SECTION 8, OPERATIONS AND MAINTENANCE

8.200 ODORIZATION OF GAS

1.0 SCOPE

1.1 The following establishes policies and procedures for the operation and maintenance of odorization equipment and testing odorant concentration levels in the NYSEG and RGE natural gas transmission and distribution systems.

2.0 REFERENCES

2.1 16 NYCRR Part 255.625
2.2 49 CFR Part 192.625 and Part 192.803
2.3 AGA Odorization Manual, 2000
2.4 Odorant Release Response Plan
2.5 ASTM D6273 (Standard Test Methods for Natural Gas Odor Intensity)

3.0 ACRONYMS

3.1 Abnormal Operating Condition (AOC)
3.2 Certificate of Analysis (COA)
3.3 Energy Control Center (ECC)
3.4 Hydrogen Sulfide (H2S)
3.5 Lower Explosive Limit (LEL)
3.6 Safety Data Sheet (SDS)
3.7 Odorant Concentration Test (OCT)
3.8 Operator Qualification (OQ)
3.9 Supervisor Control and Data Acquisition (SCADA)
3.10 Tertiary Butyl Mercaptan (TBM)
3.11 Tetra Hydro Thiophene (THT)
3.12 Threshold Detectable Limit (TDL)
3.13 Readily Detectable Limit (RDL)

4.0 DEFINITIONS

4.1 Abnormal Operating Condition: A condition as defined by Part 192.803 and as identified in the Company's Operator Qualification Program.
4.2 Bypass Odorizer: A type of vaporization odorizer where gas flows over a tank of liquid odorant that vaporizes into the dry gas stream.
4.3 Cloud Point Test: The temperature of a fluid (odorant) at which dissolved solids are no longer completely soluble, precipitating as a second phase giving the fluid a cloudy appearance.
4.4 Deleterious: Harmful to health.

4.5 Fading: The act of diminishing the smell of the odorant due to adsorption within the pipe wall or due to other contaminants.
4.6 Gas Chromatography: A test method used to analyze the chemical composition of natural gas.
4.7 Injection Style Odorizer: An odorizer that injects liquid odorant directly into the pipeline. YZ and Zeck units are example types of injection odorizers.
4.8 LEL: Natural gas is five percent gas in air.
4.9 Masking: The act of hiding the smell of odorant without reducing the actual odorant concentration.
4.10 OCT: A quantitative test to determine the odorant concentration level of the gas using an odorant concentration meter. This device measures the amount of gas, in a gas-air-mixture, that is required to produce a RDL.
4.11 Readily Detectable Limit: The point at which one recognizes an odor as a natural gas odor.
4.12 Threshold Detectable Limit: The first indication of a slight but recognizable change in odor.
4.13 Wick Odorizer: A type of vaporization odorizer that uses a cloth wick to bring odorant up into the pipeline where it vaporizes into the dry gas stream.

5.0 RESPONSIBILITIES

5.1.1 Division Gas Operations is responsible forCoordination of sampling and chemical analysis of natural gas and odorant.
5.1.2 Completing periodic OCT as described in this procedure.
5.1.3 Coordination of Ad-hoc OCT tests. .
5.1.4 Company odorizer inspection, operation and maintenance.
5.1.5 Completing periodic OCT as described in this procedure.
5.1.6 Ensuring that remedial action is taken to correct identified deficiencies
identified.
5.1.7 Ensuring adequate odorant tank levels are maintained..
5.1.8 Maintaining OCT locations within the gas network

5.2 Division Gas Engineering is responsible for:
5.2.1 Developing supplemental odorization procedures for main extensions and replacements where it is anticipated current odorization methods may not provide an acceptable quantitative test indication or reading.

5.3 Gas System Planning is responsible for:
5.3.1 Supporting Division Engineering and Gas Operations with supplemental odorization procedure(s) and method(s).

5.3.2 Periodically reviewing OCT locations with applicable input from Division Operations and Division Engineering as a result of significant system changes such as: new system installations, existing system expansion or significant changes to system operating conditions.

6.0 GENERAL

6.1 All gas transported in the transmission and distribution system shall be adequately odorized so as to render it readily detectable by the public and employees of the operator at all gas concentrations of one tenth of the LEL and above.

6.1.1 One tenth of the LEL is equal to 0.5 percent gas in air.

6.2 Odorizer and system inspections ensure that:

6.2.1 All odorizing equipment is functioning properly.

6.2.2 Gas in the transmission and distribution system can be readily detectable by the normal sense of smell.

6.2.3 Gas in the transmission and distribution system that cannot be readily detectable by the normal sense of smell is an AOC and the requirements of Section 10.0 apply.

7.0 EQUIPMENT

7.1 Where supplier gas is not odorized in accordance to Step 6.1, NYSEG & RGE odorizing equipment shall be installed to ensure reasonably uniform odorization under varying gas flow conditions. The equipment shall also be installed so that it does not cause a nuisance to nearby residents by the escape of odorant fumes.

7.2 All injection style odorizer stations shall be inspected for condition and operation once each week and documented in accordance Section 12.2 of this procedure , except under conditions identified in steps 7.2.1. Documentation shall be of either paper or electronic medium.

7.2.1 When not in operation or in stand-by, injection style odorizer stations shall be inspected at least once each month (or on a more frequent basis as determined by the Division Gas Supervisor).

7.3 All wick or bypass style odorizers shall be inspected for condition and operation monthly (or more frequent basis as determined by the Division Gas Supervisor) and documented in accordance with Section 12.2 of this procedure. Documentation shall be of either paper or electronic medium. Odorization equipment shall be maintained in accordance with the manufacturer's requirements.

7.4 Odorizers shall be operated to maintain a readily detectable limit greater than or equal to 0.05 percent to should not exceed 0.40 percent gas in air. At no time shall the readily detectable limit exceed 0.50 percent gas in air.

7.4.1 All OCT readings outside this range shall be reported immediately to the Gas Supervisor.

7.4.2 Appropriate remedial actions shall be initiated to assess the situation and correct any deficiencies in accordance with Step 10.0.

7.5 Injection style odorizers shall be connected to the SCADA system with established alarm data points that are used to confirm the odorizer is functioning.

7.5.1 Division Gas Operations Supervisor shall be immediately notified of any flow/no-odorant-injection or no-flow/odorant-injection conditions.

7.5.2 Investigation and remediation shall be in accordance with Step 10.0.

7.6 An odorant concentration meter shall be used when completing quantitative odorant concentration tests.

7.6.1 The meter shall be calibrated at an interval not exceeding 2 years.

7.6.2 The plastic sample tubing (non-rubber based or according to manufacturer's instruction) shall be checked for odorant saturation prior to performing an OCT. If an odor is detected in the tubing, it shall be replaced prior to using the meter

7.6.3 Sample tubing shall be replaced on a periodic basis according to manufacturer requirements. Tubing should be Tygon or an equivalent manufacturer approved material.

8.0 ODORANT

8.1 The odorant shall not be deleterious to persons, materials, or pipe in the diluted concentration following introduction into the gas system.

8.2 The products of combustion from the odorant shall not be toxic when breathed nor corrosive or harmful to those materials to which the products of combustion will be exposed.

8.3 The odorant shall not be soluble in water to an extent greater than 2.5 parts to 100 parts by weight.

8.4 The Company shall maintain an SDS for each odorant utilized at a Company odorizer location.

8.5 The Company shall maintain a copy of the odorant suppliers COA for each odorant shipment

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8.5.1 The COA shall include a cloud point test less than 50 degrees Fahrenheit for each odorant shipment.

8.6 Liquid injection odorizers shall use a mercaptan blend odorant such as Spotleak 1009, Scentinel E, or other equivalent odorants.

8.7 Bypass and wick odorizers shall use:

8.7.1 A mercaptan blend Spotleak 1009, Scentinel E, or other equivalent odorants, or

8.7.2 THT odorant such as Spotleak 1013,Scentinel T, or Penodorant 1063.

9.0 ODORANT CONCENTRATION TESTING

9.1 OCT to measure the numerical amount of gas in air required to produce a readily detectable limit are completed using a calibrated odorant concentration meter to confirm the proper operation of each Company odorizer or source of odorized gas received by the Company.

9.1.1 Division Gas Operations shall complete weekly not to exceed 10 days OCT at identified locations across the gas system.

9.1.2 Weekly testing shall include OCT at system test points on a rotational basis such that all system test points are completed on a monthly basis (31 day period).

9.1.3 Ad-hoc testing at system locations or frequencies other than specified in in Steps 9.1.1 and 9.1.2 shall be documented and maintained in accordance with Step 11.0.

9.2 OCT locations shall be identified to provide representative odorant concentration with the Division gas system.

9.2.1 OCT locations shall generally be located at a point that is the longest pipe flow path from the odorizer location(s) being evaluated.

- For medium pressure or gas systems with a radial type configuration the farthest away dead end is a typical location for a test point.
- For low or medium pressure looped gas systems the middle of flow is a typical location for a test point.
- For multiple feed piping configurations, consideration should be given to which pressure system represents the longest flow path.
- For large interconnected gas systems supported by multiple odorizers, consideration should also be given to test towards the extents of the gas system.

9.2.2 OCT locations shall be protected as much as practicable from strong winds or other local conditions that could influence test results.

9.2.3 Testing locations shall never be located:
- Where liquid odorant is stored or handled.
- Where other strong odors exist which could influence test results.

9.3 Results of each OCT completed shall be recorded on the Odorant Concentration Test Form 8200B in accordance with Section 12.3 of this procedure, , or on a recording odorant concentration meter to document the time, date, location, qualified personnel ID, equipment serial number TDL, and RDL. Documentation shall be of either paper or electronic medium.

10.0 REMEDIAL ACTIONS

10.1 In abnormal situations such as an increase in odor calls resulting in no leaks found potentially indicates excessive odorant being placed in the pipeline. In this event the following actions should be considered and taken as necessary:

10.1.1 Division Gas Operations shall monitor the number and location of odor complaint calls for unusual trends.

10.1.2 Mapping the location of odor calls in order to determine the extent of the abnormal condition or odorizer causing the problem.

10.1.3 Verifying proper operation of the odorizer and any alarm conditions through SCADA and identify remedial actions.

10.1.4 Confirming proper odorizer operation and instituting appropriate remedial actions

10.1.5 Making adjustments to the gas system pressures and flows to limit the amount of gas being delivered from a malfunctioning odorizer.

10.2 In the event an insufficient odorization condition is observed in the gas system, Division Gas Operations shall implement the following actions as appropriate:

10.2.1 Dispatching a qualified person to the odorizer to verify proper operation and make immediate adjustments and repairs.

10.2.2 Taking additional quantitative OCTs in order to determine the scope of the problem.

10.2.3 Installing temporary supplemental odorization equipment.

10.2.4 Taking bag samples to be analyzed for sulfur compounds. Presence of sulfur compounds without odor indicates that odorant is in the gas, but is being chemically masked.

10.2.5 Making adjustments to gas system flow and pressure to shut in (preferred) or minimize the amount of inadequately odorized gas delivered.

SECTION 8, OPERATIONS AND MAINTENANCE

11.0 RECORDS

11.1 Odorizer Inspection data in Section 12.2 of this procedure shall be reviewed by Division Gas Operations and maintained in the Companies record system.

11.2 The Odorant Concentration Test Form 8200B in Section 12.3 of this procedure , or the odorant concentration meter downloads shall be reviewed by Division Gas Operations and maintained in the Companies record system.

11.3 Each Division Supervisor shall maintain inspection records that identify the odorants used, the ratios of odorant to gas, and the locations of odorizer stations. These records shall be retained at the district office responsible for the odorizer equipment.

12.0 RECORDS DATA

12.1 Some data points may not be applicable for all installations. Where specific equipment is not installed or the inspection is not applicable, inspection data will not be collected or maintained in the Companies record system.

12.2 Odorizer Inspection

Reference Number	Data Point	Data Record
1	Date and Time of Inspection	Select Date and Time
2	Inspector	Inspectors U ID number
3	Inspector Name	Inspectors Name
4	Division	Select Division
5	Town	Select Town
6	Odorizer	Odorizer Name
7	Odorizer Model#	Model #
8	Odorizer Manufacture	Odorizer Manufacture
9	Odorant Visible in Sight Glass	Yes / No / N/A
10	Odorizer Leak Check	Ok /Not Okay
11	Odorizer Operating within Parameters	Yes / No
12	Wick Inspection	Ok / Not Okay / N/A
13	Do you need to create a	Yes / No

	Maintenance Order?	
13a	If yes to (13), Needing to create a Maintenance Order.	Complete Mainenance Order 7600. Ref O&M Procedure 7.600 Priorites for Correcting Deficiencies Found During Surveys and Inspections.
14	Additional Comments	Text Box

12.3 Quantitative Odorant Concentration Test 8200B

Reference Number	Data Point	Data Record
1	Inspector	Inspector U ID number
2	Date	Select Date
3	Division	Select Division
4	Town	Select Town
5	Location	Select Test Location
6	DTEX Serial Number	Select Detex Serial Number
7	Last Calibration Date	Date Last Calibrated
8	Calibration Due Date	Date Calibration Due
9	Odorometer Read Quantitative/Threshol d Level % Gas in Air	Quantitative Threshold Reading
10	Odorometer Read Quanitative / Readily Detectable % Gas in Air	Quantitative Readily Detectable Reading
11	Warning Are Readily Detectable levels in (9 or 10) Less than .05 or Greater than .4. Was it an incorrect value?	Yes / No
11a	If yes to (11), then Immediate notification to District Gas Supervisor is required for readily detectable levels.	Notifiy Supervisor
10	Additional Comments	Text Box