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April 5, 2017

Via Electronic and US Mail

NHPUC 6APR17PM2:42

Randall S. Knepper
Director, Safety Division
New Hampshire Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, NH 03301-2429

**Re: DG 11-040 Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Quality Assurance Plan – Revision 5**

Dear Mr. Knepper:

Enclosed for filing please find Liberty Utilities' updated Quality Assurance Plan. The plan is filed in accordance with Attachment J I(9) of the Settlement Agreement, approved by Order No. 25-370 in Docket No. DG 11-040.

Thank you for your assistance with this matter. Please do not hesitate to call if you have any questions.

Sincerely,


A handwritten signature in black ink that reads "Stephen R. Hall". The signature is written in a cursive, flowing style.

Stephen R. Hall

Enclosure

cc: Carolyn Stiles
Kerri-Lyn Gilpatric

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| | | | |
|------------------------------------------------------------------------------------------------------------|----------------------|---------------------|--------------|
|  Liberty Utilities | | | |
| Gas Operating Procedure | April 1, 2017 | CONSTRUCTION | |
| Quality Management Program (5035) | Revision # | 5 | Final |

1.0 PURPOSE

The purpose of this document is to provide criteria and guidelines to regularly inspect and monitor the new construction and installation of gas pipeline facilities to ensure that each facility is installed in accordance with applicable Liberty Utilities Construction Standards, the Liberty Utilities Operations and Maintenance Manual, and federal and state pipeline safety regulatory requirements.

2.0 SCOPE

The scope of this document is specific to Liberty Utilities gas distribution and gas transmission systems in New Hampshire that are subject to the Pipeline and Hazardous Materials Safety Administration (PHMSA) 49 CFR Part 192 Regulations.

The Quality Management Program covers:

- only those gas facilities owned and operated by Liberty Utilities;
- only new installations and new construction activities;
- the former EnergyNorth natural gas and propane service territories; and
- the former NH Gas propane service territory (Keene Division).

3.0 DEFINITIONS

Assessment – Is a term used in this document to collectively represent all of the types of construction audits, field inspections, verifications and other construction oversight activities performed under the Quality Management Program.

Quality – Is the degree to which the installation conforms to federal and state code requirements and Liberty Utilities expectations

Quality Assurance - Is the set of activities (including training, certification, operator qualification, and written procedure reviews) needed to provide confidence that the proper installation procedures and work methods are established and continuously improved upon.

Quality Control - Is the set of activities (including work assignment briefings, supervision and Assessments) that determine the level of Quality.

Quality Management Program – Is the set of management functions that creates the activities used to establish Quality at Liberty Utilities. Quality Management is the title of the Program. Quality Assurance and Quality Control are elements within the Program.

4.0 QUALITY MANAGEMENT PROGRAM

4.1 Purpose

The purpose of the Liberty Utilities Quality Management Program is twofold.

First: To identify the activities used to develop and implement the various processes that ensure the new construction and installation of gas pipeline facilities achieve the targeted level of Quality.
 Second: To compare the actual work performed in the field to established written operating procedures.

Quality is one of the three Core Values of Liberty Utilities. The others are Care and Efficiency. The Company is committed to (i) demonstrating pride of ownership and acting as a business owner; (ii) being intelligent about the time invested versus the value created and (iii) understanding and following our processes carefully.

4.2 Procedures

Liberty Utilities has prepared and follows a manual of written procedures for conducting operations and maintenance activities, for responding to emergencies and for reacting to abnormal operating conditions. These procedures are readily available in the office and at the site of the new construction and installation. They are available in the field to the person performing the work, the person supervising the work and the person inspecting the work. They are expected to be followed unless there is a prior mutual agreement that a deviation is authorized by an appropriate Company Authority.

4.3 Roles

- a) The Manager, Compliance, Quality & Emergency Management has overall responsibility for the Company procedures related to new installations and new construction. The written procedures are reviewed annually and updated as needed. These updates include a review of the work done in the field by contractors to determine the effectiveness and adequacy of the written procedures. At all times, the documents should be easily accessible and easy to follow in the field. All written procedure reviews and written procedure updates are documented to ensure that the revision history is readily available.

- b) The Manager, Field Operations Construction (or designee) has overall responsibility for the Company use of construction contractors. Prior to working on the Liberty Utilities transmission and distribution system, contractors must be familiar with the written procedures and have a thorough understanding of the work to be performed. Field Operations Construction will inform the contractor of the expected level of Quality. The training and qualifying of contractors will be documented to ensure all personnel have received the required level of instruction and guidance.

4.4 Span of Control

The Manager, Field Operations Construction (or designee) will monitor the span of control. Under most conditions, Liberty Utilities shall maintain a span of control of no more than four contractor crews per Company representative.

For situations where this ratio cannot be met, there must be an equivalent level of Quality Assurance and the NHPUC Safety Division must be notified of the variance within the same working day. An example of an equivalent level is when there may be multiple crews at a single job site with a single company representative.

4.5 Inspecting and Monitoring the Installation

To observe contractor activities, Liberty Utilities shall use a combination of Company supervisors or formally trained inspectors.

The Company representative will compare the actual work performed in the field to the established standards and take corrective action when nonconformance is detected.

The Company representative has the authority to require immediate corrective action to any deficiencies identified during the installation.

Serious infractions should be brought to the immediate attention of the Manager, Field Operations Construction (or designee). Corrective action may be taken when nonconformance is detected.

5.0 RESPONSIBILITY

5.1 General

Liberty Utilities is dedicated to the safe transmission and distribution of natural gas.

It is the philosophy of Liberty Utilities that all employees and contractors are responsible to ensure that all new construction and installations are performed to the degree necessary to meet or exceed established regulatory requirements and internal standards.

5.2 Specific

- a) Vice-President, Operations & Engineering: Responsible for engaging the direct reports on the Quality Management Program.
- b) Manager, Compliance, Quality & Emergency Management: Responsible for the overall development, maintenance and administration of the Quality Management Program. This position has the organizational freedom to identify problems, recommend or provide solutions and to verify corrective action. This position ensures that any applicable NHPUC Safety Division enforcement actions are incorporated into the Quality Management Program. This position reports to the Director of Engineering.
- c) Director, Gas Operations: Responsible for the overall gas operations including construction, maintenance, customer metering services and damage prevention. This position reports directly to the Vice-President, Operations.
- d) Manager, Field Operations Construction: Responsible for the new construction and installation of gas pipeline facilities by outside contractors. This includes the training, the procedure review with contractors, the verification of operator qualifications, the daily job assignments, the daily span of control and the daily Quality Inspections and Assessments. This position reports directly to the Director, Gas Operations.
- e) Supervisor, Field Operations or Company Representative: Responsible for the direct daily supervision of the outside contractors performing the construction of gas pipeline facilities. This position performs the Construction Inspections of the new facility installations and the Field Verification Audits of the various tasks. This position reports directly to the Manager, Field Operations Construction.

6.0 CONSTRUCTION OVERSIGHT ACTIVITIES

It is in the best interest of Liberty Utilities to establish confidence that the completed installation of gas transmission pipelines, distribution mains and services and other gas facilities meet applicable state and federal codes and the Liberty Utilities specifications and procedures. There are three essential elements to construction oversight:

6.1 Pre-Construction

- a) Identify the high risk Quality items in each job in advance of construction. The high risk items should be based on experience, contractor history, previous NOPVs / NOVs, and knowledge of the gas distribution or transmission system.
Examples include: Directional drilling pull back, pressure tests, pigging, stopping the flow of gas, purging, and tie-ins.
- b) Verify those performing the work are trained and qualified or working under the direction and observation of someone trained and qualified.
- c) Ensure that updated policies, procedures, standard drawings, manufacturers procedures, maps, detailed project information, etc. are communicated and distributed to appropriate personnel.
- d) Note that there are additional qualifications required for welders and welding inspectors.
- e) Note that there are additional qualifications required for plastic pipe joining.
- f) See Appendix B for more information.

6.2 In Progress-Construction

- a) Ensure that qualified company personnel or contractor personnel, not involved in the actual construction task, have responsibility for the oversight of the construction task.
- b) Conduct Performance Audits of various tasks during the actual time that the work is being performed.
- c) Conduct Construction Inspections that are frequent enough to encompass most of the new facility installation.
- d) Conduct targeted inspections that focus on one key item at a time.
- e) Be on site during the performance of predetermined critical tasks until an acceptable level of competency and Quality has been demonstrated. Consider informing the contractor not to proceed with certain activities until an appropriate Company Representative is on-site.
- f) If there is a change in personnel in the construction crew, the qualifications should be re-verified.
- g) If there is a change in the operator qualification status of personnel during construction, the appropriate Company Representative must be notified.
- h) See Appendix C for more information.

6.3 Post-Construction

- a) Ensure that the documentation of the construction activity is accurate and complete.
- b) Consider post installation excavations if work was not subject to oversight during construction.
- c) Conduct Field Verification Audits after the field work is completed for specific tasks.
- d) See Appendix D for more information.

The Performance Audits, Construction Inspections and Field Verification Audits are samples of the Assessments. The goal of the Assessment and Construction Oversight is to find the areas that need improvement.

In addition to the Assessments, the Company should conduct Quality bi-weekly meetings to discuss trends and progress during the construction season. Continuous Improvement in the people, process and technology is the goal of everyone involved in the installation or new construction.

7.0 STANDARDS, QUALIFICATIONS AND GUIDELINES

7.1 Performance Standards

Standards are the criteria against which the performance of an installation activity or task is measured. The performance standards used to perform an Assessment may include:

- a) The applicable Liberty Utilities Gas Operations and Maintenance Procedures
- b) The applicable Liberty Utilities Gas Operations Construction Standards
- c) All Work Package Items prepared specifically for the installation
- d) Any Liberty Utilities issued Gas Operations Bulletin or Product Advisory
- e) Any Liberty Utilities prepared System Operating Procedure
- f) Any PHMSA issued Advisory Bulletin
- g) Any internal plan, program or procedure developed by the contractor
- h) Any Settlement Agreement with the NHPUC Safety Division
- i) Any Consent Agreement with the NHPUC Safety Division

Pursuant to the Consent Agreement in PS1202LU dated May 13, 2014, Liberty Utilities must incorporate into its Quality Management Program, the importance of following the Welding Policy and Procedures.

The New Hampshire Welding Policy and Procedures can be found in Section 4.0 of the Company on-line O&M Manual.

7.2 Qualifications

Prior to working on the Liberty Utilities gas distribution and transmission systems, all contractors must be trained, qualified and have a complete understanding of the assigned tasks.

When Liberty Utilities employs a contractor to perform tasks which are covered by the PHMSA and NHPUC Operator Qualification regulations, the contractor will either be qualified under the Liberty Utilities Operator Qualification Plan or the contractor's own plan. The contractor's plan will be kept on file after it is reviewed and approved by Liberty Utilities to ensure that the contractor's plan meets all requirements. For additional information, see Appendix D, Section 2.5 of the Liberty Utilities Operator Qualification Plan.

7.3 Technical Understanding

The Company representative performing the Assessment should have a basic technical understanding of the activity that will be assessed. This understanding includes knowing the basic steps of the installation and the job duties of the contractors involved in the steps.

An understanding may be obtained by: (1) reading prior Assessment reports, (2) discussing the work assignment with others or (3) formal training.

7.4 Conduct

The Company representative performing the Assessment will follow guidelines as defined in the Liberty Utilities U.S. Employee Manual (Section 300: Code of Conduct).

The Guidelines include:

- (a) Be prudent in the use of information acquired in the course of the duties.
- (b) Use reasonable care to obtain sufficient, factual evidence to support conclusions.
- (c) Reveal any material fact which, if not revealed, could distort the report or conceal a practice.
- (d) Continually strive for improvement in safety, proficiency, and Quality.

7.5 Work Package Checklist

Processing Gas Main Work Packages ENG1 dated November 30, 2015, requires record keeping associated with planned work on certain gas facilities. Under this procedure, Field Operations Construction is required to complete a gas Main Work Package Checklist. Note that this checklist is in addition to the three (3) Oversight Forms referenced in this Quality Management Program.

7.6 Pending PHMSA Regulations on Construction Inspections

On March 11, 2015, PHMSA issued a Final Rule amending 49 CFR Part 192.305 pertaining to construction inspections.

On September 30, 2015, PHMSA issued a Stay of Enforcement until the Construction Inspection Advisory Group finishes its work. This Group is preparing additional guidance for operators. Once the guidance is issued and the Rule is effective, Liberty Utilities will adjust this Quality Management Program as it relates to the inspection process.

8.0 DATA COLLECTION

8.1 All Assessments will be documented by the Company representative and returned to the Manager, Field Operations Construction or designee. Each construction job should have dedicated forms.

Examples of data to collect are:

- a) a narrative description of the activity observed
- b) a completed checklist
- c) copy of the procedures
- d) photographs of the installation
- e) training records
- f) work packages
- g) operator qualification records
- h) interviews
- i) tools & materials

8.2 The Company representative shall use detailed forms incorporating activity checklists prepared to cover normally performed work activities for evaluation or inspection of specified field work and construction.

8.3 At year end, the Manager, Field Operations Construction (or designee) will prepare a Quality Management Program Summary and discuss the results with the contractors.

8.4 The Company encourages the use of technology to minimize the use of paper forms.

8.5 The Company will conduct a trend analysis and publish metrics on a regular basis to establish contractor performance levels. The Company will ensure that the contractor receives timely feedback on performance and that measures are in place to ensure accountability.

9.0 CORRECTIVE ACTIONS

9.1 The Manager, Field Operations Construction (or designee) will determine the appropriate corrective action after consulting with the Director, Gas Operations.

Corrective Action decisions may be based on some of the following factors:

- a) the level of risk involved
- b) recent trends
- c) installation complexity
- d) visibility
- e) volume
- f) past history
- g) recent revisions
- h) photo documentation
- i) pavement restoration

9.2 The audit and inspection findings shall be used to implement changes in procedures, training and work practices.

9.3 The Company representative should recognize when multiple errors are committed by the contractor or by Liberty Utilities. An error made in a previous installation could reoccur in the next installation if not addressed properly as a Lesson Learned. The error could be in the design, training, qualification, execution, supervision or overall management of the installation.

The errors could be a result of:

- a) team performance breakdown
- b) inaccurate expectancies
- c) not adhering to procedures
- d) misinterpreting absent information.

11.0 REFERENCES

- a) Federal Code 49 CFR 192 - Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards
- b) New Hampshire Code of Administrative Rules - Puc 500 Rules for Gas Service
- c) New Hampshire Code of Administrative Rules - Puc 800 Rules – Dig Safe
- d) New Hampshire PUC Safety Division Enforcement Actions and Compliance Agreements
- e) Settlement Agreement - Gas Operations Requirements and Conditions dated May 30, 2012
- f) Liberty Utilities Operations and Maintenance Manual
- g) Liberty Utilities Construction Standards
- h) Liberty Utilities Operator Qualification Plan
- i) Liberty Utilities U.S. Employee Manual
- j) AGA White Paper Contractor Construction Quality Management Guide dated November 22, 2016

11.0 ADMINISTRATION

- a) Liberty Utilities Quality Management Program Executive Sponsor: *Craig Jennings*
- b) Liberty Utilities Quality Management Program Owner: *Rich MacDonald*
- c) Liberty Utilities Quality Management Program Administrator: *Paul Shea*

12.0 REVISION HISTORY

This Program will be reviewed annually and will be submitted to the NHPUC Safety Division within ten days of completion of the annual review.

The Program was finalized and made effective on April 1, 2013.

| Date | Rev # | Description | Lead/Author |
|----------|-------|---------------------------------------|-------------|
| 4/1/2013 | 0 | Initial Document | Leo Cody |
| 4/1/2014 | 1 | Annual Review #1 | Leo Cody |
| 4/1/2015 | 2 | Annual Review #2 | Leo Cody |
| 4/1/2016 | 3 | Added Sections 7.5, 7.6 and 8.3. | Leo Cody |
| 6/1/2016 | 4 | Incorporated NH Gas into the Program. | Leo Cody |
| 4/1/2017 | 5 | Added 10 (j) and 13. | Leo Cody |

13.0 DEVIATION

Should circumstances prevent Liberty Utilities staff from completely following any policies or procedures in this Plan, prior approval is needed from the Quality Management Program Owner. The reason for the deviation must be documented.

Appendix A: PHMSA 49 CFR Part 192 and NHPUC 500 Rules

49 CFR Part 192 prescribes the minimum safety requirements for pipeline facilities and the transportation of gas and generally addresses the design, construction, operations and maintenance of natural gas pipelines and related facilities.

One of the critical elements for quality construction is verifying the pipeline is installed in accordance with pipeline safety regulations and the operator's own design specifications, policies, and procedures.

A pipeline built in this manner increases the probability of it providing safe and reliable service for an extended period of time.

Below are some of the minimum requirements.

| Section | Subject | Requirement |
|------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 192.13 | General Requirements | Requires that: "No person may operate a segment of pipeline unless (a)(1) the pipeline has been designed, installed, constructed, <i>initially inspected</i> , and initially tested in accordance with this part ." |
| 192.303 | General Construction Requirements and Compliance with Specifications or Standards | Requires that: "Each transmission line or main <i>must be constructed</i> in accordance with comprehensive written specifications or standards that are consistent with this part." |
| 192.305 | Inspection: General (Pending) | Current Language requires that: "Each transmission line or main <i>must be inspected</i> to ensure that it is constructed in accordance with this part." Revised Language requires that: Each transmission line and main must be inspected to ensure that it is constructed in accordance with this subpart. An operator must not use operator personnel to perform a required inspection if the operator personnel performed the construction task requiring inspection. Nothing in this section prohibits the operator from inspecting construction tasks with operator personnel who are involved in other construction tasks. |
| 192.307 | Inspection of Materials | Requires that: "Each length of pipe and each other component <i>must be visually inspected</i> to ensure that it has not sustained any visually determinable damage that could impair its serviceability." |
| 192.605 | Procedural Manual For Operations, Maintenance, and Emergencies | Requires that: "Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response." |
| 192.613 | Continuing Surveillance | Requires that: "Each operator shall have a procedure for continuing surveillance of its facilities." |
| Puc 506.01 | Pipeline Safety Standards | Various |
| Puc 506.02 | Construction, Operations and Maintenance | Various |

Appendix B: Pre - Construction Oversight Suggested Guidelines

1. Ensure the Work Package is complete and accurate.
 - a) Identify the Scope of Work.
 - b) Identify the applicable O&M procedures.
 - c) Ensure the necessary permits are in place.
 - d) Identify the high risk items and critical installation activities.
 - e) Identify the emergency shutdown locations and control valves.
 - f) Identify the tools and materials needed to be provided by the Company.
 - g) Identify the tools and materials needed to be provided by the Contractor.
 - h) Inspect the existing gas facilities:
 - Number of inside meters to be relocated outside
 - Meter Protection
 - Meter and Riser Brackets
 - Locks and Plugs
2. Review the Job with the Contractor and both sign off.
 - a) Discuss crew selection.
 - b) Discuss sub-contractors, if any.
 - c) Verify the Operator Qualifications.
 - d) Discuss the work schedule.
 - e) Handoff the Work Package.
 - f) Walk the job site limits.
 - g) Document with photos, if necessary.
 - h) Coordinate the pre-mark.
 - i) Coordinate the mark-out.
 - j) Inspect the materials to be installed by the contractor.
 - k) Inspect the equipment to be used by the contractor.
3. Conduct Weekly Planning Meetings With the Contractor (May Discuss Multiple Jobs at This Meeting).
 - a) Discuss the high risk items and critical activities.
 - b) Review the work schedule.
 - c) Prioritize the work schedule.
 - d) Discuss logistical concerns (Paving).

Notes:

1. The qualifications and training records for all of the contractor crews and contractor supervisors must be verified prior to April 1st each year (or the start of the construction season). Any new contractor employees added after April 1st will be verified before they begin work for the Company.
2. Non-gas customers situated within the limits of the construction activity will be notified and will have the ability to become gas customers during the construction.

Appendix C: In Progress - Construction Oversight Suggested Guidelines

1. Ensure a Job Briefing was conducted and understood.
2. Reinforce the same Quality messages with any sub-contractors.
3. Identify the Competent Person on the job site.
4. Inspect the previously identified high risk items.
5. Inspect the previously identified critical installation activities.
6. Recognize and react to any specific abnormal operating conditions.
7. Ensure the SOP is available on-site and is being followed.
8. Ensure the applicable written procedures are available on-site and are being followed.
9. Conduct Construction Inspections that are frequent enough to encompass most of the new facility installation.
10. Conduct Performance Audits which consist of various tasks of which a representative sample are evaluated during the actual time that the work is being performed.
11. Conduct Performance Audits on different crews to ensure that all personnel are reviewed and inspected regularly.
12. Perform targeted inspections, as appropriate.
13. Verify the proper attachments to existing meter bars, proper plugging and sealing of meter sets that have been removed and proper protection from damage. (See PS1203LU)
14. Inspect the materials, especially the dates on plastic pipe and plastic fittings.
15. Inspect the equipment, especially calibration records.
16. Inspect the tools.
17. Inspect the markouts.
18. Document with photos, if necessary.
19. Communicate any interactions with the NHPUC Safety Division Inspectors.
20. Follow-up on the Corrective Actions.

Note:

After March 11, 2015, a person must be requalified after any production joint is found unacceptable by testing under 49 CFR Part 192.513. (See 49 CFR Part 192.285(c)).

Appendix D: Post - Construction Oversight Suggested Guidelines

1. Ensure the finished Work Package documentation is complete and accurate.
2. Walk the finished job site to check for debris, equipment, materials, etc.
3. Inspect the pavement restoration.
4. Review the Stock Sheet to confirm what materials were actually installed.
5. Conduct Field Verification Audits of which a representative number are conducted after field work is completed for specific tasks.
6. Ensure the Main Cards are accurate.
7. Ensure the Service Cards are accurate.
8. Documentation – Work Package Completion Checklist.
9. Complete the required Quality reports.
10. Identify any lessons learned, new high risk items or critical installation activities for future jobs.
11. Implement the changes to the procedures, training or work practices identified during the Assessments that require Corrective Actions.
12. Correct any mapping errors.
13. Verify that the material traceability requirements were followed.
14. Document any Methane Challenge Program mitigation actions.