Number 11/30/17	Liberty Notified
1	Table of Contents	1	Section 7 should match Chapter 7 Header	BP 1613 BP 1616	Yes 12/01/17
2	Introduction	2	Plan must be incorporated into Liberty Maintenance Plan no later than March 2018. Section 5.2 is effective immediately in order to be compliant with Part 192.603(a)	BP 1614	Yes 12/01/17
3	3. Maintenance Schedule	2	3.2 says XNG will do additional maintenance on a monthly basis as listed in document yet document in Section 7 calls out for Daily, Monthly and Semiannually and Annual Inspections for boiler related equipment. This appears to be contradictory. Clarification required as to what exact expectation is.	BP 1614 BP 1616 BP 1617	Yes 12/01/17
4	3. Maintenance Schedule	2	3.3 should eliminate the word "mandated" and replace with "all". The Safety Division recommends at minimum the first 6 months (up to 1 year) that Liberty personnel be present for all maintenance activities so they witness maintenance inspections being performed, verify qualifications of personnel, attendance activities recorded and documentation forwarded in a monthly basis.	BP 1614	Yes 12/01/17
5	4. Records and Documentation	2	4.2 should add clarification of 3.3 recommendation by adding review signature by Liberty Personnel and accompanying date to any forms created by XNG and used at the Keene facility.	BP 1614	Yes 12/01/17
6	5. System Description	3	Change 5.3 Relief "Capacity" and in T&C to Relief "Settings". Also PSV 213 should reference P&ID as found on P-004 and PSV 232 should reference P&ID as found on P-005.	BP 1615	Yes 12/01/17
7	6. Key Components	4	Oasis Male /female fitting calls out for Oasis HC208 BP 45 not 308 as listed in this section.	BP 1615	Yes 12/01/17
8	6. Key Components	3 & 4	Staff recommends putting sizes, P&ID reference numbers and accompanying BP number so that maintenance personnel can verify if a change has occurred during routine inspections for the 13 items listed.	BP 1615 BP 1616	Yes 12/01/17
9	7. Maintenance Items (Boiler Maintenance)	4	This lists Daily, Monthly and Semiannual Maintenance on Boiler. Does this infer XNG will be on site daily? Who does Semiannual maintenance for water pressure relief valve, water connection inspections?	BP 1616	Yes 12/01/17
10	7. Maintenance Items (Boiler Maintenance)	4 to 8	Staff recommends putting sizes, P&ID reference numbers and accompanying BP number so that maintenance personnel can verify if a change has occurred during routine inspections for the 13 items listed.	BP 1616 BP 1617 BP 1618 BP 1619 BP 1620	Yes 12/01/17
11	7. Maintenance Items (Boiler Maintenance)	5	Staff recommends in Section C to change reference from page 2 of this manual of Operating Instructions to section HPTP Elite Commercial Boilers Users Manual BP 1031 or HTP Installation, Start-Up, Maintenance, Parts and Warranty Manual if that is what is intended.	BP 1617	Yes 12/01/17
12	7. Maintenance Items (Boiler Maintenance)	4 to 8	Staff recommends putting frequency of inspections next to each item 7.1 through 7.13. If meant to be annually for each item then why does 7.11 call out a Monthly Nitrogen Check?	BP 1616 BP 1617 BP 1618 BP 1619 BP 1620	Yes 12/01/17

Liberty provided five partially filled forms regarding Maintenance of the 60 psig system regulators outside the decompression skid composed of carbon steel specifically for the CNG system in Keene. The forms should be completed by only Liberty, not XNG. These are annually completed forms and are of similar format to other regulator maintenance forms used by Liberty throughout their system. The inspection forms should be revised to include a place for the inspector name (technician) and date inspected.

5.3 Liberty Keene 60 Psig Regulator Maintenance Forms Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Regulator Maintenance for 4505A Worker Top Run	1	Set at 45 psi There is no place on form for Inspector or Date. Corrected and completed forms should be resubmitted to the Commission prior to any approval of conversion project.	BP 1621	Yes 12/01/17
2	Regulator Maintenance for 4505AM Monitor Top Run	1	Set at 55 psi There is no place on form for Inspector or Date. Corrected and completed forms should be resubmitted to the Commission prior to any approval of conversion project.	BP 1622	Yes 12/01/17
3	Regulator Maintenance for 4505B Worker Bottom Run	1	Set at 40 psi There is no place on form for Inspector or Date. Corrected and completed forms should be resubmitted to the Commission prior to any approval of conversion project.	BP 1623	Yes 12/01/17
4	Regulator Maintenance for 4505BM Monitor Bottom Run	1	Set at 55 psi There is no place on form for Inspector or Date. Corrected and completed forms should be resubmitted to the Commission prior to any approval of conversion project.	BP 1624	Yes 12/01/17
5	Regulator Maintenance for 4505R Relief Set at 58 Psig	1	There is no place on form for Inspector or Date. Corrected and completed forms should be resubmitted to the Commission prior to any approval of conversion project.	BP 1625	Yes 12/01/17

These forms generally were in compliance with documentation provisions as required and associated with 49 CFR Parts 199.199, 192.201, 192.203, 192.603 (b), 192.605 (b) (1), 192.739, and 192.743.

Liberty provided a partially filled Station Inspection form for the carbon steel 60 Psig System Regulators outside the decompression skid specifically for the CNG system in Keene. This form must be completed by Liberty. This annual form should be completed and is of similar format to other regulator maintenance forms used by Liberty throughout their system. Much of the form is not applicable to the 60 psig portion above-ground segment (e.g., water depth, gutters on doors cleaned, pipe-to-soil read, valve boxes tested, inlet valves greased, proper fits on valve gate covers).

In general, this form was in compliance with required documentation requirements associated with 49 CFR Parts 192.603(b), 192.605(b)(1), 192.181, and 192.199.

Liberty provided three partially filled forms for Maintenance of the 105 Psig System Regulators within the decompression skid composed of stainless steel specifically for the CNG system in Keene. The forms are required to be completed by XNG and retained by Liberty. Two of the forms were for Regulator Maintenance and the third form was a station inspection form. Much of the third form is not applicable to the 60 psig portion above- ground segment (e.g., water depth, gutters on doors cleaned, pipe-to-soil read, valve boxes tested, inlet valves greased, proper fits on valve gate covers). These annual regulator maintenance forms are of similar

format to other regulator maintenance forms used by Liberty throughout their system. The inspection forms lacked places for inspector name (technician) and date inspected, as noted.

5.5 Liberty Keene 105 Psig Regulator Maintenance Forms Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Regulator Maintenance for 4504A Worker A Run	1	Set at 90 psi There is no place on form for Inspector or Date.	BP 1627	Yes 12/01/17
2	Regulator Maintenance for 4504B Worker B Run	1	Set at 70 psi There is no place on form for Inspector or Date.	BP 1628	Yes 12/01/17
3	Regulator Maintenance for 4504R Relief Set at 100 Psig	1	There is no place on form for Inspector orDate.	BP 1629	Yes 12/01/17

In general, these forms were in compliance with documentation provisions as required and associated with 199.199, 192.201, 192.203, 192.603(b), 192.605(b)(1), 192.739, and 192.743.

Liberty provided three partially filled forms regarding Maintenance of the 1400 Psig System Regulators within the decompression skid composed of stainless steel specifically for the CNG system in Keene. The forms are required to be completed by XNG and retained by Liberty. These are annual forms of similar format to other regulator maintenance forms used by Liberty throughout their system. The inspection forms lack a place for inspector name (technician) and date inspected as noted below. The Safety Division expects Liberty to review and sign the documentation as well.

5.7 Liberty Keene 1400 Psig Regulator Maintenance Forms Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Regulator Maintenance for 4503A Worker A Run	1	Set point not listed as in 5.5 and 5.3. Inlet pressure incorrectly listed as 4500 instead of 4250 psig. There is no place on form for Inspector or Date.	BP 1631	Yes 12/01/17
2	Regulator Maintenance for 4503B Worker B Run	1	Set point not listed as in 5.5 and 5.3. Inlet pressure incorrectly listed as 4500 instead of 4250 psig. There is no place on form for Inspector or Date.	BP 1632	Yes 12/01/17
3	Regulator Maintenance for 4503R Relief Set at 1350 Psig	1	There is no place on form for Inspector or Date.	BP 1633	Yes 12/01/17

In general, these forms were in compliance with documentation requirements as required and associated with 49 CFR Parts 199.199, 192.201, 192.203, 192.603 (b), 192.605 (b) (1), 192.739, and 192.743.

Liberty provided a partially filled form for Station Inspection of the stainless steel 1,400 Psig System Regulators within the decompression skid specifically for the CNG system in Keene. This form is required to be completed by XNG and retained by Liberty. This annual form is of similar format to other regulator maintenance forms used by Liberty throughout their system. The inspection form lists the pressure incorrectly as 4,500 psig. Much of the form is not applicable to the 1,400 psig portion contained within the skid, e.g., water depth, gutters on doors cleaned, pipe to soil read, valve boxes tested, inlet valves greased, proper fits on valve gate covers, so the Safety Division recommends that Liberty be directed to review and sign the documentation, as well.

5.8 Liberty Keene 1400 Psig Regulator Station Forms Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Regulator Station Inspection Form for 4503	1	Inlet pressure incorrectly listed as 4,500 instead of 4,250 psig.	BP 1634	Yes 12/01/17

In general, this form was in compliance with documentation requirements as required and associated with 49 CFR Parts 192.603(b), 192.605(b)(1), 192.181, and 192.199.

Emergency Response Plan Review

Liberty provided an updated Emergency Plan dated November 12, 2017, that includes a separate Emergency Plan for the Keene distribution system which covers 43 Production Avenue in Keene (the site of the CNG facility). This plan is similar in format to the centralized Emergency Plan Liberty uses for other locations in New Hampshire, but is specific to the Keene distribution system. The Liberty plan includes the following 12 sections:

3.1 Emergency Plan Update and Summary

3.2 Liberty Utilities Emergency Plan for 43 Production Avenue - Keene NH Final

(1) Purpose
(2) Statement of Policy
(3) Plan Summary
(4) Scope of the Emergency Plan
(5) Revision History
(6) Classification and Notification of Emergencies
(7) Emergency Organization Charts
(8) Responsibilities and Emergency Organization Positions
(9) Assignment of Responsibilities for Support Organizations
(10) Emergency Response
(11) Plan Maintenance and Administration
(12) Liaison with Fire, Police, Public Officials, and Other Utilities

The Keene Emergency Plan also includes 10 Appendices (A through J).

The Safety Division reviewed these sections and appendices and found they are generally in compliance with the Emergency Plan requirements of 49 CFR Part 192.615. Appendix J of the Keene Emergency Plan is a new section detailing "Emergency Response Procedures – CNG Decompression Skid." This section was added based on preliminary comments provided by the Safety Division to Liberty. The Emergency Plan amendments need to be implemented and effective the day natural gas starts to flow. Appendix J outlines roles and responsibilities for the Keene Fire Department, XNG and Liberty. Gas emergencies specifically related to Keene are classified as Level 1 Advisory, Level 2 Elevated and Level 3 High Alert, depending on the escalation of the emergency. Each classification includes a description, notifications required, assessment, actions and reevaluations. The Safety Division recommends the following nine changes be made in Table 3.2, below:

3.2 Liberty Keene Emergency Response Plan Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	C. Plan Summary	4	Needs to add bullet addressing Potential Inadvertent Intermixing of 2 systems (NG and P/A)	BP 1443	Yes 12/01/17
2	D. Scope	6	Scope needs to incorporate that there is a second supply source located at 43 Production Avenue . Plan currently references only the P/A Plant on Emerald St.	BP 1445	Yes 11/15/17
3	I. Assignment of Responsibilities for the Support Organizations	18	Section 2 needs to add bullet: Gas Control should coordinate or verify Instrument Readings with XNG Control Center regarding CNG alarms.	BP 1457	Yes 12/01/17
4	I. Assignment of Responsibilities for the Support Organizations	18	Section 4 re: Production needs to include the CNG Facility in 4th bullet.	BP 1457	Yes 12/01/17
5	J. Emergency Response	20	Appendix J needs to be referenced.	BP 1459	Yes 12/01/17
6	Appendix A	33	Level 1 Event Other should include emergency shutdowns associated with the CNG facility.	BP 1472	Yes 12/01/17
7	Appendix E	42	Needs to add ninth procedure addressing Potential Inadvertent Intermixing of 2 systems (NG and P/A) in both the list and the body of text.	BP 1481	Yes 12/01/17
8	Appendix F	54	District 4 may need to be updated Level 2's apply to propane air systems but customer lists 16 Ashbrook Rd which will now be natural gas	BP 1490	Yes 12/01/17
9	Appendix J	65/ 66	Level 2 and 3 High Alerts Reference a particular individual R. MacDonald as IC. Liberty should use language referencing page 14 of ERP, Incident Commander Description.	BP 1504 BP 1505	Yes 12/01/17

3.3 XNG Emergency Response Plan - 43 Production Avenue – Keene NH Final

Liberty's Emergency Response Plan for Keene includes a copy of the XNG Response Plan for 43 Production Avenue. XNG's plan is a modified company plan that indicates that XNG will follow Liberty's Emergency Response Plan. XNG's emergency response plan appears to be applicable to potential emergencies occurring on the road or in transit and regulations pertaining to the tank trailer safety, rather than gas distribution and supply piping systems. The introduction states that the plan complies with NFPA 55-Compressed Gases and Cryogenic Fluids, NFPA 59 - LPG at Utility Plants and NFPA 59A - LNG Storage and Handling. The Safety Division is unclear which code sections are intended to be referenced and applicable to the Liberty CNG site. Staff recommends that the plan clearly indicate the applicable code sections.

The XNG plan is outlined as follows:

(1) Introduction
(2) Scope
(3) Hazard Identification Labeling
(4) Quantity of Compressed Natural Gas On Site
(5) Emergency Equipment
(6) Incidents

The Safety Division recommends the following changes summarized below:

3.3 XNG Emergency Response Plan Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	2. Scope	4	Minor edits references to hose station, when there is no hose station at this site. Weight of CNG not consistent with Section 4. There is no external gas heater.	BP 1510	Yes 12/01/17
2	4. Quantity of CNG on Site	5	Minor Edits unloaded should be unloading. Max number of trailers says two when it should say three. Empty bay is not always next to Bay 1 as stated.	BP 1511	Yes 12/01/17
3	6. Incidents	9 & 10	If Appendix J from Recommendation 9 of Liberties ERP gets modified above, this must also get modified.	BP 1515 BP 1516	Yes 12/01/17

3.4 XNG – Liberty Interlock Matrix

The Emergency Response Plan included a two page copy of the XNG Liberty Interlock Matrix for 43 Production Avenue. The Safety Division found no changes were necessary to the matrix.

3.5 Site Safety and Security Equipment Plan

A single page copy of a Site Safety and Security Equipment Plan for 43 Production Avenue was included.

The Safety Division had a single comment regarding the one-page plan.

3.5 Site Safety and Security Plan Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	-	-	Staff questioned why the alarm setting at 50% of the lower explosive level would activate a complete system shutdown rather than alarm recognition. There is no external gas heater as referenced.	BP 1520	Yes 12/01/17

The emergency shutoff devices (ESDs), pull alarms, site configuration, signage, fencing, and control panels appeared to be shown correctly on the as-built plans.

3.6 CNG Sequence of Operations – 43 Production Avenue – Keene NH

A five page copy of the CNG Skid Operating Procedures Plan for 43 Production Avenue was attached to the plan. It was not marked final as the others were. While this was submitted as part of the Emergency Plan Response, this operating procedure has nothing to do with the Emergency Plan and should be incorporated into Liberty's Operation and Maintenance Plan. The operating plan amendments need to be implemented and effective the day natural gas starts to flow.

The Safety Division recommends the following changes summarized in the table below:

3.6 XNG CNG Skid Operating Procedures Submittal Date 11/13/17					
Safety Division Recommendation	**Section**	**11/13/17 Submittal Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	2. Says See 11-1 CNG Operating Procedures Appendices	1	This Operating Procedure has not been submitted nor is an on-line version available to Staff.	BP 1521	Yes 12/01/17
2	Electronic Version Submitted does not Match the Paper Copy Submitted	1	Example: Trailer Connection D is part of Hose Station Preparation and Vale Opening labeled Part E is now D.	BP 1521	Yes 12/01/17
3	Trailer Arrival: a) Arrival	1	Liberty does not reference phone # to call or which Gas Operations Department to call. (Gas Control, Production, Keene AWC). Liberty did not incorporate Safety Divisions previous suggestion of being specific in the event of an abnormal operating condition is found.	BP 1521	Yes 12/01/17
4	Trailer Arrival c) Hose Station Preparation	1	This section should Reference Drawing P-003, as earlier suggested.	BP 1521	Yes 12/01/17
5	Trailer Preparation	1	Language should be inserted stating that the technician shall verify the trailer pressure does not exceed 4,250 psi.	BP 1521	Yes 12/01/17
6	System Depressurization	2	This section should Reference Drawing P-004 , P-005, and P-006 as earlier suggested preferably next to each component.	BP 1522	Yes 12/01/17
7	Shut down Procedure	3	This section (4) is the important section that is the critical piece needed for emergencies. The remaining sections are applicable for non-emergency situations.	BP 1523	Yes 12/01/17

These recommendations supplement those found on page 24 of this report.

3.7 APPEX Plume Study – 43 Production Avenue, Keene NH

The Safety Division notes the misspelling of "APEX" by Liberty in the Table of Contents and misspelling of the "Ploom Study" on BP 1526.

A single page copy of a Thermal Plume Study prepared by Apex Engineering was included in the plan. The Plume Study was requested by the Keene Fire Department for the 43 Production Avenue site. The Plume Study indicated a 175 foot minimum safety zone radius from the connection point between the trailer, and the decompression skid is recommended since that is where the relief valves are located. This places the plume entirely within the Liberty parcel and within the fence line of the property. The Plume Study indicated a 26-foot vertical release would be diluted enough so that the Lower Flammability Limit of 5% will not be reached if an ignition source is present.

Similarly a 75-foot horizontal release would be diluted enough so that the Lower Flammability Limit of 5% will not be reached if an ignition source is present. These were based on modeling with pressures and characteristics of the flammable gas used as inputs. A 9-foot vertical flame was calculated with a 55-foot radiant setback required from the vertical flame. This is not an issue at 43 Production Avenue since there are no items above of the facility. A 92-foot horizontal flame was calculated with another 69 foot radiant setback required from the horizontal flame. The 175-foot minimum exceeds the combined (92 +69) necessary. The Safety Division had no recommendations for this section and there are no code requirements regarding these clearances in 49 CFR Part 192.

3.8 XNG CNG Safety Data Sheet

Liberty's Emergency Response Plan for Keene also includes a standard CNG Material and Safety Data sheet available for all employees to (3.8).

Operator Qualifications and Training Review

Liberty provided documentation regarding Operator Qualifications (OQs) associated with the new storage tanks and the decompression skid. In all, 20 documents were provided to show compliance with current regulations and what has been accomplished as of November 12, 2017. Staff reviewed Operator Qualification (OQ) Plan updates and personnel training required for the operation and maintenance of the Keene CNG depressurization skid. The training materials included a CNG General Awareness Training power point developed by XNG as well as the written evaluation test for a new OQ-covered task for performing CNG start up and shutdown. Liberty developed OQ Plan covered task #3LU for trained personnel to connect and disconnect tank trailers from the depressurization skid and prepared a summary of covered task training required for XNG, Liberty Instrumentation and Regulation personnel, and Liberty Keene personnel.

On November 12, 2017, Liberty provided the following summary in regard to OQs for the Keene CNG system:

- Covered task #3LU will be added to the Liberty Utilities OQ Plan.
- Existing Liberty Utilities OQ Plan, revision dated April 1, 2017, Appendix G will be updated to reflect Section 19-CNG Decompression recognition and reaction to abnormal operating conditions although they are also included in Covered Task #3LU section E.
- A list of covered tasks identified in the November 07, 2017 CNG-Keene Production Avenue submission specifies which companies (XNG, EnergyNorth northern, central and southern divisions, and local EnergyNorth Keene division personnel) may perform the covered tasks and the associated required qualifications of individuals for those companies was provided. This document will be added as an amendment during the next scheduled update of Liberty Utilities OQ Plan.

Liberty also noted the following additional information in regard to the Keene CNG system OQ:

- XNG has accepted the Liberty Utilities OQ Plan.
- In the future, XNG drivers will be required to be qualified under covered task #3LU. Currently only Liberty Keene technicians are required to be qualified under #3LU. (Note: This is allowed under 49 CFR Part 192.805.)
- The Liberty Keene facility supervisor completed the #3LU qualification (written and skill evaluation) on and. The five Keene technicians completed the #3LU qualification (written and skill evaluation) on October 26, 2017 and November 09, 2017.
- XNG technicians were scheduled for evaluation under covered task #3LU during the period from November 13, 2017 through November 17, 2017.

Liberty also identified Liberty I&R and Keene technicians working on the Keene CNG skid who will be required to be qualified to conduct existing leak survey covered tasks 18,19, and 20, existing pressure regulation tasks 59, 60, 62, 63, and 65 and AOC task 70. Liberty I&R technicians will also be required to be qualified under covered tasks 61, 64, 66 and 67. Liberty Keene technicians will also be required to be qualified under task #3LU. Liberty will also require XNG personnel to be qualified under tasks 59, 60, 61, 62, 63, 64, 65, 66 and 67. On November 27, 2017, Staff confirmed Liberty and XNG personnel qualifications in the Industrial Training Services (ITS) database which indicated training is still required for Liberty and XNG personnel to be fully qualified to perform the identified covered tasks.

Tables 4.1, 4.3, 4.4, 4.5, 4.10, 4.11, 4.12 and 4.15 summarize 14 recommendations:

I. Addition of a new natural gas supply source
Operator Qualifications and Training Review

4.1 - Liberty Keene O&M & OQ Plan Updates and Summary Submittal Date 11/12/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	O & M Updates-Hose Procedure	1	The hose connection procedure should be added or amended to Liberty's O&M Manual prior to CNG system operation.	BP 1534	Yes 12/5/2017
2	OQ Plan Updates	1	Liberty should amend its OQ plan adding #3LU to Appendix B of current plan and proposed Section 19 of to Appendix G prior to start of flowing gas (not during its normal annual review)	BP 1534	Yes 12/5/2017
3	OQ Plan Updates	1	Liberty should amend its OQ plan Appendix G Section 2. Currently it requires the recognition and reaction to abnormal operator conditions for CNG hose connection to be known by XNG prior to performance even if under the supervision of a qualified individual (Keene Tech) . This is inconsistent with Appendix E	BP 1534	Yes 12/5/2017
4	OQ Plan Updates	1	LU3 should say #3LU in the bulleted item.	BP 1534	Yes 12/5/2017
5	OQ Plan Updates	1	"XNG technicians took exams". This statement should be precise and modified to list which Covered Tasks are being referred to.	BP 1534	Yes 12/5/2017

4.3-CNG Awareness XNG Trailer Training Submittal Date 11/09/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	XNG CNG Awareness Training	10 and 16	Training PowerPoint Slide 10: stated PUC has authority to review and approve procedures. Stated local fire will perform response with XNG personnel oversight. - Slide 16: changed this to state evacuation of public 1 mile downwind from site (per ERG 115). This slide is for when there is a fire.	BP 1550 BP 1556	Yes 12/5/2017

4.4-Response to NH PUC Safety PP Questions Submittal Date 11/11/17					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1		1	Comments are listed in response	BP 1574	Yes 12/5/2017

4.5-Liberty Utilities I & R and Keene Technician Training Submittal Date 11/7/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	LU Keene	1	Keene employees to be initially trained and tested on covered tasks 59, add 60,62,63, 65 add #3LU	BP 1576	Yes 12/5/2017

4.10- Covered Tasks CNG Training Submittal Date 11/7/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	Legend	1	Personnel is misspelled as "Personal"	BP 1580	Yes 12/5/2017
2	Legend	1	Are only annual inspections conducted by Liberty I&R and XNG? Monthly equipment inspections will also be conducted by XNG and Liberty.	BP 1580	Yes 12/5/2017

4.11- Covered Task #3LU Submittal Date 11/7/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1		1	An additional AOC should be added in regard to recognizing and reacting to CNG tank pressures exceeding 4,250 psi.	BP 1581	Yes 12/5/2017

4.12- Abnormal Operating Conditions Submittal Date 11/11/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	19	10	An additional AOC should be added in regard to recognizing and reacting to CNG tank pressures exceeding 4,250 psi.	BP 1592	Yes 12/5/2017

4.15- ITS XNG OQ Task Report Submittal Date 11/07/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	NA	ITS	The ITS data base report indicates that some XNG personnel are not qualified under all CNG related covered tasks identified by Liberty.	BP 1596 to BP 1599	Yes 12/5/2017

4.18-ITS Liberty Utilities NH Qualified Task Report Submittal Date 11/08/2017					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	NA	ITS	The ITS data base report does not reflect Liberty qualification under covered task #3LU. The data base also indicates that some Liberty personnel are not qualified under all identified CNG related covered tasks.	BP 1603 to BP 1607	Yes 12/5/2017

Staff concluded that the proposed Liberty CNG system OQ training and evaluation appears to be generally in compliance with 49 CFR Part 192 Subpart N requirements. Staff recommends that the skill assessment for covered task #3LU include an evaluation of actions required for the CNG depressurization unit start up and shutdown as described in the XNG operating procedures. Staff also recommends that Liberty and XNG personnel obtain the qualifications to perform the identified covered tasks prior to CNG system operation.

Sectionalization of Portions of the Existing System and Gas Quality Measuring

Liberty's submission of plans touched briefly upon sectionalizing of the system. Sections 7.3 and 7.4 of the submittal discussed sectionalizing of the Monadnock Marketplace and Production Avenue and provided single page drawings of new valves installed mostly to be used in the conversion procedure of the Monadnock Marketplace.

Settlement Agreement Attachment J of DG 11-040 Item 2 Designation of Critical Valves for Gas Pipeline requires installation of:

A. Critical Valves at stations/plants,
B. Critical Valves at certain road crossings,
C. Critical Valves at designated water crossings,
D. Critical Valves at rail crossings,
E. Critical Valves for Sectionalizing, and
F. Maintenance of Critical Valves.

A. Critical Valves at stations/plants

Critical Valves at stations/plants shall be installed such that the first immediate outlet valve(s) of any Take (Gate) Station that is located outside the secured or fenced area shall be designated a Critical Valve. Critical Valves require annual maintenance and are to be relied on as always working in case of emergency use. Liberty has installed a valve (#132) outside the security fence line and it should be considered a Critical Valve.

B. Critical Valves at certain road crossings

Each side of a State or Federal designated highway shall have a designated Critical Valve. This would include all direct buried pipelines, directionally bored pipelines or any other similar method using a type of trenchless technology. The October 26, 2017 Proposed Sectionalizing Plan shows Valve 1 and Valve 2 both on the north side of Route 9. There is no critical valve shown on south side. The nearest valve is 2,030 feet to V132. The proposed sectionalizing plan shows Valve 9 and Valve 10 both on the east side of Route 12. There is no critical valve shown on the west side. The nearest valve is considerable distance to Valve 8 on Ashbrook Road. The Safety Division notes a conflict with Settlement Attachment J of DG 11-040 as Liberty sought to consolidate rates and operations in DG 17-048, ultimately approved by the Commission.

Route 101 in Phase 2, Route 12 in Phase 4, and Park Avenue in Phase 5 will all require future installations of Critical Valves. (See Appx 1-C.) Liberty provided no details of these.

C. Critical Valves at water crossings

Each side of a pipeline that crosses a public water body, including any pond, lake, tidal water, river, or stream designated in the Official List of Public Waters compiled and published by the New Hampshire Department of Environmental Services (DES), shall have a designated Critical Valve. In Phase1 (Production Avenue and Monadnock Marketplace) there are no river crossings. Staff notes Island Street over Ashuelot River in Phase 2 requires valves at each end of the bridge. Winchester Street over Ashuelot River in Phase 2, and the Ashuelot River in Phase 4 all require valves. Liberty provided no details regarding these future crossings and associated maintenance.

D. Critical Valves at rail crossings

There are no applicable rail crossings in Keene

E. Critical Valves for Sectionalizing

Liberty did not provide any sectionalizing plan beyond Phase 1 of Monadnock Marketplace.

Sections are required to be sized so that any isolation area will be designed to be interrupted for no greater than 12 hours. Total restoration, including relighting, is designed to be accomplished within the same 12 hours. All assumptions of mutual aid must be specified, and any other technical relighting resources relied upon to design the isolation area size shall be documented in the Sectionalizing Plan. Critical Valves shall be designed so as to limit isolation zones based on the smallest number of customers affected. Of towns with greater than 100 gas customers but less than 1,250 gas customers, no more than 25% of the customer base within the town borders can be interrupted at any one time.

F. Maintenance of Critical Valves

Each Critical Valve installed on a main shall be maintained to be readily accessible and identifiable in the field by tagging or other means to facilitate its operation in an emergency. Prompt (not to exceed 60 days) remedial action is required upon discovery of an inoperable Critical Valve to correct the valve, unless Liberty designates an alternative valve that can be documented as fully functioning and that meets applicable criteria. The Safety Division shall be notified in writing within 30 calendar days of the discovery of an inoperable Critical Valve, and the notice must include the location of the inoperable Critical Valve.

The Safety Division recommends the following 7 changes be made:

Liberty Keene Critical Valve Impact as contained in the Pressure Test Documentation and Conversion Procedure					
Safety Division Recommendation	**Section**	**Page No.**	**Safety Division Comments**	**Corresponding Bates Page Number 11/30/17**	**Liberty Notified**
1	7.2 Conversion Plan SOP	-	Oct 26 2017 Proposed Sectionalizing Plan shows 2 underground 6 inch valves that were proposed but are not installed. Drawing should be updated to reflect valves were not installed.	BP 1702	Yes 12/5/2017
2		-	Liberty should amend its Critical Valve List to include 8" Kerotest Poly Ball Valve Underground Valve #132 (shown on M3).	M3 Drawing	Yes 12/5/2017
3	2.2 Pressure Test Doc	-	Although inside the fence of Production Avenue, Valve List to include 6" Kerotest Carbon Steel Ball Valve Underground Valve #129 (shown on M3).	BP 1427 M3 Drawing	Yes 12/5/2017
4	7.2 Conversion Plan SOP	-	Oct 26 2017 Proposed Sectionalizing Plan shows V1 and V2 both on North Side of Route 9. There is no critical valve shown on South Side. Nearest valve is 2030 feet to V132. **Safety Division notes conflict with Settlement Attachment J of DG 11-040 when and if Liberty consolidate rates and operations.**	BP 1702	Yes 12/5/2017
5	7.3 Conversion Plan SOP	-	Oct 26 2017 Proposed Sectionalizing Plan shows V9 and V10 both on East Side of Route 12. There is no critical valve shown on West Side. Nearest Valve is considerable distance to V8 on Ashbrook Rd. **Safety Division notes conflict with Settlement Attachment J of DG 11-040 when and if Liberty consolidate rates and operations.**	BP 1703	Yes 12/5/2017
6	7.3 Conversion Plan SOP	-	Liberty did not provide any sectionalizing plan beyond Phase 1 of Monadnock Marketplace. Staff (see Appx 1-C) notes Island St over Ashuelot River in Phase 2, Winchester Street over Ashuelot River in Phase 2, Route 101 in Phase 2, Ashuelot River in Phase 4, Park Avenue Phase 5, Route 12 Phase 4, will require Critical Valves and associated maintenance. **Safety Division notes conflict with Settlement Attachment J of DG 11-040 when and if Liberty consolidate rates and operations.**	-	Yes 12/5/2017
7	7.3 Conversion Plan SOP	-	Liberty did not provide any sectionalizing plan describing how 25% criteria will be met for sectionalizing of town that has high pressure segments. This will be required in detailed analysis.	-	Yes 12/5/2017

Gas Quality Measuring

The existing distribution system has a single calorimeter used to measure the heat content of the propane/air mixture at the Emerald Street plant. As of Liberty's submittal date, there is not a single meter used at the outlet of propane/air production plant that measures the volume of flow for the entire system. The existing tariff stated that "*The standard heat content value for the propane-air gas sold will be 0.74 therms per hundred cubic feet and will apply to all bills rendered for the same meter reading month.*" This method of billing is not as

accurate as therm billing and while it was allowed for Liberty Keene division as a method, it is not employed elsewhere within Liberty's New Hampshire territories.

From the onset, the Safety Division has strongly recommended that when a second source of supply is introduced, with a completely different heat content, such as natural gas, then Liberty should measure the heat content at the CNG facility and the volume at the CNG station as well as the heat content at the existing propane/air facility and measure the volume at the production propane/air plant. The implementation of all 4 measuring devices will be required to yield the most accurate thermal billing for the combined Keene systems and to allow it to be configured similarly to other Liberty territories. Liberty has proposed only two of the four devices be installed (metering at the CNG facility and measuring heat content at the propane/air plant). The Safety Division recommends installing a turbine meter at the propane/air facility, even though it may be subject to potential freeze ups and accumulation of liquids. Proper maintenance and filtering should minimize any complications by including frequent checks that should be able to offset any risk in freezing up.

Liberty has proposed not using a chromatograph for measuring heat content at the CNG station. Instead the Company wants to rely solely on the trucking manifest that lists the measured Btu of the inventory within the CNG trailer. The Safety Division finds this initial solution (Phase 1) to be acceptable only on the condition that no two CNG trailers will ever flow into the system simultaneously and that the Btu content of the CNG trailer is instantly recorded upon transfer switchover. Language must be written into trailer procedures prohibiting the dispensing of fuel from more than one trailer at a time. As future phases of expansion occur, then Liberty needs to have an updated written procedure of how the Btu content will be determined. A chromatograph is an acceptable solution. This should be clearly outlined or referenced in Liberty's tariff.

Alteration of Pressure Configurations

Liberty's existing distribution systems, as stated in the Introduction, consist of 2 pressure distribution systems, a low pressure distribution system that operates at approximately 0.5 psig (13.8 in w.c. MAOP), and a smaller section that operates at 3 psig (5 psig MAOP). The new CNG distribution system will exit Production Avenue at 55 psig with a 60 psig MAOP. The new system is a standard pressure level consistent with most other Liberty distribution operating systems in other franchise territories. This pressure level should easily allow Liberty to attain new customers, install polyethylene gas piping, maintain consistency of construction standards, test procedures, construction equipment, standardized components, and provide consistent qualifications and trainings.

Unfortunately, the Keene system will need to maintain at least 3 pressure systems for the near future and Liberty has not provided any detail as to how long the existing systems will remain. Liberty has not provided any plans, cost estimates, locations, or drawings indicating where distribution system regulator vaults will be used.

Currently in Keene there are approximately 9 miles of cast iron mains. As long as there is cast iron, the maximum pressure must remain 0.5 psig; thus Liberty will not be able to significantly add capacity to the existing low pressure system. At approximately $1.75 million dollars per mile, the replacement will be approximately $15.75 million dollars to replace the cast iron mains and attached services. Liberty has not included those costs with any future conversion plan.

The Safety Division is concerned that as Liberty expands and collocates pipes of differing pressures and, more importantly, differing gas characteristics (propane/air and natural gas), that the risks and consequences for making an error and introducing one system to another will become larger. There are no other locations within New Hampshire that would have such a threat.

Phase 2 shows a threat of running parallel pipelines on Winchester Street,[14] Phase 3 shows such a threat on Marlboro Street; Phase 4 on Washington Street; and Phase 5 shows such a threat on Park Avenue. Liberty needs to provide a plan that addresses these increased threats associated with collocation of pipelines. Reference Appendix 1-C for a depiction of where the parallel mains may be located.

If, eventually, the low pressure cast iron system is not replaced and district regulator stations are used, the Safety Division predicts that the wetter cast iron pipes will be prone to increased leakage associated with the much drier natural gas being introduced. This will cause more leaks, more responses, increased call outs, and the potential for greater amounts being invoiced to Liberty by the Keene Fire Department.

Order No. 25,370 requires Liberty to sectionalize and install critical valves that shut off no more than one quarter of the City of Keene at any given time. Prior to the introduction of CNG, Liberty had only one critical valve but there will be more valves to operate and maintain with the introduction of CNG. See *Section II. Sectionalizing Portions of the Existing System* for further discussion.

[14] Liberty has subsequently filed in DG 18-092 a petition to cross the Ashuelot River near Winchester St with a directionally drilled pipeline.

Conversion of Existing Customers from Propane/Air to Natural Gas and Character of Service

Liberty provided conversion details for 14 customers in Phase 1 of the Monadnock Marketplace that require approximately 97 gas burning appliances to be converted. It is estimated that approximately 120 hours of work will be required and 2 gas fitting and plumbing contractors will be used. The conversion process is blended in with the purging plan because conversions will be done in 4 stages as natural gas is introduced into the former propane/air gas mains and services. Liberty has orally stated that many of the meter sets will be rebuilt at the same time. No cost estimate was provided to the Safety Division for this portion of project costs. Liberty estimates a cost of $87,000 for customer conversions alone. According to Liberty, customers would not be charged directly for conversions, consistent with Puc 503.04(b), however, Liberty has stated that these costs are eligible for recovery and may be shared by other Liberty customers if and when consolidation of rates are approved. Consolidated rates were approved in Docket No. DG 17-048. The potential recovery of the costs to convert the Keene system, including the conversion of customer appliances, was not examined in this review.

Price Chopper at Monadnock Marketplace

MZL at Monadnock Marketplace

Longhorn Steakhouse at Monadnock Marketplace

Bed Bath and Beyond at Monadnock Marketplace

The Phase 1 Monadnock Marketplace conversion equates to approximately $6,215 per customer if estimated costs are not exceeded. These are direct costs and do not include Liberty's loaded costs.

In Docket No. DG 17-048, Liberty stated in its response to Staff Supplemental Responses 2-41:
"The existing Keene customers will be converted over multiple years by geography and strategic valves to isolate these customers from the propane air system. It is expected to take between four and seven years to accomplish the conversion. Current estimates are conversion costs will be approximately $850 per customer, which equates to $1,062,500 (based on 1250 customers). These costs will be borne by all (existing and new) Keene Division customers over a number of years through the Keene Division COG."

Puc 503.04 Change in Character of Service.

The rule states:
(a) A utility shall provide certain services to its customers when service conditions such as change in pressure or composition of the gas affect or would affect efficiency of operation or adjustment of appliances.
(b) When any change occurs as described in (a) above, a utility shall, without undue delay and without charge, inspect the appliances of its customers and, if necessary, readjust those appliances for the new conditions.

The Safety Division believes that the conversion process that Liberty has discussed constitutes a change in character of service because the composition of the gas is affected and the change will affect both the efficiency and the operation of appliances, as well as the adjustment and replacement of certain gas burning appliances. Puc 503.04 states that customers are not to be charged. It does not explicitly address whether incurred costs can or cannot be spread to other customers. This issue should be addressed by the Gas Division and ultimately the Commission. The Safety Division bases its conclusion regarding the change in character of service on the following elements.

First, the Safety Division believes a Change in Character of Service applies when a standard gas burning appliance purchased at a retailer cannot be substituted or immediately inserted into the distribution system without modification. Thus a natural gas burning appliance will not perform burning pure propane or butane because the equipment is not calibrated, designed or installed for those gas compositions and vice versa. The conversion of CNG to natural gas is not a change in service because they are both natural gas in the vapor state. Similarly LNG to natural gas is not a change in service because it too, ends up as natural gas in the vapor state.

Another way to characterize a change in service is when the heat content and Btu content differ by approximately 10% of what was previously applied. The Safety Division uses 10% as an approximate threshold amount, as further supported below.

At one time the Keene system used butane/air, which was produced at 780 Btu per cubic foot, the substitution was propane/air at 740 Btu per cubic foot (a 5% differential). Liberty stated that pure butane itself was once

used in the Keene distribution system but the Safety Division questions the accuracy of that statement because butane liquefies at 32 degrees F and has a heat content of 3,200 Btus[15].

For example, where natural gas is typically supplied at a nominal value of 1,020 Btus, the natural gas is supplied ranges between 918 Btus and 1,122 Btus, this would be considered as a normal deviation and equivalent service. Outside this range, gas appliances will start exhibiting characteristics of improper combustion. Converting from 740 Btu propane/air to 1,000 Btu propane/air would constitute a change in character of service. This is supported by Section 6.3 of Liberty's Emergency Plan which outlines Abnormal Btu mixtures as being below 650 or above 850 at which point alarms are triggered and a Class 3 or Level 3 highest emergency response is required. These correspond to a -12%/+14% range which is slightly higher than the 10% proxy used by the Safety Division. Typically Liberty manages or controls its scada system with four trigger points The Hi Hi alarm is set to trigger at 755 Btus, a High alarm is set to trigger at 750 Btus, a Lo alarm set to trigger at 730 Btus and aLo Lo alarm at 725 Btus. This results in a range which is +/- 2%, a much tighter control so as to limit combustion problems at the appliance.

A third parameter to consider is the density change associated with gas properties going heavier than air to lighter than air. Density changes affect operations, such as venting of combustion products in a customer's home or business and construction hazards for gas employees during in-trench installation. This in turn requires changes in public messaging for customers and first responders. It would also require training adjustments for first responders and employees with regard to emergency response.

A fourth element to consider is the introduction of two different types of gas distribution systems co-existing on the same street in the same vicinity and whether that leads to additional risks that were not present with only one gas type.

Lastly, one more consideration affecting gas characteristics would be that the current propane/air gas is a wetter gas than natural gas, which is dryer. This will have an effect on the cast iron distribution system, as more leaks will develop as joints dry out.

[15] DG 17-068 Liberty testified that pure butane was once used in Keene in 1954 (page 8, sect 17 of revised testimony 4/27/17).

Expansion Plans

Liberty has not provided a detailed set of expansion plans or how the Keene system will be converted. It does not address the 7-day storage requirement of Puc 509.16, nor does it discuss installation of regulator vault types, locations that may be needed, or the low pressure cast iron constraints.

In its DG 17-048 redacted response to Staff inquiry 2-41, Liberty states that there are 5 phases of its Keene expansion plans. These are graphically depicted in Appendix 1-C. Liberty did not graphically depict the expansions alongside the existing low pressure distribution system. The Safety Division is still uncertain as to what Liberty's final plans are since the Production Avenue facility is considered "temporary." Liberty did indicate the following:

- Phase 1 will include customers along Production Avenue and on Ashbrook Road., served from the temporary CNG facility to be constructed in summer of 2017.[16] Adding a single customer would put the temporary facility at its maximum capacity. The remaining customers would be expected to be converted in summer of 2018.

- Phase 2 will be an extension of high pressure main from the existing "high line" and includes an extension on Winchester Street south of Route 101. Phase 2 is expected to commence in spring of 2019. Unloaded costs are approximately $1.3 million including mains and services for this phase.

- Phase 3 would continue across Main Street and down Marlboro Street as well as Optical Avenue to serve new customers. This phase is expected in spring of 2020. Unloaded costs are approximately $1.3 million including mains and services for this phase.

- Phase 4 would begin an extension north along Route 9. This phase is also expected to begin in spring of 2020. Unloaded costs are approximately $1.1 million, including mains and services for this phase.

- Phase 5 extends further north and is expected to begin in spring of 2021. Unloaded costs are approximately $1.1 million including mains and services for this phase.

Liberty states *"The final business plan will be completed once the Commission approves EnergyNorth's request to set the Keene Division's distribution rates at the level of EnergyNorth's distribution rates. That business plan will include information such as, but not limited to, the marketing plan, operations, how the sales force will be utilized (i.e., personnel in the Keene Division, personnel in the central office or a combination of the two). Since EnergyNorth's growth plans are contingent on approval of its proposal regarding the Keene Division's distribution rates, it would not be productive to establish a detailed business plan prior to receiving such approval."*

Each of Liberty's brief Phase descriptions discusses the installation of new mains but does not detail how conversion of existing customers will be completed, where new odorization points will be located, possible installation of regulator stations, whether uprating is appropriate, what conditions determine when pipeline replacement is necessary, and other missing parameters.

[16] Now it is expected to be completed in late summer/fall 2018.

APPENDICES

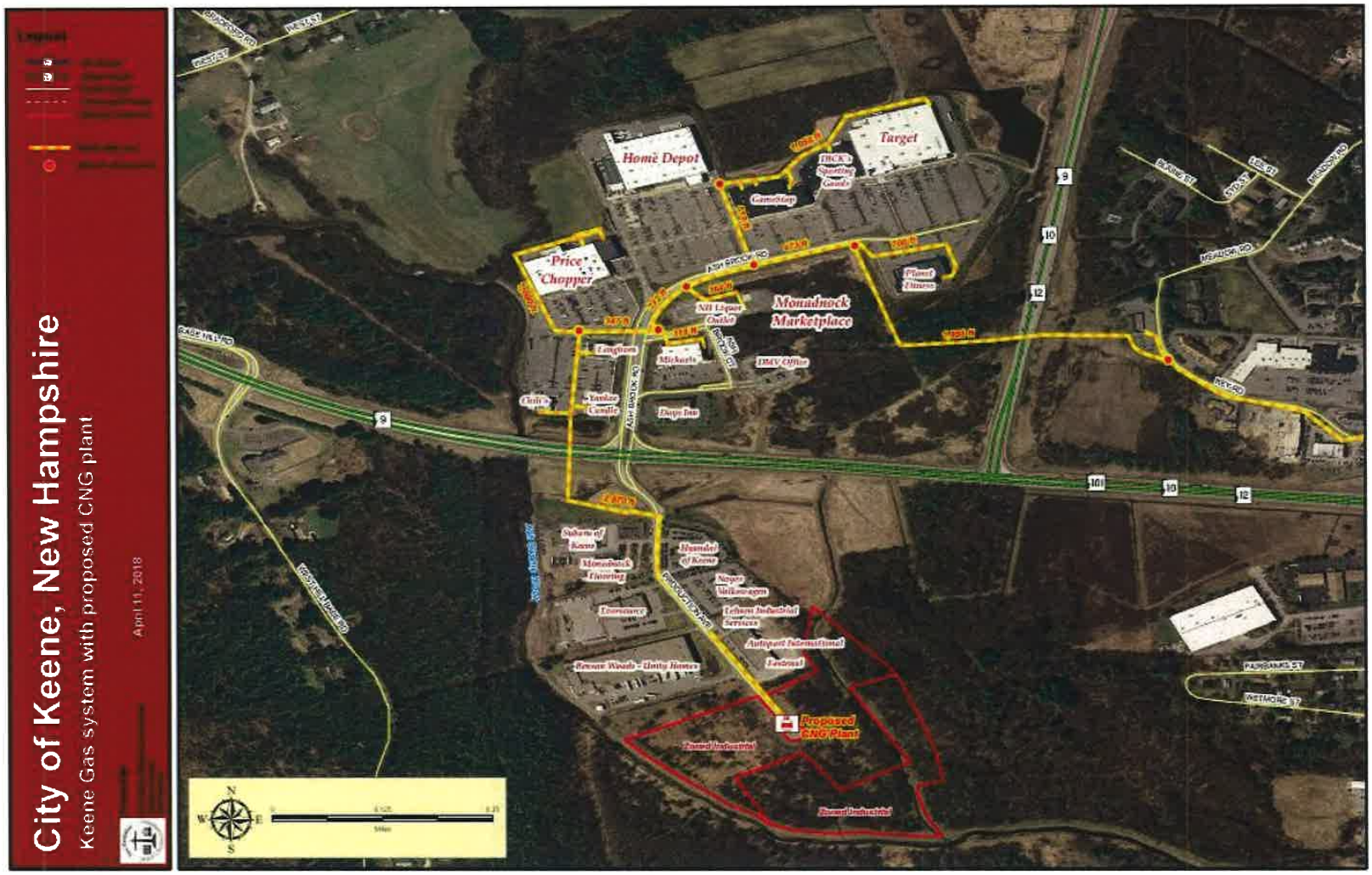
Appendices

Appendix 1

1-A. System Map of Liberty's Existing Keene Distribution Systems

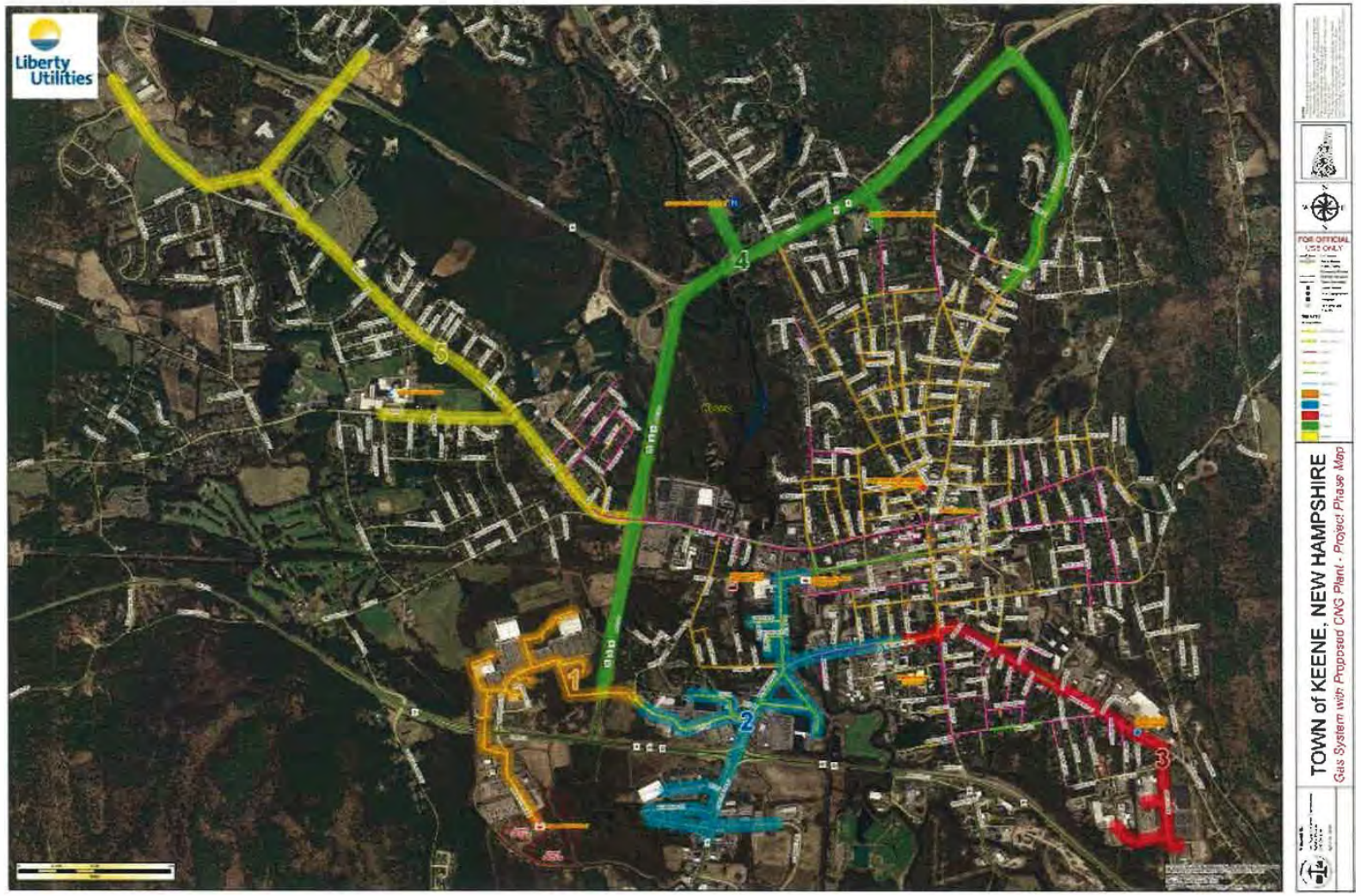
Appendix 1
1-B. Close Up of Liberty's CNG Installation Phase 1

1-B. Close-Up of Liberty's CNG Installation Phase 1.



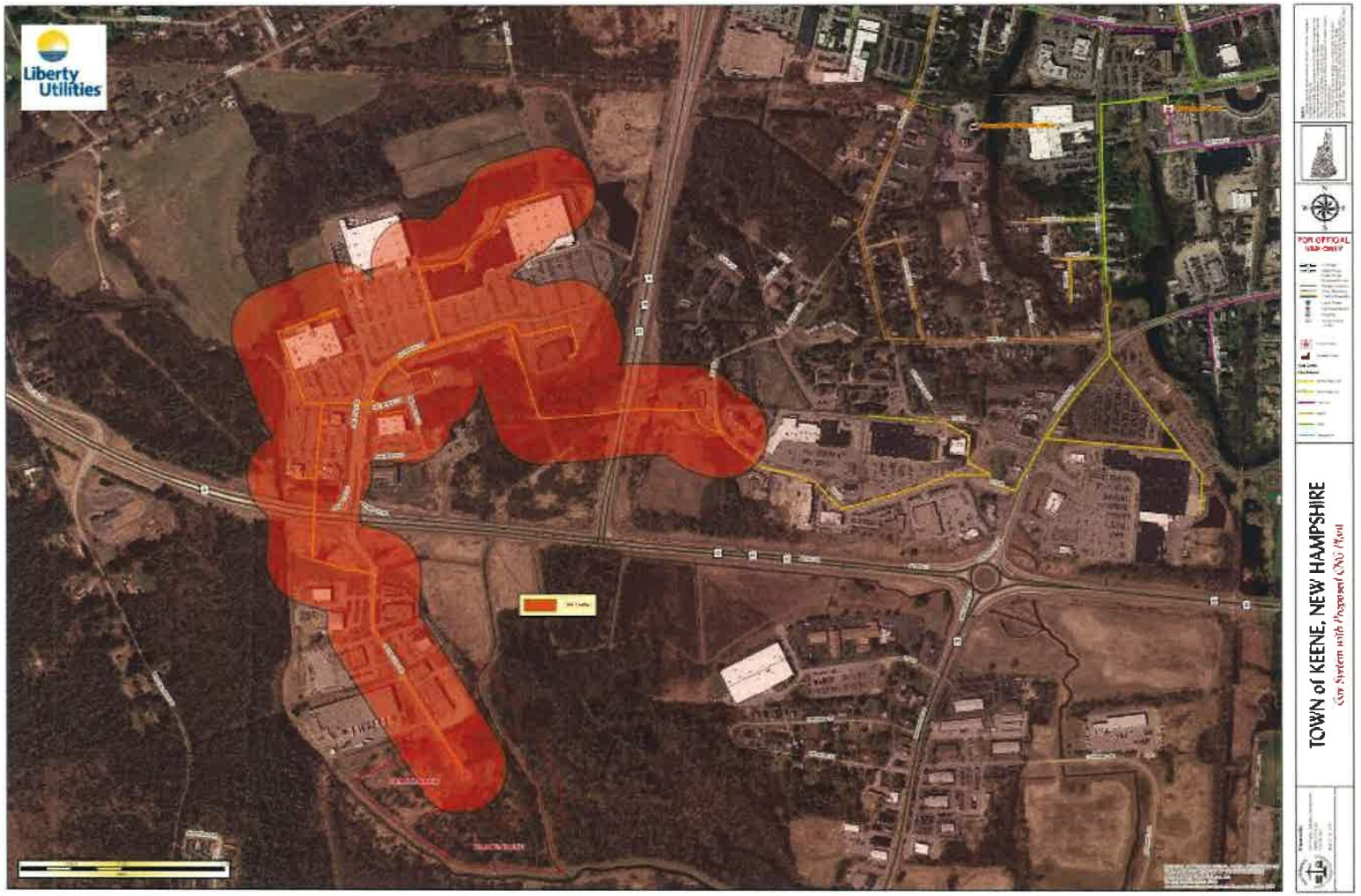
Appendix 1
1-C. Liberty's Phase 1 through Phase 5 of CNG supplied natural gas Keene Expansion

1-C. Liberty's Phase 1 through Phase 5 of CNG Keene Expansion.



Appendix 1
1-D. 300 foot Buffer zone applied to pipeline on Production Avenue and Ashbrook Rd Resulting in a Class 3 Location

1-D. 300-foot Buffer Zone applied to the pipeline on Production Avenue and Ashbrook Road Resulting in a Class 3 Location.



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

December 29, 2017

Craig Jennings
Vice President of Operations and Engineering
Liberty Utilities
15 Buttrick Rd
Londonderry, NH 03053

RE: Liberty Utilities, Keene Division
Notice of Probable Violations of Natural Gas Pipeline Safety Act and NH Code of Administrative Rules Part 500
Control # PS1710LU
Pipeline Affected: CNG, Keene.

Dear Mr. Jennings:

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 (together, the gas pipeline safety laws), the Commission hereby serves upon EnergyNorth Natural Gas d/b/a Liberty Utilities (Liberty) this Notice of Probable Violation pursuant to Puc 511.05 with respect to the installation and construction procedures, performance and documentation for the Production Avenue CNG installation, Keene conversion project in the Keene Division New Hampshire. This does not include the three other divisions within Liberty.

This notice arises from a Commission ordered review by the Safety Division of the documentation and procedures related to pressure testing conducted October 19 and October 20, 2017. The Safety Division also notes on October 17 and October 18, 2017 an oral warning for this project was previously required when the Safety Division Director had to intercede and recommend changes for the piping proposed at and within the decompression skid as submitted by Liberty. Liberty's proposed installation would not have met design, class location and pressure testing requirements potentially not complying with 192.7, 192.5 (b) (3) (ii), 192.105, 192.619, 192.503 (b), 192.503(c) and others regulations. Liberty did make recommended changes to wall thickness of piping and associated design factors and initiated pressure testing. Ultimately, the pressure testing was performed in accordance with 192.503, 192.505, 192.507, 192.509 and 192.517 but Liberty did not follow the adopted written pressure testing procedure for a number of steps in accordance with 192.13 (c).

This notice includes the following single probable pipeline safety code violation.

Notice of Probable Violation
Control # PS1710LU
December 29, 2017

Probable Violation No.1 **Part 192.13 What general requirements apply to pipelines regulated under this part?**
Part 192.13 (c)
(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 Liberty violated 192.13(c). Subpart J Test Requirements contains established provisions of Part 192 that must be met regarding pressure testing. The Safety Division asserts Liberty was required to follow the customized pressure testing procedure for the newly installed CNG decompression skid. Liberty established but did not follow its customized pressure testing requirements for the CNG tubing located in the decompression skid.

Liberty created a specific SOP for the decompression skid located on Production Avenue that directed Liberty personnel to document several steps that were required for the pressure test. The Safety Division believes that neither Liberty nor the contractor documented all the specific steps within the procedures used during the pressure testing activity. This error then resulted in incomplete documentation and records.

Liberty created a specific SOP for pressure testing sections within the decompression skid. Reference *Liberty Utilities CNG Decompression Project 2017 CNG Test Procedure* developed by APEX Engineering 10-23-17 Revision 3. This pressure test procedure was composed of three testing sequences, TS-30 High Pressure hydraulic test to 6,375 psig for 8 hours, TS-31 Medium Pressure pneumatic test to 2100 psig for 1 hour with a leak test TS-35 and FB-30 Low Pressure pneumatic test to 158 psig for 1 hour.

Within *Liberty Utilities CNG Decompression Project 2017 CNG Test Procedure* are 2 procedures PT-101 Hydraulic Test Procedure and PT-100 Pneumatic Test Procedure.

Procedural Steps not followed or documented for the CNG Test Procedure (General):

7.1 Liberty Utilities –Daily Log was not created or missing documentation. The Safety Division requested all documentation and no daily log sheet was provided.

12.2.1 The pressure recorders and the deadweight tester shall be at the test point end of the section. Liberty did not use a deadweight tester.

12.2.3 A pen temperature recorder shall measure the pipe temperature and another the ambient air temperature. (Liberty only included one temperature recorder).

The documentation of the procedure was October 23, 2017 (revision 3) while the pressure tests were performed on October 19 and 20, 2017. This indicates that pressure tests were performed without finalized procedures. Liberty did not establish the finalized procedure before the test was performed.

In addition the Signature Page for Liberty Utilities APEX Engineering and Express Natural Gas was not completed prior to the test with Names, Signatures and Dates.

Procedural Steps not followed or documented for PT-101 include:

8.1.4 Blind Check List was not created or missing documentation. The Safety Division requested all documentation and no check list was provided.

8.1.7 Thickness of all Test Blinds and locations will be recorded. Thicknesses were not shown.

8.1.8 Identification of location for connection of fill and drainage points not shown. (Liberty failed to identify locations in TS-30)

8.1.13 Location of pressure gauges to be used was not shown at all locations. Liberty did not show on TS-30 the location of pressure gauges or charts.

8.1.14 Temperatures to be recorded for pipe temperature, ambient temperature and ground temperature. (Liberty only recorded ambient temperature.)

8.1.6 Equipment and instrument certifications and calibrations. Liberty did not provide any documentation showing pressure recording chart calibration.

Procedural Steps not followed or documented for PT-100 include:

15.1.4 Blind Check List was not created or missing documentation. The Safety Division requested all documentation and no check list was provided.

15.1.7 Thickness of all Test Blinds and locations will be recorded. Thickness were not shown.

15.1.8 Identification of location for connection of fill and drainage points not shown. (Liberty failed to identify locations in TS-31)

15.1.13 Location of pressure gauges to be used was not shown at all locations. Liberty did not show all locations on TS-31 of pressure gauges or charts.

15.1.14 Temperatures to be recorded for pipe temperature, ambient temperature and ground temperature. (Liberty only recorded ambient temperature.)

15.1.6 Equipment and instrument certications and calibrations. Liberty did not provide any documentation showing pressure recording chart calibration.

The Safety Division alleges that Liberty did not comply with all the requirements of its own SOP created for these procedures and thus did not comply with Part 192.13 (c).

Civil Penalties

RSA 374:7-a I and II sets the maximum civil penalty that is permissible to match those found in 49 U.S.C. section 60122(a) which is currently limited to a maximum of $200,000 per violation per day, up to a maximum of $2,000,000 for a related series of violations.

RSA 374:7-a, III and Puc 511.05(c)(5) require the Commission's Safety Division to set forth the factors relied upon by the Safety Division in making its determination of civil penalties. The factors are essentially identical to the factors that the federal Office of Pipeline Safety has long relied upon in assessing similar penalties under the Natural Gas Pipeline Safety Act. *See* 49 CFR 190.225. The Safety Division considered the severity of not appropriately following the most minimal of federal safety regulations, Liberty's inability to properly follow its own written procedures and maintaining documentation of the steps being completed per the applicable

procedures. Liberty was unfamiliar with referenced ASME regulations and often discussed and referred to the procedures as if they were not their own. The Safety Division also considered the prior history of offenses noting that the inability of contractors and company personnel to follow company procedures has been cited numerous times in the past, the nature and circumstances of the above probable violations, as well as the effect the associated imposition of civil penalties will have on Liberty's ability to continue operations.

In light of these factors, the Commission Staff imposes civil penalties as follows:

Probable Violation No. 1 **$20,000**
(Non-compliance with 49 CFR 192.13 (c) General Provisions of Part 192)

TOTAL CIVIL PENALTIES **$20,000**

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 anticipated[1];

(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. Liberty may execute the Consent Agreement and remit a check or money order payable to the State of New Hampshire, in the amount of $20,000. Responses and payments relevant to this notice should reference "PS1710LU CNG Pressure Test" and be directed to the Safety Division Director at the Public Utilities Commission.

[1] *This option often does not apply to violations that are written after the violation has occurred. It usually applies only to forward looking violations.*

Notice of Probable Violation
Control # PS1710LU
December 29, 2017

Alternately, Liberty may file with the Executive Director a request for an informal conference before the Commission 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: Leo Cody, Liberty, Compliance & Quality Assurance & Emergency Management Manager

enclosure:

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

NOPV CONSENT AGREEMENT

WHEREAS, the New Hampshire Public Utilities Commission (Commission) received evidence that Liberty Utilities (Respondent) committed possible violations of the National Gas Pipeline Safety Act. 49 U.S.C. §60101 *et seq.*. New Hampshire state law and/or Puc 500 (the gas pipeline safety laws):

WHEREAS, after investigation, the Commission then issued a Notice of Probable Violation (NOPV) pursuant to Puc 511.05 on December 29, 2017 against Respondent alleging that compliance violations were discovered after reviewing documentation, procedures and records associated with recordkeeping and the inability to properly follow procedures for pressure tests conducted on CNG decompression skid at Production Avenue, Keene, and that Respondent violated the gas pipeline safety laws; and

WHEREAS, the Respondent was afforded the opportunity pursuant to Puc 511.06 to, as applicable, refute the probable violation referenced in the NOPV, to submit a plan of action outlining action the Respondent will take to correct the violation, to execute a consent agreement to resolve the probable violation and remit any civil penalty, or request an informal conference to examine the basis of the probable violation.

NOW, THEREFORE, the Commission and the Respondent hereby agree as follows:

1. Liberty Utilities violated the gas pipeline safety laws as described in NOPV PS1710LU.

2. A civil penalty of $20.000 is imposed on the Respondent for the above violation[s], which civil penalty shall be received by the commission on or before January 29, 2018.

3. The Commission shall pursue no further action against the Respondent arising out of the facts alleged in the NOPV except as provided in paragraph 6 and in order to enforce this Agreement.

4. This Agreement shall not release the Respondent from any claims of liability made by other parties under applicable law.

5. This Agreement shall not constitute a waiver of the Respondent's right to pursue any other party or person for any claims based on facts alleged in the NOPV.

6. This Agreement shall be considered by the Commission in assessing any civil penalties for future violations, if any, of the gas pipeline safety laws.

7. This Agreement shall be construed in accordance with the laws of the State of New Hampshire and the Rules of the New Hampshire Public Utilities Commission.

Dated: December 29, 2017 By: Randell S. Knepper
For the New Hampshire Public Utilities Commission

Dated: January 16, 2018 By:
For the Respondent

REDACTED (SUPPLEMENTAL)

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities

DG 17-048
Distribution Service Rate Case

Staff Data Requests - Set 2

Date Request Received: 6/16/17
Request No. Staff 2-41

Date of Response: 10/31/17
Respondent: William Clark

REQUEST:

Please provide a comprehensive business plan for the Keene Division that includes a Discounted Cash Flow analysis based on stand-alone operating, supply and capital costs and revenue estimates. The business plan should include a detailed description of plans and costs to convert Keene customers from propane air service to natural gas service and expected sales and revenue growth. Provide an electronic version of the DCF analysis and supporting schedules with all spreadsheets in "live format."

RESPONSE:

Please refer to Confidential Attachment Staff 2-41.xlsx for a DCF analysis of the five-year growth projections of the Keene Division if fuel supply switched to natural gas and EnergyNorth distribution rates. (Temp Rates effective July 1, 2017).

Phase 1 will include customers along Production Ave and [redacted]. [redacted] on Production Ave., has already committed to taking service and is expected to be served from the temporary CNG facility to be constructed in summer of 2017. Adding this customer would put the temporary facility at its maximum capacity. The remaining customers would be expected to be converted in summer of 2018.

Phase 2 will be an extension of high pressure main from the existing "high line" to serve [redacted] This Phase also includes an extension on Winchester Street south of Route 101. Phase 2 is expected to commence in spring of 2019.

Phase 3 would continue across Main Street and down Marlboro Street as well as Optical Avenue to serve customers such as [redacted], and [redacted]. This phase is expected to begin in spring of 2020.

Phase 4 would begin an extension north along Route 9 with [redacted] This phase is also expected to begin in spring of 2020.

Phase 5 extends further north and is expected to begin in spring of 2021.

Docket No. DG 17-048 Request No. Staff 2-41 (Supplemental) REDACTED

The existing Keene customers will be converted over multiple years by geography and strategic valves to isolate these customers from the propane air system. It is expected to take between four and seven years to accomplish the conversion. Current estimates are conversion costs will be approximately $850 per customer, which equates to $1,062,500 (based on 1250 customers). These costs will be borne by all (existing and new) Keene Division customers over a number of years through the Keene Division COG.

The identities of potential customers for each phase of the Company's planned expansion in Keene is confidential customer information, and confidential business information. Therefore, pursuant to RSA 91-A:5, IV, and Puc 203.08(d), the Company has a good faith basis to seek confidential treatment of this information, and will submit a motion seeking confidential treatment prior to the final hearing in this docket.

SUPPLEMENTAL RESPONSE:

Please refer to Confidential Attachment Staff 2-41.1.xlsx for an updated DCF analysis. This updated analysis includes four additional units in Phase 1. These units are under construction at the [redacted] and have committed to take service. Phase 2 and Phase 3 remain unchanged. Phase 4 has been updated to include an extension, which will serve [redacted]. This extension will also allow for the northern section of low pressure piping to be connected to the new high pressure pipe via a regulator station. Phase 5 now includes the residential homes along the distribution route. This addition assumes a 60% saturation rate and includes the cost of service lines as well as the associated distribution revenues.

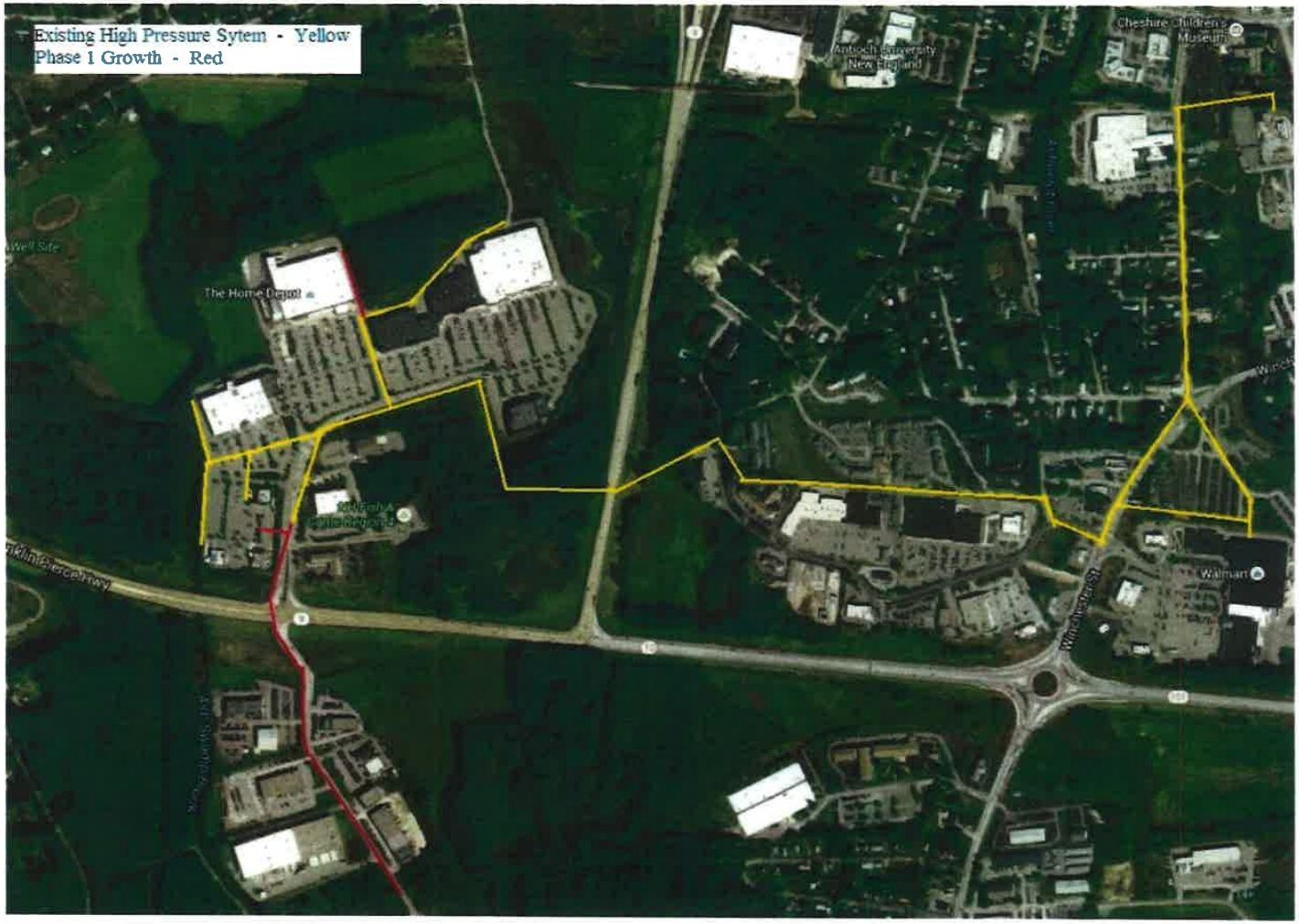
The estimated revenue used in this analysis is premised on EnergyNorth's currently effective rates (temporary rates that became effective on July 1, 2017). Therefore, the actual revenue level will be higher beginning in the second year, since the rate case will be completed and permanent rates will be in effect. While [redacted] very recently decided to utilize bottled propane for the 2017 – 2018 heating season, they have expressed a desire to convert to natural gas in the summer of 2018. Therefore, revenue from that customer is included for the Year 1 revenue of Phase 1.

Also attached are maps of the five phases as well as the construction estimates for Phases 2-5. See Attachment Staff 2-41.2. Phase 1 construction is close to completion and includes all actuals with assumptions for the few remaining services. In addition, the updated spreadsheet tracks the Keene Division's LDAC payments at an assumed $.045 per therm rate. See Attachment Staff 2-41.3.xlsx for an updated GPM spreadsheet with EnergyNorth temporary rates.

The final business plan will be completed once the Commission approves EnergyNorth's request to set the Keene Division's distribution rates at the level of EnergyNorth's distribution rates. That business plan will include information such as, but not limited to, the marketing plan, operations, how the sales force will be utilized (i.e., personnel in the Keene Division, personnel in the central office or a combination of the two). Since EnergyNorth's growth plans are contingent on approval of its proposal regarding the Keene Division's distribution rates, it would not be productive to establish a detailed business plan prior to receiving such approval.

Docket No. DG 17-048 Request No. Staff 2-41 (Supplemental)

The shaded (or redacted) information above and within Confidential Attachment Staff 2-41.1.xlsx is the identity and estimated usage of potential customers, which constitutes confidential customer and commercial information exempt from disclosure under RSA 91-A:5, IV, and RSA 363:37 and :38. Therefore, pursuant to Puc 203.08(d), the Company has a good faith basis to seek confidential treatment of this information and will submit a motion seeking confidential treatment prior to the final hearing in this docket.


Existing High Pressure Sytem - Yellow
Phase 1 Growth - Red
Cheshire Children's Museum
Antioch University New England
The Home Depot
Walmart

Liberty Utilities Sales Estimating Tool
(2" - 6" Plastic)

ENGINEERING REVIEW REQUIRED

CLEAR ALL

Calendar Year	2018
Address	
Town	MANCHESTER
State Road	○ YES ◉ NO

Proposed New Main Segments on Project

	1	2	3
*Proposed Size	6" 1001' - 2000'	4" 1001' - 2000'	2" 1001' - 2000'
Existing Conditions	In Pavement - Municipal	In Pavement - Municipal	Off Pavement - Municipal
Proposed Material	Plastic	Plastic	Plastic
Proposed Footage	2,190	4,805	2,450

* For multiple sizes use total length of project (i.e. if you need 750' total: 500' of 2" and 250' of 4", use 2" 501' - 1000' & 4" 501' - 1000')

Main Install Direct Cost	$1,002,853.29

Proposed # of New Services w/ Main on Project

	1	2	3
Service Size	2"	< 2"	< 2"
Existing Conditions	Off Pavement - Municipal	In Pavement - Municipal	Off Pavement - Municipal
Service Material	Plastic	Plastic	Plastic
# of Services	12	9	9
Extra Footage > 100'			

Service Install Direct Cost	$84,542.10

Proposed # of Main Connections on Project

	1	2	3
**Connection Size/Type	6 inch - PL to PL/CI	4 inch - PL to PL/CI	2 inch - PL to PL/CI
# of Main Connections	1	1	1

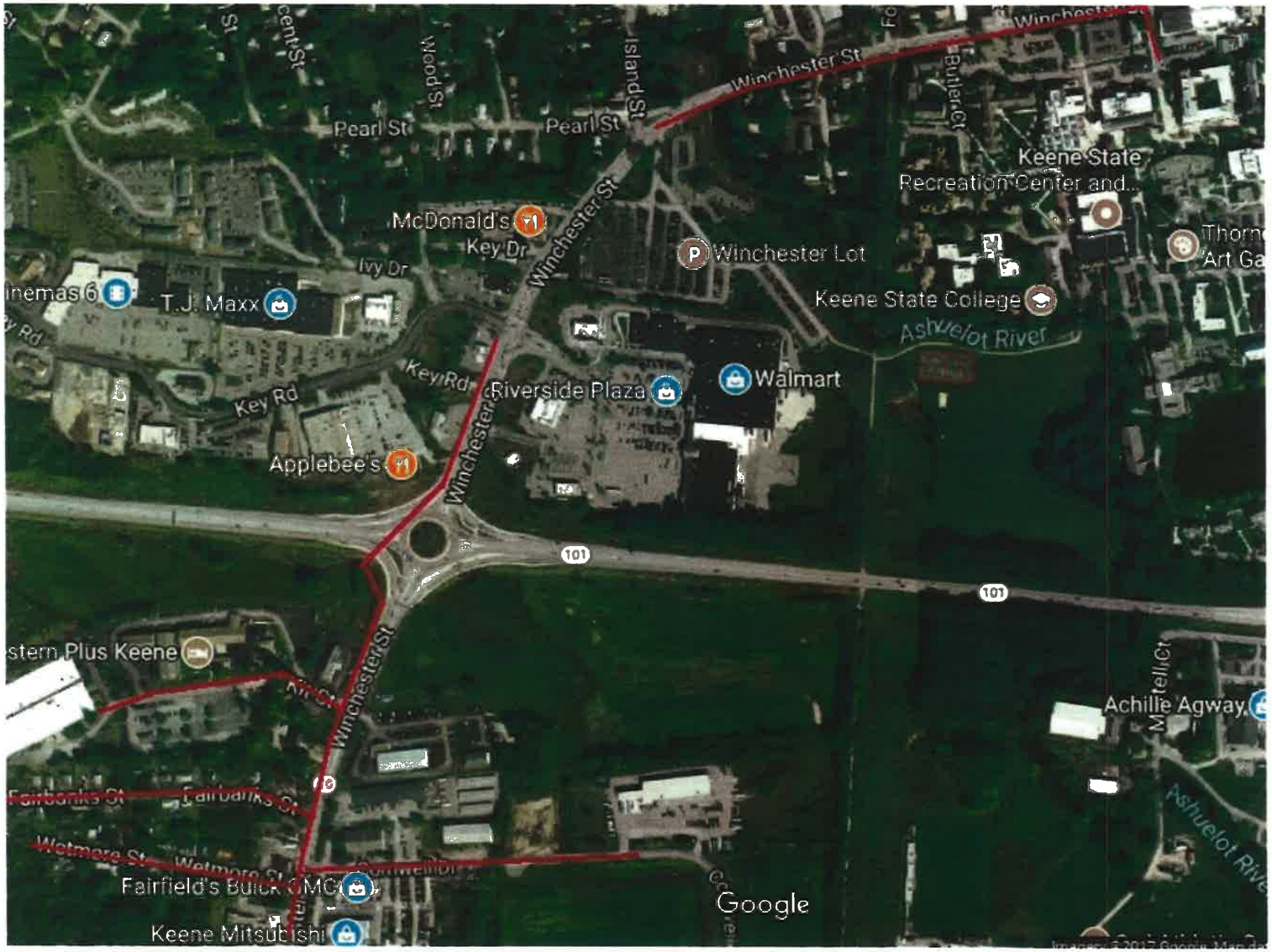
**Use connection size of new main to be installed

Main Connection Direct Cost	$8,897.10
HDD	$75,000.00
Unit Cost ($/ft) - Direct	$134.46
Estimate - Direct	$1,269,958.81
# of Residential Meters	
Residential GPM	
Commercial GPM	
CIAC	$1,269,958.81

Comments

*15% Contingency Built In

Ver. 8 - Liberty Utilities - Effective 2/19/2016


Pearl St
Pearl St
Island St
Winchester St
Butler Ct
Keene State
Recreation Center and...
McDonald's
Key Dr
Winchester Lot
Ivy Dr
T.J. Maxx
Keene State College
Ashuelot River
Key Rd
Riverside Plaza
Walmart
Applebee's
Winchester St
101
Winchester St
Achille Agway
Fairbanks St
Google
Keene Mitsubishi

Liberty Utilities Sales Estimating Tool
(2" - 6" Plastic)

ENGINEER NG REVIEW REQUIRED

Calendar	2019
Address	
Town	MANCHESTER
State Road	○ YES ◉ NO

	1	2	3
***Proposed Size**	6" 1001' - 2000'	4" 1001' - 2000'	2" 1001' - 2000'
Existing Conditions	In Pavement - Municipal	In Pavement - Municipal	Off Pavement - Municipal
Proposed Material	Plastic	Plastic	Plastic
Proposed Footage	7,075		

* For multiple sizes use you use

Main Install Direct **$977**

	1	2	3
Service	2	< 2"	< 2"
Existing Conditions	In Pavement - Private	In Pavement - Municipal	Off Pavement - Municipal
Service Material	Plastic	Plastic	Plastic
# of Services	5		
Extra Footage > 100'	2,000		

Service Install Direct Cost **$125,059.55**

	1	2	3
****Connection**	6 inch - PL to PL/CI	4 inch - PL to PL/CI	2 inch - PL to PL/CI
# of Main	1	1	1
		new	

Main Connection Direct **10**

HDD **$50,000.00**

Unit Cost ($/ft) - $183.03

Estimate - Direct **$1,294,905.62**
# of Residential Meters
Residential GPM
Commercial GPM
CIAC **$1,294,905.62**

Comments

'15% Contingency Built In
/er 8 - Liberty Utilities - Effective 2/19/2016


Winchester St
Marlboro St
Main St
101
101
Ashuelot River
Google

Liberty Utilities Sales Estimating Tool

(2" - 6" Plastic)

ENGINEERING REVIEW REQUIRED

CLEAR ALL

Calendar Year	2019
Address	
Town	MANCHESTER
State Road	○ YES ◉ NO

Proposed New Main Segments on Project

	1	2	3
*Proposed Size	6" 1001' - 2000'	4" 1001' - 2000'	2" 1001' - 2000'
Existing Conditions	Off Pavement - Municipal	In Pavement - Municipal	Off Pavement - Municipal
Proposed Material	Plastic	Plastic	Plastic
Proposed Footage	15,629		

* For multiple sizes use total length of project (i.e. if you need 750' total: 500' of 2" and 250' of 4", use 2" 501' - 1000' & 4" 501' - 1000')

Main Install Direct Cost	$834,644.47

Proposed # of New Services w/ Main on Project

	1	2	3
Service Size	2"	< 2"	< 2"
Existing Conditions	In Pavement - Private	In Pavement - Municipal	Off Pavement - Municipal
Service Material	Plastic	Plastic	Plastic
# of Services	4		
Extra Footage > 100'	2,500		

Service Install Direct Cost	$147,540.64

Proposed # of Main Connections on Project

	1	2	3
**Connection Size/Type	6 inch - PL to PL/CI	4 inch - PL to PL/CI	2 inch - PL to PL/CI
# of Main Connections	1	1	1

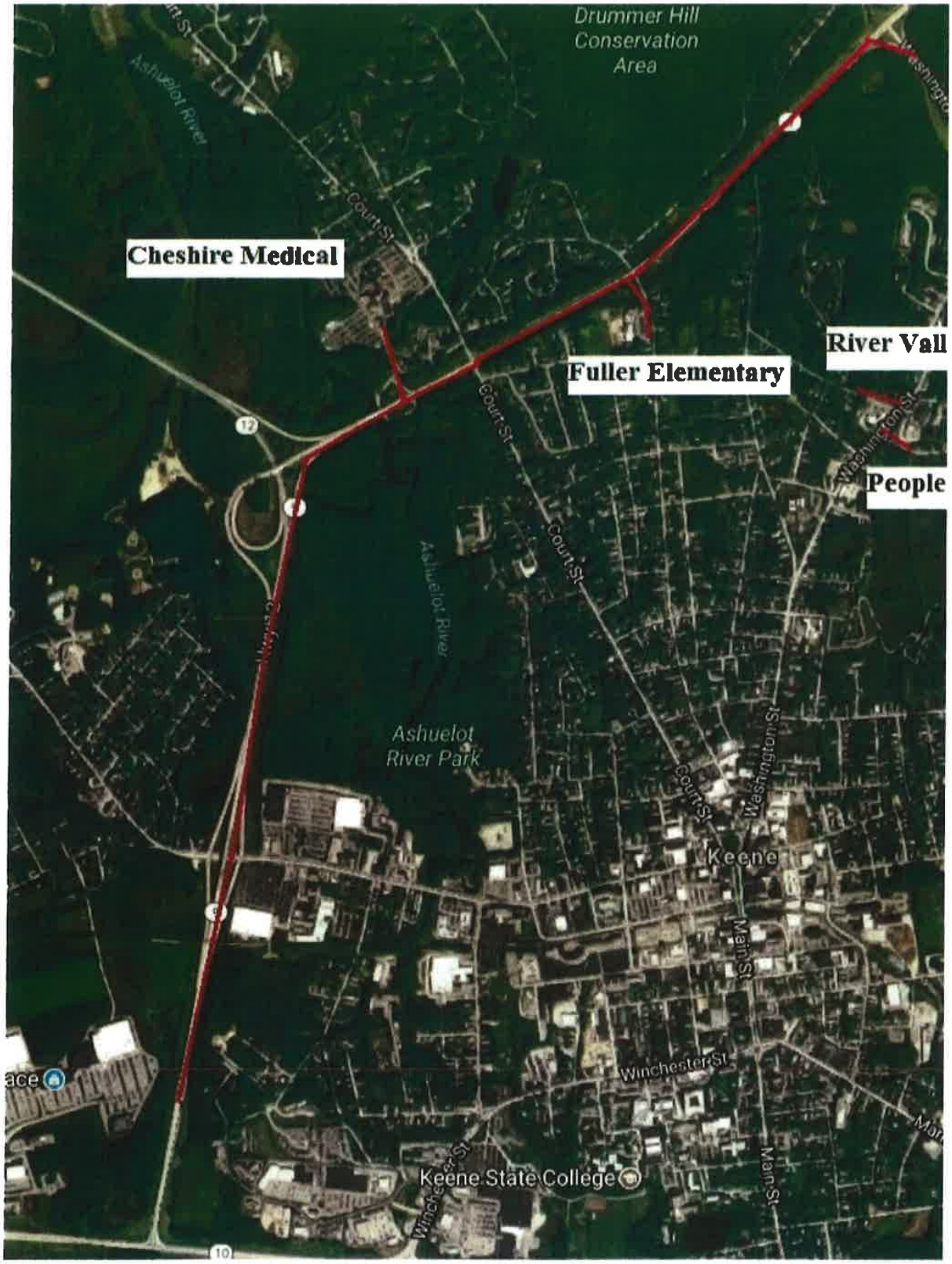
**Use connection size of new main to be installed

Main Connection Direct Cost	$8,897.10
HDD	$50,000.00
Unit Cost ($/ft) - Direct	$74.22
Estimate - Direct	$1,160,012.08
# of Residential Meters	
Residential GPM	
Commercial GPM	
CIAC	$1,160,012.08

Comments	

*15% Contingency Built In

Ver. 8 - Liberty Utilities - Effective 2/19/2016


Drummer Hill
Conservation
Area
Ashuelot River
Court St
Cheshire Medical
Fuller Elementary
River Vall
Washington St
People
12
Ashuelot River
Ashuelot
River Park
Court St
Washington St
Keene
Main St
Winchester St
Keene State College
10

Liberty Utilities Sales Estimating Tool

(2" - 6" Plastic)

ENGINEERING REVIEW REQUIRED

CLEAR ALL

Calendar Year	2019
Address	
Town	MANCHESTER
State Road	○ YES ◉ NO

Proposed New Main Segments on Project

	1	2	3
*Proposed Size	4" 1001' - 2000'	4" 1001' - 2000'	2" 1001' - 2000'
Existing Conditions	Off Pavement - Municipal	In Pavement - Municipal	Off Pavement - Municipal
Proposed Material	Plastic	Plastic	Plastic
Proposed Footage	17,225		

* For multiple sizes use total length of project (i.e. if you need 750' total: 500' of 2" and 250' of 4", use 2" 501' - 1000' & 4" 501' - 1000')

Main Install Direct Cost	$748,724.33

Proposed # of New Services w/ Main on Project

	1	2	3
Service Size	2"	< 2"	< 2"
Existing Conditions	In Pavement - Private	Off Pavement - Municipal	Off Pavement - Municipal
Service Material	Plastic	Plastic	Plastic
# of Services	5	53	
Extra Footage > 100'	500		

Service Install Direct Cost	$149,952.03

Proposed # of Main Connections on Project

	1	2	3
**Connection Size/Type	6 inch - PL to PL/CI	4 inch - PL to PL/CI	2 inch - PL to PL/CI
# of Main Connections	4		

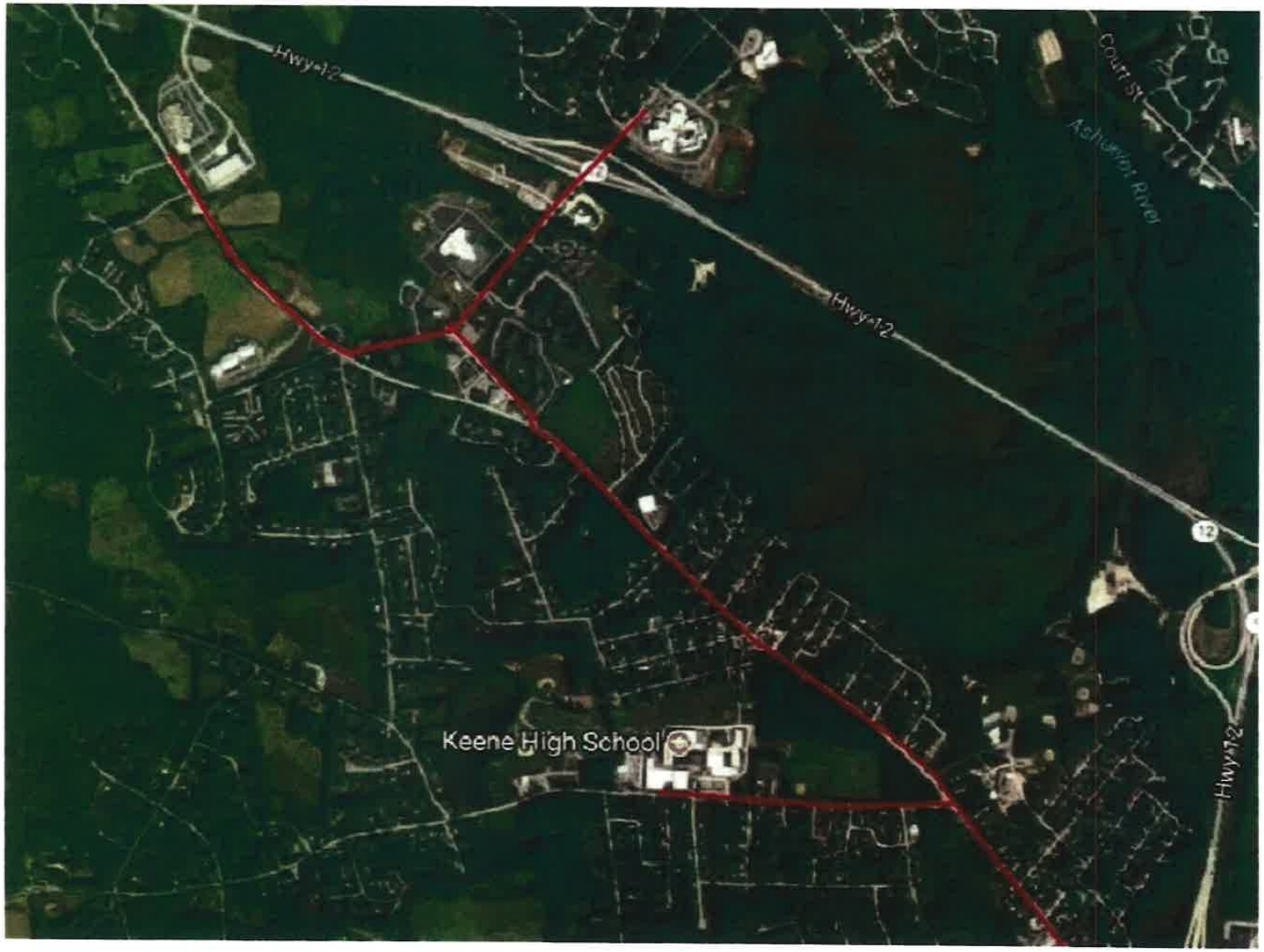
**Use connection size of new main to be installed

Main Connection Direct Cost	$14,099.56
HDD	$75,000.00
Unit Cost ($/ft) - Direct	$63.70
Estimate - Direct	$1,097,309.03
# of Residential Meters	
Residential GPM	
Commercial GPM	
CIAC	$1,097,309.03

Comments

*15% Contingency Built In

Ver. 8 - Liberty Utilities - Effective 2/19/2016


Hwy-12
Court St
Ashuelot River
Hwy-12
Keene High School
12
Hwy-12

CNG SERVICE TERM SHEET

Buyer	Liberty Utilities (EnergyNorth Natural Gas) Corp.
Seller	Xpress Natural Gas LLC
Service Location	Keene, New Hampshire
Delivery Point	Meter installed immediately prior to Buyer's site based piped connection.
Contract Term	May 1, 2017 to April 30, 2020
Contract Extension	Term may be extended at Buyer request for 12 months on the same terms and conditions provided Buyer notifies Seller at least 180 days prior to end of the initial Term.
Provided Equipment	Seller shall provide a regulator skid, manifold, delivery trailers and attachments required to meet Buyer's projected demand (see Exhibit B, the "CNG Equipment").
Mobilization Fee	[redacted] payable to Seller 90 days prior to the Contract Term to support mobilization.
Contract Quantity	Contract Quantity serves as the basis for expected nominations each month. Buyer and Seller agree that the Contract Quantity shall be as set forth below:

Month	MMBTU
January	9,000
February	7,500
March	6,500
April	4,000
May	2,500
June	2,000
July	1,500
August	1,500
September	1,500
October	3,000
November	5,000
December	7,000
Total	51,000

Nomination	Not less than 7 days prior to the beginning of each month the Buyer shall send to Seller a notice in writing indicating its expected daily usage for the subsequent month.
Purchase Price	Price per MMBtu for natural gas shall be the sum of: (I) Commodity Gas; plus (II) marketer's basis charges applicable to purchase of the Commodity Gas; plus (III) Service Adder, a variable delivery charge per MMBtu; plus (iv) Fixed Demand Charge; plus (iv) any other applicable fees and expenses set forth in Exhibit A.
Commodity Gas	Unless otherwise agreed, nominated volumes of natural gas will be priced at the [redacted]
Service Adder	[redacted] per MMBTU
Fixed Demand Charge	[redacted] annually to be paid in twelve (12) equal monthly installments of [redacted]
Title & Risk of Loss	Title and risk of loss shall pass from Seller to Buyer at the Delivery Point.

Special Provisions: Minimum Gas Storage Requirement	The Public Service Commission of the State of New Hampshire requires Buyer to maintain a minimum gas inventory during the period November to March. Seller agrees to provide three (3) CNG trailers on site during this period. Seller agrees to increase the number of trailers or to contract for firm capacity on behalf of the Buyer if required. Any costs related to such request are the responsibility of the Buyer.
General Terms & Conditions Governance	The Compressed Natural Gas Master Agreement attached hereto as Exhibit A.

ALL TERMS AND CONDITIONS INCLUDED IN THIS CONTRACT SHALL APPLY TO EACH SALE AND DELIVERY OF PRODUCT BY SELLER TO BUYER (1) UNDER THIS CONTRACT AND HEREAFTER (2) WHETHER OR NOT UNDER A WRITTEN CONTRACT.

EXHIBIT A – COMPRESSED NATURAL GAS MASTER AGREEMENT

This Compressed Natural Gas Master Agreement ("CMA") between **Xpress Natural Gas LLC**, a Delaware limited liability company (together with its subsidiaries and affiliates "Seller") located at 22 Main Way, Stratham, NH 03885 and **Liberty Utilities Co.** (together with its subsidiaries and affiliates "Buyer") located at 15 Buttrick Road, Londonderry, NH 03053 (each a "Party" and collectively, the "Parties") is entered into and effective as of November 4, 2016 ("Effective Date").

A. Compressed Natural Gas Master Agreement

1. **Delivery Requirement:** Seller will provide Natural Gas to the Buyer in compressed form (~3,600 psi) and decompressed prior to the Delivery Point. Seller acknowledges that Buyer has firm needs for an uninterrupted supply of natural gas, and that any failure of Seller to supply any nominated volumes, in accordance with the applicable Contract Quantity, without interruption exposes Buyer to significant costs. It is therefore a material condition of Seller's performance under this Agreement to supply all nominated volumes without interruption.

2. **Commodity Gas Purchasing:** If the Buyer elects to enter a separate agreement to purchase Commodity Gas on a fixed volume commitment (a "Transaction Confirmation"), Buyer will pay the price stated in each Transaction Confirmation. This CMA, any amendments to this CMA and any associated commodity gas Transaction Confirmation ("Transaction") that may be entered into (together, a single integrated, "Agreement") are the entire understanding between Parties and supersedes all other communication and prior writings with respect thereto; no oral statements are effective.

3. **Billing and Payment:** Not more than 5 days after the conclusion of any month the Seller will invoice Buyer for all delivered gas pursuant to this Agreement. Payment shall be due and payable within 20 days after the date of such invoice. If the Actual Quantity cannot be verified by the time the Invoice is issued, the Invoice will be based on Seller's good faith estimate of the Actual Quantity derived using internal calculations of the net gas delivered and adjusted for the Actual Quantity by a credit or charge, as applicable, in the next invoice for which the Actual Quantity is available. Seller will adjust Buyer's account following (i) confirmation of the Actual Quantity or (ii) any adjustment to, or re-calculation of, Taxes. Buyer will pay interest on late payments at 1.5% per month or, if lower, the maximum rate permitted by law ("Interest Rate"). Buyer is also responsible for all costs and fees, including reasonable attorney's fees, incurred in collecting payment. "Actual Quantity" means the actual quantity of Commodity that is either delivered or metered, as applicable, to Buyer's account. If the Purchase Price incorporates an Index and the Index is not announced or published on any day for any reason or if the Seller reasonably determines that a material change in the formula for or the method of determining the Purchase Price has occurred, then the Parties will use a commercially reasonable replacement price that is calculated by the Seller. If Seller concludes that a change in any Law(s) increases Seller's costs, the Purchase Price may be adjusted by Seller to reflect such costs. "Law(s)" mean all tariffs, laws, orders, rules, taxes and regulations. Beginning on the 3rd anniversary of the Effective Date of the Agreement, the XNG Adder shall be subject to annual adjustment based on increases in the Producer Price Index, as published annually by the Bureau of Labor Statistics. The adjustment shall be communicated 30 days prior to the anniversary of this Agreement.

4. **Taxes:** Buyer is responsible for paying any Taxes associated with the Actual Quantity of Commodity sold under this Agreement that may become due at and after the Delivery Point. The Purchase Price does not include Taxes that are or may be the responsibility of the Buyer, unless such inclusion is required by Law. Buyer will reimburse Seller for any Taxes that Seller is required to collect and pay on Buyer's behalf and will indemnify, defend and hold Seller harmless from any liability against all Buyer's Taxes. Buyer will furnish Seller with any necessary documentation showing its exemption from Taxes, if applicable, and Buyer will be liable for any Taxes assessed against Seller because of Buyer's failure to timely provide or properly complete any such documentation. "Taxes" means all applicable federal, state and local taxes, including any associated penalties and interest and any new taxes imposed in the future during the term of this Agreement. Liabilities imposed in this Section will survive the termination of this Agreement.

5. **Disputes:** If either Party in good faith disputes amounts owed under Sections 2, 3, 4, or 7 the disputing Party will contact the non-disputing Party promptly and pay the undisputed amount by the payment due date. The Parties will negotiate in good faith regarding such dispute for a period of not more than fifteen (15) Business Days. In the event the Parties are unable to resolve such dispute, the disputing Party will pay the balance of the original invoice and either Party may exercise any remedy available to it in law or equity pursuant to this Agreement. In the event of a dispute other than for an invoiced amount, the Parties will use their best efforts to resolve the dispute promptly. Actions taken by a Party exercising its contractual rights will not be construed as a dispute for purposes of this Section. "Business Day" means any day on which banks are open for commercial business in New York, New York.

6. **Title and Risk of Loss:** Title to, possession of and risk of loss to the Commodity will pass to Buyer at the Delivery Point.

7. **Force Majeure:** A Party claiming Force Majeure will be excused from its obligations under Section 1 as long as it provides prompt notice of the Force Majeure and uses due diligence to remove its cause and resume performance as promptly as reasonably possible. During a Force Majeure, Buyer will not be excused from its responsibility to pay for Commodity received. "Force Majeure" means a material, unavoidable occurrence beyond a Party's control, and does not include inability to pay, an increase or decrease in Taxes or the cost of Commodity, the economic hardships of a Party, or the full or partial closure of Buyer's facilities, unless such closure itself is due to Force Majeure.

8. **Financial Responsibility:** Seller's entry into this Agreement and each Transaction is conditioned on Buyer, its parent, any guarantor or any successor maintaining its creditworthiness during the Contract Term and any Contract Extension. When Seller has reasonable grounds for insecurity regarding Buyer's ability or willingness to perform all of its outstanding obligations under any agreement between the Parties, Seller may require Buyer to provide adequate assurance, which may include, in the Seller's discretion, security in the form of cash deposits, prepayments, letters of credit or other guaranty of payment or performance ("Credit Assurance").

9. **Default:** "Default" means: (i) failure of either Party to make payment by the applicable due date and the payment is not made within three (3) Business Days of a written demand; (ii) failure of Buyer to provide Credit Assurance within two (2) Business Days of Seller's demand; (iii) either Party, its parent or guarantor, becomes Bankrupt or fails to pay its debts generally as they become due; or (iv) failure of either Party to satisfy any representations and warranties applicable to it contained in Section 12A or 12B and the failure is not cured within fifteen (15) Business Days of a written demand, provided that no cure period or

demand for cure applies to a breach of Section 12A(c). "Bankrupt" means an entity (a) files a petition or otherwise commences, authorizes or acquiesces in the commencement of a proceeding or cause of action under any bankruptcy, insolvency, reorganization or similar law, or has any such petition filed or commenced against it, (b) makes an assignment or any general arrangement for the benefit of creditors, (c) otherwise becomes bankrupt or insolvent, however evidenced, (d) has a liquidator, administrator, receiver, trustee, conservator or similar official appointed with respect to it or any substantial portion of its property or assets, (e) has a secured party take possession of all or any substantial portion of its assets or (f) is dissolved or has a resolution passed for its winding-up, official management or liquidation (other than pursuant to a consolidation, amalgamation or merger.

10. Remedies: In the event of a Default, the non-defaulting Party may: (i) withhold any payments or suspend performance; (ii) upon written notice, provided that no notice is required with respect to Section 9(iii) or a breach of Section 11A(c), accelerate any or all amounts owing between the Parties and terminate any or all Transactions and/or this Agreement; (iii) calculate a settlement amount by calculating all amounts due to Seller for Actual Quantity and the Close-out Value for each Transaction being terminated; and/or (iv) net or aggregate, as appropriate, all settlement amounts and all other amounts owing between the Parties and their affiliates under this Agreement and other energy-related agreements between them and their affiliates, whether or not then due and whether or not subject to any contingencies, plus costs incurred, into one single amount ("Net Settlement Amount"). Any Net Settlement Amount due from the defaulting Party to the non-defaulting Party will be paid within three (3) Business Days of written notice from the non-defaulting Party. Interest on any unpaid portion of the Net Settlement Amount will accrue daily at the Interest Rate. "Close-out Value" is the sum of (a) the amount due to the non-defaulting Party regarding the Contract Quantities (or, as applicable, estimated Contract Quantities) remaining to be delivered during the Contract Term or, if applicable, the current Contract Extension, calculated by multiplying the Service Adder for such untaken quantities; and (b) without duplication, any net losses or costs incurred by the non-defaulting Party for terminating the Transaction(s), including costs of obtaining, maintaining and/or liquidating commercially reasonable hedges and/or transaction costs. For purposes of determining Close-out Value, (i) Commodity Price will be determined by the non-defaulting Party in good faith as of a date and time as close as reasonably practical to the date and time of termination or liquidation of the applicable Transaction(s), and (ii) Commodity Price may be ascertained through reference to quotations provided by recognized energy brokers or dealers, market indices, bona-fide offers from third-parties, or by reference to commercially reasonable forward pricing valuations. The Parties agree that the Close-out Value constitutes a reasonable approximation of damages, and is not a penalty or punitive in any respect. Seller may, but need not, physically liquidate a Transaction or enter into a replacement transaction to determine Close-out Value or Net Settlement Amount. The defaulting Party is responsible for all costs and fees incurred for collection of Net Settlement Amount, including, reasonable attorney's fees and expert witness fees.

11. Representations and Warranties:

A. Each Party represents that: (a) it is duly organized, validly existing and in good standing under the laws of the jurisdiction of its formation and is qualified to conduct its business in those jurisdictions necessary to perform to this Agreement; (b) the execution of this Agreement is within its powers, has been duly authorized and does not violate any of the terms or conditions in its governing documents or any contract to which it is a party or any law applicable to it; and (c) it is not Bankrupt.

B. Buyer represents and warrants that: (a) it is not a residential customer; (b) it will immediately notify Seller of any change in its ownership; (c) execution of this Agreement initiates service for the Contract Term and any Contract Extension; (d) no communication, written or oral, received from the Seller will be deemed to be an assurance or guarantee as to any results expected from this Agreement; (e) if it is executing this Agreement in its capacity as an agent, such Party represents and warrants that it has the authority to bind the principal to all the provisions contained herein and agrees to provide documentation of such agency relationship, and (f) (i) it will provide, to Seller, information reasonably required to substantiate its usage requirements, including information regarding its business, locations, historical/projected usage, time of use, hours of operation, agreements, schedules, which in substantial part form the basis for the calculation of charges for the transactions hereunder; (ii) acceptance of this Agreement constitutes an authorization for release of such usage information; (iii) it will assist Seller in taking all actions necessary to effectuate Transactions, including, if requested, executing an authorization form permitting Seller to obtain its usage information from third parties; and (iv) the usage information provided is true and accurate as of the date furnished and as of the effective date of the Agreement.

C. Each Party acknowledges that: (a) this Agreement is a forward contract and a master netting agreement as defined in the United States Bankruptcy Code ("Code"); (b) this Agreement shall not be construed as creating an association, trust, partnership, or joint venture in any way between the Parties, nor as creating any relationship between the Parties other than that of independent contractors for the sale and purchase of Commodity; and (c) Seller is not a "utility" as defined in the Code.

12. Indemnification: Both parties shall release, indemnify, and hold the other, its affiliates, and their officers and employees harmless from any and all claims, losses, liabilities, and expenses (including reasonable attorney's fees and costs of defense) in any way arising out of or relating to (1) any act or omission by Indemnifying Party which results in personal injuries (including death) or property damage, This indemnification obligation shall survive the termination of this Agreement. NEITHER PARTY WILL BE LIABLE TO THE OTHER UNDER THE AGREEMENT FOR CONSEQUENTIAL, INDIRECT OR PUNITIVE DAMAGES OR SPECIFIC PERFORMANCE, EXCEPT AS EXPRESSLY PROVIDED IN THIS AGREEMENT.

13. Insurance: Both parties agree at all times during the term of this Agreement to carry adequate insurance, but in no event less than five million dollars ($5,000,000) general liability insurance, covering all such liability and contractual obligations, and upon request shall furnish the requesting party evidence satisfactory to it of such insurance.

14. Measurement: The quantity of Gas delivered to the Delivery Point shall be measured by means of a revenue grade meter consistent with industry practice. Buyer shall be invoiced for the actual number of dekatherms of Gas recorded by the meter at the Delivery Point. If the Buyer elects to install sub-metering downstream of the Seller's meter, and in the event of a discrepancy between Buyer and Seller meter results for the same period of time that leads to a billing question, either party may request the other to verify its meter. In the event a meter is found to be inaccurate by recording results in excess of 2% of actual volume, the owner of the inaccurate meter will pay for the calibration and invoicing will be adjusted to correct any inaccuracy. If the recalibrated meter is within 2% of actual volume, the party requesting the calibration pays for the calibration and invoicing for any previous period in question shall not be changed. If the period of such error is not known definitely or agreed upon, the Parties agree that Seller truck delivery logs for the period in question provide an audit record acceptable for invoicing. Buyer may witness all testing and gauging; provided however, if no representative for Buyer is present, Seller's measurement and/or determination of quantity shall be final.

15. Security: Each party shall provide to the other together with the annual nomination, its most recent set of audited financials. In the event that XNG has a reasonable concern with respect to the credit worthiness of the Buyer after review of the annual financial statements and prior period payment history, the Seller may submit such financial statements to an independent third party for evaluation of solvency. If the third party determines the Buyer insolvent, then on written notice to the Buyer XNG may request security (cash or letter of credit) for up to one month of expected deliveries.

16. Other:
(a) This Agreement is governed by the law of the State of New Hampshire without regard to any conflict of rules doctrine. The Parties submit to the non-exclusive jurisdiction of the courts of the State of New Hampshire and any United States District Court located in New Hampshire. (c) Each Party waives its right to a jury trial regarding any litigation arising from this Agreement. (d) No delay or failure by a Party to exercise any right or remedy to which it may become entitled under this Agreement will constitute a waiver of that right or remedy. (e) Seller warrants that (i) it has good title to Commodity delivered, (ii) it has the right to sell the Commodity, and (iii) the Commodity will be free from all royalties, liens, encumbrances, and claims. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, ARE DISCLAIMED. (f) All notices and waivers will be made in writing and may be delivered by hand delivery, first class mail (postage prepaid), overnight courier service or by facsimile and will be effective upon receipt; provided, however, that any termination notice may only be sent by hand or by overnight courier service, and, if sent to Seller, a copy delivered to: Seth Berry, 22 Marin Way, Stratham, NH 03885. (g) If the Parties entered into Gas transactions prior to the execution of this Agreement ("Existing Transactions"), the Parties agree that these Existing Transactions shall be Transactions governed under the terms of

this Agreement. This Agreement supersedes and replaces any other agreement that may have applied to the Existing Transactions. (h) No amendment to this Agreement will be enforceable unless reduced to writing and executed by both Parties. (i) Either Party may assign this Agreement with consent from the other Party, which consent shall not be unreasonably withheld. In addition, Seller may pledge, encumber, or assign this Agreement or the accounts, revenues, or proceeds of this Agreement in connection with any financing or other financial arrangements without Buyer's consent; in which case Seller shall not be discharged from its obligations to Buyer under this Agreement. (j) This Agreement may be executed in separate counterparts by the Parties, including by facsimile, each of which when executed and delivered shall be an original, but all of which shall constitute one and the same instrument. (k) Any capitalized terms not defined in this CMA are defined in the Transaction Confirmation or shall have the meaning set forth in any applicable rules, tariffs or other governmental regulations, or if such term is not defined therein then it shall have the well-known and generally accepted technical or trade meanings customarily attributed to it in the natural gas or electricity generation industries, as applicable. (l) The headings used in this Agreement are for convenience of reference only and are not to affect the construction of or to be taken into consideration in interpreting this Agreement. (m) Any executed copy of this Agreement and other related documents may be digitally copied, photocopied, or stored on computer tapes and disks ("Imaged Agreement"). The Imaged Agreement will be admissible in any judicial, arbitration, mediation or administrative proceedings between the Parties in accordance with the applicable rules of evidence; provided that neither Party will object to the admissibility of the Imaged Agreement on the basis that such were not originated or maintained in documentary form. (n) Where multiple parties are Party to this Agreement with Seller and are represented by the same agent, it is agreed that this Agreement will constitute a separate agreement with each such Party, as if each such Party had executed a separate Agreement, and that no such Party shall have any liability under this document for the obligations of any other Parties. (o) The Buyer will not disclose the terms of this Agreement, without prior written consent of the Seller, to any third party, other than the Party's employees, affiliates, agents, auditors and counsel who are bound by substantially similar confidentiality obligations, trading exchanges, governmental authorities, courts, adjudicatory proceedings, pricing indices, and credit ratings agencies; provided that a Party that receives a demand for disclosure pursuant to court order or other proceeding will first notify the other Party, to the extent practicable, before making the disclosure.

EXHIBIT B – CONSTRUCTION, COMMISSIONING and MAINTENANCE

As conditions to the delivery of CNG to the Buyer under this contract,

1. **SITE PREPARATION & PERMITTING:**
   a. Buyer will be responsible for design, engineering and construction work to construct an unloading site (the "Site") for the installation of Seller's equipment and delivery of CNG to the Buyer.
   b. Buyer shall be required to reasonably prepare the Site, including ensuring that the Site is cleared, level, secured by fencing, and provided with utilities including electric, data, and an interconnect with any controls systems Buyer requires the CNG delivery system to interface with, as well as an access point equipped with a piping flange interconnect capable of coupling with Seller's skid. All costs of preparing and maintaining the Site shall be borne by the Buyer.
   c. Seller shall provide reasonable engineering support and site layout recommendations to the Buyer. Seller shall review and approve the Site design prior to construction, consistent with minimum setbacks and other requirements per NFPA 52.
   d. Seller shall be responsible for all permits required for the installation and operation of the XNG equipment provided however that Buyer shall be responsible for all permits related to land use, air, and environmental.

2. **CNG EQUIPMENT:**
   a. Seller shall provide a package of skid-mounted equipment capable of delivering CNG to the Buyer Facility at a maximum rate of 40 SCFH. Such equipment shall be provided at the Buyer site to serve as a delivery trailer connection and unloading point for the Seller. The equipment shall be connected via piping to the flange as provided by the Buyer at the site as the point of delivery for natural gas.
   b. The CNG Equipment is expected to conform to the following general specifications:
      i. Manifold connections allowing for up to 3 CNG delivery trailer with hose connections compatible with delivery trailers.
      ii. Heater(s) sized to support proper intermediate temperatures as well as final delivery temperature of the gas stream. Heating must be sufficient to prevent cold temperatures and possible hydrate formation downstream of regulator.
      iii. 2-stage primary pressure step-down regulation with over-pressure protection. Custody transfer metering to be provided on outlet of skid. Meter shall be a custody grade meter with capability to interface with control system.
      iv. Safety systems to include gas and flame detection. Methane detection system to be included with process skid. Flame detector located along truck loading area. Flame detectors coverage area shall include the connection end of the transports and the process skid. Detectors will input alarms and faults into the control system.
      v. Control system required to monitor key process conditions, switch trucks when empty, provide emergency shutdown, and remotely communicate system condition. System shall have a method to transmit data or screen control to remote site for customer monitoring.
   c. During the Delivery Period the Seller shall be responsible for all maintenance and support for the CNG Equipment.

3. **INSTALLATION & COMMISSIONING:**
   a. Seller shall review the completed Site prior to installation to evaluate and confirm that the Site was built to the approved design and specifications. Determination of whether the Site is suitable for installation shall be on mutual agreement. Upon acceptance of the Site, Seller shall install the CNG Equipment.
   b. Seller shall deliver and unload its equipment to the Service Location prior to the Start Date. Buyer will provide and allow for storage of that equipment as needed at no charge.
   c. Seller will be responsible for connecting its equipment to existing utilities. Once the CNG Equipment is connected, Seller and Buyer will initiate gas flow. Controls and safety systems will be tested during commissioning period prior to commencing operation.

4. **SITE MAINTENANCE:**
   a. For the duration of the Agreement, all site maintenance, including but not limited to snow removal, and all costs related to the upkeep of the site and its ingress and egress shall be borne by the Buyer. Failure to maintain the site in a manner sufficient to permit delivery shall be a Buyer act of default.

IN WITNESS WHEREOF, this CMA is entered into and effective as of the date written above.

BUYER:	SELLER:
By: F. Chico DaFonte	By: Matthew F. Smith
Name: F. Chico DaFonte	Name: Matthew F. Smith
Title: Vice President, Energy Procurement	Title: EVP, Sales and Marketing

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service Commission held in the City of Albany on June 26, 2014

COMMISSIONERS PRESENT:

Audrey Zibelman, Chair
Patricia L. Acampora
Garry A. Brown
Gregg C. Sayre
Diane X. Burman

CASE 14-G-0019 - Petition of New York State Electric & Gas Corporation for a Declaratory Ruling Concerning Regulation of a Proposed Compressed Natural Gas Supply Station and Related Facilities.

DECLARATORY RULING AND ORDER APPLYING THE COMMISSION'S JURISDICTION TO PROPOSED CNG SUPPLY STATION

(Issued and Effective July 1, 2014)

BY THE COMMISSION:

INTRODUCTION

On January 24, 2014, New York State Electric and Gas Corporation (NYSEG) submitted a Petition for Declaratory Ruling (January 24 petition) in which it requested the Public Service Commission (PSC, Commission) declare that (1) third-party compressed natural gas (CNG) suppliers with whom NYSEG plans to contract for peak gas supplies not be subject to Commission regulation and (2) only NYSEG's facilities at the proposed "CNG Supply Station," as described in NYSEG's January 24 petition, be subject to 16 NYCRR Part 255, the Commission's rules governing transmission and distribution of gas.

As more fully described in this ruling and order, and consistent with our recent ruling in Case 13-G-0187, third-party

CNG suppliers with whom NYSEG contracts to provide natural gas supply are not subject to the Commission's jurisdiction within the parameters established by the Procurement Ruling.[1] The "CNG Supply Station," as NYSEG proposes it in its January 24 petition, however, assigns to third-party suppliers facilities that extend beyond the limitations of the Procurement Order and conflicts with the definition of gas "pipeline" in our regulations.[2] Therefore, we will not assert jurisdiction over NYSEG's CNG suppliers consistent with the Procurement Ruling. NYSEG, however, will be required to install and operate, subject to 16 NYCRR Part 255 oversight, the remainder of the CNG Supply Station to the extent described herein.

Notice of the Petition for Declaratory Ruling was published in the State Register on March 12, 2014 in conformance with the State Administrative Procedure Act (SAPA). The minimum period for receiving comments expired on April 28, 2014. No comments were received.

DISCUSSION AND CONCLUSION

Pursuant to Public Service Law §§65 and 66, the Commission oversees the provision of safe and adequate gas services. In furtherance of that supervision (Public Service Law §66(1)), transmission and distribution gas regulations were adopted, which provide standards for gas safety and service. Based upon our obligation to ensure the safety of gas service to NYSEG's Mechanicville customers, and as more fully described in

[1] Case 13-G-0187 - Petition of Procurement Energy, LLC for a Declaratory Ruling Regarding Regulation of Compressed Natural Gas Filling Stations and Related Facilities, Declaratory Ruling Regarding Jurisdiction (issued August 16, 2013) ("Procurement Ruling"); see Public Service Law §2(10)[definition of gas plant].

[2] 16 NYCRR §255.3(24).

this ruling and order, we deny NYSEG's request and declare that the demarcation point at which the Commission's jurisdiction attaches is where the CNG supplier's trailers attach to pipe that will be used to supply NYSEG's customers.

With respect to the ratemaking treatment of NYSEG's proposed CNG Supply Station, and consistent with our authority to establish just and reasonable utility rates pursuant to Public Service Law §65, we grant NYSEG's request for rate treatment. We will allow recovery, in NYSEG's Gas Supply Charge (GSC), of the reasonable gas supply costs that NYSEG incurs through contracts with its CNG suppliers whose commodity services are needed to provide CNG during peak demand, subject to later Commission review.[3] The Company can seek recovery of the costs of the facilities this ruling and order deems "gas plant" through the normal rate setting process.

The Need for CNG and
the Jurisdictional Demarcation Point

In its January 24 petition, NYSEG explains that it needs CNG to provide added supply to natural gas customers in its Mechanicville franchise because of the transport and pressure constraints that exist in the Company's distribution system. Given these constraints and to ensure the reliable provision of gas service to NYSEG's current Mechanicville customers, the Company has placed a moratorium on new natural

[3] See City of New York v. Pub. Serv. Commn. of State of N.Y., 105 A.D.2d 1200, 1204 (3d Dept. 2013)[wherein the Appellate Division found that the allocation of fuel costs beyond utility's current rate plan was reasonable]; see Matter of Niagara Mohawk Power Corp. v. Pub. Serv. Commn. of State of N.Y., 69 N.Y.2d 356 (1987)[Commission's authority to refund fuel adjustment charges implied from Commission's authority to allow fuel adjustment charges].

gas service requests.[4] NYSEG states that its contract with National Grid permits delivery of no more than 3,000 dekatherms (Dth) per day to Mechanicville and that growth in demand in Mechanicville has exhausted that supply.[5]

Therefore, NYSEG has developed a plan to purchase CNG for the foreseeable future from third-party suppliers to meet peak natural gas demand, primarily in the winter months. As NYSEG envisions it,

> [w]hen needed, compressed natural gas will be delivered in tube trailers to the [CNG Supply] Site, where they will be interconnected to NYSEG's natural gas distribution system through a decompression skid and delivery system to be constructed, owned, and maintained by the Supplier just upstream of the demarcation point between NYSEG's distribution system and the Supplier's equipment. The CNG Station will be designed and built to store up to three tube trailers of CNG.[6]

NYSEG posits that its CNG supplier should not be regulated by this Commission and should be regulated like Procurement Energy LLC, pursuant to federal and state laws that govern the transport of fuel products, as well as by fire and environmental regulations and safety codes, up to NYSEG's proposed demarcation point. Beyond NYSEG's proposed demarcation point, NYSEG's Public Service Law regulatory obligations would

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[4] January 24 petition at 2. Niagara Mohawk Power Corporation d/b/a National Grid (National Grid) gas pipelines feed supply to NYSEG's Mechanicville franchise. Improving supply via National Grid's infrastructure, NYSEG states, is cost-prohibitive.

[5] Were NYSEG and National Grid able to negotiate additional supply to Mechanicville, the pressure capability of NYSEG's delivery system would be exceeded. January 24 petition at 4.

[6] January 24 petition at 3.

begin.[7] The question we must answer, therefore, is whether NYSEG's proposed demarcation point is the appropriate dividing line between the CNG services the Commission will not regulate and the regulated utility services.

We determine that the Commission's regulatory authority attaches, as shown in Appendix A (green line) and as explained more fully below, when the CNG supplier with whom NYSEG contracts releases its supply from the tube trailers that carry the CNG to NYSEG.[8] NYSEG will be bound to adhere to regulatory safety requirements for all facilities beyond a CNG supplier's tube trailers.

Jurisdiction Over CNG Supplier

NYSEG's January 24 Petition seeks a ruling that the CNG supplier with whom NYSEG contracts for service will not be subject to Commission jurisdiction for the same reasons we ruled that Procurement Energy would not be subject to our oversight. NYSEG states that the companies with whom it will contract to supply CNG will be similar to Procurement Energy and that the CNG suppliers will be required to comply with the following:

> (i) Federal laws and regulations pertaining to gas pipeline safety and compressed natural gas facilities set forth in 49 U.S.C. 60101 et seq. and 49 CFR Part 192;
>
> (ii) National Fire Protection Association (NFPA) Part 52 standards applicable to the design, installation, operation, and maintenance of compressed natural gas (CNG) engine fuel systems on vehicles of all types and for

[7] See Appendix A, which is a colorized reproduction of Appendix A to the January 24 petition, showing NYSEG's proposed jurisdictional demarcation point in red.

[8] Whenever the CNG supplier is on NYSEG property, NYSEG also becomes responsible for the safety and adequacy of the CNG supplier's apparatus', equipment, and actions.

fueling vehicle (dispensing) systems and associated storage;

(iii) Occupational Safety and Health Administration (OSHA) regulations relating to the transport, delivery, and unloading of heating fuel products;

(iv) State and federal laws and regulations regarding the transport, delivery, and unloading of heating fuel products, including, as applicable, those requirements in the states of Massachusetts, Maine, and New York;

(v) Requirements of the New York State Fire Marshall and those of local fire protection, public health, and emergency response personnel in Mechanicville;

(vi) DEC air permitting requirements under applicable law and regulation, and use restrictions in the Site Management Plan for the former manufactured gas plant site where the CNG Station will be located; and

(vii) Any other applicable state, federal, or local laws, rules, regulations, or standards applicable to the construction, operation, and maintenance of suppliers' facilities at the Site.

In our Procurement Ruling, we relied on Public Service Law §2(10)'s definition of "gas plant" as excluding "property used solely for or in connection with the business of selling, distributing or furnishing of gas in enclosed containers" as the basis for abstaining from asserting jurisdiction over CNG suppliers. NYSEG's CNG suppliers will be providing services similar to Procurement's in many respects. In one vital respect, however, NYSEG's suppliers will be different than Procurement Energy's -- NYSEG's CNG suppliers will not be providing CNG to end-users who will consume CNG on-site; NYSEG's supplier will be "furnishing gas in enclosed containers" that will be delivered to a regulated utility, which will then distribute it to its customers. However, like the large, end-use customers Procurement Energy will serve, whose "piping required to transport natural gas from the location of the

trailer at a customer's site to other locations at the customer's location will be the responsibility of the customer," NYSEG must also own the delivery facilities that extend from the CNG supplier's tube trailers to NYSEG's distribution system.[9] NYSEG will own and operate the facilities that extend from the tube trailers directly into NYSEG's distribution system (utility gas plant), which will all be subject to 16 NYCRR Part 255 safety requirements. This is because the facilities meet the definition of "pipeline" in Commission rules; as such, the Commission is obligated to ensure that NYSEG, as a gas corporation, provide safe and adequate service to its end-use customers. Therefore, the demarcation point at which our jurisdiction attaches is the point at which a CNG supplier attaches its tube trailers to utility gas plant used to transfer, decompress, and meter gas to end-use utility customers.

Definition of Pipeline

Our jurisdictional oversight appropriately attaches in this case as soon as the CNG leaves the tube trailers because our rules define "pipeline" to mean "all parts of those physical facilities through which gas is transported, including pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies."[10] Further, the Scope of 16 NYCRR §255.1(a)

> prescribes minimum safety requirements for the ... installation ... inspection, testing and operation and maintenance of gas transmission and distribution systems, including ... gas compressor stations, gas metering and

[9] Procurement Ruling at 3.

[10] 16 NYCRR §255.3(24).

> regulating stations...(b) Every person engaged in the transportation of gas via pipeline within the State of New York shall comply with the rules set forth in this Part.[11]

Because NYSEG is a gas corporation within the meaning of Public Service Law §2(11) in that it owns, operates and manages gas plant, the facilities needed to supply CNG to NYSEG's customers to meet peak demand are subject to the Commission's Part 255 regulation, which prescribes safety standards for pipe, compressors, pressure reduction, and valves. Therefore, every part of NYSEG's proposed CNG Supply Station beyond the tube trailers fits into the definition of the "pipeline" that is part of a distribution company's facilities that we regulate.[12]

Notably, in somewhat of a contradiction, the Company admits that pipeline will be used to deliver to NYSEG's customers, stating "none of the supplier's facilities at the [CNG Supply] Site will constitute 'gas plant' ... because no piping will be used in the Supplier's operations except for limited piping needed to deliver the gas from the tube trailers to the decompression skid ..."[13] Even the "limited piping needed to deliver the gas from the tube trailers," however, is "pipeline" within the meaning of 16 NYCRR §255.3(24).

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[11] 16 NYCRR §255.1(a). Further, Part 255 "does not apply to: (1) design and fabrication of pressure vessels covered by the ASME Boiler and Pressure Vessel Code," which would include the CNG supplier's tube trailers.

[12] Similarly, in the Procurement Ruling, we ruled that Commission jurisdiction would not attach to Procurement because Procurement Energy would not "install or use any piping, whether aboveground or underground in connection with its proposed operations. . . [and] that its customers may have piping at their locations, but that such piping will be installed and owned by the customer, not PE." Procurement Ruling at 4.

[13] January 24 petition at 11, emphasis added.

Therefore, Commission jurisdiction attaches as soon as the pipe that will deliver CNG to NYSEG's customers attaches to the tube trailers.

Odorization

In NYSEG's proposal, NYSEG's facilities "downstream from the demarcation flange will include interconnection piping, a gas regulator station, [and] odorization equipment."[14] While we will not require precisely where odorization of the CNG must occur, our rules require that all gas transported in transmission lines, distribution mains, and service laterals be adequately odorized in accordance with 16 NYCRR §255.625.[15] Therefore, while the transported CNG need not be odorized during transit in its enclosed containers to NYSEG's property, under our regulations, it will have to have been odorized once it enters the pipes leaving the tube trailers at the PSC's jurisdictional demarcation point.[16]

Cost Recovery

In its January 24 petition, NYSEG seeks recovery of "the supplier's costs" associated with the Mechanicville CNG plant through the Company's monthly gas supply charge (GSC). Further, as NYSEG proposes it, the demand charges associated

[14] January 24 petition at 6. One supplier states it will odorize much earlier in the transfer process.

[15] 16 NYCRR §255.625(a)and(b).

[16] Because the tube trailers will be used only for peak demand, they may sit for some time on site at the CNG Supply Station. Odorization may dissipate over time; therefore, NYSEG will be responsible for ensuring the odorization of CNG in stored tube trailers remains at levels that comply with 16 NYCRR §255.625 so that when it is delivered into NYSEG's distribution system, it is odorized at Part 255 levels.

with the service would be recovered through NYSEG's system-wide Weighted Average Cost of Capacity and its Reliability Surcharge.[17]

NYSEG's request that the supplier's costs associated with the Company's Mechanicville CNG Supply Station be recovered through the Company's GSC, Weighted Average Cost of Capacity, and Reliability Surcharge is granted in part. In its petition, NYSEG identifies "the supplier's costs" as almost the entire CNG Supply Station, which includes facilities we have determined are utility gas plant. Therefore, while we will allow NYSEG to recover in its GSC "the supplier's costs," those costs are limited to the costs associated with only the delivery of CNG to NYSEG, which will include CNG supply to meet peak demand.

With respect to the ratemaking treatment of the rest of NYSEG's CNG Supply Station -- the gas plant that NYSEG will own and operate to deliver the CNG from the tube trailers to supply NYSEG's customers -- will be subject to normal rate treatment. Consistent with our authority to establish just and reasonable utility rates pursuant to Public Service Law §65, we will determine, upon later Commission review, whether the supply station costs should be included in rate base or recovered through the GSC.

The Commission finds, declares and orders:

1. The Public Service Law excludes from Commission jurisdiction third-party suppliers of compressed natural gas who transport compressed natural gas in containers to New York State Electric and Gas Corporation.

2. The requirements of 16 NYCRR Part 255 applies to the facilities installed, owned and operated by New York State Electric and Gas Corporation to distribute or furnish,

[17] January 24 petition at 9.

decompress, and meter the compressed natural gas at the point the CNG leaves the (enclosed) tube trailers that have transported to New York State Electric and Gas Corporation.

3. Public Service Commission jurisdiction attaches at the point the compressed natural gas leaves any compressed natural gas supplier's tube trailers that have transported the CNG onto New York State Electric and Gas Corporation property.

4. New York State Electric and Gas Corporation is authorized to charge ratepayers through New York State Electric and Gas Corporation's Gas Supply Charge for the supplier's costs to provide the compressed natural gas, which are the contractual costs incurred to meet peak demand. All remaining facility costs are subject to review and normal rate treatment.

5. This proceeding is closed.

By the Commission,

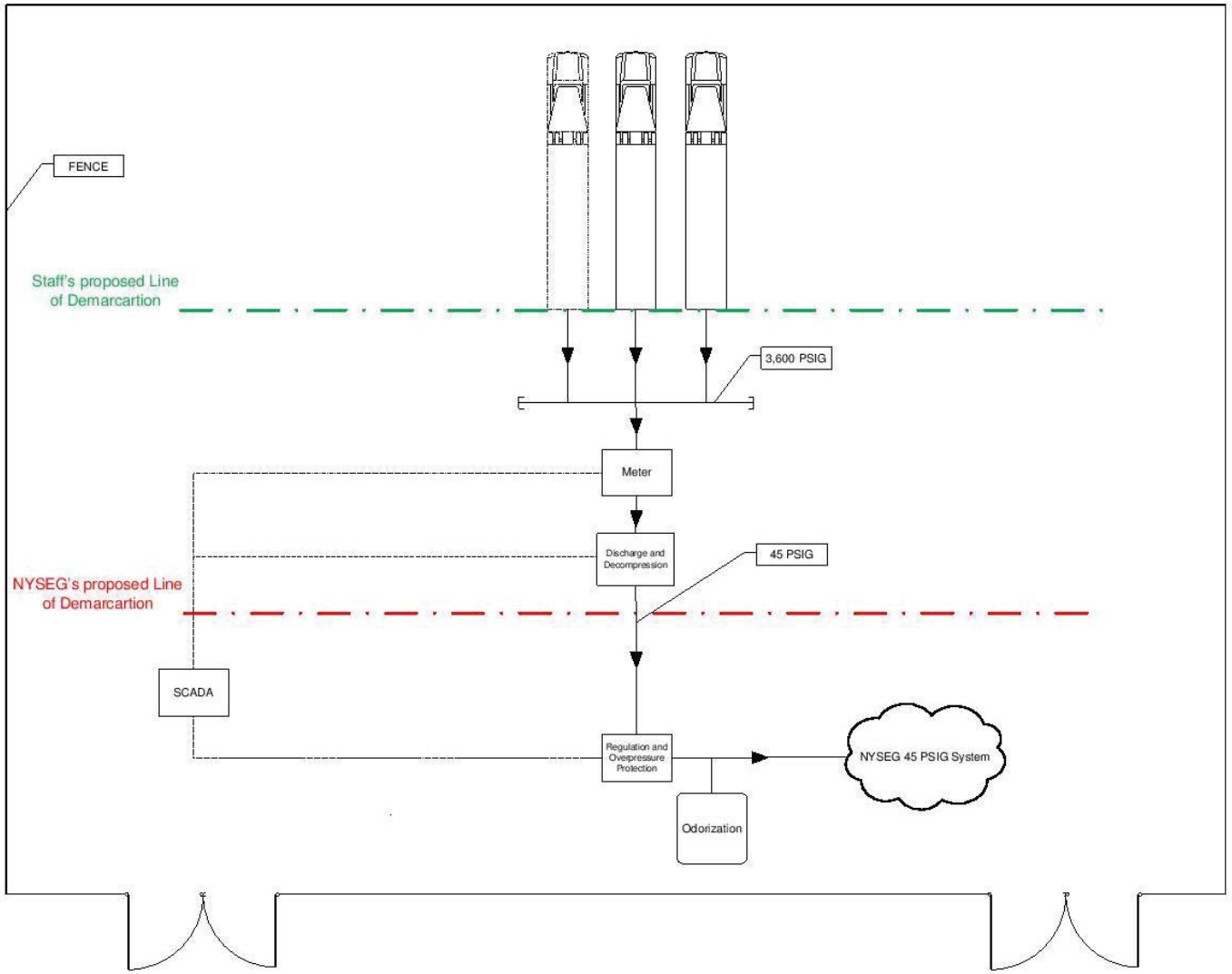
Kathleen H. Burgess

Digitally Signed by Secretary
New York Public Service Commission

KATHLEEN H. BURGESS
Secretary

Appendix A:

CONCEPTUAL DRAWING



Knepper Applicable PHMSA Training Completed

	Online Computer Based Training	Status	Date
1	PHMSA-PL1DIMP Introduction of Distribution Integrity Management Program WBT	Successful	5/3/2011
2	PHMSA-PL1GLAW Introduction to Gas Laws WBT	Successful	8/11/2014
3	PHMSA-PL1HCA High Consequence Areas WBT	Successful	7/4/2005
4	PHMSA-PL1ICDA Internal Corrosion Direct Assessment WBT	Successful	4/1/2011
5	PHMSA-PL1IPROC Integrity Management Processes WBT	Successful	7/6/2005
6	PHMSA-PL1ODOR Natural Gas Odorization WBT	Successful	4/4/2011
7	PHMSA-PL1PRESS Fundamentals of Gas Pressure Regulators WBT	Successful	2/26/2007
8	PHMSA-PL1RA Introduction to Risk Assessment Methods WBT	Successful	4/25/2015
9	PHMSA-PL2FLMEC - Fundamentals of Fluid Mechanics WBT	Successful	4/24/2015
10	PHMSA-PL2P195 Introduction to Part 195 WBT	Successful	4/14/2015
11	PHMSA-PL3CP Fundamentals of Pipeline Corrosion and Cathodic Protection WBT	Successful	8/14/2007
12	PHMSA-PL3ECDA External Corrosion Direct Assessment WBT	Successful	4/1/2011
13	PHMSA-PL3ELEC Fundamentals of Basic DC Electricity WBT	Successful	8/18/2007
14	PHMSA-PL3OQ Operator Qualification WBT Course	Successful	1/31/2006
15	PHMSA-PL3PIG Fundamentals of Launching and Receiving Maintenance Pigs WBT	Successful	6/8/2010
16	PHMSA-PL3PP Fundamentals of Plastic Pipe WBT	Successful	4/12/2007
17	PHMSA-PL3REG Regulatory Overview WBT	Successful	4/8/2015
18	PHMSA-PL3SCADA Fundamentals of SCADA Systems WBT	Successful	3/14/2011
19	PHMSA-PL3SCCDA Stress Corrosion Cracking Direct Assessment WBT	Successful	8/23/2006
20	PHMSA-PL3WELD Introduction to Pipeline Welding WBT	Successful	6/1/2007
21	PHMSA-PL4LNG Fundamentals of Liquefied Natural Gas (LNG) WBT	Successful	6/15/2005
21	PHMSA-PL3IC - Investigating and Managing Internal Corrosion of Pipelines WBT	Successful	10/6/2016
22	PHMSA-PL3DA Drug and Alcohol Testing for the Pipeline Industry WBT	Successful	10/8/2016
	COURSES	**Status**	**Date**
1	PHMSA-PL1297 Gas Integrity Management (IM) Protocol Course	Successful	5/5/2005
2	PHMSA-PL4253 Liquefied Natural Gas (LNG) Safety Technology and Inspection Course	Successful	7/29/2005
3	PHMSA-PL1250 Safety Evaluation of Gas Pipeline Systems Course	Successful	12/15/2005
4	PHMSA-PL2284 (HAZWOPER) Refresher for Pipeline Safety Representatives	Successful	1/9/2007
5	PHMSA-PL3322 Evaluation of Operator Qualification (OQ) Programs Course	Successful	1/21/2016
6	PHMSA-PL3256 Pipeline Failure Investigation Techniques Course	Successful	2/9/2007
7	PHMSA-PL1255 Gas Pressure Regulation and Overpressure Protection Course	Successful	4/12/2007
8	PHMSA-PL1310 Plastic and Composite Materials Course	Successful	6/15/2007
9	PHMSA-PL3242 Welding and Welding Inspection of Pipeline Materials Course	Successful	6/15/2007
10	PHMSA-PL3254 Joining of Pipeline Materials Course	Successful	6/15/2007
11	PHMSA-PL3257 Pipeline Safety Regulation Application and Compliance Procedures Course	Successful	8/17/2007
12	PHMSA-PL3600 Root Cause/Incident Investigation Course	Successful	8/21/2009
13	PHMSA-PL3292 Safety Evaluation of Inline Inspection (ILI)/Pigging Programs Course	Successful	6/11/2010
14	PHMSA-PL3293 Corrosion Control of Pipeline Systems Course	Successful	6/25/2010
15	PHMSA-PL3291 Fundamentals of (SCADA) System Technology and Operation Course	Successful	4/1/2011
16	PHMSA-PL3355 Safety Evaluation of Control Room Management Programs	Successful	8/29/2014
17	PHMSA-PL1245 Safety Evaluation of Distribution Integrity Management Programs (DIMP) Course	Successful	4/23/2015
18	PHMSA-PL2258 Safety Evaluation of Hazardous Liquid Pipeline Systems Course	Successful	5/15/2015
19	PHMSA-PL3267 Fundamentals of Integrity Management Course	Successful	7/31/2015
20	PHMSA-PL3306 External Corrosion Direct Assessment (ECDA) Field Course	Successful	8/14/2015
21	PHMSA-PL2294 Safety Evaluation of Hazardous Liquid Pipeline (IM) Programs Course	Successful	4/28/2017
22	PHMSA -PLWK31A Inspection Assistant Training Workshop	Successful	11/9/2018
23	PHMSA-PH3275 General Safety Awareness for Inspectors and Investigators	Successful	5/29/2020

New Hampshire Public Utilities Commission
Docket Related Experience of Randall S Knepper

Testimonies:

I have testified in numerous dockets at the Commission including:

DW 04-048, DG 08-048, DG11-040, DG 11-106, DG11-196, DG 13-149, DG 14-041, DG 14-155, DG 15-104, DG15-121, DE 15-459, DE 15-460, DE 15-461, DE 15-462, DE15-463, DG16-449, DG 17-048, DG17-063, DG18-064, DG 18-092, DG 19-054, DG 20-152.

Rulemakings:

I have been in numerous rulemakings including:

Puc 800 Rules for Underground Damage Prevention in December 2008 and again in February 2017; Puc 500 Gas Rules in January 2005, and again in May 2013; Puc 1300 Rules for Pole Attachments in December 2009. Puc 300 Electric Rules in May 2014; Puc 1400 Rules for Pipeline Public Utilities in July 2013.

Investigations:

I have been the principal investigator in numerous after actions and investigations including:

Liberty Keene Plant Malfunction Investigation 2015, Unitil Hampton Locke Rd Investigation 2015, December 2008 Ice Storm After Action Review, October 2011 Snowstorm After Action Review, 2014 Thanksgiving Storm After Action Review, National Grid Benton Logging Incident 2015, Eversource Keene Fatality 2014, and Eversource Phase 2 System Investigation 2016, Liberty Keene CNG Adequacy Assessment 2018

Recommendations:

I have written dozens of recommendations for Commission consideration in a number of Commission dockets and can provide those cases upon request.