

(v)

**Training and Qualification Procedures
(for the above items)**

- 2008 New Operations Employee Construction Orientation School
 - Emergency Plan Section V reviewed with employees and written test
 - Underground leak repair procedure (evacuation policy) – review of Standard Practice 5-00-08 with discussion of gas migration during review of check list
 - Blow down, purging, and repair of broken natural gas lines
 - Emergency Plan Quiz
- DOT Operator Qualification – Quality Assurance Review
 - Physical Properties
 - Abnormal Operating Conditions
 - Leak Detection
 - Emergency Response
- Physical Properties of Natural Gas PowerPoint Training Presentation

2008 NEW OPERATIONS EMPLOYEE CONSTRUCTION ORIENTATION SCHOOL

May 5th through May 14th

FIRST DAY (Monday - May 5)

- 8:00-9:00 a.m. Introduction and orientation films:
* Pipeline 29"
* Southbound 87"
- 9:00-9:30 a.m. Importance of good customer relations, proper clothing, time off,
drug, alcohol and harassment policies.
- 9:45-10:45 a.m. Emergency plan *Review Section V & written
Test*
- 10:45-11:00 a.m. Convincer video
- 11:00-11:45 a.m. Oxygen analyzer/Gas Ranger/CGI
- 1:00-2:00 OQ Module 47 Leak Detection review & test
- 2:00-4:00 p.m. Flagger certification

SECOND DAY (Tuesday - May 6)

- 7:30-9:30 a.m. Introduction to Standard Practices
- 9:50-11:50 a.m. Map Reading
- 1:00-2:30 p.m. Pipe Locators
- 2:45-4:00 p.m. Oxy-acetylene safety

THIRD DAY (Wednesday - May 7)

- 7:30-9:00 a.m. Excavation safety and backfill procedures OQ Modules 18 - 44 review & tests
- 9:20-10:20 a.m. Under ground leak repair procedure (evacuation policy)
Review S.P. 5-00-08, including gas migration when discussing check sheet.
- 10:20-11:05 a.m. Drilling and plugging operations
- 11:10-11:45 p.m. Locator wire, and mechanical fittings OQ Module 41 review & test
- 1:00 - 2:00 p.m. Blow down, purging, and repair of broken natural gas lines
- 2:00-4:00 p.m. Flow control by squeeze off and static electricity

FOURTH DAY (Thursday - May 8)

- 7:30 a.m.-4:00 p.m. Plastic fusion machine identification, maintenance and use. Plastic fusion procedures and qualification Module #38 review & test

FIFTH DAY (Friday - May 9)

- 7:30 a.m.-8:30 a.m. Cad welding and wrapping of steel pipe and fittings
- 8:30 a.m.- 10:00 a.m. OQ Testing #45 - Coating Repairs, #20 - Other Pressure Testing, #31-Inspecting Pipe and Coating,
- 10:00a.m.-4:00 p.m. Plastic fusion qualification

SIXTH DAY (Monday - May 12)

- 7:30 a.m.-4:00 p.m. Safety

SEVENTH DAY (Tuesday - May 13)

- 7:30 a.m.-4:00 p.m. Safety (first aid and CPR)

EIGHTH DAY (Wednesday - May 14)

- 7:30 a.m. -9:30 a.m. Fire Training
- 10:00 a.m.-2:30 p.m. Commercial Driver License requirements; pre-trip inspection, skills test and road test.
- 2:30 p.m.-4:00 p.m. OQ make-up testing or if needed
#42 - Abnormal Operating Conditions, #36 Physical Properties

EMERGENCY PLAN

I. Emergency Plan - Section V

A. Handout test and Section V

1. Let class complete test
2. Go over test
3. Explain each question
4. Give answers in detail

Emergency Plan Quiz

NAME _____

DATE _____

- 1.1-1 1. List the six priority concerns in an emergency.
- customer and general public safety
 - employee safety
 - property damage protection
 - customer inconvenience
 - public relations
 - economic considerations
- 3.2 (a) 1-4 2. List the four methods for shutting off the gas when you have a fire in a building.
- closing the inlet valves
 - shutting off the service at the main
 - pinching off or installing a pressure control fitting on the service line upstream of the meter
 - isolating the area
- 3.1(c)1-6 3. Name six of the methods used to stop flow of escaping gas from a point of damage.
- use of the Halt emergency control device
 - installation of a suitable leak clamp
 - use of an expandable stopper plug
 - use of a wooden plug
 - tightening or greasing the leaking valves or fittings
 - installing a barrel type sleeve over the leaking valve or fitting
- 2.1-2.10 4. What measures should be taken to minimize hazards in an emergency?
- evacuating premises which are or which may be affected
 - blocking off potentially hazardous areas
 - preventing accidental ignition
 - ventilation of affected premises
 - controlling the flow of leaking gas by section isolation, pressure reduction, shutting off meters, or other appropriate means
 - the discovery of any gas migration, in or around nearby buildings, sewers or other structures
 - the possibility of multiple leaks as a result of the initial damage
 - reporting to appropriate supervision and where appropriate, Gas Control, details of the emergency and requesting further instructions or assistance if needed
 - evaluate situation and based upon need call 911
 - requesting notification to and/or assistance from appropriate fire, police or other public officials

- 3.8(2)i-vi 5. What steps should be taken to restore the quality of gas in your system after an abnormal BTU value has been discovered to be below 950-1150 per cubic foot of gas.
- isolate the system or segment of the system
 - divert the gas to another area
 - blow down and/or purge
 - use gas as is, depending on the conditions
 - mix with storage or other gas to raise or lower BTU value
 - use a substitute gas mixture from another source
- 3.6(a)1-2 6. Name the three situations that would lead to evacuation of building
- any gas detected within a building
 - gas in the ground within 10 feet (20 feet during the winter season) of a building
 - any gas registering a stable reading on a CGI (approximately 2% or more) is detected within a duct system, such as sewer, telephone, storm drain or power. If less than 2% is detected within such a duct system, monitor the situation closely until a leak is found and repaired or verification is made that no leak exists.
- 3.6 (3) 7. When is it acceptable to have gas against the building and not evacuate?
- any leak on a riser less than a 2% CGI read at 20" below ground that can be vented may be classified as a AB@ Leak (rush evaluate and/or repair - to be determined by construction appropriate supervision)
- 3.8(b)i-ix 8. If water content in the system is above the pre-established limits of seven lbs. in water vapor per MMCF or free water, list the steps that need to be taken to minimize any hazards.
- isolate the system or segment of the system
 - blow down and/or purge
 - pig the line
 - use of line heaters
 - use of dehydrator units
 - injection of methanol in line
 - additional stages of regulation
 - monitor line and take dew point readings
 - use gas as is, depending of the condition
- 3.8(d) (1) 9. How many parts per million of Hydrogen Sulfide (H₂S) does it take to exceed pre-determined allowable limits within the system? 12 parts per million
10. If pressure in the system falls below a safe operating level, what action needs to be taken to protect end users?
Inspect and take corrective action prior to restoring pressure to the system
- 3.4(b) (3)
- 3.8(f) (1) 11. Is it true or false that the oxygen level within a system cannot exceed (10) ten parts per million in volume?
- 3.8(g) (1) 12. What is the pre-established limit of inert substance level within the system? 5% by volume

UNDERGROUND LEAK REPAIR PROCEDURES

STANDARD PRACTICE.....5-0-8

- I. Evacuation policy
 - A. Show overheads 1-4
 - I. Explain each
 - B. Show overheads 5-9
 - I. Explain each
 - C. Ask questions
- II. Show and explain overheads on actual instances (overheads in classroom)
 - A. Have class explain what they would do and why do it for each example
 - B. Correct any mistakes they make on each example



Questar Gas – Questar Pipeline

DOT OPERATOR QUALIFICATION – QUALITY ASSURANCE REVIEW

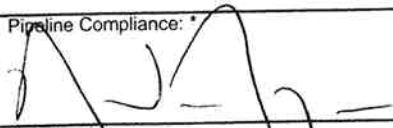

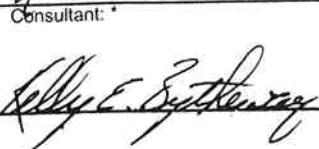
PURPOSE: Review completed module to verify:

- Conformity to DOT requirements
- Adequate content on covered task
- Addresses abnormal operating conditions
- Identifies training resources available
- Defines evaluation and acceptance criteria
- Identifies requalification requirements
- Appropriate record keeping

PREPARED BY

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QUALITY ASSURANCE REVIEW

SIGNATURE	DATE	SIGNATURE	DATE
Pipeline Compliance: * 	10/2/01	Other: T. Kelly Smith	9/25/01
Training: * 	9/25/01	Other:	
Consultant: * 	9/25/01	Other:	

* Required, at a minimum.

Physical Properties of Natural Gas

(Module 36)

- I. **Purpose**
To inform employees about Natural Gas and its physical properties, and what to expect when working with it
- II. **Resources**
 - A. Properties of natural gas demonstration
 - B. PowerPoint presentation
 - C. Pipeline Safety Regulation Requirements--49 CFR 192.751, "Prevention of accidental ignition"
 - D. Midwest Gas Association, Operator Qualification Training Program, Module 101, "Characteristics and Hazards of Natural Gas"
 - E. Properties of Natural Gas video, 1994 (in-house produced)
- III. **Abnormal Operating Conditions**
 - A. Uncontrolled ignition
 - B. Gaseous atmosphere
 - C. Carbon monoxide
- IV. **Evaluation Criteria**
 - A. Written test evaluating the individual's understanding of the subject matter
 - B. A score of 80 percent or higher is required for passing
- V. **Requalification Interval**
Personnel performing this covered task will be requalified every five years
- VI. **Record Keeping**
 - A. Written tests will be sent to the training department
 - B. The scores will be entered into the PeopleSoft record-management system

Physical Properties of Natural Gas Training Outline

Covered Task: General Knowledge Elements-NG Properties-Ignition Sources and Prevention of Accidental Ignition
49 CFR 192.75
Module 36

- I. Expected outcomes—after training, employees will be able to do the following:
 - A. Identify the physical properties of natural gas
 - B. Identify sources of ignition
 - C. Know how natural gas reacts in different situations
 - D. Work safely around natural gas

- II. Natural gas components
 - A. Natural gas is mostly methane (approximately 90 percent)
 - B. The other 10 percent is made up of propane, ethane, pentane and butane
 - C. Natural gas is 92 to 98 percent combustible; the other 2 to 8 percent is made up of carbon dioxide and nitrogen
 - D. It is an excellent grade of gas
 - E. The Btu content (amount of heat the gas contains) of Questar's gas can change constantly according to how much of the other gases are present, such as propane, ethane, etc.
 1. The Btu content also is affected by altitude and atmospheric pressure
 2. We have a standard that we use based upon the altitude
 - a. This helps us to know what Btu rate per hour an appliance should burn at any given altitude

- III. Sweet vs. sour gas
 - A. At the well head, we find sweet gas and sour gas
 1. Sweet gas is a gas that has little or no impurities
 2. It can be shipped via transmission lines to our service area
 - B. Sour gas is gas contains hydrogen sulfide (H₂S)
 1. Hydrogen sulfide is very toxic
 - a. Can smell it at 1 part per million
 - b. It is heavier than air
 2. It will deaden the sense of smell and paralyze your respiratory system causing suffocation and death
 - a. 50 to 100 parts per million - lose sense of smell, eyes and respiratory tract can become irritated, head ache and dizziness will occur
 - b. 100-300 parts per million - loss of reasoning and unconsciousness
 - c. 600 to 700 parts per million - death will occur
 3. If H₂S is burned, it produces sulfur dioxide which is a respiratory irritant
 4. The hydrogen sulfide is removed from our gas before it enters our distribution system
 5. We monitor our lines to make sure that no H₂S gets into our systems

6. There are alarms throughout the transportation system
- IV. There are three physical properties of natural gas
- A. The first physical property of natural gas is:
1. Odorless (show card if doing demonstration)
 - a. Natural gas, when it comes out of the ground, has no odor
 - b. We add an odorant that is very objectionable to our senses
 - (1) This odorant is a mixture of butyl mercaptan and thiophene
 - (2) We add approximately 3/4 pounds per million cubic feet of gas
 - (3) The odor of a skunk is part of the mercaptan family
 - (4) This odorant does not attach itself to the gas molecule, it can be filtered out in certain soils
 - (5) It is heavier than natural gas thus we cannot evaluate a gas leak by odor only, because once the gas vents to the atmosphere the odorant can separate from the gas
 - (6) The Odorant has the same smell world wide
 - c. The odorant is combustible and is consumed in the flame
 - d. It is similar to charcoal lighter fluid, it takes a lot to get it burning
 - e. The odorant will also maintain its strength over long distances
 - f. It is possible for the odor to be disguised by another stronger odor (this is why we never trust our noses or use any open flame to detect leaking gas)

Example: A long time ago there was a customer of ours that called constantly. Our service technicians hated to go to her house because she cried wolf so often. One day she called in a gas leak. When the technician arrived he could not smell gas. He proceeded to tell the customer exactly that. Then he lit a match to prove his theory. Of course we did replace the house for the customer after it blew up. No one was hurt but the service technician probably felt pretty stupid. This customer owned a tire store and had excess inventory stored at her house. The odor of the tires covered up the odor of the gas.

2. Repeat: **Never use an open flame or your nose for leak detection**
 3. We use items like combustible gas indicators, combustible gas detectors and soap for leak detection
- B. Non-Toxic (show card if doing demonstration) is the second property of natural gas
1. Tests have been done subjecting animals to concentrations of eight to 30 percent gas for up to 30 days and 80 percent gas for two 8-hour days with the animals showing no ill effects
 2. They have also tested four men at 25 percent gas for two hours with no ill effects
 3. The only way to make natural gas lethal is to; displace enough oxygen

from a space causing asphyxiation or have uncontrolled ignition of the gas.
An explosion (**abnormal operating condition**)

- a. To eliminate any danger from these situations, when gas is leaking, keep all sources of ignition out of area
- b. When it is necessary to enter a gaseous environment, wear a fire suit and supplied air respirator

4. Propane is also non-toxic, butane is slightly toxic

Example: Suicide using natural gas: I'm sure everyone has seen a movie or heard of someone sticking their head in the oven and turning on the gas - this is totally untrue. The only way that life can be stopped is to eliminate the oxygen in the oven and then you suffocate, or have uncontrolled ignition. There was a man in Salt Lake that had seen some of these movies and he decided to do exactly what he had seen. He blew out the pilots on the range, turned on the gas and stuck his head into the oven. After a while he must have become bored so he decided to have a smoke while waiting for the toxic gas to kill him. Of course he didn't get to finish the cigarette and he probably didn't even get the cigarette lit before he blew himself up. He did accomplish his task but probably with more mess than he had anticipated.

C. Lighter than air (show card if doing demonstration)—third property

1. This is what makes natural gas so safe
2. Natural gas will rise
3. If a building is ventilated as high as possible, the gas will exit in a very short time period
4. Ventilate as high as possible and try to create a draft
5. If air is assigned the number one for vapor density of a gas, then;
 - a. Natural gas, in our distribution area, has a vapor density of .56 to .62 or about two-thirds the density or weight of air
 - b. Propane has a vapor density of 1.56
 - c. Butane has a vapor density of 2.04
 - d. Gasoline is 2-4 times the density of air
6. Proving the weights of both gases (natural gas and propane)
 - a. Use the small glass tube and demonstrate by putting your finger on the hole in the glass tube then fill with propane
 - b. Remove your finger from the hole at the bottom of the glass tube and light the gas
 - (1) For safety, light the small hole first
 - (2) Then hold a wax taper above the glass tube to demonstrate that because propane is heavier than air, it will not light the gas
 - c. Before you burn all of the gas out of the tube
 - (1) Show that by pouring the propane in the glass tube towards one of the lit Bunsen burners, the propane will again light

- (2) Thus, proving propane can be poured, bucketed and swept
 - d. After the propane demonstration has been completed, fill the glass tube with natural gas from the Bunsen burner with a secondary flame
 - (1) Be sure to invert the glass tube while holding your finger over the hole
 - (2) Take the lit taper and pass under the tube showing that natural gas is lighter than air
 - (3) Then light the hole at the top to demonstrate that there really is gas in the tube
 7. Discuss how propane and gasoline vapor will remain in low spots until it is physically removed by a broom or fan
 - D. Recap the physical properties
 1. Odorless
 2. Non-toxic
 3. Lighter than air
- V. Requirements for combustion
- A. Fuel in a gaseous state (show card if doing demonstration)
 1. All fuels must be in a gaseous state before they will burn
 2. You have to heat a solid such as wood or coal to produce a vapor which is burned
 3. Natural gas is in a gaseous state beginning at a temperature of -260°F .
 4. Propane is in a gaseous state above -44°F .
 5. Butane is in a gaseous state above $+33^{\circ}\text{F}$.
 - a. This is why butane is not used much because our area experiences temperatures in the winter well below $+33^{\circ}\text{F}$.

Example: Put a lighter in a freezer, it will not light until the temperature of the butane reaches above $+33^{\circ}\text{F}$.
 - B. Proper amount of air mixed with gas (show card if doing demonstration)
 1. A ratio of one cubic foot of natural gas to 10 cubic feet of air will provide complete combustion
 2. The products of complete combustion are:
 - a. Carbon dioxide- CO_2
 - b. Nitrogen- N_2
 - c. Water vapor- H_2O
 - d. Heat
 3. There are no harmful products of complete combustion
 4. Ask participants why are gas appliances vented?
 - a. We can't be certain of complete combustion at all times
 - b. In the event that the appliance loses the 1-10 ratio, the vent will carry the products of incomplete combustion to the outside
 - c. When we do not have a 1-10 ratio, we create carbon monoxide (**abnormal operating condition**)
 - d. The products of incomplete combustion consist of:

- (1) carbon dioxide
 - (2) nitrogen
 - (3) water vapor
 - (4) heat
 - (5) **carbon monoxide**
- e. Besides carbon monoxide, we also create approximately one gallon of water per 100,000 Btu
- (1) This should be vented to the outside
- f. Show primary and secondary burners/flames
- (1) Explain that both have complete combustion
 - (2) The primary burner introduces oxygen into the gas before it is burned, making a nice blue flame with a temperature as high as 2600⁰ F.
 - (3) The yellow or secondary burner gets all of its oxygen surrounding the flame and is only approximately 1800⁰ F.
 - (4) Yellow flames aren't controllable because they have a tendency to impinge upon the combustion chamber creating soot and carbon monoxide
 - (a) Use a screen and cover yellow flame to show how it cools the flame when impingement occurs
- g. Recap—carbon monoxide is created by lack of oxygen and flame impingement
- h. Discuss flammability limits of natural gas
- (1) Lower explosive limit is 5 percent gas to 95 percent air
 - (2) Upper explosive limit is 15 percent gas to 85 percent air
 - (3) Natural gas will not burn outside of those limits
- i. Show large glass tube
- (1) Turn the air mixer all the way off and light the top of the tube
 - (2) Once it is burning at the top, open the air mixer slowly
 - (3) Watch the flame move down the tube when the limits of flammability are met
5. Show glass house (**abnormal operating condition**)
- a. Discuss combustion-air- and vent-relationship
 - b. Combustion air permits the complete combustion of the gas
 - c. Proper venting of the appliance maintains safe operating temperature and the proper supply of air
 - d. Show improper venting by using glass house
 - (1) Light the burner with combustion air vents at bottom
 - (2) Open then close the vents
 - (3) Show how the flame goes out
 - (a) Before the flame is all the way out it is producing carbon monoxide because of insufficient combustion air

- (4) Show relighting the burner and plugging off the vent
 - (5) Ask participants to watch the flame lift off the burner, all the time creating carbon monoxide that is trapped in the house because the vent is blocked
6. The effects of carbon monoxide
- a. Carbon monoxide (CO) is slightly lighter than air depending on the humidity at the time (.975)
 - b. It is colorless, tasteless and very toxic
 - c. CO produces flue like symptoms in humans
 - d. CO can build up in your blood stream over a period of time
 - e. Early warning signs are headache, nausea, dizziness and confusion
 - (1) 400 parts per million-headache for one to two hours, life threatening after three hours
 - (2) 800 parts per million-nausea, convulsions, death within 2 hours
 - (3) 1600 parts per million-nausea within 20 minutes, death within one hour
 - f. With four hours fresh air, only 50 percent of the CO in your blood is removed
 - g. The only positive way CO poisoning can be verified is with a blood test
- C. Heat source required to ignite the following (show card if doing demonstration)
- 1. Natural gas = 1100 - 1200° F. (requires the highest amount of heat)
 - 2. Propane = 871° F.
 - 3. Butane = 761° F.
 - 4. Gasoline = 495° F.
 - 5. A cigarette burns at approximately 900-1,000° F.
 - a. The cigarette alone is usually not hot enough to ignite natural gas
 - b. But if you take a drag on it or the paper flairs it could reach high enough temperature to ignite natural gas
 - c. The source of ignition for the cigarette will be high enough to ignite natural gas
 - 6. Sources of ignition
 - a. Lighter, matches, sparks
 - b. Electrical switch, telephone, none-intrinsically safe electronic equipment (cell phones, radios, etc.)
 - c. Vehicles, combustions engines
 - 7. Static spark is a good source of ignition
 - a. A static spark is approximately 3,000-10,000° F.
 - b. When there is a gas leak call, never ring the door bell
 - c. Always turn-off any equipment before entering the building
Any equipment that needs to be turned on for use in the building should be turned on outside
 - d. If there is gas present in the building, instruct the customer to

evacuate and not to touch anything that might cause a spark such as a telephone, light switch, etc.

- e. Show demonstration of red hot rod in flame
 - (1) Demonstrate by blowing out the flame on the rod and explaining that even though the rod is red hot, it does not have a temperature hot enough to ignite the gas
 - (2) Now use striker to relight the burner
- 8. Discuss presence of gas plumes
 - a. Know where you are.
 - b. Know where the gas is.
 - c. Do not carry anything that is not intrinsically safe or drive a vehicle into an area that might have natural gas in it.
- 9. Recap (show overhead)
 - a. Fuel in gaseous state
 - b. Proper amount of air mixture with the fuel
 - c. Hot enough source of ignition
- 10. Discuss possible fireplace danger
 - a. Open fireplaces remove air from inside the house
 - b. One of the places the air can be replaced from is the common vent of the appliance
 - c. Because so much air is being removed it may create a severe down draft on the common vent
 - d. This can cause the products of combustion to be pulled back into the building
 - e. Generally this will cause CO and can cause asphyxiation
- 11. If doing demonstration,
 - a. Show how a small flame causes so much suction that an egg is sucked into a bottle
 - (1) Take a small piece of paper that is burning, drop it into the bottle
 - (2) Place the egg on the mouth of the bottle with narrow end into the bottle
 - (3) The egg will be pushed into the bottle
 - (4) To remove the egg, put some pressure into the bottle
 - (5) Do this by positioning the egg in the neck of the bottle and blow into the bottle creating a pressure inside the bottle

D. Recap

- 1. Natural gas is:
 - a. Lighter than air
 - b. Odorless
 - c. Non-toxic
- 2. Requirements for combustion are the following:
 - a. Fuel in a gaseous state
 - b. Proper amount of air mixed with gas

- c. Ignition source
- 3. Natural gas is a safe, reliable source of heat for our customers
- E. Ask and answer questions
- F. Request completion of training evaluation
- G. Proceed to the evaluation portion of the module

Physical Properties of Natural Gas
(Module 36)
Written Evaluation

Name: _____
Date: _____
Employee Number: _____

1. What does natural gas contain causing it to be referred to as sour gas?
 - a. Sulfur Dioxide
 - b. Gas condensates
 - c. Propane and Butane
 - d. Hydrogen Sulfide

2. Using the symbol of 1 for air with vapor density, we can say that natural gas, in our distribution area, is _____ when compared to air.
 - a. 1.76 to 1.84
 - b. 2 to 4 times
 - c. .56 to .62
 - d. 1.58 to 1.64

3. What would occur if there were not enough combustion air?
 - a. May cause carbon monoxide
 - b. Pilot light problems
 - c. Furnace problems
 - d. All of the above

4. You arrive on a broken and blowing line; it is difficult to tell what direction the wind is blowing. Which of the following answers best describes what you should do?
 - a. Drive as close to the damage as possible and evaluate the situation to determine what action should be taken.
 - b. Park the vehicle away from the damaged line and walk as near as possible to the area of damage to determine what action should be taken, use cell phone to call for additional help.
 - c. Park the vehicle away from the area, ensure you don't have any non-intrinsically safe electronic equipment with you and walk as near as possible to the area of damage to determine what action should be taken
 - d. Natural gas is lighter than air and will rapidly dissipate so all of the above are correct.

5. Natural gas is made up of approximately _____ percent of methane.
- 90 to 95
 - 45 to 50
 - 75 to 80
 - 20 to 25
6. What is the perfect ratio of air mixed with gas for complete combustion?
- 7 to 3 ratio
 - 20 to 1 ratio
 - 10 to 1 ratio
 - 1 to 1 ratio
7. If we have flame impingement or cooling of the flame, it could start producing:
- Carbon monoxide
 - Nitrogen
 - Water vapor
 - Heat
8. What is the upper explosive limit of natural gas for flammability?
- 05% gas 95% air
 - 10% gas 90% air
 - 50% gas 50% air
 - 15% gas 85% air
9. What is the ignition temperature for natural gas?
- 871° - 1000 ° F.
 - 1100° - 1200 ° F.
 - 495° F.
 - 775° F.
10. If natural gas is suspected in a building, what would be possible sources of ignition?
- Door bell
 - Static sparks
 - Light switch
 - All of the above

Physical Properties of Natural Gas (Module 36)
Evaluation Answers (Do Not Distribute)

1. What does natural gas contain causing it to be referred to as "sour gas"?
 - a. Sulfur Dioxide
 - b. Gas condensates
 - c. Propane and Butane
 - d. **Hydrogen Sulfide**

2. Using the symbol of 1 for air with vapor density, we can say that natural gas, in our distribution area, is _____ when compared to air.
 - a. 1.76 to 1.84
 - b. 2 to 4 times
 - c. **.56 to .62**
 - d. 1.58 to 1.64

3. What would occur if there were not enough combustion air?
 - a. May cause carbon monoxide
 - b. Pilot light problems
 - c. Furnace problems
 - d. **All of the above**

4. You arrive on a broken and blowing line; it is difficult to tell what direction the wind is blowing. Which of the following answers best describes what you should do?
 - a. Drive as close to the hole as possible and evaluate the situation to determine what action should be taken.
 - b. Park the vehicle away from the damaged line and walk as near as possible to the area of damage to determine what action should be taken, use cell phone to call for additional help.
 - c. **Park the vehicle away from the area, ensure you don't have any non-intrinsically safe electronic equipment with you and walk as near as possible to the area of damage to determine what action should be taken**
 - d. Natural gas is lighter than air and will rapidly dissipate so all of the above are correct.

5. Natural gas is made up of approximately _____ % of methane.
 - a. **90 to 95**
 - b. 45 to 50
 - c. 75 to 80
 - d. 20 to 25

6. What is the perfect ratio of air mixed with gas for complete combustion?
- a. 7 to 3 ratio
 - b. 20 to 1 ratio
 - c. **10 to 1 ratio**
 - d. 1 to 1 ratio
7. If we have flame impingement or cooling of the flame, it could start producing _____.
- a. **carbon monoxide**
 - b. nitrogen
 - c. water vapor
 - d. heat
8. What is the upper explosive limit of natural gas for flammability?
- a. 5% gas - 95% air
 - b. 10% gas - 90% air
 - c. 50% gas - 50% air
 - d. **15% gas - 85% air**
9. What is the ignition temperature for natural gas?
- a. 871° -1000°
 - b. **1100°-1200°**
 - c. 495°
 - d. 775°
10. If natural gas is suspected in a building, what would be possible sources of ignition?
- a. Door bell
 - b. Static sparks
 - c. Light switch
 - d. **All of the above**

QUALIFICATION METHODS

Indicate how knowledge, skill and ability will be evaluated

COVERED TASK NAME: Prevention of accidental ignition; ignition sources

MODULE: 36-Physical Properties of Natural Gas

WRITTEN

Demonstrate knowledge (80% passing score) #

OBSERVATION – Performance on the Job

Demonstrate knowledge

Demonstrate skills

Demonstrate abilities

OBSERVATION – Simulation *

Demonstrate knowledge

Demonstrate skills

Demonstrate abilities

Evaluators need to ensure missed questions are discussed and there is understanding of the subject matter including any AOCs related to the question.

* When simulation is used, evaluator shall note any employee limitations that may interfere with covered task and refer this evaluation to the Training Department for special consideration.

Performance of task includes abnormal operating conditions

When skill and/or ability are not required, explain: _____

No observation, this is a knowledge base task

Physical Properties of Natural Gas



Questar Gas Operator Qualifications

Natural gas components

- Natural gas is mostly made up of methane (approximately 90 percent)
- The other 10 %
 - propane
 - ethane
 - pentane
 - butane
- Natural gas is 92% to 98% combustible
Other 2% to 3% carbon dioxide and nitrogen
- The Btu content of the gas can change
Other gases present, such as propane, ethane.
Altitude and atmospheric pressure

Sweet vs. Sour Gas

- Sweet gas has little or no impurities
- Sour gas contains hydrogen sulfide (H₂S)
- Hydrogen sulfide is very toxic
 - Can smell it at 1 part per million
 - It is heavier than air
 - It can deaden the sense of smell
 - Could paralyze your respiratory system causing suffocation and death

Sour Gas

- **50 to 100 ppm**
 - lose sense of smell
 - Eyes and respiratory tract can become irritated
 - Head ache and dizziness can occur
- **100-300 ppm**
 - Loss of reasoning and unconsciousness
- **600 to 700 ppm**
 - Death will occur
- If H₂S is burned, it produces sulfur dioxide
- The hydrogen sulfide is removed from the gas before it enters the transmission system
- We monitor our lines to make sure that no H₂S gets in the systems
- There are alarms throughout the transportation system.

The Three Physical Properties

- The first physical
"Odorless"
- Natural gas has no odor. We add an odorant
- Mixture of butyl mercaptan and thiophene
- 3/4 pounds per million cubic feet of gas

- This odorant does not attach itself to the gas molecule.
 - It can be filtered out in certain soils
 - It is heavier than natural gas, the odorant can separate from the gas
- The Odorant has the same smell world wide
- The Odorant is combustible and is consumed in the flame
- The odorant will also maintain its strength over long distances
- It is possible for the odor to be disguised
- Never use an open flame or your nose for leak detection
 - We use CGL's
 - CGD's
 - Soap for leak detection.

- Non-Toxic is the second property of natural gas
- Humans and animals have both been exposed to various concentrations of natural gas with no ill effects.
- Natural gas is lethal if:
 - displace enough oxygen causing asphyxiation
 - uncontrolled ignition of the gas. (AOC)
- When gas is leaking, keep all sources of ignition out of area
- When entering a gaseous environment, wear a fire suit and supplied air respirator
- Propane is also non-toxic, butane is slightly toxic.

- The third property of natural gas:
 - Lighter than air
- This is what makes natural gas so safe Natural gas will rise
- Ventilate as high as possible and try to create a draft
- If air is assigned a number of one for vapor density then, Natural gas, has a vapor density of .56 to .62 or about two-thirds the density or weight of air
- Propane - 1.56
- Butane - 2.04
- Gasoline is 2-4 times the density of air.
- To recap on the physical properties it is
- Odorless, Non-toxic, Lighter than air.

Requirements for Combustion

- Fuel in a gaseous state
- All fuels must be in a gaseous state before they will burn
- Natural gas is in a gaseous state beginning at a temperature of -260°F
- Propane -44°F
- Butane $+33^{\circ}\text{F}$

Complete Combustion

- A ratio of 1 cubic foot of natural gas to 10 cubic feet of air will provide complete combustion
- The products of complete combustion are
 - Carbon dioxide (CO_2)
 - Nitrogen (N_2)
 - Water vapor (H_2O)
 - Heat
- There are no harmful products of complete combustion
- We can't be certain of complete combustion at all times
- If the appliance loses the 1-10 ratio, the vent will carry the products of incomplete combustion to the outside
- When we do not have a 1-10 ratio, we create carbon monoxide (AOC)
- The products of incomplete combustion are the same as complete combustion + Carbon Monoxide

Complete Combustion...

- 100,000 Btu's creates one gallon of water per hour.
 - Should be vented to the outside
- Primary Air
 - Nice blue flame
 - 2600°F
- Secondary Air
 - Yellow flames
 - 1800°F
 - Impinge upon the combustion chamber
- Carbon monoxide is created by lack of oxygen and flame impingement.

The effects of carbon monoxide

- Carbon monoxide (CO) is slightly lighter than air depending on the humidity at the time (975)
 - Colorless
 - Tasteless
 - Very toxic
 - Flu-like symptoms
 - Early warning signs are headache, nausea, dizziness and confusion
- 400 ppm - For one to two hours headache, life threatening after three hours
- 800 ppm - Nausea, convulsions, death within 2 hours
- 1600 ppm - nausea within 20 minutes, death within one hour
- 50 percent of the CO in your blood is removed within 4 hours fresh air
- The only positive way CO poisoning can be verified is with a blood test

Flammability Limits of Natural Gas

- Lower explosive limit is 5 % gas to 95 % air
- Upper explosive limit is 15 % gas to 85 % air
- Natural gas will not burn outside of those limits.

Heat Source Required to Ignite

- Natural gas – 1100 - 1200° F.
- Propane – 871° F.
- Butane – 761° F.
- Gasoline – 495° F.
- A cigarette burns at approximately 900–1,000° F.

Ignition Sources:

- Lighters, matches, sparks
- Electrical switch, telephones, non-intrinsically safe electronic items (cell phones, radio, computer, etc.)
- Vehicles, combustion engines

Sources of Ignition

- Static spark is a source of ignition
A static spark is approximately 3,000 to 100,000° F.
- When there is a gas leak call
never ring the door bell
Always turn-off any equipment before entering the building (cell phones, pagers, etc.)
Any leak detection equipment should be turned on before entering building.
- If gas is present in the building
Instruct the people to evacuate
Not to touch anything that might cause a spark
 - Telephone
 - light switch
 - etc.

Recap “Natural gas is”

- Lighter than air
- Odorless
- Non-toxic
- Requirements for combustion:
- Fuel in a gaseous state
- Proper amount of air mixed with gas
- Ignition source.



Questar Gas – Questar Pipeline

DOT OPERATOR QUALIFICATION – QUALITY ASSURANCE REVIEW

- PURPOSE:** Review completed module to verify:
- Conformity to DOT requirements
 - Adequate content on covered task
 - Addresses abnormal operating conditions
 - Identifies training resources available
 - Defines evaluation and acceptance criteria
 - Identifies requalification requirements
 - Appropriate record keeping

Note: The training outline might be developed at a later date on a “as needed” basis

PREPARED BY

Consultant: Kelly S & DeeRay W	Department: Training	Phone:
Preparer: Reid Hess	Department: Training	Phone: 3374

QUALITY ASSURANCE REVIEW

SIGNATURE	DATE	SIGNATURE	DATE
Pipeline Compliance* 	10/7/04	Other:	
Training* 	7.23.03	Other: 	7.23.02
Consultant: *		Other:	

* Required, at a minimum.

Abnormal Operating Conditions (Module 42)

I. Purposes

- A. This module is for the purpose of qualifying the individual to recognize and react to general abnormal operating conditions
- B. To verify the individual's knowledge about general abnormal operation conditions
- C. To prepare each individual so that they may qualify under 49 CFR 192 Subpart N (Qualification of Pipeline Personnel) to perform the following Covered Task:
Abnormal Operating Conditions

II. Resources

- A. Federal Pipeline Safety Regulations
 - 1. 49 CFR 191.23, Reporting Safety Related Conditions
 - 2. 49 CFR 192, Subpart N, Qualification of Pipeline Personnel
 - 3. 49 CFR 192, Subpart I, Requirements for Corrosion Control
 - 4. 49 CFR 192.169, Compressor stations: Pressure limiting devices
 - 5. 49 CFR 192.325, Underground clearance
 - 6. 49 CFR 192.615, Emergency plans
 - 7. 49 CFR 192.613, Continuing surveillance
 - 8. 49 CFR 192.619, Maximum allowable operating pressure: Steel or plastic pipelines
 - 9. 49 CFR 192.621, Maximum allowable operating pressure: High- Pressure distribution systems
 - 10. 49 CFR 192.706, Transmission lines: Leakage surveys
 - 11. 49 CFR 192.723, Distribution systems: Leakage surveys
 - 12. 49 CFR 192.751, Prevention of accidental ignition
- B. Questar Regulated Services Standard Practices Procedures Manual
 - 1. Standard Practice 1-01-02, "Designing Steel Piping Systems"
 - 2. Standard practice 1-11-01, "Design for Protection of Transmission Lines and Mains from Physical Hazards"
 - 3. Standard Practice 1-90-01, "Test Requirements for Pipelines and Pipeline Facilities"
 - 4. Standard Practice 1-97-04, "Determining Maximum Allowable Operating Pressure for Steel or Plastic Pipelines"
 - 5. Standard Practice 3-10-03, "Pipeline Patrolling and Leakage Surveys"
 - 6. Standard Practice 4-14-01, "Combustible Gas Indicator Maintenance and Operation Procedures"
 - 7. Standard Practice 5-00-07, "Underground Facilities Damage Prevention Program"
 - 8. Standard Practice 7-00-01, "General Corrosion Control Procedures"
 - 8. Standard Practice 7-60-01, "Monitoring Cathodic Protection of Steel Pipelines"
- C. Questar Gas Standard Practices Procedures Manual

V. **Requalification Interval**

Individuals performing this covered task will be required to re-qualify every three years with this module (requalification will be completed by the end of the third calendar year)

VI. **Record Keeping**

Written or oral test will be proctored; scores will be recorded and entered into Questar's PeopleSoft record-management system by the training staff

Abnormal Operating Conditions Training Outline

Covered Tasks: Abnormal Operating Conditions

Standard Practice: 1-01-01, 1-01-02, 1-11-1, 1-90-01, 1-97-04, 3-10-03, 4-14-01, 4-14-02, 4-65-02, 5-00-07, 5-00-08, 7-00-01, 7-60-01,

Emergency Plans: QPC section V, XIII, QGC section V, IX

Midwest Energy Association: Energy training Network; Abnormal Operating Conditions 104

49 CFR 191.23, 192 subpart N, 192 subpart I, 192.169, 192.325, 192.613, 192.615, 192.621, 192.706, 192.723, 192.751

Module 42

I. **Expected Outcomes**

Demonstrate the ability to recognize and react to general abnormal operating conditions that could reasonably be expected during a qualified employee's performance of day to day responsibilities.

II. **Lesson**

A. Background

1. Regulatory requirements for transmission and distribution pipeline patrols (49 CFR Part 192.5, 192.613, 192.705, 192.707, 192.709, 192.721, 191.23, 192 subpart N, 192 subpart I, 192.169, 192.325, 192.613, 192.615, 192.621, 192.706, 192.723, 192.751)
2. Standard Practice: 1-01-01, 1-01-02, 1-11-1, 1-90-01, 1-97-04, 3-10-03, 4-14-01, 4-14-02, 4-65-02, 5-00-07, 5-00-08, 7-00-01, 7-60-01, Emergency Plans: QPC section V, XIII, QGC section V, IX

B. Safety

1. No specific safety instructions required

III. **Training**

A. Abnormal Operating Conditions

1. 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 environment (192 definition)
2. An individual must be able to recognize and react to an Abnormal Operating Condition.
 - a. Depending on the individual's expertise and qualifications the response may be to take care of the situation and make repairs, or to report it to the proper person so the necessary action can be taken, usually their supervisor, Gas Control or dispatch (depends whether QPC or QGC).
 - b. The important item to remember is the individual must be able to recognize and react to an Abnormal Operating Condition.

proper response could be to notify supervisor, if qualified determine if regulator is bad, if so replace, if not investigate to find problem and initiate repairs.

- f. Conditions creating stress on a pipeline such as earth movement, floods, etc.
 - (1) Example: Soil is starting to slough away from a transmission pipeline running along side of a hill. A proper response would be to notify a supervisor, engineering and gas control.
 - (2) Example: A plastic distribution line has been exposed and appears to be stretched tight due to flooding. A proper response would be to notify supervision and engineering. If qualified shut down the line and make necessary repairs.

A. Federal and state reporting criteria

- 1. Federal reporting-- two-hour notification required for an event that involves a release of gas and:
 - a. A death, or personal injury necessitating in-patient hospitalization; or
 - b. Estimated property damage, including cost of lost gas, of the operators or others, or both, of \$50,000 or more; or
 - c. An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs 1 or 2

NOTE: Notifications will be made by pipeline compliance under the direction of the general manager. Due to the time-sensitive nature of this reporting, it is critical to report any such incident to gas control or dispatch immediately, who will then notify the appropriate personnel

- 2. State reporting (In states other than Utah just mentions reporting requirements are different, **no need to discuss Utah requirements with individuals that will not work in Utah**)
 - a. Utah one hour notification required for the following:
 - (1) Removal of any segment of transmission pipeline from service
 - (2) Property damage of \$15,000 or more
 - (3) Damage or leaking of high pressure or belt lines
 - (4) Loss of gas service to 10 or more customers
 - (5) Evacuation by natural gas operator of highly populated areas (commercial business, office buildings, eateries, schools, churches and public meeting places)
 - (6) Incidents and safety-related conditions reportable to Office of Pipeline Safety (OPS) and Department of Transportation (DOT)
 - (7) Fire or explosion on pipeline systems, including customer-owned piping

**Abnormal Operating Conditions
(Module 42)
Written Evaluation**

Name: _____

Date: _____

Employee #: _____

Instructions: Circle "True" or "False" or circle the letter that corresponds with the correct answer.

1. According to the Operator Qualification Rule, an abnormal operating condition:
 - A. Is when a condition, identified by the operator, might indicate a component malfunction or deviation from normal operations
 - B. Might indicate a condition exceeding design limits
 - C. Might result in hazards to persons, property or the environment
 - D. All of the above

2. When an abnormal operating condition is observed, the employee must:
 - A. Make all repairs immediately
 - B. Notify Questar's pipeline compliance group
 - C. Recognize and react correctly to the situation
 - D. All of the above

3. Which of the following would **not** be considered an abnormal operating condition?
 - A. Improper pipeline installation
 - B. Earth movement
 - C. Low pressure in the pipeline
 - D. Freezing and thawing around a pipeline

4. A situation is **not** considered an abnormal operating condition unless it involves the release of natural gas.

True

False

11. Which of the conditions identified below is **not** an abnormal operating condition within a compressor station?
- A. Minor hail damage to the station roof
 - B. Equipment damage
 - C. Pipeline damage
 - D. Pressure equipment failure
12. Leaking gas is **not** considered an abnormal operating condition if:
- A. It can not be smelled
 - B. It can not be heard
 - C. A qualified individual is on sight ready to stop the leak
 - D. None of the above
13. When corrosion or pitting is found to be excessive but is not leaking, you should:
- A. Notify System Integrity and supervision
 - B. Contact Questar's pipeline compliance group
 - C. Fill out a leak repair order
 - D. All of the above
14. Which of the following is **not** an abnormal operating condition?
- A. Fire in a regulator station
 - B. Fire in a compressor station
 - C. Fire on a meter
 - D. Fire in an empty Questar business office
15. From the choices listed below, select the best reaction to the following abnormal operating condition: You expose a section of pipe with damaged wrap. After close examination, you determine the pipe has pitting in the area but is not leaking, you should:
- A. Evacuate the area because of the potential for a hazardous leak
 - B. Wrap the pipe and bury it because it is not leaking
 - C. Evaluate the situation and determine whether to repair or replace the pipe
 - D. Both A and C
16. All individuals performing covered tasks, regardless of expertise or job requirements, are expected to react the same way to Abnormal Operating Conditions.

True

False

17. You arrive at a job sight and find dead vegetation directly above one of our pipelines, the surrounding areas vegetation is in good shape. Is this situation potentially an abnormal operating condition? If so, why?
- A. No, vegetation is tough to grow in certain areas
 - B. No, natural gas does not cause vegetation to die because it is non-toxic
 - C. Yes, vegetation does not grow well in a natural gas environment
 - D. None of the above
18. Which of the following would be considered an abnormal operating condition?
- A. Dented steel pipeline
 - B. Pipeline burial depth less than allowed by standard practices
 - C. Pipeline installed within 6" of another underground utility
 - D. Unpainted meter set
19. Who is responsible for reporting a safety-related condition to the DOT Office of Pipeline Safety?
- A. The person discovering the Safety Related Condition
 - B. Questar's Pipeline Compliance group
 - C. Dispatch or Gas Control
 - D. None of the above
20. Which of the following would be considered a reportable incident to the Office of Pipeline Safety, Department of Transportation?
- A. Death or overnight hospitalization as a result of a release of natural gas
 - B. Cause property damage of approximately \$50,000 or more, including loss of gas
 - C. A significant incident, according to company judgment, even though it did not meet the above criteria
 - D. All of the above

Abnormal Operating Conditions (Module 42)

Written Evaluation Answers - Do Not Distribute

1. According to the Operator Qualification rule an abnormal operating condition is:
 - A. Is when a condition, identified by the operator, that might indicate a component malfunction or deviation from normal operations
 - B. May indicate a condition exceeding design limits
 - C. May result in hazards to persons, property or the environment
 - D. All of the above

2. When an abnormal operating condition is observed the employee must:
 - A. Make all repairs immediately
 - B. Notify Questar's pipeline compliance group
 - C. Recognize and react correctly to the situation.
 - D. All of the above

3. Which of the following would not be considered an abnormal operating condition?
 - A. Improper pipeline installation
 - B. Earth movement
 - C. Low pressure in the pipeline
 - D. Freezing and thawing around a pipeline

4. True or False
A situation is not considered an abnormal operating condition unless it involves the release of natural gas.

5. Which of the following would be considered an abnormal operating condition?
 - A. A third-party excavator trenching across Questar's right-of- way, having made proper notification to the appropriate one call center
 - B. Chipped paint exposing bare pipe with corrosion on an above ground assembly
 - C. A valve that will no turn
 - D. Both B and C

6. True or False
An abnormal operating condition that is not a safety hazard must still be repaired immediately.

7. Which of the following would be considered an abnormal operating condition?
- A. Gas leaking from a meter
 - B. Damaged wrap on an exposed pipe
 - C. A sudden unexplained increase in pressure on the system
 - D. **All of the above**
8. Which of the following would not be considered an abnormal operating condition?
- A. **Breaking an electrical line during excavation while installing a new gas line**
 - B. A relief blowing off unexpectedly
 - C. A dent in the pipe
 - D. A leaking valve
9. Which of the following is not a true statement regarding an abnormal operating condition?
- A. Requires a prompt response
 - B. May indicate a system malfunction
 - C. **Always results in an emergency**
 - D. Can result in a hazard to property
10. Which is not a source of accidental ignition of natural gas?
- A. Accidental electrical arcing
 - B. **Properly wired and installed explosion proof light switch**
 - C. Properly wired electrical devices in use
 - D. Potential for static electrical discharge
11. Which of the conditions identified below is not an Abnormal Operating Condition within a compressor station?
- A. **Minor hail damage to the station roof**
 - B. Equipment damage
 - C. Pipeline damage
 - D. Pressure equipment failure
12. Leaking gas is not considered an abnormal operating condition if?
- A. It can not be smelled
 - B. It can not be heard
 - C. A qualified individual is on sight ready to stop the leak
 - D. **None of the above**

13. When corrosion or pitting is found to be excessive, but is not leaking you should:
- A. Notify System Integrity and supervision
 - B. Contact Questar's pipeline compliance group
 - C. Fill out a leak repair order.
 - D. All of the above
14. Which of the following is not an abnormal operating condition?
- A. Fire in a regulator station.
 - B. Fire in a compressor station.
 - C. Fire on a meter.
 - D. Fire in an empty Questar business office.
15. From the choices listed below, select the best reaction to the following abnormal operating condition: You expose a section of pipe with damaged wrap. After close examination, you determine the pipe has pitting in the area but is not leaking. You should:
- A. Evacuate the area because of the potential for a hazardous leak.
 - B. Wrap the pipe and bury it because it is not leaking
 - C. Evaluate the situation and determine whether, or not, to repair or replace the pipe
 - D. Both A and C
16. All individuals performing covered tasks, regardless of expertise or job requirements, are expected to react the same way to Abnormal Operating Conditions.
- True False
17. You arrive at a job sight and find dead vegetation directly above one of our pipelines, the surrounding areas vegetation is in good shape. Is this situation potentially an abnormal operating condition? If so, why?
- a. No, vegetation is tough to grow in certain areas
 - b. No, natural gas does not cause vegetation to die because it is non-toxic
 - c. Yes, vegetation does not grow well in a natural gas environment
 - d. None of the above
18. Which of the following would be considered an abnormal operating condition?
- A. Dented steel pipeline
 - B. Pipeline burial depth less than allowed by standard practices
 - C. Pipeline installed within 6" of another underground utility
 - D. Unpainted meter set

19. Who is responsible for reporting a Safety Related Condition to the Office of Pipeline Safety, Department of Transportation?

- A. The person discovering the Safety Related Condition
- B. Questar's Pipeline Compliance group
- C. Dispatch or Gas Control
- D. None of the above

20. Which of the following would be considered a reportable incident to the Office of Pipeline Safety, Department of Transportation?

- A. Death or overnight hospitalization as a result of a release of natural gas
- B. Caused an estimated property damage of \$50,000 or more, including loss of gas
- C. A significant incident, according to company judgment, even though it did not meet the above criteria
- D. All of the above

Abnormal Operating Conditions

Sec. 192.803 Definitions.

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

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

The operator - Questar

1. A condition identified by Questar that may indicate a malfunction of a component:

- a. That may indicate a condition exceeding design limits, or
- b. That may result in hazard to person, property, or the environment.

2. Or a condition identified by Questar that may indicate a deviation from normal operation:

- a. That may indicate a condition exceeding design limits, or
- b. That may result in hazard to person, property, or the environment.

Federally Reportable Incidents

1 - Death or Overnight Hospitalization,

2 - Property Damage of \$50,000 or More, or

3 - Significant, May Not Meet Above Criteria

⊗ Phone notice to Fed within two hours of discovery

⊗ Arizona - within two hours of discovery

⊗ California - within two hours of discovery

⊗ Nevada - within two hours of discovery

⊗ Utah - within one hour of discovery

⊗ Wyoming - within two hours of discovery

Abnormal Operating Conditions

I - Reportable Incidents

II - Safety Related Conditions

III - Abnormal Operating Conditions

IV - Who is Responsible?

V - What Do I Do?

Who is Responsible?

- »»» You must report incidents and safety related conditions to Gas Control - ASAP
- »»» Gas control must report the same to the Pipeline Compliance Group - ASAP
- »»» System Integrity must report the same to the DOT - ASAP

Safety Related Conditions

1. Corrosion reduced pipe wall thickness - Less than MAOP,
2. Unintended movement or loading - Environmental,
3. Material defect or physical damage,
4. Leak considered an emergency, or
5. Hazard and cause a 20% reduction in operating pressure

⊗ Written report within 5 days, but not later than 10

⊗ Report not required, if repaired before deadline
(except #1)

QUALIFICATION METHODS

Indicate how knowledge, skill and ability will be evaluated

COVERED TASK NAME: Abnormal operating conditions

MODULE: 42-Abnormal Operating Conditions

WRITTEN

Demonstrate knowledge (80% passing score) #

OBSERVATION – Performance on the Job

Demonstrate knowledge

Demonstrate skills

Demonstrate abilities

OBSERVATION – Simulation *

Demonstrate knowledge

Demonstrate skills

Demonstrate abilities

Evaluators need to ensure missed questions are discussed and there is understanding of the subject matter including any AOCs related to the question.

* When simulation is used, evaluator shall note any employee limitations that may interfere with covered task and refer this evaluation to the Training Department for special consideration.

Performance of task includes abnormal operating conditions

When skill and/or ability are not required, explain: _____
Knowledge base task. Individual AOC's are covered with each specific task.
