

APR CONSULTANTS

FAILURE INVESTIGATIONS, PIPELINE SAFETY CONSULTING AND TRAINING SINCE 1983

302 IVY LANE
P.O. BOX 1188
DICKINSON, TEXAS 77539

281.337.6700

281.337.6700
FAX 281.337.3582
aprcompany@aol.com

EVALUATION AND AUDIT REPORT

OF

QUESTAR GAS COMPANY

180 EAST 100 SOUTH

SALT LAKE CITY, UTAH

MAY 29, 2009

**APR Consultants
Sammy Russo, President
Pipeline Safety Consultant**

APR Consultants does not warrant that the materials contained in this report satisfy all of the requirements applicable to your operations. You must review in detail the various sections of this report to ensure they satisfy the legal, operations and safety requirements applicable to your operating system. Your acceptance and use of this report in whole or in part gives rise to an obligation on your part to defend and indemnify APR Consultants or any persons or entities related thereto from and against any claims or suits brought against you and/or APR Consultants in connection with operations on your system arising out of allegations that the report is not adequate regardless of the sole or concurrent negligence of APR Consultants in issuing this report.

Introduction

I was asked to provide an independent and objective analysis/audit of Questar Gas Company ("Questar," "company" or "operator"), specifically Questar's "practices, procedures, and training in the event of an alleged natural gas leak." The audit was accomplished in three phases. First, documents applicable to a natural gas leak event were requested from Questar as well as additional documents, procedures, and records which should be generated in the normal course of business by a gas distribution operator. These documents were reviewed to prepare for the second phase of the audit, a five day on-site inspection, during which a representative sample of gas distribution personnel were interviewed. Individuals interviewed ranged from an Operations Representative 3 to the Vice President of Operations who reports to the CEO/President of the company. Each individual was asked a variety of questions about their duties, responsibilities, and experience with natural gas distribution. Particular questions were designed to verify that individuals have the knowledge, experience, and skills commensurate with comparable gas industry professionals. Many questions were hypothetical representations of real industry day-to-day issues that required individuals to apply their knowledge and experience. Frequently, these questions prompted discussions of how Questar had addressed and solved the same or similar situations in the past.

During the interviews, I was provided all of the information and source documents requested and it appeared that all interviewed personnel attempted to answer the questions fully and to the best of their ability. At my request, Questar's attorney was present for all of the interviews and had the opportunity to restrict an employee's answer or refuse to provide the requested documents. There was not a single restriction placed on any question, answer, or document request.

The third phase of the audit focused on analyzing, comparing, and validating the collected data. Procedural information was validated by information derived from the interview process, inspections of random portions of the gas system, and by comparing parallel procedures in the Operations, Maintenance and Emergencies (O, M & E) Manual and training documents. Questar procedures were further evaluated using the Guide for Gas Transmission and Distribution Piping Systems ("GPTC Guide"), 2009 Edition, published by the Gas Piping Technology Committee (GPTC) Z380 and approved

by the American National Standards Institute, which offers "best practices" guidance information, and the O, M & E Manuals/Emergency Plans of at least five other gas distribution operators. The selected operators are of comparable size or larger than the Questar gas distribution system. The Operator Qualification Program was evaluated using the DOT (now PHMSA) Operator Qualification Inspection Form 14 (Rev. 6) dated December 15, 2008, and the Operator Qualification Programs of a number of comparable gas distribution operators.

As part of the audit process, inspections were conducted of Questar's company headquarters, central call center, service vehicles, equipment, emergency stores, warehouse storage, measurement shop, training center, and various other company facilities. The inspections verified that the resources identified in the interviews were available for the operations, maintenance, emergency response, and training practices conducted by the company.

Qualifications

The experience and qualifications that render me competent to conduct this audit and to issue professional opinions and recommendations are detailed in the following paragraphs and in my curriculum vitae, a true and correct copy of which appears at the end of this report.

I am a pipeline safety consultant engaged in the business of auditing pipeline operators and in conducting pipeline incident investigations. Over the past 20 years, I have conducted hundreds of audits and/or investigations of pipeline operators, which include gas distribution systems, master meters, transmission, hazardous liquids, highly volatile liquids, and liquefied petroleum gas facilities. The evaluations/investigations include, but are not limited to, regulatory compliance with federal and state pipeline safety regulations, operations, practices, procedures, policies, system maintenance records, O & M Manuals, emergency plans, unaccounted for gas, operator qualification programs, safety, training, damage prevention, and operator/contractor oversight.

Since 1990, as an associate staff member of the Transportation Safety Institute (the training arm of the U.S. Department of Transportation), I have trained federal and state pipeline safety inspectors in the science of conducting failure investigations to determine probable cause. I possess a knowledge and understanding of pipeline safety regulations and the industry practices that pipeline operators implement to comply with the U.S. Department of Transportation (DOT, now PHMSA) and state regulatory agencies. PHMSA promulgates the federal regulations governing pipeline safety and individual states generally adopt the federal regulations and supplement additional state regulations. Such is the case with the State of Utah through the Utah Public Service Commission, Division of Public Utilities ("Commission"). The federal rules, which apply and are enforced by the Commission, are found in Title 49, Code of Federal Regulations, Part 191 - Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, Part 192 - Transportation of Natural and

Other Gas by Pipeline: Minimum Federal Safety Standards, and Part 199 - Drug and Alcohol Testing. The state rules are found in the Utah Administrative Code Title R746 Rule 402 - Rules Governing Reports of Accidents by Electrical, Gas, Telephone, and Water Utilities, Rule 409 - Pipeline Safety, and Utah Code Title 54 Chapter 08a - Damage to Underground Utility Facilities and Chapter 13 - Natural Gas Pipeline Safety.

The evaluation of a pipeline operator is a complex process which requires an understanding and interpretation of the regulations, an understanding of how the operator and industry comply with the regulations, and a detailed evaluation of the company's operations, practices and procedures as they apply to the regulations. Pipeline safety regulations establish minimum standards that an operator must meet. "Industry practices" identifies a range of operations, practices and procedures which are used by the industry to comply with the regulations. Without an understanding of the regulations, industry practices, and a company's operations, practices and procedures, an accurate assessment of that company's compliance cannot be determined. All of these factors were considered when formulating the opinions and recommendations offered in this report.

Scope of Work

The Scope of Work for this audit was described and performed as follows.

1. Consulting Services
 - (a) Consultant shall provide the Commission with confidential professional consulting services (Services) for an independent and objective analysis of Questar Gas Company's practices, procedures, and training to address the following items in the event of an alleged natural gas leak:
 - (i) Emergency call processing and response procedures;
 - (ii) Emergency evacuation procedures;
 - (iii) Scene control procedures;
 - (iv) Natural gas migration; and
 - (v) Training and qualification procedures for the above items.
 - (b) In performing the Services, Consultant shall:
 - (i) Review Questar Gas Company's current practices, procedures, and training regarding the five above-referenced items.
 - (ii) Technically evaluate Questar Gas Company's current procedures in the five specified areas compared to applicable federal and state laws, rules, and regulations;
 - (iii) Technically evaluate Questar Gas Company's current procedures in the five specified areas compared to existing industry standards of similarly situated natural gas distribution utilities of similar size, serving approximately

- 870,000 commercial and residential customers in the Western United States; and
- (iv) Recommend any changes and estimated implementation costs to Questar Gas Company's procedures that are consistent with procedures of similarly situated natural gas distribution utilities in the Western United States.

Materials Reviewed

During the course of the audit, the following Questar documents were reviewed and evaluated.

1. Emergency Call Processing and Response Procedures
 - ◆ Questar Gas Emergency Plan
 - Section II: Emergency Pre-Planning (Section 4, paragraph 4.4)
 - Section III: Assignment of Responsibilities (Section 4)
 - Section IV: Handling and Evaluating Emergency Calls (All)
 - Section V: Controlling Emergency Situations (All)
 - ◆ Questar Technical Service Policies and Procedures
 - 02-00-01 – Emergency Call Procedures (All)

2. Situations Requiring Evacuation
 - ◆ Questar Gas Emergency Plan
 - Section I: Introduction (Section 10, subparagraph 10.2.1(a))
 - Section IV: Handling and Evaluating Emergency Calls (Table – Emergency Call Checklist)
 - ◆ Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (All)

3. Scene Control
 - ◆ Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (All)
 - ◆ Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (Section 7)

4. Natural Gas Migration
 - ◆ Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (Section 2, subparagraph 2.7.1)
 - ◆ Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (Section 3, paragraph 3.7; Section 7, subparagraph 7.1.5; Section 11, paragraph 11.4)

5. Training and Qualification (For above)
 - ◆ Questar Technical Service Policies and Procedures
 - 02-00-01 – Emergency Call Procedures (All)
 - ◆ 2008 New Operations Employee Construction Orientation School
 - Emergency Plan, Section V (Reviewed with employees and written test)
 - Emergency Plan Written Evaluation
 - Underground Leak Repair Procedure (Evacuation Policy) – Review of Standard Practice 3-75-01 (With discussion of gas migration during review of check list)
 - Blow down, Purging, and Repair of Broken Natural Gas Lines
 - ◆ DOT Operator Qualification – Quality Assurance Review
 - Questar Gas Company DOT Operator Qualification Program
 - ◆ Physical Properties of Natural Gas PowerPoint Training Presentation
 - Physical Properties Training Outline
 - Physical Properties Written Evaluation
 - ◆ Abnormal Operating Conditions PowerPoint Training Presentation
 - Abnormal Operating Conditions Module 42
 - Abnormal Operating Conditions Training Outline
 - Abnormal Operating Conditions Written Evaluations
 - ◆ Leak Detection and Survey
 - Leak Detection
 - Leak Training Bulletins
 - Leak Detection Module 47
 - Leak Detection Training Outline
 - Leak Detection and CGI Operation Written Test
 - Flame Ionization Detector Written Test
 - Operator Qualification Observation Forms
 - Leak Survey
 - Leak Survey PowerPoint Training Presentation
 - Leak Survey Training Outline Module 10
 - Questar Standard Practice
 - 4-65-02 – Conducting Instrumented Leak Surveys
 - Emergency Response
 - Emergency Response Module 62
 - Emergency Response Training Outline
 - Emergency Response Written Evaluation
6. Operations and Maintenance Manual
 - ◆ Questar Operations and Maintenance Plan
 - Section A – General Scope
 - Section B – Transmission System
 - Section C – Feeder Line System
 - Section D – Distribution System
 - Section E – Maximum Allowable Operating Pressure
 - Section F – Compressor Stations

- Section G – Pressure Limiting and Regulating Stations
 - Section H – Vault Maintenance
 - Section J – Investigation of Failures
 - Section K – Corrosion Control
 - Section L – Class Location Inspections
 - Section M – Uprating Procedures
 - Section N – Emergency Plan and Public Awareness Plan
 - Section O – General Safety Practices and Procedures
7. Emergency Plan and Damage Prevention Plan
 - ◆ Emergency Plan
 - Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (All)
 - ◆ Damage Prevention Plan
 - Questar Standard Practice
 - 5-00-07 – Underground Facilities Damage Prevention Program (All)
 - Questar Operations and Maintenance Plan
 - Section N – Emergency Plan and Public Awareness Program (Section 3)
 8. Program for Liaison with Public Officials
 - ◆ Questar Gas Emergency Plan
 - Section XI: Liaison with Appropriate Public Officials (All)
 - Section IV: Handling and Evaluating Emergency Calls (Section 4, subparagraph 4.2.2(b))
 - Section V: Controlling Emergency Situations (Section 6)
 9. Public Awareness Plan
 - ◆ Questar Gas Public Awareness Program
 - Streamline (Per API RP 1162)
 - ◆ Questar Operations and Maintenance Plan
 - Section N – Emergency Plan and Public Awareness Program (Sections 3 & 4)
 10. Operator Qualification Program (Including covered task designations for emergency response and leak investigation)
 - ◆ Questar Gas Company DOT Operator Qualification Program
 11. Safety and Training Programs for Emergency Response and Leak Investigations
 - ◆ See No. 5 (Training and Qualification)
 12. Call Center Procedures (Receiving and Dispatch)
 - ◆ See No. 1 (Emergency Call Processing and Response Procedures)

13. Scene Control Procedures (Including equipment, personnel, protection of life/property, gas migration, determination of safe and hazardous areas, criteria for evacuations, gas control procedures, etc.)
- ◆ Scene Control Procedures
 - Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (Section 2)
 - Section VII: News Media Communication (Section 1)
 - Questar Standard Practice
 - 8-22-01 – Abnormal Operations for Transmission Pipelines (All)
 - ◆ Equipment
 - Questar Gas Emergency Plan
 - Section XXI: Location and Inventory of Pipeline Repair Materials and Equipment (All)
 - Section II: Emergency Pre-Planning (Sections 7 & 8)
 - ◆ Personnel
 - Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (All)
 - Section III: Assignment of Responsibilities (Section 3)
 - ◆ Protection of Life/Property
 - Questar Gas Emergency Plan
 - Section I: Introduction (Section 1, paragraphs 1.1 & 1.2)
 - Section V: Controlling Emergency Situations (Section 1, paragraph 1.3; Section 5, subparagraph 5.2.3)
 - Section X: Employee Training (Section 2, subparagraphs 2.14.1 & 2.14.2)
 - Section XII: Customer and General Public Education Program (Section 3, subparagraph 3.4.2)
 - ◆ Gas Migration
 - Questar Gas Emergency Plan
 - Section V: Controlling Emergency Situations (Section 2, subparagraph 2.7.1)
 - Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (Section 3, paragraph 3.7; Section 7, subparagraph 7.1.5; Section 11, paragraph 11.4)
 - ◆ Determination of Safe and Hazardous Areas
 - Questar Gas Emergency Plan
 - Section III: Assignment of Responsibilities (Section 2, subparagraph 2.1.3)
 - Section IV: Handling and Evaluating Emergency Calls (Section 3)
 - Section V: Controlling Emergency Situations (All)
 - Section XII: Customer and General Public Education Program (Section 2)

- ◆ Criteria for Evacuations
 - Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (All)
 - ◆ Gas Control Procedures
 - Questar Gas Emergency Plan
 - Section II: Emergency Pre-Planning (Section 4, paragraph 4.1)
 - Section IV: Handling and Evaluating Emergency Calls (Section 6; Table 2 – Gas Control Emergency Call Procedures)
 - Section V: Controlling Emergency Situations (Section 2, paragraph 2.8)
 - Section VI: Service Interruption Procedures (All)
14. Communications and Back-up Procedures
- ◆ Questar Gas Emergency Plan
 - Section II: Emergency Pre-Planning (All)
 - Section III: Assignment of Responsibilities (Section 2, subparagraphs 2.1.1(j), 2.1.3(h), 2.1.5(b); Section 3, paragraph 3.2)
 - Section V: Controlling Emergency Situations (Section 5, subparagraph 5.6.3; Section 6, subparagraph 6.3.3)
 - Section VII: New Media Communications (Section 2)
 - ◆ Questar Standard Practice
 - Section N: Emergency Plan and Public Awareness Program (Section 2, subparagraph 2.1.2)
15. Command Structure in the Event of an Emergency
- ◆ Questar Gas Emergency Plan
 - Section III: Assignment of Responsibilities (Section 1)
 - Section IV: Handling and Evaluating Emergency Calls (Section 5, subparagraph 5.5.2)
 - Section V: Controlling Emergency Situations (Section 6)
16. Availability of System Maps (Laptop Access)
- ◆ Questar Gas Emergency Plan
 - Section I: Introduction (Section 7, subparagraph 7.3.7)
 - Section II: Emergency Pre-Planning (Section 6, subparagraph 6.5.1)
 - Section III: Assignment of Responsibilities (Section 2, subparagraph 2.1.4)
17. Leak Classification Procedures
- ◆ Questar Standard Practice
 - 3-75-01 – Underground Gas Leak Procedure (Section 3; Table 2 – Leak Class Codes; Table 3 – Leak Repair Order Codes)

18. Regulatory Manuals and References
 - ◆ Title 49 Code of Federal Regulations Parts 191, 192 & 199
 - ◆ U.S. Department of Transportation Guidance Manual for Operators of Small Natural Gas Systems, June 2002 Edition
 - ◆ U.S. Department of Transportation Operator Qualification Guide for Small Distribution Systems, Revision January 2004
 - ◆ American Gas Association Guide for Gas Transmission and Distribution Piping Systems, 2009 Edition
 - ◆ Utah Administrative Code Title R746 Rules 402 & 409
 - ◆ Utah Code Title 54 Chapters 08a and 13
 - ◆ Questar Gas Technical Service Policies and Procedures Manual
 - ◆ Questar Gas Good Practices for Gas Piping and Appliance Installations
 - ◆ Questar Gas Standard Practice Pipeline Accident and Failure Investigation
 - ◆ Questar Gas Company Tariff for Gas Service in the State of Utah
 - ◆ Questar Gas Company Annual Reports 2005–2008

During the course of the audit, the following Questar personnel were interviewed.

1. Mr. C. Scott Brown, VP of Operations
2. Mr. Vaughn Shosted, General Manager
3. Mr. Mike Jaynes, Operations Manager
4. Mr. Craig Johnson, Operations Supervisor
5. Mr. Reid Hess, Operations Supervisor
6. Mr. Joey Mariani, Operations Foreman
7. Mr. Wade Homer, Operations Foreman
8. Mr. Greg Lowder, Operations Specialist
9. Mr. Mike Pirtle, Operations Rep. 1
10. Mr. Preston Hansen, Operations Rep. 3
11. Ms. Abbie Magrane, Attorney

Evaluation and Analysis

The federal pipeline safety regulations which are relevant and applicable to this Scope of Work are listed below, followed by an evaluation of Questar Gas Company's compliance with the regulations and consistency with prevailing industry practices. The State of Utah has adopted the federal pipeline safety regulations and has supplemented state regulations as listed in the Compliance Review Chart at the end of this section.

49 CFR §192.603 General Provisions. (Operations)

- (a) No person may operate a segment of pipeline unless it is operated in accordance with this subpart.
- (b) Each operator shall keep records necessary to administer the procedures established under §192.605.
- (c) The Administrator or the State Agency that has submitted a current certification under the pipeline safety laws, (49 U.S.C. 60101 *et seq.*) with respect to the pipeline facility governed by an operator's plans and procedures may, after notice and opportunity for hearing as provided in 49 CFR 190.237 or the relevant State procedures, require the operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

Relevant Regulatory Application to this Scope of Work

Questar, as a gas distribution operator, has established and maintained applicable records for the operation and maintenance of their gas distribution system as required. Consistent with the regulations and prevailing practices within the State of Utah, those records are periodically inspected by the Utah Public Service Commission. The operator is required to correct any deficiency in a timely manner and advise the Commission as to what actions have been or will be taken to address their concerns. The Commission either accepts or denies the proposed action and schedules a follow-up visit to verify compliance. Based upon the review of those records applicable to this Scope of Work, Questar has operations and maintenance records which satisfy the requirements of this regulation.

49 CFR §192.605 Procedural Manual for Operations, Maintenance, and Emergencies.

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

must be kept at locations where operations and maintenance activities are conducted.

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

- (i) Unintended closure of valves or shutdowns;
 - (ii) Increase or decrease in pressure or flow rate outside normal operating limits;
 - (iii) Loss of communications;
 - (iv) Operation of any safety device; and
 - (v) Any other foreseeable malfunction of a component, deviation from normal operation, or personnel error, which may result in a hazard to persons or property.
- (2) Checking variations from normal operation after abnormal operation has ended at sufficient critical locations in the system to determine continued integrity and safe operation.
 - (3) Notifying responsible operator personnel when notice of an abnormal operation is received.
 - (4) Periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.
 - (5) The requirements of this paragraph (c) do not apply to natural gas distribution operators that are operating transmission lines in connection with their distribution system.
- (d) *Safety-related condition reports.* The manual required by paragraph (a) of this section must include instructions enabling personnel who perform operation and maintenance activities to recognize conditions that potentially may be safety-related conditions that are subject to the reporting requirements of §191.23 of this subchapter.
- (e) *Surveillance, emergency response and accident investigation.* The procedures required by §§192.613(a), 192.615, and 192.618 must be included in the manual required by paragraph (a) of this section.

Relevant Regulatory Application to this Scope of Work

This regulation requires that an operator have a manual for operations, maintenance, and emergency procedures. Questar has a comprehensive manual for Operations, Maintenance and Emergencies which is periodically reviewed for adequacy by the operator and by the Utah Public Service Commission. Based upon the review of those portions of the manual applicable to this Scope of Work, the manual is in compliance with this regulation.

49 CFR §192.615 Emergency Plans.

- (a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:
 - (1) Receiving, identifying, and classifying notices of events which require immediate response by the operator.

- (2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.
 - (3) Prompt and effective response to a notice of each type of emergency, including the following:
 - (i) Gas detected inside or near a building.
 - (ii) Fire located near or directly involving a pipeline facility.
 - (iii) Explosion occurring near or directly involving a pipeline facility.
 - (iv) Natural disaster.
 - (4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.
 - (5) Actions directed toward protecting people first and then property.
 - (6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards of life or property.
 - (7) Making safe any actual or potential hazard to life or property.
 - (8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.
 - (9) Safety restoring any service outage.
 - (10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible.
- (b) Each operator shall:
- (1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures.
 - (2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.
 - (3) Review employee activities to determine whether the procedures were effectively followed in each emergency.
- (c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:
- (1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;
 - (2) Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;
 - (3) Identify the types of gas pipeline emergencies of which the operator notifies the officials; and
 - (4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

Relevant Regulatory Application to this Scope of Work

This regulation requires that an operator have written procedures to minimize the hazard resulting from a gas pipeline emergency and that, as a minimum, address all areas specified above. Questar has a written Emergency Plan, and based upon the review of those portions of the plan applicable to this Scope of Work, the plan is in compliance with this regulation.

Emergency Call Processing and Response Procedures

Emergency calls are received by the Questar Call Center in Salt Lake City, Utah. Two toll-free emergency numbers are available to the public and responses are provided in both English and Spanish. The computerized center categorizes the reporting of a gas leak as the highest priority and automatically schedules the handling of the response within 60 seconds or less. If the call exceeds the 60-second response time, a bell is sounded at the center and an available operator or an operator handling a non-emergency call will pick up the emergency call. On several occasions during the audit, the emergency telephone numbers were dialed, and in each case, an operator was reached in less than 30 seconds.

The Call Center is a secure facility which has sufficient equipment to utilize the entire staff of approximately 100 employees at the same time. The daily peak shift has 45 to 50 personnel, with some variations in staffing to address off-peak call periods. In an emergency, the center is self-contained with its own electrical power equipment and back-up generators to provide power should a failure occur in the primary equipment. The facility maintains sufficient food and water to sustain operations for an extended period of time.

The Call Center was inspected on May 1, 2009. Mr. Reid Hess (Operations Supervisor) and Ms. Linda Matern (Call Center Manager) were interviewed and provided a tour of the facility. During the tour, the computer system went down, however, there was no loss of service as the staff is trained to operate the system manually. Call handling was professional and it was noted that no calls exceeded the maximum 60-second hold time, even while the system was temporarily out of service. The computer system was later restored, with no noticeable transition difficulties.

The Questar Call Center was found to be a modern, progressive facility that appeared to be well managed and operated by knowledgeable and professional personnel.

Questar has written procedures which provide basic instructions to personnel to ensure that appropriate individuals are prepared to recognize and deal with emergency situations in a safe and efficient manner. The written procedures include provisions for identifying and classifying emergencies as well as instructions to ensure prompt and adequate handling of all calls or reports concerning potential emergencies from all

sources. The Call Center provides coverage for receiving emergency calls twenty-four hours a day, seven days a week and adequate staffing appears to be available at all times.

Direction and training is provided to Call Center personnel to obtain information from callers and to provide safety information if warranted. Operators receiving the calls are instructed to obtain and document the caller's name, address, telephone number (cell phone number if the caller evacuates), and reason for the call. Frequently, Call Center personnel will ask additional questions to further define the situation and to provide adequate response. If the information provided indicates a hazardous situation, additional instructions may be given to not create sources of ignition by operating switches, electrical appliances, or telephones. If evacuation of the area is warranted, the customer is instructed to leave immediately, wait for gas company personnel to arrive, and call back from a safe location to provide additional information to assist responding personnel. If it is determined that a significant hazard and/or gas leakage exists, the Call Center operator will contact local emergency public service personnel by calling 911 as appropriate. Call Center personnel are provided periodic refresher training on standard procedures and the training program includes an evaluation of Call Center proficiency.

Emergency information received at the Call Center is dispatched to Questar personnel who respond in an urgent manner, giving potential emergency calls top priority until the urgency of the situation can be determined. Responses are prioritized according to hazard levels. Gas detected inside or near a building, fire located near or involving a pipeline facility, explosion, natural disaster, or strong odors of gas are some situations warranting immediate response. Responding personnel are able to establish and maintain adequate communications during the emergency response.

When the Questar employee/responder arrives on the scene, the responder reports to the incident commander as a representative of the gas company. If first on the scene, the responder assesses the situation and take steps to protect life first, then property. The responder may take steps as appropriate to implement the company's emergency plan, evacuate buildings, block off areas, re-route traffic, eliminate sources of ignition, stop the flow of gas, ventilate the area, and notify police and fire departments. Prompt and effective response to each type of emergency is taken to mitigate the danger. Questar's Emergency Plan identifies numerous potential emergencies and the steps necessary to reduce or eliminate the hazards.

The Emergency Plan establishes reserves of personnel, equipment, and tools which may be needed. In some instances, procedures are prepared to designate personnel, staging of command centers, equipment, and manpower. Plans are in place to mitigate anticipated emergencies and to shut down and restore normal gas service. Stocks of tools and designated emergency equipment are stored at strategic points throughout the distribution system. Pre-planning and training are provided to personnel on the actions necessary to control emergency situations.

Once the emergency is mitigated, an investigation may be initiated by Questar's investigative team to determine the probable cause of the event. The information obtained

may be used to prevent future emergencies and to evaluate the company's emergency response activities. The emergency procedures, training and response of Questar personnel are consistent with prevailing industry practices.

One of the most important requirements for Emergency Plans is establishing and maintaining liaison with public officials so that both the operator and public officials can coordinate response activities to mitigate the hazards to life, property, and the environment. Questar has implemented a good liaison program in accordance with regulatory requirements and good industry practices.

Overall, Questar's emergency call processing and response procedures comply with federal and state regulatory requirements and are consistent with prevailing industry practices.

Situations Requiring Evacuation

49 CFR 192.615(a)(5) establishes that in an emergency, the pipeline operator must take actions directed toward protecting people first and then property. A review of the applicable Questar documents demonstrates that the company has written emergency procedures which meet federal and state regulatory requirements.

Within the industry, evacuation is often initiated when the operator has reason to believe that a hazard to life may exist. In some circumstances, the decision is made by other emergency personnel such as police and fire officials. Under those circumstances, the operator assumes a supportive role, but still has the obligation to identify gas hazards to public officials.

Since the recognition of the gas hazard is key to requiring an evacuation, the criteria used to identify the hazard and the subjective perception of the operator are important considerations. For example, some operators will evacuate an area which has a strong odor of gas irrespective of gas concentrations. The decision is subjective, but acceptable, if it errs on the side of safety. Evacuation decisions are often based upon the size of the leak, type of buildings in the immediate area, wind direction and velocity, type of cover, migration patterns, or if there is gas in conduits.

In reviewing emergency plans from other comparable operators, there is some variation in identifying what constitutes a gas hazard. For example, for gas concentrations within a building, one manual shows that a gas concentration of 1 % gas in air (20 % of the lower explosive limit (LEL)) is considered hazardous. In two other manuals, a concentration of 0.625 % gas in air (12.5 % of the LEL) is considered hazardous. Still another manual uses 2 % gas in air (40 % of the LEL) as the hazardous level. At all of these levels, the gas concentrations will not produce a fire or explosion and actions taken by gas companies at these levels have been considered reasonable. Questar uses 1 % gas in air concentrations within a building and 2 % gas in air concentrations within a duct or sewer. This practice is acceptable, however, many companies are using 1 % gas in air in a

confined space and/or the strong odor of gas as the criteria to identify a hazardous concentration of gas.

Questar has established more stringent criteria for evacuation than many other comparable gas distribution companies. They evacuate houses and buildings when gas has entered the structures and when gas is in the vicinity of the structures (10 feet in the summer, 20 feet in winter/frost conditions). "Winter/frost conditions" is defined as December 21 through March 21, and frost conditions may be expanded as directed by the Region Manager.

In order to provide guidance to employees in recognizing gas-related hazards, Questar and other companies identify specific situations which are recognized gas hazards. For example, a fire on or near a pipeline or gas inside a building. Questar has developed procedures to address situations that are generally accepted as hazards on their gas system. In addition, information regarding what constitutes a gas hazard is incorporated into safety and training meetings and the Operator Qualification Program. Before an individual can be qualified to perform covered tasks in the gas industry, that individual must be trained to recognize and respond to abnormal operating conditions. While all abnormal operating conditions are not emergencies, they do constitute conditions which may lead to an emergency or which may be considered hazards to life, property, or the environment. Training to assist operating personnel to recognize gas-related hazards is required as part of Questar's Operator Qualification Program.

Questar's Emergency Plan identifies five pipeline-related situations which may require evacuation:

1. Gas detected inside or near a building
2. Fire involving or near a gas facility
3. Explosion occurring near or directly involving a gas facility
4. Natural disasters that impact pipeline facilities
5. Civil disturbances that impact pipeline facilities

Questar's evacuation procedures are initiated for gas detected inside or near a building with the report of a potential natural gas hazard to a call center operator. Depending upon the information received describing the location and magnitude of the leak, the operator may instruct individuals in the area to immediately evacuate. Instructions are given to avoid ignition sources (flames, sparks, operating electrical devices, etc.), not to hang up the telephone, but to go to a safe place, call back, and await the arrival of gas company personnel or a first responder. The operator may contact police, fire and other agencies to provide and/or assist with evacuation, scene control and other emergency response activities.

Responding Questar personnel will implement procedures to locate, identify and classify areas with hazardous gas concentrations. If hazards are identified and an evacuation is implemented, or a Class A (hazardous) leak exists, the hazardous area will be marked off with warning tape so the general public will know not to enter. If the

hazardous area is large or there is a significant evacuation, assistance from emergency response officials is requested to help with the evacuation and to mark off and/or secure the area.

In accordance with Questar's written procedures, if the level of gas anywhere within a building measures 1 % or higher, the building is evacuated and emergency response officials are called to assist with securing the area and making the area safe. If the ducts, conduits, or the sewer system is found to contain 2 % or greater gas in air, structures on both sides of the street are evacuated. Surrounding structures within 70 feet (minimum) of buildings evacuated due to natural gas proximity are also evacuated. Once evacuated, no one—occupants, the public, or employees—should be in the building.

As with many other procedures in the gas industry, Questar's evacuation procedures do not establish definitive safe distances for each situation. However, the DOT Emergency Response Guidebook (www.phmsa.dot.gov) and the Pipeline Emergency Response Guidelines from the Pipeline Association for Public Awareness (www.pipelineawareness.org) are two of many available resources regarding evacuation safety.

In January 2008, Questar supplemented procedures and training of emergency response personnel to provide additional instructions regarding evacuation and scene security. Once building occupants have been evacuated, responders are instructed to ensure that they stay back (in designated safe areas) and away from the evacuated building and the work area. If bystanders approach the evacuation/work area, they are instructed for their own safety to remain out of the immediate area. Evacuated building occupants are encouraged to take a key for re-entry once the building is made safe and cleared by emergency responders and/or Questar personnel as re-entry via garage doors or electronic means will not be allowed.

For re-entry into an evacuated building, Questar has established stringent guidelines and procedures prior to allowing the occupant or the public access to the building. When it has been determined safe to begin clearing the building, Questar personnel are instructed to obtain permission from the occupant. If the building is locked, personnel are to obtain a key and instruct the occupant to stay in the safe area and away from the work area. Under no circumstances should an occupant or member of the public be allowed into the evacuated building prior to or during the clearing process.

To clear a building for re-entry, two independent tests using two separate gas detection instruments must demonstrate that the building is free of natural gas. Preferably, the tests are independently conducted by two different employees and two different types of gas detection equipment. If both tests determine that no gas exists, the building is considered cleared. If either inspection using approved procedures and equipment detect natural gas, the evacuation is continued until the building is free of natural gas. In every case, the clearing procedure must be verified by two independent inspections by Questar personnel using two separate instruments.

If a Class A (hazardous) leak involves a broken or blowing main 1¼ inch or larger, the Questar first responder must notify 911 or have dispatch notify 911 to request assistance. Hazardous areas must be evacuated and responders are used to help secure the area, protect the public (life), protect property, control traffic, and keep bystanders out of the work area. If the flowing main is in a remote area with no buildings suitable for human occupancy, emergency response officials need not be notified unless deemed necessary in the judgment of the lead person.

The remaining four pipeline-related situations which may require evacuation identified in Questar's procedures (fire involving or near a gas facility; explosion occurring near or directly involving a gas facility; natural disasters that impact pipeline facilities; and civil disturbances that impact pipeline facilities) will likely involve the Incident Command System, which identifies who is responsible for the management of on-scene emergency response operations. In cooperation with the pipeline operator's contact person, the Incident Commander establishes zones and barricades to prevent unauthorized people and unprotected emergency responders from entering the hazardous area. The size of the zones will be dictated by the location and size of the hazard.

These general guidelines are consistent with regulatory requirements and with the practices and procedures of other comparable gas distribution companies.

Scene Control Procedures

The initial objectives for scene control in the natural gas industry are to isolate and deny entry to the area of a hazardous leak, begin public protection actions based upon initial information, gather additional information for risk/hazard assessment, and if warranted, contact 911 and company management for assistance. If 911 responders are first on the scene, gas personnel are trained to establish contact with the Incident Commander before and upon arrival to avoid accidental entry into isolation zones. The gas company employee will initially serve as the primary contact for communications between the operator's team and emergency responders. In conjunction with the Incident Commander, the company representative will review which personnel and equipment may enter the incident area, provide information to identify the zone of influence, and decide when the area is safe.

The Questar Emergency Plan addresses the procedures for controlling emergency situations. Priorities are established which identify that protecting life and then property are the main objectives of the emergency response. Plans have been developed to address a number of anticipated emergencies which range from activities by a single service person to establishing an on-site command center and response team. Personnel and supplies have been allocated to address anticipated emergencies.

Questar's written scene control procedures are found in Section V of the Emergency Plan (Controlling Emergency Situations) and Section 7 of 3-75-01 (Underground Gas Leak Procedure). The Emergency Plan identifies protecting life

(customers, the general public, and employees) as the highest priority of emergency action, with the protection of property as a secondary consideration.

The Questar chain of command during an emergency is the same as the organizational structure of the company. Supplemental or replacement chains of command can be established by management at any time prior to or during an emergency condition, usually when reinforcements or increased expertise are needed. Primary responsibilities for each company department are outlined in Section III of the Emergency Plan (Assignment of Responsibilities). If additional support is required for on-scene efforts, the first responder communicates those requests to the company through Central Dispatch or the Gas Control Department. For on-scene activities, the Operations Department provides logistical and technical support for emergency response, and makes engineering support available to emergency responders. The Gas Control Department monitors and controls gas flow and will assist as necessary. To implement and support emergency response and initial scene control activities, Questar will designate an adequately sized crew to be available on a 24-hour basis.

While the management and coordination of an emergency response (including scene control) follows the chain of command of the company organizational structure, the first on-scene Questar employee will assume first responder command of the scene. This individual will implement and/or manage the early emergency response and scene control activities, and will remain in command of the scene until formally relieved by a designated company representative.

Upon arrival at an emergency scene, Questar personnel are directed to determine the existing hazard(s) and to implement actions based upon the assessment to evacuate premises which may be affected. If significant fugitive gas is found within 10 feet (summer) or 20 feet (winter) of the building or if the building has 1 % or greater gas in air concentrations, the building is evacuated. If the ducts, conduits, or the sewer system is found to contain 2 % or greater gas in air, structures on both sides of the street are evacuated. Surrounding structures within 70 feet (minimum) of buildings evacuated due to natural gas proximity are also evacuated. Steps are taken to isolate the hazardous area and to deny entry to all unauthorized persons (including other responders). An initial perimeter around the hazardous area will be established as necessary using warning tape, vehicles, barricades, and cones. To keep people from re-entering a dangerous area, traffic is re-routed and activities by company personnel are directed at mitigating the danger.

According to Questar procedures, the evacuated premises are clearly marked with warning tape and tags to prevent unauthorized re-entry. All entrances to the building will be marked off with warning tape in a manner that the entrant will understand they should not enter the building. When possible, the entire front of the building will have warning tape, as well as side or rear entrances when accessible. The Questar Emergency Evacuation Notice (Form 50700) will be provided to the occupant along with a company phone number so the occupant can obtain information as needed.

The scene is systematically leak surveyed and monitored to identify and track gas migration. Gas service to the affected structure is turned off to reduce the opportunity for gas ignition and an emergency shut-off warning tag is attached to the gas meter. Questar personnel begin collecting gas migration data to identify and monitor gas concentrations in the ground. Once the source(s) of leaking gas is identified, steps are taken to stop the flow of gas. Isolation of a gas leak at the scene is most often accomplished by closing existing valves, installing flow-stopping devices, or pinching off the gas line. Questar personnel are instructed that stopping the flow of gas does not remove all dangers as gas migration may continue and must be continuously monitored. Questar procedures require that personnel systematically clear each structure contaminated with natural gas before re-entry is made by the occupant.

If the event is significant, involves a number of homes, and/or requires the assistance of police, fire, EMS, etc., Questar will call 911 and work with local officials to control the situation/emergency. Typically, the fire department will facilitate the evacuation and suppress any fire spread, and the police department will control traffic and provide scene security.

If 911 responders are notified, fire officials usually mediate the evacuation process and establish the response perimeter, and police officials establish security and maintain the public safety perimeter. If the event does not warrant the involvement of 911 responders, Questar personnel, vehicles, and barricades will be used to block off a small scene. If scene control procedures block off traffic, the traffic will be rerouted around the hazardous area. Evacuation distances are generally a minimum of 150 to 300 feet initially, but can be expanded upon further assessment.

To mitigate the hazard while securing the scene, Questar personnel and other responders will reduce the likelihood of accidental ignition by eliminating ignition sources, cutting off the gas to eliminate standing pilots, ventilating affected premises, and controlling the flow of leaking gas. These steps are addressed by Questar's emergency procedures to isolate leaks, isolate sections of the gas system, reduce gas system pressure, and shut off gas meters. Steps are then taken to determine the full extent of the hazardous area. Grids are systematically tested and leak surveyed to discover and monitor any gas migration around nearby buildings, sewers, or other structures.

Once the source of fugitive gas is eliminated and ventilated from the hazardous area, Questar procedures require that the scene remain secure until buildings are ventilated and systematically cleared by two independent tests using two separate gas detection instruments. Clearing or re-entry procedures are fully described in the previous section (Situations Requiring Evacuation) of this report. Questar's procedures then address the restoration of service to customers once the area is declared safe and scene security ended.

Questar's scene control procedures meet federal and state pipeline safety requirements and meet or exceed comparable prevailing industry practices.

Natural Gas Migration

Section V of the Questar Emergency Plan addresses the requirement of emergency response to determine the full extent of the hazardous area, including the discovery of any gas migration in or around nearby buildings or other structures, and the possibility of multiple leaks. Determining the extent of migration at an emergency response is described in Section 7 (Underground Gas Leak Procedure 3-75-01) subparagraph 7.1.5 and paragraph 11.4. The sections in the Emergency Plan are adequate to satisfy pipeline safety requirements, however, the leak characterization procedures used by Questar, while appearing more stringent than prevailing practices, can actually result in many Class B leaks being improperly graded as Class C leaks. A Class B leak is not hazardous at the time of discovery, but has the potential of becoming hazardous and will require action in a timely manner to monitor and repair the leak. A Class C leak is not hazardous and has no potential of becoming hazardous. The action required for a Class C leak is much less stringent than for a Class B leak.

The mischaracterization of a Class B leak as a non-hazardous Class C leak can have significant consequences at response sites because gas leakage/migration is not a static event. With time and even with the same leak rate, conditions at the site may change, resulting in a corresponding change in the migration pattern. For example, if the soil above a leak receives rain, fire suppression water, snow, frost, etc., the migration pattern will likely expand. Natural gas migration from an incorrectly classified, potentially hazardous Class B leak can expand to reach a building or conduit and can quickly become a hazardous Class A leak.

The influence of the Questar "10 feet summer and 20 feet winter" rule was further evaluated during interviews and by an examination of Questar's leak survey data. It was noted that few, if any, Class B leaks were found. This is inconsistent with leak survey data found in the industry. During the migration portion of the interviews, leak investigation and bar hole/CGI techniques were discussed. Based upon those interviews, it was determined that improvements in the techniques and procedures would likely improve both the precision and accuracy of migration data and underground leak classification. The review of Questar's procedures and training materials found that, like most other gas companies, Questar should consider additional training and procedures to address gas migration.

49 CFR §192.801 Scope. (Operator Qualification)

- (a) This subpart prescribes the minimum requirements for operator qualification of individuals performing covered tasks on a pipeline facility.
- (b) For the purpose of this subpart, a covered task is an activity, identified by the operator, that:
 - (1) Is performed on a pipeline facility;
 - (2) Is an operations or maintenance task;
 - (3) Is performed as a requirement of this part; and

- (4) Affects the operation or integrity of the pipeline.

49 CFR §192.803 Definitions. (Operator Qualification)

Abnormal operating condition means a condition identified by the operator that may indicate a malfunction of a component or deviation from normal operations that may:

- (a) Indicate a condition exceeding design limits; or
- (b) Result in a hazard(s) to persons, property, or the environment.

Evaluation means a process, established and documented by the operator, to determine an individual's ability to perform a covered task by any of the following:

- (a) Written examination;
- (b) Oral examination;
- (c) Work performance history review;
- (d) Observation during:
 - (1) Performance on the job,
 - (2) On the job training, or
 - (3) Simulations.
- (e) Other forms of assessment.

Qualified means that an individual has been evaluated and can:

- (a) Perform assigned covered tasks; and
- (b) Recognize and react to abnormal operating conditions.

49 CFR §192.805 Qualification Program. (Operator Qualification)

Each operator shall have and follow a written qualification program. The program shall include provisions to:

- (a) Identify covered tasks;
- (b) Ensure through evaluation that individuals performing covered tasks are qualified;
- (c) Allow individuals that are not qualified pursuant to this subpart to perform a covered task if directed and observed by an individual that is qualified;
- (d) Evaluate an individual if the operator has reason to believe that the individual's performance of a covered task contributed to an incident as defined in Part 191;
- (e) Evaluate an individual if the operator has reason to believe that the individual is no longer qualified to perform a covered task;
- (f) Communicate changes that affect covered tasks to individuals performing those covered tasks;
- (g) Identify those covered tasks and the intervals at which evaluation of the individual's qualifications is needed;
- (h) After December 16, 2004, provide training, as appropriate, to ensure that individuals performing covered tasks have the necessary knowledge and skills to perform the covered tasks in a manner that insures the safe operation of pipeline facilities; and

- (i) After December 16, 2004, notify the Administrator or a state agency participating under 49 U.S.C. Chapter 601 if the operator significantly modifies the program after the Administrator or state agency has verified that it complies with this section.

49 CFR §192.807 Recordkeeping. (Operator Qualification)

Each operator shall maintain records that demonstrate compliance with this subpart.

- (a) Qualification records shall include:
 - (1) Identification of qualified individual(s);
 - (2) Identification of the covered tasks that individual is qualified to perform;
 - (3) Date(s) of current qualification; and
 - (4) Qualification method(s).
- (b) Records supporting an individual's current qualification shall be maintained while the individual is performing the covered task. Records of prior qualification and records of individuals no longer performing covered tasks shall be retained for a period of five years.

49 CFR §192.809 General. (Operator Qualification)

- (a) Operators must have a written qualification program by April 27, 2001. The program must be available for review by the Administrator or by a state agency participating under 49 U.S.C. Chapter 601 if the program is under the authority of that state agency.
- (b) Operators must complete the qualification of individuals performing covered tasks by October 28, 2002.
- (c) Work performance history review may be used as the sole evaluation method for individuals who were performing a covered task prior to October 26, 1999.
- (d) After October 28, 2002, work performance history may not be used as a sole evaluation method.
- (e) After December 16, 2004, observation of on-the-job performance may not be used as the sole method of evaluation.

Relevant Regulatory Application to this Scope of Work

Questar has established and implemented an Operator Qualification Program as required. Specific covered tasks have been identified for the Questar gas system and individuals have been qualified to perform covered tasks. For each identified covered task, personnel receive training and are evaluated to determine if they have the knowledge, skills and ability to perform the covered tasks. In addition, personnel are trained and tested on recognizing and responding to abnormal operating conditions which may be encountered while performing the covered tasks. A covered task, as defined under §192.801 and sometimes referred to as "the 4-part test," is any activity, identified by the operator, that: 1) is performed on a pipeline facility; 2) is an operations or

maintenance task; 3) is performed as a requirement of this part; and 4) affects the operation or the integrity of the pipeline. Questar personnel performing covered tasks on the gas distribution system have been adequately qualified to perform the covered tasks as required.

Training and Qualification Procedures

Questar has a very good training program, with monthly safety and training meetings. The program is thorough and comprehensive, from teaching new hires the basics about the gas industry to continuing education and training for experienced personnel. The training includes formal classes with periodic written tests (generally, 80 % proficiency is considered passing) and on-the-job training where various activities are trained for and tested in the field. Promotions are based in part upon the demonstration of knowledge through formal written classroom tests, periods of field training with one-on-one instruction and the development of on-the-job experience, and ultimately, field testing of the employee's skills and ability to perform tasks under actual working conditions. The satisfactory demonstration of proficiency for each skill level is necessary for promotion to the next job title. As required by §192.615, Questar personnel are trained on the procedures necessary to implement the Emergency Plan.

To verify the effectiveness of the training program, personnel were interviewed during the audit. A variety of unscripted questions were asked, including and beyond the scope of emergency response, regarding gas operations, maintenance, and management issues. A sampling of some of the questions included: 1) describe the proper steps to conduct a leak investigation; 2) describe the proper steps for a gas turn-on; and 3) describe your corrosion monitoring practices. A sampling of topical discussions included: 1) unaccounted for gas and gas measurement practices; 2) leak survey and leak classification practices; 3) leak frequency changes over time; 4) the progress being made to uprate the gas system to polyethylene pipe; and 5) the adequacy of personnel and equipment to address catastrophic natural disasters.

Interviewed personnel demonstrated a level of knowledge and experience equal to or exceeding the average proficiency for similar personnel in comparable gas distribution companies. It should be noted that the basis for this opinion is my experience in providing training in the gas industry and regulatory community for over 20 years. For comparison purposes, two benchmark companies, which have very good training programs and are actually larger than Questar, were considered. One company has distribution systems in more than 10 states and the other company, based upon number of personnel, meter count, and miles of pipe, is approximately 2.5 times larger than Questar. In my professional opinion, Questar's training program is equivalent to the training programs of both of these significantly larger companies.

Operator qualification requirements for a gas distribution operator are found in §192.801 through §192.809. The regulatory program became effective on October 26, 1999, and had incremental performance dates of April 27, 2001, October 26, 2002,

October 28, 2002, and December 16, 2004. The Questar Operator Qualification ("OQ") Program was not inspected to determine if the operator had met the specified performance dates between 1999 and 2004, but was reviewed to verify compliance with current regulatory requirements.

The compliance inspection of Questar's OQ Program, revised June 2008, was performed using the PHMSA (DOT) Operator Qualification Inspection Form 14 (Rev. 6) dated December 15, 2008. The Questar OQ Program is administered in-house and is based on DOT operator qualification guidance materials and supplemental information from the Midwest Energy Association. The Midwest Energy Association assisted in the preparation of the "Iowa Plan," which is the sample in some of the DOT guidance material. The Questar OQ Program has been updated to comply with the statutory requirements in the Office of Pipeline Safety (OPS) Advisory Bulletin issued on November 26, 2004. The program is compliant with requirements for training as appropriate, periodic requalification which may be less than five years, and the requirement to notify OPS if the program is significantly modified after inspection and acceptance. In addition, the program incorporates the most recent regulatory positions on emergency response and qualification of emergency response activities which are considered to be covered tasks. The Questar OQ Program has been inspected by PHMSA.

The Questar OQ Program identifies covered tasks (Appendix A1) and establishes reevaluation intervals (1.01). The program requires contractors performing covered tasks independently to be qualified, at a minimum, to Questar's qualification requirements (1.02). For mutual assistance, the program states that individuals must be evaluated and qualified for covered tasks on the Questar system (1.03), however, this practice had not been fully implemented at the time of audit. The program includes the new policy and criteria to address the "training as appropriate" requirement for qualification and covered tasks were developed by identifying procedures which meet the required 4-part test.

As part of the OQ Program, Questar uses both formal classroom training and field training on the performance of covered tasks and the abnormal operating conditions which may be encountered while performing the tasks. Formal testing and field evaluations using specific procedures and criteria are implemented to ensure that qualified individuals have the necessary knowledge, skills and ability to perform the covered tasks and to recognize and respond to abnormal operating conditions.

The program identifies qualified individuals and the specific tasks the individuals are qualified to perform. Records are maintained for a minimum of five years after the qualified individuals perform the last covered task as required. The program includes the additional elements specified in the regulation as well as protocols such as performance of tasks by non-qualified individuals under direct observation, the role of work performance history, and personnel performance monitoring. The Questar Operator Qualification Program meets federal and state pipeline safety regulations and is consistent with prevailing industry practices

Supplemental State Regulations and Compliance Review Chart

R746-409-4. Accidents or Incidents Reports and Annual Reports.

- A. U.S. Department of Transportation - An operator shall report to the U.S. Department of Transportation (800-424-8802) accidents or incidents involving its pipeline facilities operated within the state of Utah that cause personal injuries requiring in-patient hospitalization, fatality, or estimated damage to property totaling \$50,000 or more.
- B. Commission Notification - The Commission shall be notified of the accidents or incidents as soon as possible, consistent with public welfare and safety. In those instances where a telephonic report to the United States Department of Transportation is required, a similar report of the accident or incident shall be made by telephone to the Utah Division of Public Utilities.
- C. Written Report - An operator, except for master meter systems, shall furnish to the Commission, within 30 days after the occurrence of a reportable accident or incident, a written report of the accident or incident. The report may be made on the standard US DOT form designated Accident or Incident Report, or on a form acceptable to the Commission showing the same information. If certain information is not available, an incomplete report should be submitted indicating this unavailability. When the information becomes available, a supplemental report will be submitted.

R746-409-5. Operation and Maintenance Plans.

An operator of natural gas transportation facilities, except for master meter operators and liquid propane operators, shall file with the Commission for review by the Division of Public Utilities, a plan for the operation and maintenance of pipeline facilities owned or operated by it, and shall subsequently file changes in the plan. The plan shall cover gas transmission facilities, distribution facilities, and those gathering or production facilities located in non-rural areas. Master meter operators and liquid propane gas operator shall have at their distribution facility a plan for the operation and maintenance of their pipeline facilities. The essential requirements stated in Title 49 CFR Part 192.605, shall be covered by the plan. If the Commission, on recommendation of the Division, finds the plan inadequate for safe operation, the Commission shall, after notice and opportunity for a hearing, require revision of the plan.

R746-409-06. Emergency Plan.

An operator, except for master meter operators and liquid propane operators, shall file with the Commission, for review by the Division, a plan of written procedures to minimize the hazard resulting from a gas line emergency. The plan shall cover gas

transmission facilities, distribution facilities, and those gathering or production facilities located in non-rural areas. Master meter operators and liquid propane operators shall have at their distribution facilities a plan to minimize hazards resulting from an incident involving their gas facilities. The essential requirements stated in Title 49 CFR Part 192.615 shall be covered by the plan. If the Commission, on recommendation of the Division, finds the plan inadequate for safe operation, the Commission shall, after notice and opportunity for a hearing, require the plan to be revised.

Federal Compliance as per Applicable Portions of Title 49 Code of Federal Regulations Parts 191 & 192

§191.9	In compliance.	Incident Report filed as required. Reviewed copy of subject incident filing.
§191.11	In compliance.	Reviewed last four Annual Reports.
§192.603	In compliance.	Records are maintained as required to administer procedures established by §192.605. Reviewed applicable operations and maintenance records.
§192.605	In compliance.	Procedural manual for Operations, Maintenance and Emergencies is in place. O, M & E Manual was reviewed.
§192.615	In compliance.	Written Emergency Procedures are in place. Emergency Plan was reviewed.
§192.801- §192.809	In compliance.	Written Qualification Program is in place. Reviewed Operator Qualification Program and covered task qualifications.

State Compliance as per Applicable Portions of Utah Administrative Code-Title R746-Rules 402 & 409 and Utah Code-Title 54-Chapters 08a & 13

§R746-409-3	In compliance.	Records confirm that periodic compliance inspections are performed.
§R746-409-4	In compliance.	Incident Reports and Annual Reports are filed as required.
§R746-409-5	In compliance.	O, M & E Manual was reviewed.
§R746-409-6	In compliance.	Emergency Plan was reviewed.
Title 54 Chapter 08a	In compliance.	Applicable records verify participation in the state one-call program.
Title 54 Chapter 13	In compliance.	Applicable records verify regulation by state agency.

Opinions and Recommendations

The following opinions and recommendations are offered based upon my review of the documents listed, on-site audit, facilities inspection and personnel interviews, and my extensive experience conducting pipeline safety audits and incident investigations.

1. Questar should consider implementing an on-going review program to simplify procedures as much as possible and make all manuals and reference documents more user-friendly. Currently, to explore a single procedure in full, the reader may need to consult the O, M & E Manual, the Emergency Plan, and the Technical Service Policies and Procedures Manual. Such a large volume of detailed information in separate manuals can make it difficult to understand and apply a single procedure as a whole. The Emergency Plan in particular should be reviewed to ensure clear, concise and easy-to-follow instructions are available to personnel who may be fully involved in an emergency situation where timely decisions must be made. Emergency procedures should provide adequate information to determine the priority of actions. Guidance on the organization and content of the Emergency Plan can be found in the Guide for Gas Transmission and Distribution Piping Systems (GPTC Guide) (ANSI GPTC Z380.1-2009), 2009 Edition, under §192.615 Emergency Plans, Guide Material.

Estimated Cost: Nominal, as the review/revision of the Emergency Plan can be accomplished in-house by the Questar O, M & E Review Committee, which should review and update the plan annually. Printed and electronic copies of the GPTC Guide, 2009 Edition, can be purchased from the American Gas Association at aga.org for \$430.00.

2. Questar should update the current leak grading system using the Leak Classification and Action Criteria provided in the 2009 GPTC Guide under Guide Material Appendix G-192-11, Gas Leakage Control Guidelines for Natural Gas Systems. The current Questar leak grading system results in very few Class B leaks (non-hazardous at the time of discovery, but has the potential of becoming hazardous), which indicates that these leaks are being incorrectly graded as Class A (hazardous) or Class C (non-hazardous). The Questar practice of the "10 feet summer and 20 feet winter" rule can be incorporated into the guide material as long as the operator substantiates that the practice results in leak classifications which are equal to or more stringent than the G-192-11 recommended practices.

Estimated Cost: Nominal, as this can be accomplished through in-house reviews and editing of O M & E procedures and training materials.

3. Questar should expand the training on natural gas migration to provide additional information regarding:
 - (a) Migration dynamics - which is often used to describe gas moving through soil from its source. There are many different types of soil along with surface cover that will affect the rate and direction of natural gas.
 - (b) Conduited flow of gas - this term is not as common as other terms, but this type of gas flow can move gas a great distance in a very short period of time. Often, this is described as "gas traveling in a sewer." It is known that a pipe or utility conduit can easily become an avenue for conduited flow of gas.
 - (c) Gaseous clouds - gas escaping from an above ground opening in a pipe takes the form of an inverted cone. The gas will rise and disperse and be carried downwind, and can enter buildings. The best defense for investigating escaping gas is continuous monitoring of the leak area.

It should be emphasized that gas migration is a constantly changing condition and must be monitored continuously.

Estimated Cost: Nominal, as this can be accomplished through in-house expansion of the natural gas migration training program.

4. Questar should consider making the following revisions to the Technical Service Policies and Procedures Manual:
 - (a) Remove the term "Policies" to avoid policy conflicts with the O, M & E Manual. The O, M & E Manual contains the company policies which must be followed to comply with pipeline safety regulations. The Technical Service "Policies" and Procedures Manual should be considered a guidance manual and not an extension of the O, M & E Manual.
 - (b) Update the current leak grading system using the Leak Classification and Action Criteria provided in the 2009 GPTC Guide under Guide Material Appendix G-192-11, Gas Leakage Control Guidelines for Natural Gas Systems.
 - (c) When testing for inside gas leaks, since natural gas rises, one test point should be at the top of the door.

- (d) Screening for below ground leakage by testing the atmosphere with a combustible gas indicator (CGI) is not considered the best practice for finding below ground leaks, as CGI equipment does not have adequate sensitivity.
- (e) Bar hole placement for natural gas should be approximately four inches to the side of the pipeline and at or slightly above the pipeline (care must be taken not to hit or damage the pipeline). Insertion of the CGI probes must be at a constant depth, generally 10-18 inches. Probes must be above the leak and pipeline and sampling must be conducted under the same conditions for each reading. Bar hole tests should be documented with location, time, and gas concentration as a minimum.

Estimated Cost: Nominal, as these revisions can be accomplished through in-house reviews and editing.

- 5. Questar should expand the training of emergency responders with in-house annual continuing education training on implementing the Emergency Plan. The training should include simulated exercises where individuals must apply their training to address various emergency situations. The company should consider holding periodic mock emergency drills which could be rotated through the various districts. If possible, the drills should include local public officials (police, fire, EMS). Simulation and mock drill exercises should be evaluated to identify deficiencies and make improvements to the training program.

Estimated Cost: \$5,000 - \$10,000 depending upon the size of the drill.

- 6. Questar should consider sending a manager/instructor to attend outside training on managing natural gas emergencies. Excellent industry seminars and training sessions are offered by many of the gas associations such as the American Gas Association, Midwest Energy Association, and the Southern Gas Association. The updated knowledge and information would enhance the Questar training program.

Estimated Cost: \$1,000 - \$1,500 per person for a typical 3-day seminar, including travel expenses.

7. Questar should require that contractors and mutual assistance personnel performing covered tasks on the Questar gas system be qualified, as a minimum, to the requirements of the Questar Operator Qualification Program

Estimated Cost: Nominal, as contractors and mutual assistance personnel can provide proof of their qualifications to the requirements established by Questar's OQ Program.

8. While Questar has recently purchased three Remote Methane Leak Detectors (RMLD), after evaluating the technology, the company should consider purchasing additional units over the next five years so that each district office has a unit. Where practical, the RMLD units should be used to survey and monitor emergency responses that involve evacuation and/or underground construction damage.

Estimated Cost: \$16,000 - \$20,000 per unit currently; expected development of this technology may reduce future costs per unit.

Summary

The audit of Questar Gas Company's practices, procedures and training for the five designated categories specified in this Scope of Work, found that the company is in compliance with applicable federal and state pipeline safety regulations. In many areas, Questar not only meets, but exceeds, minimum regulatory requirements and prevailing industry practices. Questar's operations and maintenance records and personnel interviews verified that the company not only has the required procedures, but is implementing and properly documenting regulatory compliance with those procedures.

Questar's practices and procedures were evaluated as compared to existing standards of similarly situated natural gas distribution companies of similar size which are located in the southwest and western part of the United States. It should be noted that while there are slight geographical differences in gas distribution companies' operations and maintenance practices, federal pipeline safety regulations establish minimum performance standards for all operators regardless of location. To ensure that the small sample of five gas distribution companies used for comparison purposes did not contain any bias, the Guide for Gas Transmission and Distribution Piping Systems (GPTC Guide), published by the Gas Piping Technology Committee and approved by the American National Standards Institute was also used to establish "best practices" benchmarks for the audit. Using the range of best practices criteria established by the GPTC Guide and industry consensus, all of Questar's practices and procedures fell within the acceptable range of prevailing industry practices.

The evaluation of Questar's training procedures and Operator Qualification program included an assessment of the effectiveness of those programs. Questar's training records and the practices of other comparable operators were considered, and interviews with a representative sampling of Questar personnel were conducted. Personnel at all levels were found to be knowledgeable and experienced gas industry professionals. The Questar training program uses an effective combination of classroom education and testing, field training and evaluations, cross-training of subject matter, and continuing education. Supplemental training materials from independent, well-established sources are often incorporated into the program. Questar's training and qualification programs were found to be better than most when compared to prevailing industry practices.

It should be noted that the recommendations in this report are offered to assist Questar in their efforts to continually improve their operations, practices and procedures. No recommendations were necessary to correct pipeline safety violations or to address significant deviations from prevailing industry practices.

Respectfully submitted,



Sammy Russo, President
APR Consultants