COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ORIGINAL

The Joint Application of Kentucky Frontier Gas, LLC Belfry Gas, Inc., Floyd County Gas (East Kentucky Utilities, Inc.) Elam Utility Company, Inc., and Mike Little Gas Company for approval of transfer and acquisition of assets and stock, and issuance of a certificate of convenience and necessity, if necessary.	))))))	Case No. 2005-00348

APPLICATION

Kentucky Frontier Gas, LLC, Belfry Gas, Inc., Floyd County Gas, formerly East Kentucky Utilities, Inc., Elam Utility Company, Inc. and Mike Little Gas Company, by counsel, petition the Commission for an order approving the acquisition and transfer of assets or stock of several natural gas utilities pursuant to KRS 278.020(4) and (5), and the issuance of a certificate of convenience and necessity, if necessary.

KRS 278.020(4) provides that "[n]o person shall acquire or transfer ownership of, or control, or the right to control, any utility under the jurisdiction of the commission ... without prior approval by the commission."

KRS 278.020(5) provides that "[n]o individual, group, syndicate, general or limited partnership, association, corporation, joint stock company, trust, or other entity (an "acquirer"), whether or not organized under the laws of this state, shall acquire control, either directly or indirectly, of any utility furnishing utility service in this state, without having first obtained the approval of the commission."

A separate, related application has been filed for approval of the financing plan for Frontier under Case No. 2005- ("Application to Finance"), which is incorporated by reference.

1. Kentucky Frontier Gas, LLC ("Frontier") is a Colorado company authorized to do business in Kentucky. Its address is 3760 Vance Street, Wheat Ridge CO 80033. Managing partners are Robert Oxford and Steven Shute. A copy of its articles of organization and its certificate to operate in Kentucky are attached as exhibit 1.

2. Frontier is an LLC formed for the purpose of acquiring and operating several small natural gas utilities generally located in eastern Kentucky. Frontier has studied about 10 small gas distribution companies in eastern Kentucky. These utilities are all similar: they serve 400 to 1100 customers, mostly small residential and commercial accounts; annual gas volume has not reached a critical mass to achieve profitability; and most have negative equity and large debts. Due to chronic operating losses, these utilities are unable to pay their loans or form capital to market their services or expand systems; they are only marginally able to comply with federal and state regulations for pipeline safety, training and utility reporting; and there is little or no prospect for significant change in their financial outlook.

3. Frontier has entered into purchase contracts with the four gas utilities listed below. The contracts are attached as exhibit 2. All purchases are subject to approval by PSC, including approval of proposed capital structure, financing, tariffs, and transfer of any certificates of public convenience and

necessity (CPCN) granted by PSC to any of these entities. Purchase prices are based on the industry standard of $1000 per meter, plus other factors such as gas volume and growth potential. The resulting purchase prices are about 2 times Book Value, which is another industry standard for acquiring existing utility systems. The utilities are:

a. **Belfry Gas, Inc.** Incorporated in 1969, Belfry is owned by JW Kinzer and has about 560 customers in eastern Pike County, from Belfry to the border near Williamson, WV. The owner of Belfry Gas will transfer the assets of the gas distribution entity, including the CPCN, but will retain some of the transmission pipelines and the Belfry name.

b. **Floyd County Gas.** Originally incorporated as Ohio-Kentucky Utilities in 1969, the system was bankrupted and assets taken over by Floyd County ca 1979. Since then, the system has been operated by a non-profit entity **Eastern Kentucky Utilities** (EKU) headed by John Allen (now deceased) under contract with the County. It is unclear which entity (if any) holds the CPCN. In April 2005, Floyd County placed the assets up for public bid, and accepted the offer by Frontier partners. The purchase of assets will *not* include EKU. This system serves about 1100 customers in Floyd County from Prestonsburg toward Pikeville. Frontier currently has a management agreement with the county to operate the gas system. That agreement is included with exhibit 2.

c. **Elam Utility Company, Inc.** Incorporated in 1936, this gas-only utility is now owned by Wilma Ison. This utility serves about 475 customers, mostly in the West Liberty community in Morgan County.

d. **Mike Little Gas Company** Incorporated in 1964, company is now owned by the heirs of Mike Little. This utility serves about 400 customers, mostly in the Melvin community in southwest Floyd County.

4. No rate adjustment is being proposed at this time and no acquisition adjustment is being requested at this time. Frontier proposes to adopt the currently approved General Rates and tariffs used by each respective certificated gas utility. Adoption Notices are attached as exhibit 3. Frontier anticipates these rates will stay in effect for 1 to 2 years. Frontier plans to eventually file a consolidated rate case and serve all customers through a single utility brand with a single rate structure.

5. The consolidation of these utilities is expected to create a critical mass which is much more viable. Many utility functions - billing, accounting, customer calls, emergency response, operator training and regulatory compliance - would be enhanced by a common, central organization.

6. Elam and Mike Little customers will continue to be served under those operating names, rates and tariffs. Customers of East Kentucky Utilities and Belfry Gas will be served under the "Frontier Gas" brand, but at the current rates and tariffs of those companies.

7. Frontier will hold all assets and liabilities of all companies acquired.

8. Frontier is a limited liability company formed to acquire Kentucky gas utilities. Upon funding of equity and debt, and after closing on the purchase of these utilities, Frontier LLC members will hold the following ownership (percentages will vary slightly). See detailed resumes attached as exhibit 4:

a. **Industrial Gas Services, Inc.** *(20%)* was created by Robert Oxford in 1972. IGS works to provide energy solutions to large industrial customers, including drilling and exploration, delivery pipelines and gas transportation and management services. From 1994-98, Bob Oxford was a founder and principal of Frontier Energy, a gas utility start-up serving 7 counties in northwestern North Carolina. Through IGS, Bob and Steve Oxford have worked on numerous other gas distribution projects.

b. **Gilmer Mickey** *(23%)* is a registered professional engineer, gas pipeline contractor and co-owner of Pinedale Natural Gas.

c. **Larry Rich** *(10%)* has an MBA and was formerly a regional operations manager with a large southeastern gas utility. He helped with initial construction and operation of Frontier Energy in NC.

d. **Steven Shute** *(24%)* is a registered professional engineer and owner / operator of several small gas utilities including Frontier Energy and Pinedale Natural Gas.

e. **Don Silversmith** *(23%)* is a finance and real estate specialist in Denver.

9. The acquired companies will be serviced by 5 experienced full-time operating personnel from EKU and Elam. Office workers will be available part-

time from Mike Little and EKU for at least the transition stage, and possibly for longer-term employment. All Belfry operators will remain with their affiliate Kinzer Drilling, and will no longer operate the utility. Additional workers will be hired as needed. Frontier will initiate an Operator Qualification (OQ) program to qualify its present workers, and will train and qualify any new hires through this program.

10. The acquired companies will be managed by experienced gas distribution personnel. See attached detailed resumes in exhibit 4 for specific work experience. Preliminary management assignments are as follows:

Bob Oxford will be Chief Executive Officer, based in Colorado. He will oversee all financial, gas management and acquisition matters.

Steven Shute will be President, based in Colorado. He will oversee all technical and operations matters and will serve as Chief Engineer.

Larry Rich will serve as VP and General Manager of utility operations. He will be based in the Frontier central office near Prestonsburg, and will manage all day-to-day operations of the consolidated company.

Steve Oxford will be VP – Regulatory Matters, responsible for US DOT pipeline safety compliance matters. He will oversee the company DOT compliance operations and records, will interface with Kentucky PSC safety personnel, and will administer the company Operator Qualification training and certification plan and all other DOT-required tasks.

Gilmer Mickey will serve as Chief Financial Officer, based in Wyoming.

He will set up and monitor a central billing and accounting system for the entity.

11. Frontier intends to operate the utilities centrally, with operating personnel available to work on any entity, while maintaining distinct billing rates and financial reporting for each separate utility at least for the initial 2 years. The bid proposal to Floyd County included detailed descriptions of the consolidated operation. Expected operations are outlined in the Floyd County proposal. A copy of that bid proposal is included in exhibit 2.

a. **Operating Employees.** The Frontier group plans to consolidate the operations of several small gas distribution systems into a larger utility based in Eastern Kentucky. Frontier has signed purchase agreements with 4 entities, and has pending offers to others.

The combined utility will have about 2800 meters in Floyd, Morgan and Pike counties. It will be based in Prestonsburg and will have about 5 operating and maintenance field employees, and 2 managerial and clerical employees. Frontier expects to employ operating employees currently with EKU and Elam. Several others are retiring, and Frontier hopes to be able to use their expertise as available.

b. **Physical Location.** The Floyd County system near Prestonsburg is near the center of the combined utilities, so the central office will be located there. Frontier will initially lease the existing EKU shop, and will evaluate requirements for a local base central to all utility

operations. Most employees will be based around Prestonsburg, but a few will remain with their respective utility systems in their present location.

Customer service and support will be based locally. Frontier will develop a new shared billing and support system for the consolidated gas utility. Payments will be collected and banked locally. Engineering and technical, pipeline safety and gas supply support will be based in Colorado.

c. **Emergency Coverage.** Phone numbers for each local utility will ring in to the central office for dispatching emergency response. After hours and on weekends and holidays, the phones will be forwarded to a 24/7/365 Call Center. Each operator and manager will have a company mobile phone. There will be at least 1 employee designated "on-call" after hours and on weekends and holidays. If mobile phone coverage is not adequate, the on-call operator may also carry a pager.

When an emergency call comes in, the central office or off-hours Call Center will have a list of gas company operations personnel to call, starting with the on-call operator for that area. The call center must run through the mobile-home-pager numbers until verbal contact is made with an operator who will respond.

Frontier intends to set a standard of service that every emergency call will get a response within 45 minutes, even to the customers located furthest from Prestonsburg.

c. **Billing & Customer Service.** The combined utility will be based in or near Prestonsburg. Customer service and support will be based locally. Frontier will purchase a new shared billing and support system for the consolidated gas utility. Frontier will provide a drop box for personal payments in each local utility. All payments will be deposited in a local bank. Billing, collections and front-end accounting will be based in Kentucky.

d. **US DOT – Office of Pipeline Safety Requirements.** The US Department of Transportation (DOT), Office of Pipeline Safety (OPS) administers regulations in 49 CFR Part 192 et al ("DOT 192") that pertain to natural gas pipelines and utilities. These rules govern all facets of gas pipeline design, construction, operations, and maintenance.

The Floyd County natural gas distribution system is jurisdictional to DOT under Part 192. Federal pipeline safety regulations are administered and enforced by the Kentucky Public Service Commission (PSC) pipeline safety agency. Frontier plans to substantially improve DOT compliance from its existing condition:

i. Under DOT §192.605, every utility must prepare and follow a written **Operations & Maintenance** plan to maintain compliance with pipeline safety regulations. This O&M plan also must include an **Emergency Plan**. The current O&M plans are either non-existent or inadequate to meet present and anticipated future regulations. Frontier will implement its 500-page, 8 section O&M

plan used by a half dozen associated utilities, modified specifically for Kentucky operations. A draft O&M manual is submitted with the Supplemental Technical Data as part of exhibit 8.

ii. Under DOT §199, every utility must prepare and follow a written anti-drug & alcohol misuse prevention plan. The utilities are performing random drug testing, but we have no evidence of a written program for **drug & alcohol** compliance. Frontier will implement a written plan. A sample plan is included in exhibit 8.

iii. Under DOT §192.801 Subpart N, every utility must prepare and follow an **Operator Qualification** (OQ) program to provide documentation of adequate training, field skills and recurrent education. The utilities presently have no such program. Frontier will implement an OQ program used by a half dozen associated utilities to train and qualify experienced and new employees. A draft OQ plan is submitted with the Supplemental Technical Data in exhibit 8.

iv. Under DOT §192.901 Subpart O are regulations for **Pipeline Integrity Management** (PIM). Those regulations currently apply only to transmission pipelines, but OPS soon expects to require Integrity Management Programs (IMP) for gas distribution systems. Frontier partners have formulated several IMPs, and will tailor a plan to the consolidated utilities as required.

v. Under DOT §192, every utility must prepare and follow **Damage Prevention** and **Public Education** programs to educate customers and the general public about the existence of gas pipelines and the rules of gas safety. The utility must also review the same information with area excavators and public safety agencies. The utilities presently have an incomplete program. Frontier will implement programs used by its associated utilities in Colorado, Nevada and Wyoming, but tailored specifically for these Kentucky utilities.

Each utility will benefit from the operating experience of the Frontier partners. Among the consolidated small utilities, compliance with the US DOT pipeline safety programs will improve.

e. **Effect on Customer Service.** The effect of Frontier ownership should be at least transparent to the system customers; and in fact should improve customer service. It is anticipated that the same operators will run the system and the same phone number will ring into a Prestonsburg-area office. Customer records will be kept electronically and available at a moment's notice, as contrasted with old paper records. Frontier plans to operate each utility at existing rates for at least 18-24 months, then to file a consolidated rate case to combine all utilities into a common rate schedule. With economies of scale, the combined rate should be less than the existing rates charged by these companies.

f. **Tariff Revisions.** Frontier will review all existing tariffs to determine the need for revisions, updates and additions and file necessary modifications as appropriate.

12. A current financial statement for member Industrial Gas Services, Inc. is attached as exhibit 5. Frontier has no historical financial statements due to its recent formation.

13. The most recent PSC Annual Reports for Belfry, Elam and Mike Little are incorporated by reference. No annual report is available for East Kentucky Utilities, but the 2004 financial statements prepared for the Floyd County gas system bid package are provided in exhibit 2.

14. The capital structure of Frontier will consist of 30% cash equity contributed toward the acquisition, along with 70% long-term debt.

Most of the existing long-term debt is through Gas System Restoration and Development Project (GSRP) and Kentucky Infrastructure Agency (KIA) programs administered by the Governor's Office of Local Development (GOLD). For simplicity, all such loans are referred here as GOLD loans. Frontier has proposed to GOLD that approximately 50% of the acquisition and improvement cost would be funded with long-term, low-interest debt. The remaining 20% will be funded with long-term corporate debt from commercial sources, arranged and possibly guaranteed by the partners.

15. A financing application pursuant to KRS 278.300 has been filed by Frontier contemporaneously with this application. Frontier expects to assume existing GOLD debt or incur new debt in the following amounts.

a.	Assumed GOLD debt	$1,135,000
b.	New GOLD debt	$ 465,000
c.	New Commercial debt	$ 640,000

16. Each utility will cease to be a separate corporate entity under Frontier ownership. The proposed debt structure of Frontier is attributable to the original utility systems as follows:

a. **Belfry Gas.** Belfry has no external debt, except for amounts payable to owner JW Kinzer. This acquisition will leave this entity without debt. The acquisition cost of $750,000 includes farm tap customers controlled by Kinzer but not currently included in the Belfry system. *Frontier proposes to fund $350,000 with a new GOLD loan, about half the acquisition cost. Commercial bank debt will be $175,000.*

b. **Floyd County Gas.** This system has substantial debt to GOLD, to Floyd County and to a commercial bank. Under the terms of the public bid, the acquisition price of $1,075,000 will be paid to Floyd County, which will discharge all debts. The Floyd County / EKU loan is a recent debt consolidation loan, and is currently about $550,000 for 30 years at 4% APR. *Frontier proposes to assume or renew the existing $550,000 Floyd County loan through GOLD. Commercial bank debt will be $200,000.*

c. **Elam Utility.** This system has substantial debt to GOLD of about $775,000 for 27 years at 2.9% APR. The current owner has a debt to the previous owner, which will be paid out of sales proceeds. *Frontier proposes to negotiate with GOLD to reduce the debt to $450,000 under*

the same terms of the existing loan. Commercial bank debt will be $110,000.

d. **Mike Little.** Company has a small GOLD loan, and 2 small commercial bank loans. The GOLD loan is approved up to $135,000. *Frontier proposes to assume or renew the existing Mike Little loan through GOLD, and to increase the approved amount to $250,000. Commercial bank debt will be $85,000.*

17. Pro forma financial statements, schedules and models for Kentucky Frontier Gas are attached as exhibit 6. A proposed income statement and balance sheet are attached as exhibit 7.

18. Gas Supply is available from multiple sources. The Belfry system is supplied by local production through gathering pipelines, but has connections with Columbia Natural Gas for emergency backup. The Floyd County and Mike Little systems are supplied through the Kentucky-West Virginia transmission pipeline system affiliated with Equitable Gas. Each utility has one or more pipeline connections through which hundreds of producers can transport and sell gas. IGS is expert in managing gas supplies and has gas supply offers from numerous marketers. Frontier plans to buy gas through 6 to 12 month contracts, and will hedge prices as deemed prudent. Frontier plans to establish a single Gas Cost Recovery Account (GCA) for all utilities. All gas costs for all systems will be blended into a single gas cost figure for all customers.

No gas supply contract will be executed until these utility acquisitions are approved by PSC and the transactions closed.

19. For each of the companies to be acquired, a set of system maps is submitted with the Supplemental Technical Data in exhibit 8.

20. Frontier's business plan is generally reflected in the proposed operations of the systems contained in this application and as reflected in the proposed pro forma financial statements, schedules and models attached as exhibit 6.

21. Time is of the essence for these transactions. Because of the seasonal nature of gas utility sales, it is highly important that Frontier take over operation of each of these utilities before winter. To achieve that deadline, Frontier requests expedited approval by PSC of the necessary actions herein described on or before November 1, 2005.

Based on this information, the Joint Applicants believe the transfers of these four utilities to Kentucky Frontier are in the public interest, will not adversely affect the current level of customer service or rates and that there will be an overall improvement in quality of service and reliability, and the potential for additional services, lower rates or reduction in overall operating expenses.

For these reasons, the Joint Applicants request an order finding that Kentucky Frontier has the managerial, technical and financial ability to own and operate the utilities identified, that the acquisition and transfer of those utilities is in the public interest and in accordance with law pursuant to KRS 278.020 and that Belfry Gas, Inc., Elam Utility Company, Inc., Floyd County Gas (formerly East Kentucky Utilities, Inc.) and Mike Little Gas Company are granted approval

to transfer ownership to Kentucky Frontier and Kentucky Frontier is granted approval to acquire ownership of those utilities.

Submitted By:

John N. Hughes
124 West Todd St.
Frankfort, KY 40601

Attorney for:

Kentucky Frontier Gas, LLC
on behalf of Joint Applicants

COLORADO

JEFFERSON COUNTY

Robert J. Oxford, being first duly sworn, deposes and says:

That he is a Member, to wit, Manager of Kentucky Frontier Gas, LLC, Petitioner, named in the above entitled matter; that he has read the foregoing Application and knows the contents thereof and that the same is true of his own knowledge except as to those matters and things therein alleged upon information and belief, and as to those matters and things he believes them to be true.

Robert J. Oxford

Sworn to and subscribed before me this 19th day of August, 2005.

Notary Public

My Commission Expires: 10/31/06

List of Exhibits

1) Kentucky Frontier Gas, LLC articles of organization and certificate to operate in Kentucky.

2) Purchase contracts with the four gas utilities.

3) Adoption Notices for Frontier to adopt the General Rates and tariffs used by each respective certificated gas utility.

4) Resumes.

5) Current financial statement for member Industrial Gas Services, Inc.

6) Pro forma financial statements, schedules and models for the consolidated Frontier utility

7) Proposed balance sheet and income statement

8) Technical Data:

    Draft O&M manual (2 copies).
    Draft OQ program (2 copies).
    Draft substance abuse programs (2 copies)
    System maps for each of the 4 companies to be acquired (1 copy).

COMMONWEALTH OF KENTUCKY

Trey Grayson
SECRETARY OF STATE

CERTIFICATE

I, Trey Grayson, Secretary of State for the Commonwealth of Kentucky, do hereby certify that the foregoing writing has been carefully compared by me with the original thereof, now in my official custody as Secretary of State and remaining on file in my office, and found to be a true and correct copy of

APPLICATION FOR CERTIFICATE OF AUTHORITY OF

KENTUCKY FRONTIER GAS, LLC FILED AUGUST 25, 2005.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my offical seal at Frankfort, Kentucky this 26th day of August, 2005.

Trey Grayson
Secretary of State
Commonwealth of Kentucky

(Printed By: BWeber - Certificate ID: 19205)

COMMONWEALTH OF KENTUCKY
TREY GRAYSON
SECRETARY OF STATE

0620382.06
Trey Grayson
Secretary of State
Received and Filed
08/25/2005 12:38:13 PM
Fee Receipt: $90.00

phart
L902

APPLICATION FOR CERTIFICATE OF AUTHORITY

Pursuant to the provisions of KRS Chapter 275, the undersigned hereby applies for authority to transact business in Kentucky on behalf of the limited liability company named below and for that purpose submits the following statements:

1. The company is (☑) a limited liability company (LLC).
   ( ) a professional limited liability company (PLLC).

2. The name of the limited liability company is
Kentucky Frontier Gas, LLC

3. The name of the limited liability company to be used in Kentucky is
Kentucky Frontier Gas, LLC
(if "real name" is unavailable for use)

4. Colorado is the state or country of organization.

5. August 4, 2005 is the date of organization and, if the limited liability company has a specific date of dissolution, the latest date upon which the limited liability company is to dissolve is August 3, 2035.

6. The street address of the office required to be maintained in the state of formation or, if not so required, the principal office address is

Street	City	State	Zip Code
3760 Vance St, Suite 200	Wheat Ridge	CO	80033-6275

7. The names and usual business addresses of the current managers, if any, are as follows:

Name	Address
Robert J. Oxford	3097 Owens Ct, Lakewood, CO 80215
Larry Rich	104 Sand Castle Dr, Emerald Isle, NC 28594

(Attach a continuation, if necessary)

8. The street address of the registered office in Kentucky is

Street	City	State	Zip Code
Kentucky Home Life Building	Louisville	KY	40202

and the name of the registered agent at that office is
CT Corporation System

9. This application will be effective upon filing, unless a delayed effective date and/or time is specified:
N/A
(Delayed effective date and/or time)

I certify that, as of the date of filing this application, the above-named limited liability company validly exists as a limited liability company under the laws of the jurisdiction of its formation.

Robert J. Oxford
Signature
Robert J. Oxford, Member
Type or Print Name & Title
Date: August 22, 2005

I, CT Corporation System, consent to serve as the registered agent on behalf of the limited liability company.
Type or print name of registered agent

James Martin
Signature of Registered Agent
James Martin
Type or Print Name & Title
Assistant Secretary

SLL-902 (2/98)

(See attached sheet for instructions)

COMMONWEALTH OF KENTUCKY
TREY GRAYSON
SECRETARY OF STATE

0620382.06
Trey Grayson
Secretary of State
Received and Filed
08/25/2005 12:38:13 PM
Fee Receipt: $90.00

phart
L902

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3. The name of the limited liability company to be used in Kentucky is
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(if "real name" is unavailable for use)

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(Attach a continuation, if necessary)

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Street	City	State	Zip Code
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(Delayed effective date and/or time)

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Robert J. Oxford
Signature
Robert J. Oxford, Member
Type or Print Name & Title
Date: August 22, 2005

I, CT Corporation System, consent to serve as the registered agent on behalf of the limited liability company.
Type or print name of registered agent

James Martin
Signature of Registered Agent
James Martin
Type or Print Name & Title
Assistant Secretary

SLL-902 (2/98)

(See attached sheet for instructions)

ARTICLES OF ORGANIZATION
For
Kentucky Frontier Gas LLC, a Colorado LIMITED LIABILITY COMPANY

The undersigned, natural persons of at least 18 years of age, acting as organizers, hereby form a limited liability company by virtue of the Colorado Limited Liability Company Act and adopt the following Articles of Organization for such limited liability company.

ARTICLE I
Name

The name of the limited liability company is Kentucky Frontier Gas, L.L.C.

ARTICLE II
Principal Place of Business

The principal place of business of the limited liability company is the county of Jefferson, State of Colorado. The address of the principal place of business is:
3760 Vance Street, Suite 200, Wheat Ridge, Colorado 80033.

ARTICLE III
Duration

The limited liability company shall dissolve and terminate thirty (30) years from the date of filing of these Articles of Organization with the Secretary of State.

ARTICLE IV
Registered Agent

The registered agent of this limited liability company in this state is Industrial Gas Services, Inc., a Colorado corporation. The business address of the registered agent is 3760 Vance Street, Suite 200, Wheat Ridge, Colorado 80033.

ARTICLE V
Initial Managers

The management of the LLC is vested in the managers of the LLC. The name and business addresses of the initial managers who shall serve until the first annual meeting of the members or until their successors are elected and qualified are: Robert J. Oxford, 3097 Owens Court, Lakewood, CO 80215, and Steven Shute, ~~993 Brush Creek~~, Glenwood Springs, CO. ~~81601~~, and Larry Rich, 104 Sand Castle Drive, Emerald Isle, NC 28594.

ARTICLE VI
Purposes

The limited liability company is organized for the following purposes:

1. To conduct and carry on any lawful business.

ARTICLE VII
Manager Liability and Indemnity

To the fullest extent permitted by Colorado law:

(a) A Manager of the limited liability company shall not be personally liable to the limited liability company or to the Members for monetary damages for breach of fiduciary damage, except with respect to (1) any breach of the duty of loyalty; (2) acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law; or (3) any transactions from which the Manager derived an improper personal benefit;

(b) A Manager shall not be liable to the limited liability company or to any Member for any action taken or omitted to be taken by such Manager, provided that such Manager acted in good faith and such action or omission does not involve the gross negligence, willful misconduct or fraud of such Manager; and

(c) The limited liability company shall hold harmless and defend each such Manager against expenses (including any legal fees and expenses), judgments, fines, and amounts paid in settlement, actually and reasonably incurred by such Manager, in connection with any threatened, pending or completed claim, demand, action, suit or proceeding to which such Manager was or is a party or is threatened to make a party, by reason of (1) such Manager's status as Manager or any person who is or was serving at the request of the Manager, or (2) any action taken or omitted to be taken by such Manager in any capacity referred to in clause (1) of this subsection (c), relating to the property, business, affairs or management of the limited liability company (provided that the Manager acted in good faith and the act or omission that is the basis of such claim, demand, action, suit or proceeding does not involve the gross negligence, willful misconduct or fraud of such Manager).

IN WITNESS WHEREOF, we have signed these Articles of Organization this 4th day of August, 2005, and we acknowledge the same to be our true act and deed.

ORGANIZER

Robert J. Oxford

ORGANIZER

Steven E. Shute

STATE OF COLORADO)
) ss.
COUNTY OF JEFFERSON)

I, Pamella A. Oxford a Notary Public in and for the County and State as aforesaid, hereby certify that Robert J. Oxford and Steven Shute whose names are subscribed to the annexed and foregoing Articles of Organization appeared before me this day in person and acknowledged that they signed, sealed, and delivered the said instrument of writing as their free and voluntary act, for the uses and purposes therein set forth.

SUBSCRIBED AND SWORN TO before me this 4, day of August 2005.

PAMELLA A. OXFORD NOTARY PUBLIC STATE OF COLORADO

NOTARY PUBLIC

My Commission expires My commission expires 9/22/08

IN WITNESS WHEREOF, I have signed these Articles of Organization this 8th day of August, 2005, and acknowledge the same to be my true act and deed.

ORGANIZER

Larry Rich

STATE OF NORTH CAROLINA)
) ss.
COUNTY OF CARTERET)

I, Rebecca Smith a Notary Public in and for the County and State as aforesaid, hereby certify that Larry Rich whose name is subscribed to the annexed and foregoing Articles of Organization appeared before me this day in person and acknowledged that he signed, sealed, and delivered the said instrument of writing as his free and voluntary act, for the uses and purposes therein set forth.

SUBSCRIBED AND SWORN TO before me this 9th, day of August, 2005.

NOTARY PUBLIC

REBECCA G. SMITH NOTARY PUBLIC ONSLOW COUNTY, NC

My Commission expires 6/28/07

99061b.rjo

Information On File

ID Number:	20051297798
Name:	Kentucky Frontier Gas, LLC.
Registered Agent:	Industrial Gas Services, Inc.
Registered Agent Street Address:	3760 Vance Street, Suite 200, Wheat Ridge, CO 80033, United States
Registered Agent Mailing Address:	
Principal Office Street Address:	3760 Vance St., Suite 200, Wheat Ridge, CO 80033, United States
Principal Office Mailing Address:	
Status:	Good Standing
Form:	Limited Liability Company
Jurisdiction:	Colorado
Formation Date:	08/04/2005
Term of Duration:	Perpetual
Annual Report Month:	August

You may:

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- Obtain Certificate of Good Standing
- File a Document
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Business Search Results

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#	ID Number	Document Number	Name	Event	Status	Form	Formation Date
1	20051297798	20051297798	Kentucky Frontier Gas, LLC.	Articles of Organization	Good Standing	DLLC	08/04/2005

Previous Page

Industrial Gas Services, Inc.
3760 Vance Street, Suite 200
Wheat Ridge, CO 80033
303-422-3400

June 23, 2005

Ms. Wilma Ison
Elam Utility Company, Inc.
459 Main Street
West Liberty, KY 41472

Re: Agreement for Sale (Revised)
Elam Utility Company, Inc.

Dear Ms. Ison:

In response to your letter dated April 11 and our meeting with you and Mr. Robert Ison on April 20, 2005, Industrial Gas Services, Inc. (IGS), on behalf of itself, Steven Shute and Don Silversmith, hereby offer to purchase one hundred percent (100%) of the stock of Elam Utility Company, Inc. (the Company) for $750,000., subject to due diligence and other terms and conditions as outlined herein. A detailed Purchase and Sales Agreement will be mutually agreed upon before closing.

Using several valuation tools, we have determined the fair market value of the Company to be about $720,000. The existing 30 year GOLD loan of about $700,000 and your personal debt of about $130,000 to Phillips exceed the proposed purchase price. It is understood that the Phillips note must be paid off at closing. All terms for payment and debt retirement are subject to the Company's Accountants review and approval.

Upon execution of this agreement, IGS will immediately begin negotiations with GOLD to reduce the amount of the loan to no greater than $450,000, or an amount mutually agreeable to IGS and the Company. If successful at negotiating with GOLD, IGS at closing will pay Company one sixth of the net purchase price, and the balance in five equal annual installments, plus 5.5% interest APR. Net purchase price is defined as Purchase Price minus the reduced GOLD principal and minus the Phillips loan payoff.

In addition to the purchase price, IGS agrees to retain you as a full-time employee of the Company under a five year guaranteed contract at a salary of

$48,000 per year, plus insurance and retirement benefits that are currently being paid by Company. We anticipate you will be based in West Liberty and work in sales and customer service throughout the consolidated gas utility system in Eastern Kentucky. An expected three week vacation time will be included in the salary base.

As an incentive to increase sales in the Elam system, the 5 annual payments on the purchase price shall be increased by a formula that reflects an increase in the weather-adjusted volume of gas sold annually in excess of a base volume and other factors as more fully described in Exhibit A. (20% for the Elam Utility system and 7% for all other systems acquired by IGS in Eastern Kentucky).

IGS intends to continue the employment of the 2 Company employees after the closing of the sale of the Company with substantially the same compensation and benefit package as now in effect.

Upon execution of this Agreement, IGS will schedule a time with the Company to review financial statements, customer records, DOT reports, KPSC reports, tariffs, notices, rate cases and other communications, gathering system and distribution system maps, maintenance reports, cathodic protection surveys and reports, rights of way permits and agreements, franchise agreements, gas sales and purchase agreements, third party contracts, employee information, payroll records, federal and state income tax reports, schedule of assets (vehicles, construction equipment, buildings, storage yards; pipe, meters, valves and fittings; office equipment and furnishings), plus any other items relevant to the acquisition.

During the process of due diligence IGS or its agents will notify the Company of any concerns that may adversely affect the closing of the sale of the Company, or result in the adjustment of the purchase price. IGS and the Company agree to work diligently to resolve these issues quickly.

IGS is concurrently making offers to other operators of small gas distribution systems in Eastern Kentucky. This offer is contingent on IGS acquiring an aggregated minimum of 2400 customers. IGS will inform Company of the status of this goal.

Closing on the purchase will be made within six months of date of this Agreement, or two months after approval by Kentucky Public Service Commission (KPSC) and Kentucky Governor's Office of Local Development (GOLD), whichever last occurs.

If you are in agreement with the terms of this Agreement for Sale, please so indicate by signing in the space provided below.

Sincerely,

INDUSTRIAL GAS SERVICES, INC.

Robert J. Oxford
Chairman, CEO

Accepted this 23 day of June, 2005

ELAM UTILITY COMPANY, INC.

By: Wilma Dixon

IGS
INDUSTRIAL GAS SERVICES, INC.
3760 VANCE ST. STE. 200 / WHEAT RIDGE, COLORADO 80033 / (303) 422-3400 / FAX (303) 422-6105

January 19, 2005

Mr. J.W. Kinzer
Belfry Gas, Inc.
P.O. Box 155
Allen, KY 41601-0155

Re: Agreement for Sale
Belfry Gas, Inc.

Dear Mr. Kinzer:

Industrial Gas Services, Inc. (IGS), on behalf of itself, Pipeline Solutions, Inc. (PSI), and Don Silversmith, hereby offer to purchase one hundred percent (100%) of the stock of Belfry Gas, Inc. (the Company) for $700,000, subject to due diligence and other terms and conditions as outlined herein. Closing on the purchase will be made within six months of date of this Agreement, or two months after Kentucky Public Service Commission (KPSC) approval, whichever last occurs. A detailed Purchase and Sales Agreement which incorporates a definitive list of all corporate assets will be mutually agreed upon at closing.

The purchase price is essentially based on a combination of book value and number of meters (customers) as reported in data filed with the KPSC for the year 2003. The actual purchase price may be adjusted up or down for changes in the number of meters or book value, long term debt, pending law suits, excessive accounts payable or receivable, number of unregulated farm taps, number of large commercial customers and condition and age of system and related facilities.

Upon execution of this Agreement, IGS will enter into a confidentiality agreement with Belfry Gas, Inc. and then schedule a time with the Company to review financial statements, customer records, DOT reports, KPSC reports, tariffs, notices, rate cases and other communications, gathering system and distribution system maps, maintenance reports, cathodic protection surveys and reports, rights of way permits and agreements, franchise agreements, gas sales and purchase agreements, third party contracts, employee information, payroll records, federal and state income tax reports, schedule of assets (vehicles, construction equipment, tanks, pumps, compressors, property, buildings,

warehouses, storage yards, pipe, valves, fittings, office equipment and furnishings), plus any other items relevant to the acquisition.

If there are specific requirements concerning the continuing employment of certain managers, office personnel, laborers, or technicians after the closing of the sale of the Company, such requirements will be documented by the Company and attached as Exhibit A and will become a part of this Agreement.

During the process of due diligence IGS or its agents will notify the Company of any concerns, questions, or findings that may adversely affect the closing of the sale of the Company, or result in the adjustment of the purchase price. IGS and the Company agree to work diligently to resolve these issues quickly.

If you are in agreement with the terms of this Agreement for Sale, please so indicate by signing in the space provided below.

Sincerely,

Steven Shute
PSI for

INDUSTRIAL GAS SERVICES, INC.
Robert Oxford
Chairman, CEO

Accepted this 19 day of JANUARY, 2005

BELFRY GAS, INC.

By: _____

FEB - 2 2005

IGS
INDUSTRIAL GAS SERVICES, INC.
3760 VANCE ST. STE. 200 / WHEAT RIDGE, COLORADO 80033 / (303) 422-3400 / FAX (303) 422-6105

January 14, 2005

Ms. Miki Thompson, Esq.
Mike Little Gas Company, Inc.
P.O. Box 69
Melvin, KY 41650

Re: Agreement for Sale
Mike Little Gas Company, Inc.

Dear Ms. Thompson:

Industrial Gas Services, Inc. (IGS), on behalf of itself, Pipeline Solutions, Inc. (PSI), and Don Silversmith, hereby offer to purchase one hundred percent (100%) of the stock of Mike Little Gas Company, Inc. (the Company) for $475,000, subject to due diligence and other terms and conditions as outlined herein. Closing on the purchase will be made within six months of date of this Agreement, or two months after Kentucky Public Service Commission (KPSC) approval, whichever last occurs. A detailed Purchase and Sales Agreement will be mutually agreed upon at closing.

The purchase price is partly based on a combination of book value and number of meters (customers) as reported in data filed with the KPSC for the year 2003. The actual purchase price may be adjusted up or down for changes in the number of meters or book value, long term debt, pending law suits, excessive accounts payable or receivable, number of unregulated farm taps, number of large commercial customers and condition and age of system and related facilities.

Upon execution of this Agreement, IGS will schedule a time with the Company to review financial statements, customer records, DOT reports, KPSC reports, tariffs, notices, rate cases and other communications, gathering system and distribution system maps, maintenance reports, cathodic protection surveys and reports, rights of way permits and agreements, franchise agreements, gas sales and purchase agreements, third party contracts, employee information, payroll records, federal and state income tax reports, schedule of assets (vehicles, construction equipment, tanks, pumps, compressors, property, buildings,

warehouses, storage yards, pipe, valves, fittings, office equipment and furnishings), plus any other items relevant to the acquisition.

If there are specific requirements concerning the continuing employment of certain managers, office personnel, laborers, or technicians after the closing of the sale of the Company, such requirements will be documented by the Company and attached as Exhibit A and will become a part of this Agreement.

During the process of due diligence IGS or its agents will notify the Company of any concerns, questions, or findings that may adversely affect the closing of the sale of the Company, or result in the adjustment of the purchase price. IGS and the Company agree to work diligently to resolve these issues quickly.

IGS is concurrently making offers to eight other companies who operate small gas distribution systems in Eastern Kentucky. This offer is contingent on IGS being able to acquire an aggregated minimum of 3000 customers. IGS will inform Company of the status of this goal.

If you are in agreement with the terms of this Agreement for Sale, please so indicate by signing in the space provided below.

Sincerely,

INDUSTRIAL GAS SERVICES, INC.

Robert J. Oxford
Chairman, CEO

Accepted this 26th day of January, 2005

MIKE LITTLE GAS COMPANY, INC.

By: _____

RESOLUTION

At the Special Meeting of the Floyd County Fiscal Court held in the County Courtroom of the Floyd County Courthouse on Wednesday, May 25th, 2005 at the hour of 11:00 am the following Resolution was offered:

WHEREAS, the Court has previously advertised to accept sealed bids for **the sale of the Floyd County Gas System East Kentucky Utilities, Inc. and;**

WHEREAS, all sealed bids received by the advertised date and time were opened at the Special Fiscal Court Meeting held on April 22nd, 2005 with the following presenting bids:

1. JEROME A. KANNEY & DENNIES ROHRER
2. INDUSTRIAL GAS SERVICES, INC. (IGS) KENTUCKY FRONTIER
3. MARTIN GAS INC.
4. NATURAL ENERGY UTILITY CORPORATION
5. TEMPLEMAN ENERGY, LLC

NOW THEREFORE BE IT RESOLVED by the Floyd County Fiscal Court that Frontier, having submitted the highest and best bid, is hereby awarded the bid for Floyd County Gas System East Kentucky Utilities Inc., contingent upon the approval of the Kentucky Public Service Commission.

MOTION for adoption of this Resolution was made by Jackie and seconded by Gerald and vote taken as follows:

FOR

[signatures]

AGAINST

____

WHEREUPON, the Motion was declared passed and said Resolution adopted this the 25th day of May 2005.

Paul H. Thompson
Floyd County Judge/Executive

ATTEST:
Chris Waugh, Clerk
By: _____DC

April 21, 2005

Floyd County Fiscal Court
for Floyd County Gas System
149 South Central Avenue, Suite 9
Prestonsburg, KY 41653

Re: Kentucky Frontier Bid to Purchase
Floyd County Gas System

Industrial Gas Services, Inc. (IGS), on behalf of the Kentucky Frontier gas utility group (Frontier) hereby offers to purchase the assets of Floyd County Gas System (the System) and certain assets of East Kentucky Utilities, Inc. (EKU), subject to regulatory approvals as outlined herein.

1. FINANCIAL STRUCTURE

List of Assets

The Frontier proposal is to purchased the assets of the System and of EKU, including but not limited to the following:

- Certificate of Public Convenience & Necessity (CPCN) for operation of the System as a utility under authorization by Kentucky Public Service Commission (KPSC).
- Approx. 1000 gas distribution customers.
- Gas pipelines, mains and service lines.
- Gas meters and regulators, installed in system.
- Gas delivery and metering stations.
- Bell meter prover, meters, regulators, pipe, fittings, and other inventory.
- Excavator & 2 trailers.
- Gas detectors & testers, hand tools, fusion tools, utility-specific tools.
- Office equipment, computers, copier, fax, etc.
- Customer records, print outs, data files.
- DOT pipeline safety records, maps, construction & repair records.
- Customer deposit records and customer deposit accounts.
- Public Service Commission files and records.
- Checking & Savings accounts and physical records.
- All accounting records of EKU and the System.

- Solely at the option of the County, Frontier also proposes a price including the 3 Toyota Tacoma pickups and the Ford dump truck.

1.a.-b. Proposed Ownership Structure. IGS is the bidding entity and is responsible for closing on the purchase of the System.

The Frontier group plans to form an LLC to consolidate the System with other Kentucky gas utilities into a single operating entity. The Frontier group consists of IGS, Steven Shute, Gilmer Mickey, Larry Rich and Don Silversmith. The background, experience and financial strength of all proposed owners are listed at Exhibit A.

1.c. Method of Payment. At closing, IGS or Frontier will pay Floyd County the net Purchase Price in certified funds.

1.d. Disposition of Debt & Capital Structure. The System lists 3 significant long-term debts. Frontier proposes the disposition of debts and resulting capital structure as follows:

i. Kentucky DLG/GOLD - GSRD loan #10 has a balance of about $227,000. Prior to closing of purchase of the System, Frontier will work to assume or extend this loan. Any Frontier agreement with GOLD will be outside this transaction with Floyd County (County). At County's option, if Frontier assumes the GOLD loan, the Purchase Price payable to County would be reduced by the exact amount assumed.

ii. First Guaranty Bank has a loan balance of about $317,000. Floyd County has advanced to the System a Revenue Bond with an estimated balance of $430,000.

iii. At closing of purchase of the System, Frontier will pay to Floyd County the net Purchase Price in certified funds. County shall be responsible for paying the balance of all outstanding System debts at time of closing.

iv. Frontier plans to operate the System with about 30% owner's equity and 70% debt. Some of the debt may be from GOLD, and the remainder will be commercial debt.

1.e. Ownership Strength. The background, experience level and financial strength of all proposed owners are listed at Exhibit A. References will be furnished upon request.

1.f. Regulatory Approvals & Schedule. The change in ownership of the public utility and the transfer of the Certificate of Public Convenience & Necessity (CPCN) must be approved by the Kentucky Public Service Commission (KPSC). The disposition of GOLD debt must be approved by the Kentucky GOLD commission.

Immediately upon signing of a definitive Purchase Agreement for the System, Frontier will apply to each regulatory agency for approval of purchase. Closing on the purchase will be made within 30 days after approval without material conditions by KPSC and GOLD and any other jurisdictional governmental agency, whichever approval last occurs.

Frontier expects that PSC and GOLD approvals could be completed within 60 days of application. Given a Purchase Agreement by May 15, Frontier would expect to close the purchase by August 15, 2005. However, in no event would closing take place before August 1.

2. OPERATING PLANS

2.a. Operating Employees. The Frontier group plans to consolidate the operations of the System into a larger utility based in Eastern Kentucky. Frontier has signed purchase agreements with 2 entities, and has pending offers to others.

The combined utility will have about 3000 meters in Floyd and Pike counties. It will be based in Prestonsburg and will have about 5 operating and maintenance field employees, 3 managerial and clerical employees.

Frontier expects to employ the 3 current System operating employees. The current office manager expects to retire soon, but Frontier hopes to be able to use her expertise as available.

2.b. Physical Location. The combined utility will be based in or near Prestonsburg. Frontier will work with the owners of the existing System shop to keep operations there, and will evaluate requirements for a local base central to all utility operations. Most employees will be based around Prestonsburg, but a few will remain with their respective utility systems in their present location.

Customer service and support will be based locally. Frontier will develop a new shared billing and support system for the consolidated gas utility. Payments will be collected and banked locally.

Engineering and technical, pipeline safety and gas supply support will be based in Colorado.

2.c. Emergency Coverage. Phone numbers for each local utility will ring in to the central office in Prestonsburg for dispatching emergency response. After hours and on weekends and holidays, the phones will be forwarded to a 24/7/365 answering service.

Each operator and manager will have a company mobile phone. There will be at least 2 employees designated "on-call" after hours and on weekends and holidays, with assigned geographic areas of coverage. If mobile phone coverage is not adequate, the on-call operator may also carry a pager.

When an emergency call comes in, the central office or off-hours Call Center will have a list of gas company operations personnel to call, starting with the on-call operator for that area. The call center must run through the mobile-home-pager numbers until verbal contact is made with an operator who will respond.

Frontier intends to set a standard of service that every emergency call will get a response within 45 minutes, even to the customers located furthest from Prestonsburg. The Floyd County System customers are more centrally located, and most responses can be met within 20 minutes.

2.d. Billing & Customer Service. The combined utility will be based in or near Prestonsburg. Customer service and support will be locally based. Frontier will purchase a new shared billing and support system for the consolidated gas utility.

Frontier will provide a drop box for personal payments in each local utility. All payments will be deposited in a local bank. Billing, collections and front-end accounting will be based in Kentucky.

2.e-f. <u>US DOT – Office of Pipeline Safety Requirements</u>. *[Note: There are no KYDOT requirements.]* The US Department of Transportation (DOT), Office of Pipeline Safety (OPS) administers regulations in 49 CFR Part 192 etal ("DOT 192") that pertain to natural gas pipelines and utilities. These rules govern all facets of gas pipeline design, construction, operations, and maintenance.

The Floyd County natural gas distribution system is jurisdictional to DOT under Part 192. Federal pipeline safety regulations are administered and enforced by the Kentucky Public Service Commission. Frontier plans to substantially improve DOT compliance from its existing condition:

Under DOT §192.605, every utility must prepare and follow a written **Operations & Maintenance** plan to maintain compliance with pipeline safety regulations. This O&M plan also must include an **Emergency Plan**. The System's existing O&M plan is not adequate to meet present and anticipated future regulations. Frontier will implement its 500-page, 8 section O&M plan used by a half dozen associated utilities. (See copy of front cover and first index page of a sample O&M manual in Exhibit C.)

Under DOT §199, every utility must prepare and follow a written anti-drug & alcohol mis-use prevention plan. The System is performing random drug testing, but we have no evidence of a written program for **drug & alcohol** compliance. Frontier will implement a written plan.

Under DOT §192.801 Subpart N, every utility must prepare and follow an **Operator Qualification** (OQ) program to provide documentation of adequate training, field skills and recurrent education. The System presently has no such program. Frontier will implement its OQ program used by a half dozen associated utilities.

Under DOT §192.901 Subpart O are regulations for **Pipeline Integrity Management** (PIM). Those regulations currently apply only to transmission pipelines, but OPS soon expects to require Integrity Management Programs (IMP) for gas distribution systems. Frontier partners have formulated several IMPs, and will tailor a plan to the consolidated utilities as required.

Under DOT §192, every utility must prepare and follow **Damage Prevention** and **Public Education** programs to educate customers and the general public about the existence of gas pipelines and the rules of gas safety. The utility must also review the same information with area excavators and public safety agencies. The System presently has an incomplete program. Frontier will implement programs used by its associated utilities, but tailored specifically for Floyd County.

The System will benefit from the operating experience of the Frontier partners. Among the consolidated small utilities, compliance with the US DOT pipeline safety programs will improve.

2.g. Effect on Customer Service. The effect of Frontier ownership should be at least transparent to the System customers; and in fact should improve customer service. We anticipate the same operators will run the System and the same phone number will ring into a Prestonsburg-area office. Customer records will be kept electronically and available at a moments notice, as contrasted with old paper records. Frontier plans to operate each utility at existing rates for at least 12-18 months, then to file a consolidated rate case to combine all utilities into a common rate schedule. With new economies of scale, the combined rate should be less than the existing rates charged by these companies.

None of these little utility systems have reached the critical mass to financially thrive. Several of the utility systems owe more than they are worth. For the security of customers of a regulated public utility, these systems should be operated for the benefit of the Public, not the Utility.

Frontier's consolidation proposal is a first step toward providing more stable and safe natural gas service to the Eastern Kentucky region.

3. QUALIFICATIONS & REFERENCES

Technical, Financial, and Managerial qualifications for key Frontier individuals are listed at Exhibits A & B. Specific references are readily available upon request.

BID AMOUNT FOR FLOYD COUNTY GAS SYSTEM:

$1,150,000 (Includes 3 service pickups and dump truck)

$1,075,000 (Without pickups and dump truck)

Submitted this 21st day of April, 2005

INDUSTRIAL GAS SERVICES, INC.

_____

Steven E. Oxford
President

Industrial Gas Services, Inc.
3760 Vance Street, Suite 200
Wheat Ridge, CO 80033
303-422-3400

SERVICES AGREEMENT

THIS AGREEMENT made and entered into the day and year set forth below, by and between EAST KENTUCKY UTILITIES, INC., hereinafter referred to as the "County's Lessee" and KENTUCKY FRONTIER GAS, LLC, hereinafter referred to as "Contractor".

WITNESSETH:

In consideration of the mutual covenants and obligations herein expressed, it is agreed by and between the parties hereto as follows:

1. Scope of Services and Standards of Service. The Contractor agrees to operate the Floyd County Gas System, and to provide services in accordance with the Scope of Services attached hereto as Exhibit "A" and incorporated herein by this reference. The Scope of Services, compensation, and other conditions of this agreement may be changed at any time upon written agreement by both parties.

The Contractor agrees to adhere to the Standards of Service attached hereto as Exhibit "B" and incorporated herein by this reference.

2. Term. This agreement shall be effective for all purposes as of August 15, 2005, at 12:01 a.m. and shall extend for an Initial Contract Term of Six (6) Months from first effective date, subject to Section 4 of this agreement. The agreement may be extended with a written memorandum agreement signed by both parties. If any party intends to terminate and not renew the contract at the end of the Initial or Extended

periods, such party shall notify the other in writing at least two (2) months prior to the termination of operations. If no notification of termination is given but a new operating agreement is not in effect, to ensure continuity of service past the end of the Initial or Extended Contract periods, Contractor shall continue to operate the system for up to three (3) months under the last existing contractual terms.

3. Termination for Cause. Notwithstanding the time periods contained herein, either party may terminate this Agreement at any time for cause by providing 21 days prior written notice of termination to the other party. "For cause" shall include, but is not limited to incompetence, breach or neglect of duty, gaps in coverage, failure to perform the Scope of Services outlined in Exhibit A or adhere to the Standards of Service outlined in Exhibit B; non-payment or under-payment of compensation as defined in Section 9 or extraordinary capital items as defined in Section 7 of this agreement; or willful and uncorrected violation of any rule or regulation pertaining to natural gas utility operations of the utility system.

The County's Lessee reserves the right to terminate this Agreement with sixty (60) days written notice, upon the unavailability of funds due to matters outside the County's Lessee's control.

4. Termination on Sale of County Natural Gas System. The County's Lessee has approved the sale of the gas utility to Contractor and reserves the right to terminate this Agreement upon closing of such sale and subject to Section 17 of this agreement.

5. Notices. All notices provided under this Agreement shall be effective when mailed, postage prepaid and sent to the following addresses:

If Contractor:

Steve Oxford
Kentucky Frontier Gas
3760 Vance St, #200
Wheat Ridge, CO 80033

If County's Lessee:

Floyd County Gas System
c/o Paul H. Thompson
149 South Central Avenue, Suite 9
Prestonsburg, KY 41653

6. Payment Upon Termination. In the event of any early termination by either party, the Contractor shall be paid for services rendered prior to the date of termination, subject to the satisfactory performance of the Contractor's obligations under this Agreement and the provisions of paragraphs 3 and 15 of this Agreement. Such payment shall be the Contractor's sole right and remedy for such termination.

7. Extraordinary Repairs. Contractor is not expected to perform extraordinary items outside the scope of services. Such extraordinary items are reflected in Exhibit A. As long as practical before such extraordinary items are required, Contractor shall consult with the County's Lessee regarding the scope, cost, or necessity of such items. Contractor can provide personnel and resources as available to define, plan, bid if necessary, coordinate, and supervise performance of such items as Agent for the County's Lessee. The County's Lessee shall be responsible for third-party contractor costs of such items.

If the County's Lessee does not approve any item of extraordinary repair that Contractor deems required for safe operation of any part of the system, the following process shall be followed to resolve the matter. (1) The County's Lessee shall, in its

sole discretion, hire its own consultants to review the proposal; (2) The parties shall try to resolve the matter; (3) If the matter cannot be resolved, then the situation shall be referred to the Kentucky Public Service Commission; (4) The County's Lessee shall obtain a written opinion from the Commission as to the course of action that should be followed in the matter; and (5) The parties shall follow the advice of the Commission in resolving the matter.

8. Design, Project, Indemnity and Insurance Responsibility. The Contractor shall be responsible for the professional quality, technical accuracy, timely completion and the coordination of all services rendered by the Contractor, including but not limited to designs, plans, reports, repair quality, construction quality, specifications, and drawings and shall, without additional compensation, promptly remedy and correct any errors, omissions, or other deficiencies. The Contractor shall indemnify, save and hold harmless the County's Lessee, its officers and employees in accordance with Kentucky law, from all damages, claims, liability, and court awards whatsoever claimed by third parties against the County's Lessee, including the County's Lessee's costs and reasonable attorneys fees, arising directly or indirectly out of the Contractor's performance of any of the services furnished under this Agreement. The Contractor shall maintain commercial general liability insurance in the amount of $1,000,000 per occurrence with a $1,000,000 umbrella policy, and hired / non-owned automobile liability insurance in the amount of $1,000,000 per occurrence, both of which shall name the County's Lessee as an additional insured party. Contractor shall at all times

also maintain workers compensation insurance on its employees. Certificates of insurance for both liability and workers compensation coverage shall be submitted to the County's Lessee within 30 days of the signing of this contract and within 30 days of the anniversary date for every year that the contract continues in force.

9. Compensation. In consideration of the services to be performed pursuant to this Agreement, the County's Lessee agrees to pay Contractor a fee based on actual costs with a fixed percentage margin, as set out in Exhibit "C" and incorporated herein by this reference. Fee shall be paid monthly by the 20th day of each month. Contractor shall submit verifiable statements to document costs paid to third parties.

If the parties decide to extend this Agreement beyond the end of the Initial Contract Term, the parties agree to negotiate subsequent modified compensation amounts and document the understanding reached by written memorandum agreement for the prospective extension period.

Upon full payment of fees, all designs, plans, reports, specifications, drawings, and other services rendered by the Contractor shall become the sole property of the County's Lessee. Expenses that are the responsibility of the County's Lessee under this agreement are as detailed in Exhibit A.

10. Contract Representatives. Each party will designate, prior to commencement of work, its local contract representative who shall make, within the scope of his or her authority, all necessary and proper decisions with reference to this

contract. All requests for contract interpretations, change orders, and other clarification or instruction shall be directed to the respective Contract Representatives.

11. Independent Contractor. The services to be performed by Contractor are those of an independent contractor and not of an employee of the County's Lessee. The County's Lessee shall not be responsible for withholding any portion of Contractor's compensation hereunder for the payment of FICA, Workers' Compensation, other taxes or benefits or for any other purpose.

12. Personal Services. It is understood that the County's Lessee enters into this Agreement based on the special abilities of the Contractor and that this Agreement shall be considered as an agreement for personal services. Accordingly, the Contractor shall neither subcontract, assign any responsibilities nor delegate any duties arising under this Agreement without the prior written consent of the County's Lessee.

13. Acceptance Not Waiver. The County's Lessee's approval of repairs, construction, drawings, designs, plans, specifications, reports, and incidental work or materials furnished hereunder shall not in any way relieve the Contractor of responsibility for the quality or technical accuracy of the work. The County's Lessee's approval or acceptance of, or payment for, any of the services shall not be construed to operate as a waiver of any rights or benefits provided to the County's Lessee under this Agreement.

14. Default. Each and every term and condition hereof shall be deemed to be a material element of this Agreement. In the event either party should fail or refuse to perform according to the terms of this agreement, such party may be declared in default.

15. Remedies. In the event a party has been declared in default and notified of such in writing, such defaulting party shall be allowed a period of twenty-one (21) days from the date of notice within which to cure said default. In the event the default remains uncorrected, the party declaring default may elect to (a) terminate the Agreement and seek damages; (b) treat the Agreement as continuing and require specific performance; or (c) avail itself of any other remedy at law or equity. If one party commences legal or equitable actions against the alleged defaulting party, and a party is found to have been in default, then the defaulting party shall be liable to the non-defaulting party for the non-defaulting party's reasonable attorney fees and costs incurred because of the default.

The County's Lessee may take remedial action if it should find that the Contractor has substantially failed to satisfy or perform the duties and obligations in this Agreement. Substantial failure shall include, but not be limited to, incorrect or improper activities or inaction. Remedial actions may include: (1) suspension of the Contractor's performance pending necessary corrective actions; (2) proportionate reduction of payment to Contractor until the unperformed services or corrections in performance are satisfactorily completed; (3) request removal from work of any

employees or agents of the Contractor the County's Lessee reasonably deems as being incompetent, careless, unsuitable, or otherwise unacceptable, or whose continued employment is contrary to the public interest and not in the best interest of the County's Lessee; and (4) deny payment for those services or obligations not performed. These remedies are cumulative and the County's Lessee, in its sole discretion, may exercise any or all of them individually or simultaneously. Contractor may be afforded the opportunity to correct or cure its performance; however, this in no way is intended to limit the County's Lessee's right to exercise the remedial actions outlined herein.

16. Binding Effect. This writing, together with the exhibits hereto, constitutes the entire agreement between the parties and shall be binding upon said parties, their officers, employees, agents and assigns and shall inure to the benefit of the respective survivors, heirs, personal representatives, successors and assigns of said parties.

17. Event of Sale to Third Party. In the event the pending sale of the gas utility system to Contractor is not consummated, then to the extent practical, the purchasing entity shall give preference to hiring the Contractor's full-time operating personnel to continue in their respective roles.

18. Law / Severability. The laws of the State of Kentucky shall govern the construction, interpretation, execution and enforcement of this Agreement. In the event any provision of this Agreement shall be held invalid or unenforceable by any court of

competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision of this Agreement.

19. Records. Contractor shall maintain all records, documents, communications, and other written materials pertaining to this contract for at least 3 years after termination for final payment. The County's Lessee and any authorized agent for a governmental agency shall be allowed to audit or inspect Contractor's records and to monitor all activities of the Contractor during the term of this Agreement and for 3 years after to assure compliance with the Agreement and evaluate the Contractor's performance. Contractor agrees to maintain confidentiality of all utility customer records in accordance with relevant statutes or regulations.

20. Adherence to Laws and Regulations. Contractor agrees to adhere to all applicable federal, state, and local laws and regulations including labor laws and laws regulating the gas utility industry during the term of this Agreement. Contractor is required to obtain, and maintain in effect throughout the duration of the Agreement all licenses, permits and authorizations necessary to do the work, with proof thereof being provided to the County's Lessee upon request.

EAST KENTUCKY UTILTIES, INC.
BY:

_____ Date: 08/12, 2005

SELDON HORNE, President

ATTEST:

_____ Date: 08/12/, 2005

DAVID A. LAYNE, II, Secretary/Treasurer

KENTUCKY FRONTIER GAS, LLC
BY:

_____ Date: 08/15/, 2005

ROBERT J. OXFORD, Manager

EXHIBIT "A"
SCOPE OF SERVICES

The following are the services to be furnished by the Contractor to operate the Floyd County Gas System, which currently operated and managed by East Kentucky Utilities, Inc. (EKU), pursuant to a Lease Agreement. Although the list is intended to be all-inclusive, there may be other services, in the ordinary course of business that the Contractor will be asked to perform.

GAS UTILITY FIELD SERVICES

- Operate and maintain the Floyd County gas system and all its components.
- Receive, log and respond to all gas utility-related calls from customers.
- Read meters on a monthly basis. No active meter shall be estimated for more than two (2) consecutive meter cycles. Estimated usage is allowable when such meter reading creates an unsafe condition such as access due to weather conditions.
- Render bills to customers on a monthly basis.
- Answer customer inquiries about billing and accounts.
- Administer Budget Billing in accordance with the utility's rules and regulations.
- Collect amounts due from monthly billings and deposit to County's Lessee's bank account.
- Follow up on delinquent accounts and render delinquency notices if needed.
- Provide all monthly general ledger transactions for entry into the County's Lessee's accounting system.
- Provide monthly reports to County's Lessee including usage, amounts billed and collected.
- Set, change and remove meters based on service orders logged by the utility.
- Exchange meters for testing according to utility's testing schedule.
- Conduct leak surveys in accordance with utility's schedule.
- Conduct leak investigations for all leaks called in by customers.
- Repair underground leaks.
- Repair above-ground leaks.
- Perform annual and bimonthly corrosion control checks.
- Trouble shoot pressure problem areas and make recommendations for corrective actions.
- Perform annual inspections on emergency valves.

- Perform annual regulator station inspections.
- Perform line locates based on utility work orders including orders through One Call.
- Conduct pressure checks in winter months (October through April) to ensure adequate service.
- Operate the transmission pipeline, distribution system, and all related facilities.
- Perform periodic DOT required pipeline patrols.
- Perform checks of gas delivery stations and operate the utility odorizer.
- Install or remove service lines.
- Install or remove underground valves for the purpose of control, maintenance or leak repair.
- Install or remove extensions or laterals off the transmission or distribution pipeline.
- Assist the County's Lessee in ordering parts and supplies to be furnished by the County's Lessee as specified herein.
- Work in cooperation with County's Lessee's gas supplier to ensure adequate gas purchase and supply.
- Provide engineering & support for minor projects such as service line and repair work.
- Analyze L & U gas, search for solutions for any discrepancies.
- Prepare and submit all monthly operating reports to County's Lessee's supplier.
- Prepare and submit all operations-related reports required by regulatory agencies such as Kentucky PSC, DOT, etc.
- Ensure that gas system is operated in accordance with the Natural Gas Rules and Regulations filed for this utility.
- All above services shall be conducted in accordance with industry standards and DOT 49 CFR Part 192 requirements.
- Contractor will develop a comprehensive written Plan for adding new customers to the gas utility system. The Plan is to be submitted to the County's Lessee by the end of March of each year. Consideration in the plan should be given to how to add the most profitable customers for the least cost. Costs of construction should be estimated in the plan.
- Contractor shall submit a written monthly report on the gas operations to the County's Lessee that includes discussion of significant issues or problems as well as what "went right" during the month.

The County's Lessee agrees to furnish the following relating to the performance of the above services:

- Materials, parts, and supplies required to perform any routine repairs or maintenance.
- Construction materials for construction projects.
- Specialized equipment for repair, maintenance and construction, including utility trucks, PE fusion equipment and tools, gas detectors, line locators, trencher, backhoe and dump truck and accessories. Such equipment is the property of the County.
- Reasonable office space for field employees including utility record filing cabinets, access to phone and fax lines, a photocopier, and personal computer.
- Storage area at a county property.

EXTRAORDINARY ITEMS OUTSIDE THE SCOPE OF SERVICES

The following are outside the scope of services required to be completed by the Contractor:

- Major repairs caused by fire, flood, explosion, land movement, vehicular damage and similar occurrences which have caused or may cause a safety related condition
- Facility relocations required by jurisdictional agencies
- Major extensions or improvements which require more than 3 worker-days in more than 4 consecutive weeks
- Major facility replacements which require more than 3 worker-days in more than 4 consecutive weeks
- Backhoe operation more than 8 hours per project, or in environmentally sensitive areas or around transmission pipeline or other critical facilities
- Certified welding on steel pipe containing natural gas
- Meter testing and refurbishing
- Environmental disposal and remediation activities

EXHIBIT "B"
STANDARDS OF SERVICE

- The Contractor shall maintain at least ~~4~~ 3 RPO Full-Time Equivalent (FTE) employee positions at all times. One Full-Time Equivalent (FTE) employee position is defined as one or more Contractor-supplied personnel working for the benefit of the County's Lessee, on-duty for normal forty (40) hour work weeks for the entire contract month.
- An Employee may be absent for normal leaves including time off beyond the normal work week, vacation, and sick leave as long as adequate system coverage is provided.
- Part-time employees may be used to fulfill the FTE requirement.
- All operating employees shall be covered by DOT-proscribed programs for drug and alcohol testing.
- All employees shall be covered as applicable by DOT-proscribed plans for Operator Qualification for covered tasks and other programs.
- The Contractor's employees shall be expected to perform most services during normal working hours of the County's Lessee's customary work week (i.e., M-F excluding observed holidays).
- At least one employee shall remain on-call and be present within the County's Lessee's service area for after-hours emergency services (i.e., coverage is expected 24/7).
- At least one back up employee shall be provided for instances of vacation, illness, or training of regular employees. Back up employees are expected to provide regular services and after-hours emergency services for the County's Lessee as needed.
- Except when unable due to Force Majeure, Contractor employees shall respond to emergency calls within 45 minutes.
- In addition to regular and backup employees, Contractor may designate and train Emergency Responder personnel to provide emergency response more quickly or efficiently.

EXHIBIT "C"
BASIS OF FEES FOR OPERATION

As detailed in Section 9 of the Services Agreement, the County's Lessee shall pay a monthly fee for operating the Floyd County Gas System. Such fee shall be paid by the 20th of each month of operations.

Fee shall be "cost-plus". County's Lessee shall pay to Contractor a monthly fee equal to the actual costs of operations attributable to the Services Agreement, plus an Operating Margin of 10%.

Contractor's estimated monthly operating costs are outlined herein. The first month's fee shall be calculated on this estimated cost plus the Operating Margin.

Thereafter, Contractor shall invoice County's Lessee for actual costs as known, plus the Operating Margin.

Item	$ / Month
Manager	3,000
Med	200
Veh	500
Ops 1-2	5,000
Med	400
Veh	500
Office labor	1,500
FICA	727
WC & KUTA	333
Liab Insurance	500
Office & Ops	~~1,500~~ 1,259 RJO
Utils	150
Phone & Net	150
Mobile phones	250
Matls, Tools, & Suppl	500
Ans service	
KY One-Call	100
Repairs & Mtce	1,000
Travel	1,000
Billing & Acctg	1,000
Rent	1,000
Total Est Expenses	$19,310 19,069 RJO
Cost-Plus Adder (1st Month)	~~$1,690~~ 1,907 RJO
Total Est Monthly Cost	~~$21,000~~ 20,976
Total (1st Month)	$21,000

Exhibit 3

P.S.C. Ky. Adopt

ADOPTION NOTICE

The undersigned Kentucky Frontier Gas, LLC
(Name of Utility) System

of Prestonsburg, Kentucky hereby adopts, ratifies, and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs and supplements containing rates, rules and regulations for furnishing natural gas service at West Liberty, Kentucky
(Nature of Service)

in the Commonwealth of Kentucky, filed with the Public Service Commission of Kentucky by Elam Utility Co., Inc. of West Liberty
(Name of Predecessor)

and in effect on the _____ day of _____, 20____, the date on which the public service business of the said Elam Utility Co., Inc.
(Name of Predecessor)

was taken over by it.

This notice is issued on the 23 day of August, 2005, in conformity with 807 KAR 5:011, Section 11, of the Regulations for the filing of Tariffs of Public Utilities with the Public Service Commission of Kentucky.

Kentucky Frontier Gas, LLC

By Robert J. Oxford
(Member)

Authorized by Ky.P.S.C. Order No. _____

P.S.C. Ky. Adoption Notice No. _____

ADOPTION NOTICE

The undersigned Kentucky Frontier Gas, LLC
(Name of Utility) System

of Prestonsburg, Kentucky hereby adopts, ratifies, and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs and supplements containing rates, rules and regulations for furnishing natural gas service at West Liberty, Kentucky
(Nature of Service)

in the Commonwealth of Kentucky, filed with the Public Service Commission of Kentucky by Elam Utility Co., Inc. of West Liberty
(Name of Predecessor)

and in effect on the _____ day of _____, 20_____, the date on which the public service business of the said Elam Utility Co., Inc.
(Name of Predecessor)

was taken over by it.

This notice is issued on the 23 day of August, 2005, in conformity with 807 KAR 5:011, Section 11, of the Regulations for the filing of Tariffs of Public Utilities with the Public Service Commission of Kentucky.

Kentucky Frontier Gas, LLC

By Robert J. Oxford
(Member)

Authorized by Ky.P.S.C. Order No. _____

P.S.C. Ky. Adoption Notice No. _____

ADOPTION NOTICE

The undersigned Kentucky Frontier Gas, LLC
(Name of Utility) System

of Prestonsburg, Kentucky hereby adopts, ratifies, and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs and supplements containing rates, rules and regulations for furnishing natural gas service at Floyd County, Kentucky
(Nature of Service)

in the Commonwealth of Kentucky, filed with the Public Service Commission of Kentucky by E. Kentucky Utilities of Floyd County
(Name of Predecessor)

and in effect on the _____ day of _____, 20_____, the date on which the public service business of the said E. Kentucky Utilities
(Name of Predecessor)

was taken over by it.

This notice is issued on the 23 day of August, 2005, in conformity with 807 KAR 5:011, Section 11, of the Regulations for the filing of Tariffs of Public Utilities with the Public Service Commission of Kentucky.

Kentucky Frontier Gas, LLC

By Robert J. Oxford
(Member)

Authorized by Ky.P.S.C. Order No. _____

P.S.C. Ky. Adoption Notice No. _____

ADOPTION NOTICE

The undersigned Kentucky Frontier Gas, LLC
(Name of Utility) System

of Prestonsburg, Kentucky hereby adopts, ratifies, and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs and supplements containing rates, rules and regulations for furnishing natural gas service at Floyd County, Kentucky
(Nature of Service)

in the Commonwealth of Kentucky, filed with the Public Service Commission of Kentucky by Mike Little Gas Co., Inc. of Floyd County, Kentucky
(Name of Predecessor)

and in effect on the _____ day of _____, 20_____, the date on which the public service business of the said Mike Little Gas Co.,Inc.
(Name of Predecessor)

was taken over by it.

This notice is issued on the 23 day of August, 2005, in conformity with 807 KAR 5:011, Section 11, of the Regulations for the filing of Tariffs of Public Utilities with the Public Service Commission of Kentucky.

Kentucky Frontier Gas, LLC

By Robert J. Oxford
(Member)

Authorized by Ky.P.S.C. Order No. _____

P.S.C. Ky. Adoption Notice No. _____

ADOPTION NOTICE

The undersigned Kentucky Frontier Gas, LLC
(Name of Utility) System

of Prestonsburg, Kentucky hereby adopts, ratifies, and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs and supplements containing rates, rules and regulations for furnishing natural gas service at Belfry, Pike County, KY
(Nature of Service)

in the Commonwealth of Kentucky, filed with the Public Service Commission of Kentucky by Belfry Gas Inc. of Belfry, Pike County, KY
(Name of Predecessor)

and in effect on the _____ day of _____, 20_____, the date on which the public service business of the said Belfry Gas Inc.
(Name of Predecessor)

was taken over by it.

This notice is issued on the 23 day of August, 2005, in conformity with 807 KAR 5:011, Section 11, of the Regulations for the filing of Tariffs of Public Utilities with the Public Service Commission of Kentucky.

Kentucky Frontier Gas, LLC

By Robert J. Oxford
(Member)

Authorized by Ky.P.S.C. Order No. _____

INDUSTRIAL GAS SERVICES, INC.

Industrial Gas Services, Inc. (IGS) is a privately-owned company engaged in:

- The design, construction, and operation of gas **pipelines serving industrial plants**, cogeneration and power plants, and municipalities.

- The design, construction, and operation of **gas distribution systems** for residential, commercial and industrial customers.

- **Exploration and development of oil and natural gas fields**, including the completion of wells and the gathering and processing of natural gas, the operation of production and transportation facilities.

- The application of special gas technology, including the compressing of **natural gas for use in motor vehicles**, and the processing of **natural gas streams contaminated by H_2S, CO_2, and N_2** as examples; and

- Providing consulting services, including **oil and gas reserve analysis, engineering design, evaluation and cost estimates,** and **project management, for virtually all phases of the oil and gas industry.**

IGS has been incorporated since 1972 and has a very capable staff with extensive experience in the development of oil and gas production, and the design, construction, and operation of gas gathering and processing facilities, industrial pipelines and gas distribution systems. **The company currently operates three natural gas pipelines serving industrial facilities; one in Wyoming for General Chemical, one in Oregon serving Oremet-Wah Chang, and one in Washington state for Weyerhaeuser.**

In addition to its consulting services, IGS owns working interests in approximately 40 oil and gas wells in Wyoming and Colorado. IGS built, owned a portion of, and (until 1/1/89) operated a 100,000 MCF per day gas processing plant in Southwestern Wyoming.

The Company in the past has conducted exploration programs for private industries and for partnerships.

IGS worked with an electric power plant developer in Bellevue, Washington, to determine the feasibility of constructing and operating two pipeline systems in Washington. IGS has formed three joint venture companies; Frontier Energy, to construct over 700 miles of pipeline system in North Carolina to serve a seven-county area with natural gas; Ozark Natural Gas Company to serve Branson, Missouri and surrounding communities through 180 miles of pipeline system; and Penny Natural Gas, LLC to construct and operate 285 miles of gas distribution lines in three Pennsylvania and one New York county.

IGS had its beginning in 1968 as a management and engineering consulting firm, specializing in gas contracts and gas development, marketing, processing and transmission.

In 1972, IGS was incorporated when substantial work was being done for industries that use natural gas as fuel or feedstock. IGS diversified upstream into exploratory and development drilling activities and downstream into gas distribution.

Over its 32 years, IGS has provided consulting services for more than 100 clients. Following are some of the programs that IGS considers to be representative of its work.

CLIENT PROJECTS

COOS COUNTY, OREGON

Natural Gas Pipeline System

IGS is project advisor, along with PSI for the county commissioners of Coos County, OR for the design and construction of a 60 mile, 12 inch pipeline that will serve the deep water port of Coos Bay/North Bend. The project is currently under construction and is expected to be completed in 2004.

OCI CHEMICAL CORPORATION

Gas Pipeline System & Gas Supply Program

In 1972, Stauffer Chemical Company of Wyoming (now OCI) began a program to obtain a gas supply for its Soda Ash Refinery near Green River, Wyoming. IGS managed this gas supply and development program for over 20 years, purchasing gas from producers located in the area, and provided engineering and management to build and operate the pipeline system between the refinery and the producing wells. Daily volumes from this system during peak periods exceeded 30,000 MCF per day. IGS operated this 220-mile pipeline system, which is connected to over 90 wells, for 21 years and continued to administer the operation and gas supply development program from its Rock Springs and Denver office until March, 1997.

GENERAL CHEMICAL COMPANY

Gas Pipeline System

IGS designed, constructed, and operates an 11 mile pipeline system that connects the General Chemical plant with Overland Trail Transmission's pipeline system in southwest Wyoming. Daily gas volumes into the General Chemical plant are 15,000 to 20,000 MCF per day.

WINTERSHALL CORPORATION

Monroe Gas Field and Mid-Louisiana Gas

IGS assisted Wintershall, a subsidiary of BASF Corporation, to acquire gas production of over 50,000 MCF per day and over 1,000 miles of pipelines in Louisiana, by providing engineering and operations evaluation. The **acquisitions totaled over $150 million**. Gas marketing and transportation consulting functions were performed to assist Wintershall in its effort to become major gas marketer in the U.S.

WEYERHAEUSER PAPER COMPANY

Gas Pipeline System

IGS designed and managed the **construction of a ten-mile 12" gas pipeline** connecting Weyerhaeuser's Longview, Washington Plant with Williams Gas Pipeline West's main transmission line. This pipeline was constructed in congested urban areas, along a railroad, and across an 800' bridge span. IGS has operated this pipeline system for Weyerhaeuser since its completion in 1990.

REICHHOLD CHEMICALS, INC.

Mist Field

As a management and engineering consultant for Reichhold Chemicals in the mid-1970's, IGS did preliminary research on the geology of the area surrounding Reichhold's St. Helen's, Oregon fertilizer plant. As a result of this work, Reichhold made the **first commercial discovery of gas in Oregon, the Mist Field**, and subsequently formed a wholly-owned subsidiary, Reichhold Energy Corporation, to carry out this work of developing gas for its fertilizer plant. IGS performed all of the gas reserves and development engineering work and provided management guidance for Reichhold on this project.

OREMET-WAH CHANG

Gas Pipeline System

In 1998, IGS designed and constructed a 5 1/2 mile, 6 5/8" pipeline to connect Oremet-Wah Chang's Albany, Oregon titanium plant to Williams Gas Pipeline West Grant's lateral. IGS operates this pipeline, which delivers over 1,500 MCFD to the plant.

CHARTER EXPLORATION AND PRODUCTION COMPANY

Roggen Field & Gas Plant

In 1975, IGS recognized the potential gas reserves that were available in the Roggen Field and surrounding area in Weld County, Colorado. IGS entered into an agreement with Charter Exploration and Production Company to contract for gas purchases and build the necessary gas processing plant and pipeline gathering system that was capable of processing over 20,000 MCF per day of gas. On behalf of Charter, IGS acquired approximately 7,000,000 MCF of gas reserves and operated the Roggen System until late 1976, when the plant was sold to Crystal Oil and Gas. Later it was purchased by Damson. In 1987, IGS assisted Snyder Oil Company in evaluating and purchasing the plant, which had been expanded to a capacity of over 35,000 MCFD.

ADOLPH COORS COMPANY

Gas Development Program & Pipeline System

In 1971-73, IGS supervised the **drilling and completion of approximately 90 wells** in Wattenberg Field north of Denver, and **managed the construction of a 225-mile pipeline** system to access these reserves to the Adolph Coors Company in Golden, Colorado. Total developed reserves were estimated at approximately 90,000,000 MCF. In addition, IGS leased over 140,000 acres of prime gas prospect acreage in Western Colorado for future drilling by Coors. Subsequently, this acreage has been successfully drilled and developed by Coors Energy Company.

SCOTT EXPLORATION COMPANY

Raton Basin, Colorado

IGS provided engineering consulting services to Scott Exploration Company in 1998 in their CO_2 field development efforts in the Raton Basin of Colorado. IGS designed field gathering systems and prepared cost estimates for the gathering, dehydration and processing facilities required for full field development, which currently is still being pursued by Scott.

LAMAR UTILITIES BOARD

Gas Pipeline & Gas Supply - Power Plant

The City of Lamar, Colorado needed gas for its gas powered electric utility plant which was being curtailed by its gas supplier. In 1973, IGS worked with the Lamar Utility Board to purchase gas supplies from a nearby field. IGS secured over 10,000,000 MCF of gas reserves and **built a 20-mile pipeline system** to deliver the gas to the power plant.

MOUNTAIN GAS RESOURCES

Cryogenic Gas Processing Plant

IGS acted as Project Engineer to acquire, move, and **install a 30,000 MCFD capacity Cryogenic Gas Processing Plant** and related facilities near Granger, Wyoming. This plant was put on stream in September, 1991 and is currently operated by Western Gas Resources.

EXXON COMPANY U.S.A.

Non-EOR CO_2 Demand in
The Rocky Mountain Area
June 1988

IGS performed a study of non-EOR uses of CO_2, or merchant uses, within a 300 mile radius of Rock Springs, Wyoming. The objective of the study was to provide volumetric demands, purity levels and costs for each major end-use category of merchant CO_2.

EQUITY PROJECTS

NATURAL GAS UTILITIES

North Carolina, Missouri, Maine, California, Pennsylvania, New York

IGS has surveyed over 100 rural and small town communities in the U.S. that do not have natural gas service. As the result of these surveys, IGS has formed three joint venture utility companies, Frontier Energy, Ozark Natural Gas Company, and Penny Natural Gas, LLC.

Frontier has received certificates from the North Carolina Utilities Commission to serve seven counties in North Carolina. The Company is constructing over 700 miles of transmission and distribution system to serve over 14,000 customers. Operations began in May, 1998. Total cost of the facilities will be about $57,000,000. IGS and PSI sold their interest in Frontier to Sempra in 1998.

Ozark Natural Gas Company, under the management of IGS and PSI, received a certificate with the Missouri Public Service Commission to serve Branson and other communities in a three-county area with natural gas through about 180 miles of pipeline system. Over 5,000 customers will be served. Initial cost of the project is $18,000,000. Because of the downturn in the world economy in late 1998, Ozark lost its funding and the certificate expired. IGS and PSI are seeking funding to re-certificate the project under the name Frontier Missouri Energy.

IGS owns 5% of Mid-Maine Gas Company, a gas utility that has a certificate to serve Bangor and other communities in Central Maine.

Penny Natural Gas, LLC was formed to serve several counties in Pennsylvania and New York. The company is in the certification process.

IGS is also working with Alpine Gas Company to serve two communities in Central California.

GREEN RIVER GAS PROCESSING PLANT

During the winter of 1987-88, IGS built and owned a 15% interest in a **100,000 MCF per day capacity natural gas processing plant** and associated liquids pipeline in southwestern Wyoming for a total cost of $2,400,000.

IGS operated the plant for a period of ten months prior to selling its interest to the other owners. During this period, the plant processed an average of 77,000 MCF per day of wet gas, recovering 66,000 gallons per day of natural gas liquids and delivering 75,000 MCF per day of dry gas to several pipelines.

CENTENNIAL (PANTERA) PIPELINE

Pantera Energy Corporation

In 1975, IGS built the Centennial Pipeline System, located in Weld County, Colorado and operated the system until 1982. At that time Pantera Energy Corporation was formed and took over the operation of the system, which processed and delivered approximately 6,000 MCF per day of gas to a major pipeline system, as well as several industries. Later, this system was expanded to handle approximately 10,000 MCF per day of gas, and was acquired by Associated Natural Gas, Inc.

EXPLORATORY AND DEVELOPMENT DRILLING OIL AND GAS PRODUCTION

Stauffer Chemical Company contracted with IGS in 1981 to prepare an oil and gas exploration and production program. This program later resulted, in Stauffer's words, in a **". . . successful domestic E&P company."** In 1985, Stauffer sold its E&P company after having developed about $5 million per year in revenue from net production of 600 Bbl. oil per day and 1,000 MCF gas per day in the states of Utah, Wyoming, Colorado, North Dakota, Kansas, Oklahoma, and Texas. IGS participated with a working interest in some of the Colorado drilling, and retained overrides, as well, in several additional prospects.

IGS has operated two drilling partnerships since 1980. Acting as general partner in these limited partnerships, IGS has drilled and completed 4 producing oil wells in Kansas and Nebraska and has participated in another 6 wells in Colorado. As part of the first of the two limited partnerships, IGS built and operated a small gas processing plant near New Raymer, Colorado to gather and process casinghead gas being produced from 6 wells. This partnership was successful and was subsequently sold. The second partnership had three of its wells in an active waterflood.

IGS is General Partner of a Partnership that acquired 28 gas wells in Southwest Wyoming from Amoco in 1992. These wells produce gas into Williams Natural Gas, Colorado Interstate, and Overland Trail Transmission Companies' gas systems.

OTHER PROJECTS

GAS SALES AND PURCHASES

The foundation of IGS' business has been its engineering and contract consulting. At first, this engineering and contract consulting work was performed for producers who needed to market their gas. But as markets grew and gas supplies dwindled, the emphasis changed toward ***industrial users of natural gas*** who needed additional gas supplies. IGS has been instrumental in obtaining necessary gas supplies for several industries and institutions at a time when operations were being curtailed due to cutbacks in gas being provided from the local utility companies.

IGS has successfully negotiated **gas purchase contracts** with producers on behalf of Colorado State University, University of Colorado, and the University of Northern Colorado resulting in **savings of over $500,000 per year** for these institutions. In addition to these universities, IGS has arranged for direct purchase of gas for Veldkamp's, Inc. of Denver, the Dana Corporation of Pueblo, Ball Metal Container Corporation of Golden, Kodak-Colorado Division of Windsor, and Northern Colorado Medical Center of Greeley.

SPECIAL GAS TECHNOLOGY

In 1984, IGS initiated a research effort to determine the technology required to bring **natural gas to the market as a viable motor vehicle fuel**. In 1989, IGS became a major stockholder and provided all management for Continental Gas Company, a corporation that had exclusive patented technology for hydraulically compressing natural gas to 3000 psig. In 1990, IGS sold its stock in Continental to another shareholder desiring to use the technology in the burgeoning market for natural gas vehicles (NGV) in Texas. IGS retained some rights to use the technology in other states and plans to take a leading role in developing new kinds of compression, gas delivery systems and gas marketing to benefit the energy transportation and environmental sectors of the economy.

SUMMARY OF IGS ACTIVITIES

8/15/04

Current Operations:

Coos County Gas Pipeline Project, Oregon

Wamsutter Limited Partnership, Southwest Wyoming

Well & Compressor Operations

General Chemical Company Pipeline Operations, Green River, Wyoming

Weyerhaeuser Pipeline Operations, Longview, Washington

Oremet-Wah Chang Gas Pipeline Operations, Albany, Oregon

Recently Completed Projects:

Frontier Energy - North Carolina Gas Utility
Develop, Design, Construction, Operation
$57,000,000 - Certificated in seven counties in North Carolina
Initial gas deliveries began in late 1998.

Current Construction Projects:

Coos County Natural Gas Pipeline-
Develop, Design, Construction of 60 mile, 12 inch pipeline; 30 miles 4" and 6"
$40,000,000 -- EIS complete
Initial gas deliveries to begin late 2004.

Cardinal CG Natural Gas Pipeline, Lewis County, Washington
Develop, Design, Manage Construction of 4 mile 6 inch pipeline

Prospective Projects:

Alpine Gas Company - Central California

Penny Natural Gas, LLC - Pennsylvania & New York

Frontier Missouri Energy – Missouri

Eastern Kentucky Gas Distribution Companies-Purchase and Aggregate

IGS PERSONNEL INFORMATION

ROBERT J. OXFORD, PRESIDENT

Mr. Oxford obtained a Bachelor of Science degree in Petroleum Engineering at Louisiana State University. While in attendance at Louisiana State University, Mr. Oxford was admitted into Tau Beta Pi, the national engineering honor society, and was President of Pi Epsilon Tau, Petroleum engineering honor society. Mr. Oxford also was awarded the Socony-Mobil Fellowship, an achievement scholarship for petroleum engineers, and the Slack Memorial engineering scholarship.

Mr. Oxford's professional experience includes various engineering and management positions with Mobil Oil Corporation in Oklahoma, South Texas, Louisiana, and Wyoming from 1956 to 1968. During that period, Mr Oxford also served three years as a navigator in the Strategic Air Command.

In 1968, Mr. Oxford was employed by McCulloch Oil Corporation as Manager of McCulloch Gas Transmission Company. Mr. Oxford was instrumental in forming McCulloch Gas Processing Corporation, as well as McCulloch Interstate Gas Corporation, headquartered in Casper. His responsibilities included the purchase, gathering, processing, transportation, and distribution of natural gas in Wyoming. These responsibilities continued during the years 1968, 1969, and 1970.

In 1971, Mr. Oxford became a General Partner in Gas Development Enterprises in Denver, Colorado. This partnership was involved in natural gas management and engineering consultation to oil and gas producers.

Since 1972, Mr. Oxford has been President of Industrial Gas Services, Inc., (IGS), successor to Gas Development Enterprises. The business of IGS is natural gas management and engineering consulting for industrial users of natural gas, and for oil and gas producers. IGS is also an operator of oil and gas wells, gas gathering systems and gas processing plants. Additional areas of business include consultation in regard to pipeline design, construction and operation; gas measurement auditing; gas accounting; FERC filings; and reservoir engineering studies.

IGS operated an intrastate pipeline system in the Greater Green River Basin for over twenty years. This system which is over 200 miles in length, was owned by Rhone-Poulenc of Wyoming (RP), formerly Stauffer Chemical Company of Wyoming. The pipeline is now owned and operated by Duke Energy.

In the mid-1980's Mr. Oxford formed Gas Measurement Auditing Services (GMAS) to assist gas producers in dealing with gas measurement, sampling, and chart integration. GMAS negotiated settlements with gas pipeline purchasers.

In the late 1980's IGS, through Mr. Oxford's leadership, formed Continental Gas Company (CGC) to serve truck fleets with compressed natural gas. After two years of operation, this company was sold to a division of Transcontinental Gas Company. Mr. Oxford was President of Continental.

IGS, under Mr. Oxford's direction, constructed and presently operates three industrial pipeline systems; one for Weyerhaeuser in Longview, Washington, General Chemical in Wyoming, and Wahchang in Albany, Oregon.

From 1986-1990, Mr. Oxford and the IGS staff assisted Wintershall Energy Company, a subsidiary of BASF USA, in the acquisition of IMC Exploration Company and Mid Louisiana Gas Company. The acquisitions totaled over $150,000,000. This resulted in Wintershall producing, transporting, and marketing over 100,000 MCFD of gas. Mr. Oxford was active in evaluating, selecting, and administering various industrial and jurisdictional markets for Wintershall in Louisiana and Mississippi.

IGS owned a 15% interest in the Granger Gas Processing Plant under Mr. Oxford's direction and managed the construction and operation of the 95,000 MCFD plant for one year before selling it's interest to Presidio.

Mr. Oxford has testified on numerous occasions in Federal and State Courts and before State Commissions concerning the measurement, accounting and evaluation of gas and gas products for royalty.

Mr. Oxford formed Frontier Utilities, Inc. in 1994 to study opportunities to construct and operate gas distribution systems in towns where there is no gas service. Over eighty communities were identified and in September, 1994, Frontier Utilities of North Carolina was incorporated to serve four counties in northwest North Carolina. Mr. Oxford served as President of Frontier Utilities of North Carolina, and successfully merged the company into Frontier Energy. Frontier received certificates from the North Carolina Utilities Commission to serve seven counties in North Carolina. The Company constructed over 700 miles of transmission and distribution system to serve over 14,000 customers. Operations began in May, 1998. Total cost of the facilities was about $57,000,000. IGS and PSI sold their interest in Frontier to Sempra in 1998.

Mr. Oxford, as President of Ozark Natural Gas Company was successful in obtaining a certificate of public convenience and necessity to transport and distribute natural gas to a three county area in Southwest Missouri, including the city of Branson. He is a manager of Penny Natural Gas, LLC, a company formed to serve three Pennsylvania and one New York county with natural gas.

Mr. Oxford maintains membership in the Society of Petroleum Engineers of A.I.M.E. and the Rocky Mountain Natural Gas Association, where he was formerly President and member of the Board of Directors. Mr. Oxford retired from the Wyoming Air National Guard as a lieutenant colonel.

Mr. Oxford has delivered professional papers on the marketing of natural gas to the Wyoming Geological Association, Montana Geological Association, Oklahoma City Geological Society and at a regional meeting of the Society of Petroleum Engineers.

ROBERT M. RICHARDSON, Engineering Manager

BOB RICHARDSON has earned his B. S. degree in Petroleum and Natural Gas Engineering from Penn State University in 1974. Upon graduation he worked for Halliburton Services as a field engineer involved with cementing, acidizing and hydraulic fracturing operations in Bradford, Pennsylvania.

In 1975, he joined Union Oil Company of California as a reservoir and production engineer in Santa Maria, California where his efforts were concentrated on optimization of several multi-zone waterflood operations and heavy oil recovery by steam injection. In 1976, he was transferred to Coalinga, California as reservoir engineer responsible for the development of a large deep gas field that Union had discovered in the Sacramento delta area. This assignment involved extensive use of computerized well modeling with the added benefit of field supervision of completion operations.

Bob joined Long Beach Oil Development Corporation (LBOD) in 1977 as a production engineer, managing the City of Long Beach's holdings in the giant Wilmington oil field. His work here primarily involved secondary recovery (waterflood) operations as well as investigations into the feasibility of tertiary (chemical flood) operations.

In 1978, Bob joined Industrial Gas Services (IGS) as a staff engineer and was promoted to Engineering Manager in 1981. Over the past twenty-plus years at IGS, he has been intimately involved in the negotiation and administration of more than 50 natural gas sales and purchase contracts. He has performed log analyses, reserve determinations and deliverability forecasts on hundreds of oil and gas wells. Natural gas gathering system and pipeline system design and performance analysis are special subjects of his expertise. At IGS, Bob has developed the ability to analyze complex problems and effectively develop solutions, involving essentially all aspects of the petroleum engineering profession, with a careful eye towards the economic impact on clients and their projects.

STEVEN E. OXFORD, Vice President, Operations

STEVEN E. OXFORD graduated from Louisiana State University in December of 1979 with a Bachelor of Science degree in Petroleum Engineering.

Steve joined Chevron USA, Inc. in their Denver based Rocky Mountain Division office as a Production Engineer, responsible for all phases of well work (completions, recompletions, stimulations) in several oil and gas fields in Colorado, Utah, Montana, and Wyoming. Over the next 10 years, he gained additional experience and increasing responsibility through assignments in the Rangely (Colorado) Unit waterflood and the Kern River steamflood in Bakersfield, California.

Additionally, while working for Chevron, he was responsible for developing an Oilfield Operator training program that was used to transition new and recently acquired employees into Chevron operations. While in the Bakersfield District, he also developed computer based production data gathering and optimization programs for the Kern River Area.

In early 1989, Steve joined Continental Gas Company (CGC), an Industrial Gas Services, Inc. (IGS) subsidiary, as Director of Operations. CGC was created to market compressed natural gas as a vehicle fuel in the Denver, Colorado metropolitan area and to develop a proprietary hydraulically operated mobile natural gas compressor used to deliver natural gas to customers. Steve was responsible for all phases of the mobile gas compression issues, for vehicle conversion operations, and for customer fuel delivery equipment design and installation.

When IGS's interest in CGC was sold in 1990, Steve moved to IGS as Operations Manager and was subsequently elected Vice President of Operations. He has been responsible for natural gas distribution and transmission pipeline design, installation, and startup operations. Those pipeline projects included meter and regulation facilities as well as odorization equipment. Steve has written Operating and Maintenance manuals for several pipelines that IGS and others operate and he has worked extensively with State and Federal regulatory agencies concerning all aspects of pipeline safety regulations. He has worked with industrial customers to solve difficult measurement and pressure regulation problems. Additionally, he has supervised field operations for IGS's oil and gas wells, including artificial lift, well stimulation, and compressor operations.

M. STEPHEN PETERS, Corporate Attorney

STEVE PETERS earned a Bachelor of Science degree in Business Finance from the University of Colorado in 1976 and he earned a Juris Doctor degree in Law from Southern Methodist University in 1979. He was engaged in the private practice of law from 1980 until he joined Industrial Gas Services in 1981.

In 1984, he left IGS and joined Arapahoe Petroleum Incorporated as their in-house counsel. He assisted in the administration of a Chapter 11 reorganization for Arapahoe Petroleum Incorporated in 1987.

From 1988 through 1989, he was engaged in the private practice of law as a sole practitioner and as an associate with the firm of John R. Benitiz, P.C. Also, he has served on the panel of Chapter 7 Bankruptcy Trustees for the District of Colorado, from 1988 through 1989.

In 1989, he joined Continental Gas Company, an IGS-owned company engaged in the alternative motor vehicle fuels business. In March, 1990, he rejoined IGS.

LARRY RICH – General Manager

BA Management, Guilford College; MBA Babcock School of Management, Wake Forest University. Mr Rich has been employed in the natural gas industry for over 30 years, including 20 years with Piedmont Natural Gas Company as manager of operations of Greensboro and High Point, North Carolina gas systems.

Most recently Mr Rich was employed in the start up construction and operations of Frontier Energy, a new gas utility in North Carolina reported as the largest start up gas utility project in the U.S. in 35 years. Mr. Rich has been employed as a consultant by Heath and Associates on numerous gas distribution projects, and in 2003-2004 was a consultant for Coos County, Oregon, in the design and construction of a 60 mile 12" gas pipeline.

PAMELLA A. OXFORD – PERSONNEL ADMINISTRATOR

Pam Oxford joined Industrial Gas Services, Inc. in September, 2004. Her responsibilities as Personnel Administrator include employee payroll and insurance administration. She received her B.A. in Education from the University of Northern Colorado in 1982. She has been employed by various school districts in Colorado over the last 20 years.

PAM PASCHALL - Administrative Assistant

PAM PASCHALL joined the IGS staff in June, 1991 as Administrative Assistant to the President, Building Receptionist and Secretary to the building tenants. She had previously been employed for 11 years in the Jefferson County School system.

MARGARET BOSTOW – Financial Administrator

MARGARET BOSTOW joined the IGS staff in November of 1999 as Financial Administrator. She was previously employed by the Internal Revenue Service for 16 years.

PROFESSIONAL RATE SCHEDULE
Effective August, 2004

The following hourly rates apply to all fee services performed, and travel time to and from client's work locations. Rates are subject to change without prior notice unless otherwise agreed upon prior to commencement of work. Services will be invoiced monthly and payment must be in Industrial Gas Service, Inc.'s offices not later than 15 days after invoice date. Interest of 1.5% per month will be charged on all invoices not paid within 15 days of invoice date.

Accounting Code	Function	Rate $/Hr.
810.01	Executive Management I	150
810.02	Executive Management II	125
810.10	Exploration Management	125
810.11	Exploration Geology	70
810.13	Land & Lease Administration	70
810.14	Project Developer	60
810.19	Legal	90
810.20	Operations Management	125
810.21	Operations Technician (Field)*	60
810.22	Operations Administration	50
810.30	Engineering Management	100
810.31	Engineering	70
810.40	Administration Management	90
810.41	Contract Administration	60
810.43	Drafting	30
810.44	Secretarial	15
810.50	Accounting Management	70
810.52	Accounting	40
810.53	Gas Distribution System Operator	26
	Special Equipment	
810.80	In-house Computer Services	20

The above rates include office space, secretarial salaries, payroll taxes, employee benefits, insurance, etc., plus normal postage, copying and telephone expenses incurred in conducting client's business. These rates do not include direct cost such as travel and travel-related expenses, and overnight special delivery packages. These charges will be invoiced separately and must be paid within 15 days of the invoice date.

* Includes vehicle and small tools.

The following endusers have executed Agreements and have received direct-sale gas through the efforts of IGS:

Enduser	Contact
COLORADO STATE UNIVERSITY Ft. Collins, Colorado Gas flowing since August 26, 1984	R. F. Conard Director, Facilities Services (303) 491-5209
VELDKAMP's INCORPORATED Lakewood, Colorado Gas flowing since March 26, 1985	B. M. Veldkamp, Jr. Chairman of the Board (303) 234-1732
NORTH COLORADO MEDICAL CENTER Greeley, Colorado Gas flowing since August 13, 1985	Michael A. Breien Manager, Plant Services Department (303) 350-6260
UNIVERSITY OF NORTHERN COLORADO Greeley, Colorado Gas flowing since August 13, 1985	Rich McDermott Energy Conservation Manager (303) 351-2705
KODAK - COLORADO DIVISION Windsor, Colorado Materials/Planning/Purchasing Gas flowing since November 1, 1985	W. L. Goehring Supv., (303) 686-0112
UNIV. OF COLORADO, BOULDER CAMPUS Boulder, Colorado Gas flowing since December 1, 1985	Jay Sproul Asst. Director, Utilities and Energy (303) 492-5681
BALL METAL CONTAINER CORP. Golden, Colorado Gas flowing since January 1, 1986	Don Brownewell Plant Controller (303) 279-5501
DANA CORP., ENGINE PRODUCTS DIV. Pueblo, Colorado Gas flowing since February 1, 1986	N. A. (Ted) Baer Product Development Manager (303) 948-3311

Personal Resume

Steven Shute, PE

Natural gas utility consultant.

Educational & Professional Background

Bachelor of Science, Electrical Engineering, Kansas State University.
Registered **Professional Engineer** (PE): Nebraska, Colorado, Utah.
Member, National Association of **Corrosion Engineers**.
Member, **Rotary** International.

Work History

Since 1986, Steven Shute has worked to provide natural gas service to rural communities. In many areas, the large regional utilities are unable or unwilling to provide service. These projects are often feasible, if a new start-up utility installs a system and operates as a stand-alone entity. Mr. Shute, PSI and affiliated companies specialize in low-cost development of small gas utilities. After finding a suitable community, they work to bring in gas, operate the utility system, and maximize conversions. Several utility startup projects are in progress:

Coos County Gas Pipeline ***2000 to 2004***

Mr. Shute served as a Project Advisor on a $44M project to build a 12-inch gas transmission pipeline to serve the Coos Bay area on the coast of Oregon. Tasks: route & pipe selection, coordination of the environmental impact statement (EIS), secure 20+ permits from 12 governmental agencies, utilities commission liaison, public information meetings, prepare bids & administer construction. This 90-mile system with 3 laterals will serve an area with 60,000 residents and numerous industries around a deepwater ocean port.

Pinedale Natural Gas, Inc. ***1993 to present***

Mr. Shute is Founder and 50% co-owner. A small propane utility in Pinedale, Wyoming (near Jackson Hole) was purchased and converted to natural gas. This town is surrounded by an active gas producing area, but the regional utility passed over this project for 35 years. Tasks: arrange purchase & financing; liaison with Wyoming Public Service Commission; perform all design and permitting for natural gas supply pipeline and LDC system; convert from propane to natural gas in 1994; formulate Operations & Maintenance and Operator Qualification plans and implement drug testing program; train operators and implement enhanced safety program, ongoing supervision of utility operations. PNG has grown from 200 to 800 meters since starting operations in 1993.

Alpine Natural Gas **1997 to present**

Mr. Shute serves as consultant and partner on a gas distribution system in the foothills of the Sierra Nevada east of Stockton, California. Tasks: feasibility study, design and construction supervision work on a $3M green-field system, operations and safety issues. This system serves about 800 homes and small businesses, and has many opportunities for expansion in the state.

Walden Municipal Gas **1994 to present**

Mr. Shute was project manager on the $3M project to keep gas in Walden, Colorado. When the 40-year old gas field near Walden failed, the utility company abandoned the system. Mr. Shute evaluated the options for the existing natural gas system, and convinced the Town to convert to municipal operation and install a pipeline to ensure a long-term gas supply. PSI specified the use of coiled aluminum pipe to minimize cost and environmental permitting problems; negotiated joint trench and shared RoW with US West; secured permits from 13 governmental agencies for 46 miles of pipeline; administered construction and inspection for the pipeline project; helped with startup and municipal operation in 1995; designed distribution systems along the pipeline in Wyoming in 1997. The system has grown from 600 to about 1000 meters. In 2002, Mr. Shute through Pinedale Natural Gas, became the contract operator for the Walden system.

Wendover Gas Company **1996 to present**

Mr. Shute is primary consultant on a propane gas distribution system in Wendover, a small community straddling the Nevada-Utah state line on I-80 west of Salt Lake City. Tasks: feasibility studies, certification through the utilities commissions in Nevada and Utah, design and construction supervision work on a $1.2M greenfield system, gas supply and safety issues. This system serves about 700 homes, casinos and related businesses.

Frontier Energy, LLC. *- Mr. Shute was a co-Founder, officer, and stockholder of this gas utility in North Carolina. In July 1997, Frontier won a Supreme Court decision and received certification to build a $55 million gas utility system serving 7 counties in northwestern North Carolina. The initial project includes 150 miles of transmission pipeline and 500 miles of distribution, to serve about 10,000 customers within 5 to 10 years. These seven counties have a population of 250,000, with 1500 poultry growout facilities and a large industrial and manufacturing base. Mr. Shute worked with Frontier from 1994 to its sale in 1999 to Sempra Energy (parent of Southern California Gas).*

Ozark Natural Gas Co., Inc. *- Mr. Shute was a principal of Ozark, which received certification in August 1998 to serve gas to a three-county area around the country music resort community of Branson, Missouri. The $20 million project includes 40 miles of transmission pipeline and 140 miles of distribution. Ozark planned to serve more than 5,000 customers, including residential, commercial / resort, a college and a few light industries. (Project was not built.)*

Mid-Maine Gas Utilities, Inc. *– in 1997, MMGU was conditionally certificated to serve gas to unserved areas of Maine, including Bangor, Waterville, Augusta and surrounding towns. The $14M system would serve homes, businesses and light industries off the Maritimes & Northeast PL, built in 1999 from Nova Scotia. Mr. Shute performed system design, feasibility studies, and testified before the Maine Public Utilities Commission. (Project built by Sempra Energy.)*

Southern Ute Utilities *– Mr. Shute serves as gas utility consultant for the Southern Ute Tribe in Ignacio, Colorado. PSI performed a feasibility study, and prepared design & construction documents for the installation of a new $300k gas distribution system for the Tribe. This work included hydraulic models, load study, material specifications, bid documents, measurement station and odorizer design, detailed design sketches and drawings, and operations followup. The utility has operated successfully since 1993.*

Principal, Pipeline Solutions, Inc. ***1991 to present***

Mr. Shute is a consulting engineer specializing in natural gas utilities: pipeline and distribution system engineering, measurement facilities design, DOT compliance, corrosion control, operator training programs, environmental compliance. Sample project list:

Western Utility - audit to identify high gas loss problem in small propane utility. Large measurement error was found and corrected, after 25 years of non-detection.

Colorado Springs Gas - develop modules for DOT-mandated operator training program.

Colorado Clean Fuels - feasibility study and detailed cost estimate for 80 mile CO_2 pipeline to a methanol production plant.

South Park MHP - design gas distribution system for mobile home park, arrange for gas supply, negotiate with supplier utility.

Western Gas Resources - research, design, and implement program for testing for VOC leakage from large gas processing plants, to comply with EPA regulations.

Barrett Gas Resources - corrosion control program and training.

General Manager, Rocky Mountain Natural Gas ***1988 to 1991***

Managed the day-to-day operation of a mid-size regional utility (120 employees, 30,000 meters) serving resort communities in western Colorado. Administration, budgeting and long-term planning, engineering & technical supervision were bulk of duties.

Crested Butte, Colorado - feasibility studies, pipeline and distribution system design to convert ski resort town to natural gas. RMNG nearly completed the franchise procedure with town council and Colorado Public Utilities Commission. The project was abandoned by RMNG parent company but the project was carried out by a competing utility.

Strategic pipeline projects to increase capacity for future growth (numerous projects, $10+ million): increased capacity, higher pressures, better metering and communications.

Director Tech Services, Rocky Mountain Natural Gas *1988 to 1991*

Supervised the takeover and assimilation of RMNG as a new subsidiary of K N Energy, Inc. Responsible for engineering department, purchasing and material accounting, corrosion control and safety, transportation and communications department. Formulated new Standard Practices Manual for RMNG, completely overhauled measurement and telemetry systems, planned and executed numerous pipeline projects for the future.

For RMNG, major projects included:

Telluride, Colorado - permitting and planning to install a 40 mile pipeline and convert a propane distribution system to natural gas.

Crawford, Four Mile Creek, Singletree, Lake Creek, Cordillera - converted small towns and large rural subdivisions to natural gas. These projects had a very successful conversion rate even with many baseboard electric heating systems which are tough to convert.

Aspen upgrade: numerous 10" pipeline and storage re-configuring projects to enhance deliveries to Aspen area. Built new town border stations for Aspen, Basalt, Carbondale, Delta, Eagle, Gypsum, and others.

Director Tech Services, K N Energy, Inc. *1985 to 1986*
Corrosion control, compressor performance testing, communications department.

Manager of Corrosion Control, K N Energy, Inc. *1982 to 1985*
Corrosion control and DOT compliance for all operations of a 220,000 customer utility.

Project Engineer, K N Energy, Inc. *1980 to 1982*
Project Engineer, Conoco, Inc. *1977 to 1980*
Executive training program, various pipeline projects for natural gas and petroleum liquids.

Personal Data

b. 10-25-55, Manhattan, Kansas.
Married, father of two young men. Active Private Pilot.
Active in church, Rotary Club, local government, music & arts.
Current personal and professional references are available upon request.

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-9207 fax

LARRY RICH

104 Sandcastle Drive
Emerald Isle, NC 28594
Business (252) 354-7480

PROFESSIONAL SUMMARY

Natural Gas Distribution Executive with demonstrated proficiency in operations and marketing management, negotiations, strategic planning and P&L responsibilities in the natural gas utilities industry.
A sample of expertise and accomplishments include:

- Negotiating franchise agreements with local government officials.
- Public Relations expert dealing with public officials and news media.
- Marketing for market penetration and improved profitability.
- Led activities related to largest LDC "start-up" operation in the past 30 years.
- Negotiated contracts with customers with annual bills ranging up to $700,000.
- Inspected contracts/installers work to assure compliance with operations/engineering specifications.

PROFESSIONAL EXPERIENCE

INDUSTRIAL GAS SERVICES, INC 2002-2005

Project Advisor

Worked as part of management team responsible for the construction of a 60 mile 12" gas transmission line in Southwest Oregon. Presently serving as project developer in Eastern Kentucky to acquire small gas distribution systems.

FRONTIER ENERGY, Elkin, NC 1996-2002

Director of Operations

Served Northwest North Carolina and Warren County in North Carolina with natural gas. At the time of initial start-up, it was the largest Greenfield Gas Project in the US in the past 30 years.

- Negotiated franchise agreements with the local communities and contracts for service with all customers.
- Successfully handled all governmental relations.
- Handled all media and community relation's issues.
- Improved efficiency and reduced cost by advising on optimal route selection.

ORANGE TRUSS CO., Mebane, NC 1987-1996

Director of Operations/Chief Operating Partner, Manufacturing Facility

Led all operations, marketing and P&L decision-making responsibilities for operation.

PIEDMONT NATURAL GAS COMPANY, Charlotte, NC 1966-1987

Public utility engaged in the distribution and sale of natural gas with over 675,000 residential, commercial and industrial customers with sales in excess of $1,100MM.

Greensboro District Manager, Greensboro, NC

Responsible for the development of maximum contribution within a given geographical area through effective utilization of natural and financial resources, plant facilities, personnel and customer relations. Managed 100 employees with operating and capital budget of over $4.5MM.

- Increased natural gas sales by attaining a 26% gain in customers on existing and new distribution lines.
- Improved productivity of sales force by establishing a budgeted approach to the sales effort.

- Established and maintained effective relations with governmental officials at all levels.
- Built confidence with builders and developers with flexible and accommodating approach to their needs.
- Reduced district manning by streamlining business office to re-evaluating service people area assignments.
- Established a standard cost approach to jobbing activities.
- Expanded distribution lines into remote but heavily populated and growing areas.
- Supervised credit and collections policy that encourages sales, while maintaining gas, jobbing and merchandise charge-offs at an acceptable level.

High Point District Manager, High Point, NC

Managed district office with total operations and P&L responsibilities.

- Gained wide acceptance of natural gas as a dependable fuel within furniture industry where it had not been widely used previously.
- Directed the successful start-up of a propane plant.
- Shepherded district through energy shortage and successfully maintained customer base.
- Successful in handling customer complaints and employee grievances without compromising companies needs.

Office Manager, High Point, NC

Responsible for billings and collections for over 15,000 customers. Managed staff of 12, training them in data processing billing system.

Accounts Representative, Greensboro, NC

Administrative collection policy and customer inquires regarding billing and services.

Service Representative, Asheboro, NC

Installed and repaired gas appliances, read meters and performed field collections.

ADDITIONAL WORK EXPERIENCE

- Frontier Energy, Elkin, NC
- Western Gas, Edenton, NC
- Orange Truss Co., Inc., Mebane, NC
- Frontier Utilities, Denver, CO
- Heath and Associates, Shelby, NC
- Piedmont Natural Gas Co., Inc., Charlotte, NC

EDUCATION / PROFESSIONAL DEVELOPMENT

MBA, Wake Forest University, Winston-Salem, NC

B.S. Management, Guilford College, Greensboro, NC

Center for Creative Leadership, Greensboro, NC
Southern Gas Association Seminars
Southeastern Gas Association Seminars

PROFESSIONAL LICENSES

North Carolina Contractor
North Carolina Broker

PROFESSIONAL AFFILIATIONS

- Rotary Club
- Board of Realtors
- Home Builders Association
- United Way Budget Panel
- American Red Cross
- Jaycees
- Multiple Sclerosis Society
- Chamber of Commerce, Greensboro & High Point
- Salvation Army Board of Directors
- Guilford College Business & Industry Campaign
- Manpower Development Council for County & City
- City of Asheboro Recreation Planning Committee

INDUSTRIAL GAS SERVICES

Financials for
2002, 2003 2004

ITEM	2002	2003	2004
BALANCE SHEET			
Assets			
Checking/Savings	$26,638	$250,868	$117,799
Accounts Receivable	$85,197	$400,253	$105,129
Other Current Assets	$635,652	$457,066	$334,925
Fixed Assets	$448,512	$522,712	$844,103
Other Assets	$0	$0	$185,940
Total Assets	$1,195,999	$1,630,899	$1,587,896
Liabilities & Equity			
Accounts Payable	$98,435	$84,528	$55,163
Other Current Liabilities	$260,683	$284,914	$361,377
Long-Term Liabilities	$139,405	$97,900	$83,217
Total Liabilities	$498,523	$467,342	$499,757
Capital Stock	$59,633	$59,633	$59,633
Retained Earnings	$637,843	$1,103,924	$1,028,506
Total Liabilites & Equity	$1,195,999	$1,630,899	$1,587,896
PROFIT & LOSS			
Total Income	$728,952	$2,391,583	$1,038,529
Royalties Paid	$17,554	$31,101	$42,194
Gross Profit	$711,398	$2,360,482	$996,335
Total Expense	$828,995	$1,894,403	$1,071,754
Net Income/(Loss)	($117,597)	$466,079	($75,419)

Pro Forma - Kentucky Gas LDCs

Calendar Year	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Project Year	***1***	***2***	***3***	***4***	***5***	***6***
12-Aug-05						
Cumulative Investment	$ 3,400,000	$ 3,419,600	$ 3,439,200	$ 3,459,500	$ 3,479,800	$ 3,500,100
Additions		$ 19,600	$ 19,600	$ 20,300	$ 20,300	$ 20,300
Sales						
Residential - Meters	2,500	2,525	2,550	2,576	2,602	2,628
- Volume (MCF)	152,500	153,517	155,042	156,607	158,193	159,779
- Margin (MCF)	*$4.50*	*$4.50*	*$4.50*	*$4.50*	*$4.50*	*$4.50*
- Meter Fees	$75,000	$75,750	$76,500	$77,280	$78,060	$78,840
- Revenue	$761,250	$766,575	$774,188	$782,013	$789,930	$797,847
Commercial - Meters	333	336	339	342	345	348
- Volume (MCF)	73,260	73,700	74,360	75,020	75,680	76,340
- Margin (MCF)	*$4.50*	*$4.50*	*$4.50*	*$4.50*	*$4.50*	*$4.50*
- Meter Fees	$9,990	$10,080	$10,170	$10,260	$10,350	$10,440
- Revenue	$339,660	$341,730	$344,790	$347,850	$350,910	$353,970
Total Customers	2,833	2,861	2,889	2,918	2,947	2,976
Total Volume (MCF)	225,760	227,217	229,402	231,627	233,873	236,119
Gas Revenue	$1,100,910	$1,108,305	$1,118,978	$1,129,863	$1,140,840	$1,151,817
Utility Income Statement						
Gas Revenue	$1,100,910	$1,108,305	$1,118,978	$1,129,863	$1,140,840	$1,151,817
Interest on Capital Fund	$0	$2,872	$4,482	$6,088	$7,708	$9,339
						$0
Gas Commodity Cost (incl L&U)	$0	$0	$0	$0	$0	$0
Fixed Gas Costs						
PSC Assessment	$5,666	$5,722	$5,778	$5,836	$5,894	$5,952
Operating & Maint. Costs	$600,000	$607,200	$614,486	$621,860	$629,323	$636,874
Property Tax	$17,000	$17,098	$17,196	$17,298	$17,399	$17,501
Income Taxes	$87,938	$43,132	$53,458	$69,689	$78,796	$82,209

Pro Forma - Kentucky Gas LDCs

Calendar Year	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Project Year	***1***	***2***	***3***	***4***	***5***	***6***
12-Aug-05						
Deferred Income Taxes	$5,667	$52,878	$45,811	$32,964	$27,341	$27,476
Operating Income	**$384,640**	**$385,147**	**$386,729**	**$388,304**	**$389,796**	**$391,145**
Net Income	**$140,406**	**$144,015**	**$148,904**	**$153,980**	**$159,204**	**$164,527**
Return on Investment						
Return on Equity	$133,129	$138,171	$143,677	$149,668	$156,162	$163,168
Depreciation (book)	$113,333	$113,987	$114,640	$115,317	$115,993	$116,670
Interest	$130,900	$127,146	$123,185	$119,007	$114,599	$109,948
Allowable Return	**$377,362**	**$379,303**	**$381,502**	**$383,992**	**$386,754**	**$389,786**
Tax Calculation						
Net Revenue (pre-tax & interest)	$478,244	$481,157	$485,999	$490,957	$495,933	$500,829
Tax Depreciation	$127,500	$246,181	$229,168	$197,727	$184,345	$185,360
Interest	$130,900	$127,146	$123,185	$119,007	$114,599	$109,948
Taxable Income	$219,844	$107,830	$133,646	$174,224	$196,989	$205,521
Income Taxes	*$87,938*	*$43,132*	*$53,458*	*$69,689*	*$78,796*	*$82,209*
Income Tax Credit Carryforward	$0	$0	$0	$0	$0	$0
Cash Flow & Balance Sheet						
Cash Flow after Interest	$253,740	$258,001	$263,544	$269,297	$275,198	$281,197
Cash Flow aftr Principal & Dividend	$134,483	$83,990	$84,553	$85,097	$85,549	$85,846
Debt	$2,380,000	$2,311,743	$2,239,732	$2,163,761	$2,083,611	$1,999,053
Common Stock	$1,020,000	$1,020,000	$1,020,000	$1,020,000	$1,020,000	$1,020,000
Retained Earnings (ending)	$253,740	$460,741	$622,285	$788,562	$959,710	$1,135,816
plus Equity contributions		$0	$0	$0	$0	$0
less accum Depreciation	($113,333)	($227,320)	($341,960)	($457,277)	($573,270)	($689,940)

Pro Forma - Kentucky Gas LDCs

Calendar Year	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Project Year	***1***	***2***	***3***	***4***	***5***	***6***
12-Aug-05						
less Dividends	($51,000)	($102,000)	($103,020)	($104,050)	($105,091)	($106,142)
Shareholders Equity	$1,109,406	$1,151,421	$1,197,305	$1,247,235	$1,301,349	$1,359,734
Debt to Equity Ratio	**2.1**	**2.0**	**1.9**	**1.7**	**1.6**	**1.5**
Equity	**32%**	**33%**	**35%**	**37%**	**38%**	**40%**
Total Capitalization	$3,489,406	$3,463,164	$3,437,038	$3,410,996	$3,384,960	$3,358,787
Capital Additions by Year	$3,400,000	$ 19,600	$ 19,600	$ 20,300	$ 20,300	$ 20,300
Capitalized Interest						
Beg. Capital Acct Balance	$3,400,000	$134,483	$198,873	$263,826	$328,623	$393,872
Cash Flow after Principal & Divdnd	$134,483	$83,990	$84,553	$85,097	$85,549	$85,846
Capital Additions	($3,400,000)	($19,600)	($19,600)	($20,300)	($20,300)	($20,300)
New Equity	$1,020,000					
New Debt	$2,380,000					
Depreciation by Addition Year	$127,500	$245,446	$227,018	$194,242	$179,690	$170,000
		$735	$1,415	$1,309	$1,120	$1,036
			$735	$1,415	$1,309	$1,120
				$761	$1,465	$1,355
					$761	$1,465
Total Depreciation	$127,500	$246,181	$229,168	$197,727	$184,345	$174,976
Interest by Addition Year	$130,900	$127,146	$123,185	$119,007	$114,599	$109,948
		$0	$0	$0	$0	$0
			$0	$0	$0	$0
				$0	$0	$0

Pro Forma - Kentucky Gas LDCs

Calendar Year	2006	2007	2008	2009	2010	2011
Project Year	**1**	**2**	**3**	**4**	**5**	**6**
12-Aug-05					$0	$0
Total Interest Pmt	$130,900	$127,146	$123,185	$119,007	$114,599	$109,948
Principal by Addition Year	$68,257	$72,011	$75,972	$80,150	$84,558	$89,209
		$0	$0	$0	$0	$0
			$0	$0	$0	$0
				$0	$0	$0
					$0	$0
Total Principal Pmt	$68,257	$72,011	$75,972	$80,150	$84,558	$89,209
Debt	$2,380,000	$2,311,743	$2,239,732	$2,163,761	$2,083,611	$1,999,053

Assumptions:

Initial Debt Financing	**70%** *financed*	*Tax Rate*	**40%**
Interest Rate	**5.5%** *per annum composite rate*	*Gas Cost DTh*	**$0.00** *DTh*
Return on Equity	**12.0%** *target for ratemaking*	*Ave Res'l Load*	**61** *MCF*
Loan Life	**20** *years amortization*	*Ave Com'l Load*	**220** *MCF*
Rate (Book) Life	**30** *years SL*	*Growth*	**1%**
Tax Life	**20** *years (IRS) SL*	*Payout*	**50%**

Operations & Maintenance Expenses

Kentucky LDCs

Cost Item	Qty	Unit $	2000 mtrs	2500 mtrs	3000 mtrs	4000 mtrs
Personnel & Salaries						
General Manager		$60,000	$30,000	$36,000	$42,000	$60,000
Sr Tech / Marketing Spec		$45,000	$45,000	$45,000	$45,000	$45,000
Service Tech		$30,000	$60,000	$90,000	$90,000	$120,000
Meter reader		$24,000	$12,000	$18,000	$24,000	$36,000
Acctg / Customer Service		$21,000	$10,500	$15,750	$21,000	$31,500
Total employees			4.5	6	7	9
Total salaries			$157,500	$204,750	$222,000	$292,500
Vehicles			3.5	5.5	6	7
Payroll-Related Expenses						
Payroll Expenses - FICA	7.65%	of payroll	$12,049	$15,663	$16,983	$22,376
Payroll Expenses - Workers Comp	0.8%	of payroll	$1,260	$1,638	$1,776	$2,340
Payroll Expenses - Fed & State Unempl Tax	max		$1,575	$1,925	$2,450	$3,150
Benefits (Medical, Pension)	25%	of payroll	$39,375	$51,188	$55,500	$73,125
General Liability Insurance	20%	of payroll	$31,500	$40,950	$44,400	$58,500

Operations & Maintenance Expenses

Kentucky LDCs

Cost Item	Qty	Unit $	2000 mtrs	2500 mtrs	3000 mtrs	4000 mtrs
General O&M Categories						
Automobile Expense	$0.40	12,000 mi/yr	$16,800	$26,400	$28,800	$33,600
Travel Expense			$5,000	$6,000	$6,000	$7,000
Office Rental		$10 / sq ft	$15,000	$15,000	$15,000	$15,000
Office Utilities			$6,000	$6,000	$6,000	$6,000
Office Supplies & Expenses		(postage +)	$8,000	$10,000	$12,000	$16,000
Contractor - Repairs & Maintenance			$30,000	$35,000	$40,000	$50,000
DOT Specialists			$20,000	$20,000	$25,000	$30,000
Materials & Supplies			$3,000	$3,000	$3,000	$3,000
Accounting (outside)			$10,000	$10,000	$12,000	$14,000
Advertising			$5,000	$5,000	$5,000	$5,000
Bad Debts			$8,000	$10,000	$12,000	$16,000
Community Contributions			$2,000	$2,000	$2,000	$2,000
Corporate Supervision & Engineering			$50,000	$60,000	$75,000	$100,000
Insurance (stations & personal property)			$10,000	$12,000	$12,000	$14,000
Legal			$5,000	$5,000	$5,000	$5,000
Totals			***$437,059***	***$541,514***	***$601,909***	***$768,591***

KENTUCY FRONTIER GAS

PROJECTED INCOME STATEMENT 2006

INCOME:			
RESIDENTIAL METERS		$761,250.00	
COMMERCIAL METERS		$339,660.00	
TOTAL GAS REVENUE			$1,100,910.00
EXPENSES:			
PSC ASSESSMENT		$5,666.00	
PAYROLL EXPENSES:			
SALARIES	$222,000.00		
FICA	$16,983.00		
WORKER'S COMP	$1,776.00		
FUTA & SUI	$2,450.00		
BENEFITS	$55,500.00		
GENL LIAB INS	$44,400.00		
TOTAL PAYROLL		$343,109.00	
AUTOMOBILE EXPENSE		$28,800.00	
TRAVEL EXPENSE		$6,000.00	
OFFICE RENTAL		$15,000.00	
OFFICE SUPPLIES		$12,000.00	
REPAIRS & MAINTENANCE		$40,000.00	
DOT SPECIALISTS		$25,000.00	
MATERIALS & SUPPLIES		$3,000.00	
ACCOUNTING		$12,000.00	
ADVERTISING		$5,000.00	
BAD DEBTS		$12,000.00	
COMMUNITY CONTRIBUTIONS		$2,000.00	
CORP SUPERVISION & ENGR		$75,000.00	
INSURANCE		$12,000.00	
LEGAL		$5,000.00	
PROPERTY TAX		$17,000.00	
INCOME TAX		$87,938.00	
INTEREST EXPENSE		$130,900.00	
DEPRECIATION EXPENSE		$127,500.00	
TOTAL EXPENSES			$964,913.00
NET INCOME			$135,997.00

KENTUCKY FRONTIER GAS

PROJECTED BALANCE SHEEET 2006

TOTAL ASSETS		$3,400,000.00
TOTAL LIABILITIES	$2,380,000.00	
EQUITY:		
CAPITAL	$1,020,000.00	
TOTAL LIABILITIES & EQUITY		$3,400,000.00

Exhibit 8

Two copies of the following documents were filed. One disk with maps of each gas system was filed.

Technical Data:

Draft O&M manual.
Draft OQ program.
Draft substance abuse programs

System maps for each of the 4 companies to be acquired
(1 electronic copy).

Kentucky Frontier Gas LLC.

Draft Operations and Maintenance Manual

August 12, 2005

NOTE: This manual was modified from a manual presented to and accepted by the Missouri Public Service Commission. It is not intended to represent any specific utility nor are all of the procedures or regulation references current through August of 2005. We intend to have one manual, such as the following draft, that will cover all of the utility operations, with specific emergency response procedure sections unique to each operating area.

Operations & Maintenance Plan

0.0	**GENERAL INFORMATION**
0.1	GENERAL
0.2	USE OF THE PLAN
0.3	EMPLOYEE RESPONSIBILITIES
0.4	DEFINITIONS
0.5	PIPELINE DESCRIPTION

0.0 GENERAL INFORMATION

0.1 GENERAL

This "Operating and Maintenance Manual" for Kentucky Frontier's Pipeline ("Pipeline") has been developed in accordance with 49CFR 192.603. (Additional procedures or modifications to these procedures will be necessary to fully comply with Kentucky Public Service Commission regulations). The purpose of this manual is to ensure safe and efficient gas operations by:

A. Establishing written procedures for inspection, operation, and maintenance,
B. Operating the gas system in accordance with the plan, and
C. Maintaining necessary documentation to administer the plan.

0.2 USE OF THE PLAN

This manual contains a safety outline for use by all persons involved in routine or emergency response operations. The procedures in this manual apply only to the Pipeline system described herein and should not be used for other Frontier operations. The (designated Frontier management) shall be responsible for coordinating and distributing the issuance of updates to this manual. The manual is divided into the following four main sections:

Section 1.0: Normal Operating Procedures
Section 2.0: Abnormal Operating Procedures
Section 3.0: Emergency Procedures and Pipeline Contingency Plan
Section 4.0: References and Forms

0.3 EMPLOYEE RESPONSIBILITIES

Utility employees and office personnel, who may take gas leak calls or requests for pipeline locating, are expected to be knowledgeable about those portions of the Operations & Maintenance Manual which affect their respective job responsibilities. All utility employees, regardless of specific responsibilities, are expected to know general procedures to prevent accidental ignition of gas when a strong gas odor is detected as well as utility procedures regarding statements to the news media or general public.

All utility personnel who perform operation and maintenance activities are to be aware of and/or recognize any condition that could result in a hazardous and/or reportable incident situation. Such conditions are to be immediately reported to the (designated Frontier management) for appropriate action.

0.4 DEFINITIONS

"MAOP" means "maximum allowable operating pressure" at which a pipeline or segment of a pipeline may be operated under 49CFR part 192. MAOP is established by past operating history, pressure testing, pressure up-ratings, and equipment pressure ratings.

"MOP" means "maximum operating pressure" at which a pipeline or segment of a pipeline may be operated. The MOP may be the same pressure or a lesser pressure than the MAOP.

"Overpressure Protection" means equipment installed to prevent pressure in a system from exceeding the maximum pressure limit for safe operation of the system.

"Pipeline" means all parts of those physical facilities through which gas moves in transportation, including pipe, valves, compressor units, metering stations, regulator stations, delivery stations, holders, fabricated assemblies, and other appurtenances.

"Pressure" is an expression of pounds per square inch above atmospheric, i.e., gauge pressure (abbreviated "psig").

"Pressure Regulating/Relief Station" means an installation designed to automatically reduce and control gas pressure from a high pressure source of gas into a system operating at a lower pressure. It includes any enclosures, relief devices, and ventilating equipment, and any piping and auxiliary equipment, such as valves, regulators, control instruments or control lines.

"Riser" means the section of a service line which extends out of the ground and is often near the wall of a building. This usually includes a shut-off valve, a regulator, and a unit meter.

"Service Line" means a distribution line that transports gas from a common source of supply (gas main) to a customer meter or the connection to a customer's piping which ever is farther downstream, or the connection to a customer's piping, if there is not a meter.

"Service Regulator" means a device that reduces and limits gas pressure to the customer.

"Shut-off Valve" means a valve used to shut off the gas supply to a customer. The valve may be located ahead of the service regulator, below ground at the property line, or where the service line connects to the main.

"TBS" means "town border station", or the regulator facilities which drop pressure from the mainline pressure to a lower pressure before entering the pipeline system serving a community.

"Utility" means Frontier Natural Gas Company, Inc. (also referred to herein as "Frontier").

0.5 PIPELINE DESCRIPTION

(To be developed - this section will contain a general description of the pipeline system, including the construction date(s), pipe dimensions and lengths, and operating pressures - facilities and their locations will also be described)

Questions regarding the Pipeline should be referred to the (designated Frontier management) listed in Section 4.0 of this manual.

1.0	**NORMAL OPERATING PROCEDURES**
1.1	**GENERAL**
1.1.1	CONSTRUCTION RECORDS AND MAPS
1.1.2	OPERATING HISTORY RECORDS
1.1.3	TRAINING
1.1.4	MANUAL REVIEW
1.2	**PIPELINE PRESSURE**
1.2.1	MAOP (Maximum Allowable Operating Pressure)
1.2.2	PRESSURE UPRATING: GENERAL
1.2.2.1	UPRATING PROCEDURES - GENERAL REQUIREMENTS
1.2.2.2	PROJECT SCOPE
1.2.2.3	PRE-UPRATING CONSTRUCTION
1.2.2.4	UPRATING PROCEDURE
1.3	**MAINTENANCE & REPAIRS**
1.3.1	GENERAL
1.3.2	DRUG AND ALCOHOL TESTING REQUIREMENT FOR CONTRACTORS
1.3.3	LINE TAPPING: STEEL PIPE
1.3.4	LINE LOWERING OR MOVING
1.3.5	PIPELINE LOCATING PROCEDURE
1.3.5.1	CONTACT WITH THIRD PARTIES
1.3.5.2	LINE LOCATING
1.3.5.3	CONSTRUCTION INSPECTION

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1.3.5.4 AUTHORITY

1.3.6 EQUIPMENT REPAIR PROCEDURES

1.3.6.1 MECHANICAL EQUIPMENT MAINTENANCE AND REPAIRS: GENERAL

1.3.6.2 ELECTRICAL EQUIPMENT MAINTENANCE AND REPAIRS: GENERAL

1.4 **INSPECTIONS (PATROLLING): GENERAL**

1.4.1 ODORANT LEVEL INSPECTION

1.4.1.1 GENERAL INSTRUCTION FOR THE HEATH ODORATOR ODOR LEVEL TEST INSTRUMENT

1.4.1.2 THRESHHOLD ODOR DETERMINATION

1.4.1.3 MINIMUM ODORANT LEVEL DETERMINATION

1.4.2 INSPECTION OF RIGHT-OF-WAY (PATROLLING TRANSMISSION LINES)

1.4.2.1 INSPECTION OF RIGHT-OF-WAY (PATROLLING DISTRIBUTION LINES)

1.4.3 CLASSIFICATION SURVEYS

1.4.4 LEAK DETECTION SURVEY: TRANSMISSION LINES

1.4.4.1 LEAK DETECTION SURVEY: DISTRIBUTION LINES

1.4.4.2 LEAK DETECTION SURVEY: RECORDS

1.4.4.3 LEAK DETECTION SURVEY FOLLOW-UP REQUIREMENTS

1.4.4 EXTERNAL CORROSION INSPECTION (CATHODIC PROTECTION)

1.4.4.1 CATHODIC PROTECTION AREA

1.4.4.2 TEST LEAD STATIONS

1.4.4.3 ANODE TEST STATIONS

1.4.4.4 LINE CROSSING TEST STATIONS

1.4.4.5 INSULATED FITTING TEST STATIONS

1.4.4.6 SINGLE LINE TEST STATIONS

1.4.4.7 CASED CROSSING TEST STATIONS

1.4.4.8 TEST STATIONS

1.4.5 ATMOSPHERIC CORROSION INSPECTION

1.4.6 INTERNAL CORROSION INSPECTION: TRANSMISSION AND DISTRIBUTION

1.4.7 VALVE INSPECTION

1.4.8 VAULT INSPECTION

1.4.9 PRESSURE CONTROL AND RELIEF EQUIPMENT

1.5 PIPELINE REPAIRS: PREVENTION OF ACCIDENTAL IGNITION

1.5.1 PIPELINE REPAIR PROCEDURES: STEEL PIPE

1.5.1.1 WELDING QUALIFICATION

1.5.1.2 DEFINITIONS

1.5.1.3 LIMITATIONS ON USE OF THE WELDING PROCEDURES

1.5.1.4 EQUIPMENT SPECIFICATIONS

1.5.1.5 DEFECTS AND DENT REPAIR

1.5.1.6 REPAIR OF PARENT METAL DEFECTS

1.5.1.7 DENTS

1.5.1.8 INSPECTION OF WELDS

1.5.1.9 OPERATIONAL SAFEGUARDS

1.5.1.10 STANDARD WELDING PROCEDURES

1.5.1.10.1 "A1"-ARC WELDING PROCEDURE: PIPE DIAMETER LESS THAN 2-3/8" & WALL THICKNESS LESS THAN 3/16"

1.5.1.10.2 "A-2" ARC WELDING PROCEDURE: PIPE DIAMETER BETWEEN 2-3/8" & 12-3/4" WITH 3/16" TO 3/4" WALL THICKNESS

1.5.1.10.3 "A-3" ARC WELDING PROCEDURE FOR FILLET WELDING OF STEEL PIPE & FITTINGS WITH LESS THAN 3/16" WALL THICKNESS

1.5.1.10.4 "A-4" ARC WELDING PROCEDURE FOR FILLET WELDING OF STEEL PIPE & FITTINGS WITH GREATER THAN 3/16" WALL THICKNESS

1.5.1.10.5 "G-1" GAS WELDING PROCEDURE FOR STEEL PIPE & FITTINGS LESS THAN 2-3/8" O.D. AND LESS THAN 3/16" WALL THICKNESS

1.5.1.10.6 "G-2" GAS WELDING PROCEDURE FOR STEEL PIPE & FITTINGS LESS THAN 3/16" WALL THICKNESS

1.5.1.10.7 WELDING INSTALLATION PROCEDURES FOR PADS & SLEEVES

1.5.1.10.8 WELDING INSTALLATION PROCEDURES FOR FLANGES

1.5.1.10.9 WELDING INSTALLATION PROCEDURES FOR VALVES

1.5.1.10.10 WELDING INSTALLATION PROCEDURES FOR SPLIT TEE/STOPPER

1.5.1.10.11 WELDING INSTALLATION PROCEDURES FOR NIPPLES

1.5.2 NON-DESTRUCTIVE TESTING

1.5.3 REPAIR TECHNIQUES

1.5.4 REPAIR MATERIAL

1.5.5 PIPELINE COATING

1.5.6 PURGING GAS OR AIR FROM THE PIPELINE: GENERAL

1.5.6.1 PURGING GAS FROM MAINS WITH AIR

1.5.6.2 PURGING AIR FROM MAINS WITH NATURAL GAS

1.5.6.3 PURGING SERVICE LINES

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1.5.6.4 TESTING AND REINSTATING SERVICE

1.5.7 TRENCHING & EXCAVATION OPERATIONS: GENERAL SAFETY

1.6 **ABANDONMENT OR DEACTIVATION OF PIPELINE FACILITIES: GENERAL**

1.6.1 DEACTIVATION OF CUSTOMER SERVICE LINES

1.6.2 INACTIVE MAINS

1.7 LINE REINSTATEMENT AFTER ABANDONMENT OR DEACTIVATION

1.8 CONTINUING SURVEILLANCE

1.9 **PLASTIC PIPE JOINING PROCEDURES**

1.9.1 QUALIFIED JOINING PROCEDURES

1.9.2 INSPECTOR

1.9.3 REPAIR OF PLASTIC PIPE

1.9.4 QUALIFICATION OF PLASTIC PIPE JOINERS

1.9.5 REQUALIFICATION

1.9.6 JOINER QUALIFICATION DOCUMENTATION

1.9.7 POLYETHYLENE FUSION PROCEDURES

1.9.8 DISSIMILAR FUSION PROCEDURES

1.9.9 PLASTIC PIPE REPAIRS: GENERAL

1.9.10 PERSONNEL QUALIFICATIONS

1.9.11 JOINER QUALIFICATION DOCUMENTATION

1.9.12 REQUALIFICATION

1.10 **CENTRAL PLASTICS ELECTROFUSION PROCEDURE**

1.10.1 ELECTRICAL REQUIREMENTS AND COOLING TIMES

1.10.2 FUSION MESSAGES

1.10.3 FAULT MESSAGES

1.0 NORMAL OPERATING PROCEDURES

1.1 GENERAL

1.1.1 CONSTRUCTION RECORDS AND MAPS

Construction records containing the following information will be kept for the life of the pipeline and will be provided upon request to the Kentucky Public Service Commission (MPSC):

A. Location and identification of the following facilities:

1. Supplier line tap.
2. Supplier maintained facilities as follows:
   (list to be developed)
3. Odorant injection equipment.
4. "Key" valves (transmission and distribution).
5. Frontier maintained facilities as follows:

   a) Filters
   b) Meters
   c) Regulators (including pressure set point of each regulator)

6. Cathodic protection system

Notes: a) The entire Pipeline is cathodically protected.
b) There are no compressors or automatic valves on this Pipeline.

B. All known crossings of:

1. Public roads
2. Railroads
3. Rivers or streams
4. Buried utilities
5. Foreign pipelines

Note: Casings must be noted on the drawings where used.

C. Maximum Allowable Operating Pressure (MAOP) and Maximum Operating pressure (MOP) of the Pipeline.
D. Diameter, grade, type and nominal wall thickness of all pipe.
E. Class Location and all changes in Classification.

1.1.2 OPERATING HISTORY RECORDS

Operations logs, line locate requests, gas volume reports, and gas analysis reports shall be kept for three years and may be disposed of as directed by the (designated Frontier management).

The following records will be kept for the life of the Pipeline:

A. Leak reports
B. Repair records
C. Leak detection surveys
D. Line patrol reports
E. Line break reports
F. Regulatory agency reports
G. Training records
H. Line moving or lowering study records
I. Corrosion inspection reports.
J. Public Education records
K. Frontier and contractor drug and alcohol testing records
L. Service activation and de-activation records
M. Plastic and steel pipe joiner and welder certifications

1.1.3 TRAINING

Training records and qualifications will be maintained for all employees assigned to Pipeline operation, maintenance, and emergency response duties. Records of emergency response training sessions shall be kept and maintained for the life of the pipeline.

The utility shall conduct not less than one documented training meeting each year, in which employees shall receive training in those emergency training procedures within their individual responsibilities. At a minimum, that training shall include:

A. Procedures for updating the plan.
B. A review of each employee's responsibility in an emergency, including the responsibility of all employees to adhere to utility guidelines for statements to the news media and the general public.
C. A review of the location and use of system maps, main records, service records, valve records, regulator schematics, and properties of natural and LP gas.
D. A review of the location, use and periodic inspection of emergency equipment.
E. Regulator station bypass procedures.
F. A step-by-step review of procedures using a hypothetical emergency situation, including procedures for contact with public officials, fire, police and other agencies.
G. Utility and regulatory record keeping requirements.
H. Emergency reports (telephonic and written).
I. Emergency response agencies in the areas served by the Pipeline shall also be invited to attend.

1.1.4 MANUAL REVIEW

This manual will be reviewed by the (designated Frontier management) at intervals not exceeding 15 months but at least once each calendar year. At this time procedures and activities will be reviewed for effectiveness and completeness in maintaining safe operations and maintenance of pipeline facilities. Any regulation changes will also be considered. Appropriate changes will be made after this annual review.

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1.2 **PIPELINE PRESSURE**

1.2.1 MAOP (Maximum Allowable Operating Pressure)

The MAOP of the Pipeline has been determined in accordance with 49CFR 192.619. That MAOP is listed in Section 4 of this manual. Over pressure protection equipment has been provided to prevent exceeding the Pipeline's MAOP.

1.2.2 PRESSURE UPRATING: GENERAL

In accordance with 49CFR, 192 subpart K, this section provides a standard procedure for increasing the Pipeline MAOP without taking the Pipeline out of service.

1.2.2.1 UPRATING PROCEDURES - GENERAL REQUIREMENTS

A. Pressure increases must be made gradually and at a controlled rate. The pressure must be held constant at the end of each increase while the portion of pipeline and/or system being uprated is checked for leaks. Pressure increases must be documented with a recording instrument.

B. Hazardous or potentially Hazardous Leaks found during the uprating procedures must be repaired before proceeding with the project. Other leaks detected need not be repaired immediately, providing they are monitored during the project and do not become potentially dangerous.

C. A Written Plan for the uprating procedure must be developed and must specify the steps to be followed before and during the uprating operation to ensure the system can operate safely at the new MAOP.

D. Records must be retained for the life of the system and must include the design specifications (if available), and the operating and maintenance history of the affected portion of the pipeline and/or system. In addition, the records shall contain the type of work performed, investigations and tests performed, leaks found and repaired replacements or alterations made, the date and name of the person responsible for the uprating project, and the total pressure increase.

1.2.2.2 PROJECT SCOPE

A. General: When the need for a pressure increase is identified a study should be undertaken, to look at alternatives, determine the adequate pressure increase, and if the pipeline supplier will provide the increased pressure request if applicable.

B. Documentation: The uprating project should include as a minimum the following:

1. System Sketch - System map outlining the area involved in the proposed uprating project.
2. System Design - Operating & Maintenance History - A review of the design, operating and maintenance history and previous testing of the segment under consideration, and a determination as to whether the proposed increase is safe, and meets all code requirements.
3. Uprating Plan - This written plan is to outline each step in the total project and how each item will be accomplished.
4. Pressure Limiting & Regulating Station Inspection Report -A copy of the most recent DRS annual inspection report for all installations affected by the proposed uprating.
5. Customer Facility Information - In the affected area a listing of each residential (domestic), commercial, and industrial customer together with their associated metering equipment.
6. System Modification Design Drawings - Drawings and/or sketches of System modifications needed to facilitate the uprating project.

1.2.2.3 PRE-UPRATING CONSTRUCTION

All construction and/or modifications required to facilitate the uprating project must be completed before the actual pressure increase is started.

1.2.2.4 UPRATING PROCEDURE

Preliminary - After all data has been compiled and all required construction and/or modifications have been made, the actual uprating activity may begin.

NOTE: The actual uprating must be made during a time when the use of flame ionization leak detection equipment is practical; i.e., no precipitation, no high winds, frozen soil, etc.

Install a pressure recording instrument at the point on the pipeline and/or system that is being supplied and at the extreme end of the system and/or pipeline.

PROCEDURE

A. The pressure must be increased by increments of 10 psig or 25% of the total pressure uprating whichever produces the fewest number of increments.

Note: If the total pressure increase is 10 psig or less, two (2) equal incremental increases shall be made. The pressure must be increased gradually at a controlled rate, and in accordance with the following:

B. At the end of each increment of pressure, increase the recording chart at the extreme end of the pipeline and/or system must indicate the full increment increase. The pressure at the supply source must by held constant at that point until the entier pipeline segment or system being uprated is surveyed with a flame ionization leak detector.

C. Each leak found must be rated as to severity. Hazardous and/or petentially hazardous leaks must be repaired before proceeding with the uprating process. All leaks determined no to be hazardous and not repaired, must be monitored throughout the remaining uprating procedure.

D. As the uprating activity proceeds, record at each step the beginning and ending pressure, the number of leaks found, the number of leaks repaired, and a written explanation of any leak not repaired.

E. The report must be signed by the person responsible for implementing the uprating project.

F. Permanent records of the uprating process will consist of the six (6) items listed in Section 1.2.2.2, plus the recording pressure charts. These records shall be retained for the life of the pipeline and/or system uprated.

1.3 MAINTENANCE & REPAIRS

1.3.1 GENERAL

Routine repairs to the Pipeline shall be performed under qualified supervision by trained personnel aware of and familiar with the hazards to public safety. No leak repair work will proceed before the (designated Frontier management) has reviewed and provided written approval of the procedures to be followed for that repair.

All material procured for installation or maintenance of the utility's gas facilities shall meet or exceed the specifications set out in the material standards references. To the extent possible, manufacturer's data specific to the vintage and/or type shall be maintained for use in planning leakage surveys, replacement and repairs.

Steel or plastic pipe shall be manufactured and marked in accordance with a listed specification found in 49CFR Part 192, Appendix B. Thermoplastic pipe shall be identified by D2513, and the steel pipe by API 5L, A53, or A106.

Other Pipeline components shall be marked according to written specifications as required by applicable standards listed in 49CFR, Part 192, Appendix A ("Material Approved for Incorporation by Reference").

1.3.2 DRUG AND ALCOHOL TESTING REQUIREMENT FOR CONTRACTORS

In accordance with 49CFR 199, persons performing 49CFR 192 regulated operating, maintenance, or emergency response functions on the Pipeline must be covered by an acceptable drug and alcohol testing program. The (designated Frontier management) must review and approve a contractor's drug and alcohol testing program before that contractor will be allowed to perform a regulated operating, maintenance, or emergency response function on the Pipeline.

1.3.3 LINE TAPPING: STEEL PIPE

In accordance with 49CFR 192.627, any Pipeline tap to be made under pressure shall be performed by a crew qualified to perform that procedure. This section provides the utility's general standards for tapping pressurized steel distribution mains. It will prescribe application and method to be used to accomplish these activities. The method described in this section is the "stoppling" or "no-blow" technique for steel pipelines. This Section will not detail the actual mechanics associated with each type of tapping equipment or device. Consult the manufacturer's "Operations and Maintenance Instructions" for the specific information.

Detailed procedures must be prepared and approved by (designated Frontier management) before proceeding with a tap of a steel line under pressure or a line that has previously contained natural gas.

An authorized utility inspector is to be present during a hot tap operation. The inspector shall be familiar with the procedures and mechanics for accomplishing the work, and must be capable of handling emergency situations that may arise out of the operation.

The inspector will be responsible for a pre-tap job inspection consisting of the following items:

A. To determine the following on the pipe to be tapped:

1. Operating pressure in the line to be tapped.
2. The proper line to tap.
3. The wall thickness of the line to be tapped.
4. The strength of the tapping fitting (i.e., is the fitting appropriate for the MAOP of the line being tapped?).

B. To assure that the weld branch has been pressure tested before the tap occurs.

C. To assure that proper welding procedures are used.

D. To examine the tapping equipment before use to ensure that it is in satisfactory operating condition and that it is designed for the purpose and pressure that it will be used for.

E. To determine that appropriate safety equipment is in place at the job site and that procedures as listed in "PIPELINE REPAIRS: PREVENTION OF ACCIDENTAL IGNITION" have been followed.

F. To determine that unnecessary personnel are not present at the job site.

G. To determine that all personnel involved in the line tap operation understand the previously prepared and approved line tap procedures.

1.3.4 LINE LOWERING OR MOVING

Line lowering or moving is not anticipated at this time. A study shall be performed and detailed procedures for line lowering or moving shall be prepared and approved by the (designated Frontier management) before that work may proceed.

1.3.5 PIPELINE LOCATING PROCEDURE

This procedure provides guidelines for locating the Pipeline as well as instructions for exposing the Pipeline and criteria for third-party crossings and other related construction.

1.3.5.1 CONTACT WITH THIRD PARTIES

Frontier may be informed of proposed work near the pipeline either by the ("One Call System") or by direct contact with a contractor or other party proposing to perform construction work near the Pipeline.

If the (designated Frontier management) determines that the work requires a line locate then the "Line Locate Request" form shall be completed and signed by the Pipeline Operator and the contractor or private party proposing the work near the pipeline.

1.3.5.2 LINE LOCATING

If an electronic line locating device is used, only surface location shall be given. No depth information shall be recorded with the surface information and no depth information shall be communicated to the contractor or private party proposing the work near the pipeline.

The surface location of the Pipeline shall be marked with dashed lines using yellow (preferred) or white paint and the words "Frontier Gas" or "Frontier Gas Pipeline" and the size and type of line (e.g. "4 in. plastic" or "8 in. steel"). Excavation should not be performed within three feet of the marked surface location of the Pipeline. Yellow flags with the same wording may be used to mark the line location if weather or construction conditions do no permit using paint to mark the line location.

If excavation must come within three feet of the pipeline or if a depth measurement is required, the line must be exposed by digging. If a back hoe or other heavy equipment is used, the following steps should be followed:

A. Verify that there are no other utilities or substructure in the area.
B. Locate the line with an electronic line-finder.
C. Probe the line with a probe bar and mark the alignment precisely. If the line is too deep for the probe bar, first ensure that there are no obstructions in the way, then excavate down in depths at least a foot less than that to which the probe has reached and probe from the bottom of the excavation.
D. when complete, hand-dig a test hole until the pipeline is located with the shovel and is visible.
E. The back hoe can then dig around the line as necessary, but only as long as the line is in view.

Whenever the Pipeline is exposed, an "External Corrosion Inspection Form" must be completed and appropriate remedial action must be taken if necessary (see EXTERNAL CORROSION INSPECTION in section 1 of this manual).

1.3.5.3 CONSTRUCTION INSPECTION

Full time inspection by the Pipeline Operator or another party as designated by the (designated Frontier management) is required during bell holing, foreign line crossings, whenever excavation will come within three feet of the Pipeline, or at any other time as determined by the (designated Frontier management).

If full time inspection is not required, follow-up inspections shall be performed by the Pipeline Operator or other designated parties in order to determine that field changes have not occurred since the original contact with the contractor or private party proposing to perform work near the Pipeline.

Whenever blasting has been performed in the vicinity of the Pipeline, a leak detection survey shall be performed in the area of the construction activity after the blasting work has been completed.

1.3.5.4 AUTHORITY

49CFR 192 states that a pipeline may not be operated if a hazardous condition exits. Additionally, Frontier has a responsibility for public safety. If a construction operation arises that may endanger the pipeline, such as an uncooperative contractor or private party, the Pipeline Operator or other Frontier representative shall:

A. Inform the contractor or private party of the unsafe condition and of Frontier's responsibility to safeguard the public and the environment.

B. Explain Frontier's policy regarding construction near the pipeline.

C. If the construction work continues to endanger the pipeline, the (designated Frontier management) shall be notified immediately. If necessary, local law enforcement and the local fire department should also be notified.

1.3.6 EQUIPMENT REPAIR PROCEDURES

Manufacturer catalogs and data books are maintained at (to be determined locations) and shall be consulted when making repairs to or when adjusting equipment. Additionally, there are some general rules that should be followed:

1.3.6.1 MECHANICAL EQUIPMENT MAINTENANCE AND REPAIRS: GENERAL

A. Non-routine repair on an odorant injection system shall not be performed without notifying the (designated Frontier management).
B. Odorant bulk tank and/or day tank fill and transfer procedures are posted at the odorant injection stations and should be reviewed before performing those procedures.
C. (designated Frontier management) should be notified before any work is performed that will result in a Pipeline alarm or service disruption.
D. Proper safety equipment must be used at all times.
E. Verify that pressure has been removed from lines and equipment before performing repair work. If necessary, blind flanges shall be installed to adequately isolate a section of line or piece of equipment.
F. Always use new o-rings and gaskets when re-assembling equipment or flanges.
G. (designated Frontier management) shall be notified when the repair work has been completed.

1.3.6.2 ELECTRICAL EQUIPMENT MAINTENANCE AND REPAIRS: GENERAL

A. (designated Frontier management) shall be notified before performing any repair work that will result in a Pipeline alarm.
B. Before working in an enclosed area, a CGI must be used to verify that an explosive gas mixture is not present.
C. A voltmeter shall be used to verify that a circuit has been de-energized before repair work begins.
D. Broken or damaged wiring must be replaced before a circuit is placed back into service.
E. All covers should be replaced before re-energizing a circuit.

1.4 INSPECTIONS (PATROLLING): GENERAL

All utility employees are to be aware of and report to (designated Frontier management) all unusual or abnormal conditions noted during routine activities so that appropriate action may be taken to protect the utility's facilities. Unusual or abnormal conditions may take the form of but are not limited to out-of-season changes in vegetation along the Pipeline R.O.W., "skunk" odors, new construction activity, demolition, other utility excavation, road work, fire or fire damage near the utility's facilities, or ground movement near the utility's facilities.

1.4.1 ODORANT LEVEL INSPECTION

In accordance with 49CFR 192.625 and Frontier policy, an odor level test will be taken at random locations throughout the system at intervals not less than one per month. A sniff test for odorant shall be conducted and recorded on appropriate documents as routine work is carried out in the gas system, (e.g. customer service calls, meter installation, and/or routine meter change out, etc.).

1.4.1.1 GENERAL INSTRUCTION FOR THE HEATH ODORATOR ODOR LEVEL TEST INSTRUMENT

A. The gas supply should be connected to the instrument inlet fitting and pressure should be below 5 psig. Connection should be made with aluminum or plastic tubing only; do not use copper or rubber, as these tend to remove odorant compounds.
B. Run tests in an odor - and draft - free area.
C. Care must be taken to hold the nose within one inch of the funnel to avoid dilution with the surrounding air.
D. Odor level rating must be based on the first sniff or two because the olfactory senses fatigue rapidly with continued exposure to an odor.
E. Between sniffs the observer should breathe deeply but slowly moving the nose away from the instrument and breathe fresh air, then continue the test. This precaution is necessary because the sense of smell fatigues rapidly during this type of test.

1.4.1.2 THRESHHOLD ODOR DETERMINATION

A. Have the observers sniff the unodorized air stream.

B. Adjust the gas flow rate until the Odorator reads 1% gas in air and let the observers sniff at the Odorator gas outlet to see if they can smell any foreign odor. If the observer can smell an odor, have the observer characterize the odor scent and level and complete the odorant inspection form. If the observer can not smell an odor, proceed to step C.

C. Adjust the gas concentration upward and have the observer sniff again at the Odorator gas outlet.

D. Repeat this procedure until the threshold value is obtained for each observer.

1.4.1.3 MINIMUM ODORANT LEVEL DETERMINATION

A. Have the observers sniff the unodorized air stream.

B. Have the observer sniff the odorized gas stream close to the Odorator gas outlet and characterize the presence or lack of odor.

C. Have the observer take a deep breath of the unodorized air stream away from the Odorator and repeat steps A and B.

D. When the observer detects an odor, determine the % gas in air and complete the odorant inspection form.

1.4.2 INSPECTION OF RIGHT-OF-WAY (PATROLLING TRANSMISSION LINES)

In accordance with 49CFR 192.705, the Pipeline transmission right-of-way shall be patrolled at the following time intervals:

A. Class 1 and 2 locations:

1. The entire Pipeline shall be patrolled at intervals not to exceed 15 months but at least once each calendar year.

2.. Bridge crossings, railroad crossings, and street crossings shall be patrolled at intervals not to exceed 7-1/2 months but at least twice each calendar year.

B. Class 3 locations:

1. The entire Pipeline shall be patrolled at intervals not to exceed 7-1/2months but at least twice each calendar year.

2.. Bridge crossings, railroad crossings, and street crossings shall be patrolled at intervals not to exceed 4-1/2 months but at least four times each calendar year.

Patrolling activity may be performed by walking or by vehicle. Patrolling activities should be performed while meter reading and during all other routine operations and maintenance activities. Patrolling activity for regulatory purposes may be conducted at the same time as regulatory leak detection surveys are conducted.

Patrols specifically performed for regulatory purposes as listed above shall be recorded on the "Pipeline Patrol Report" and maintained for the life of the Pipeline.

1.4.2.1 INSPECTION OF RIGHT-OF-WAY (PATROLLING DISTRIBUTION LINES)

In accordance with 49CFR 192.721, the frequency of patrolling distribution system lines will be determined by the severity of conditions which could cause failure or leakage and the consequent hazards to public safety.

Additionally, mains in place or on structures where anticipated physical movement or external loading could cause failure or leakage must be patrolled at intervals not exceeding 4-1/2 months but at least four times per year.

Patrols specifically performed for regulatory purposes as listed above shall be recorded on the "Pipeline Patrol Report" and maintained for the life of the Pipeline.

1.4.3 CLASSIFICATION SURVEYS

In accordance with 49CFR 192.607, 192.609, 192.611, and 192.613, the classification of the Pipeline shall be reviewed for changes resulting from increases in population or construction near the Pipeline.

The Pipeline Operator will notify the (designated Frontier management) if routine pipeline patrolling reveals that a class change is required. Additionally, the (designated Frontier management) will annually review the need for a class change at any part of the Pipeline during the time the Pipeline leak detection survey is performed.

When a change in class location occurs, a study will be made to determine what operations changes, if any, must be made. Any operations changes required by the class change must be made within eighteen (18) months after the change in class location.

1.4.4 LEAK DETECTION SURVEY: TRANSMISSION LINES

In accordance with 49CFR 192.706, a leak detection survey of the Pipeline transmission lines shall be performed at intervals not to exceed 15 months but at least once each calendar year.

Note: The regulations do not require that a gas detection device be used to perform a leak detection survey of transmission lines. The survey can be performed during patrol activities by noting unusual odors, changes in vegetation, and/or unusual noises.

1.4.4.1 LEAK DETECTION SURVEY: DISTRIBUTION LINES

In accordance with 49CFR 192.723, a leak detection survey of the Pipeline transmission lines shall be performed periodically as determined by operations and local conditions. Additionally, the following requirements must be met:

A. Business District Survey

At least once per calendar year but at intervals not exceeding 15 months, mains in business districts must be surveyed with appropriate gas detection equipment. The inspection must include manholes, cracks in streets and sidewalks, ground surface over mains and services, building foundations, above-ground piping including town border and district regulator stations, and any other points for the possible detection of escaping gas.

B. Residential and Other Areas Survey

At intervals not exceeding 5 years (but as frequently as necessary as determined by operations and local conditions), mains and services outside the principle business areas must be surveyed with appropriate gas detection equipment.

C. Special Surveys

Special surveys shall be conducted when other contractors, city crews or other utility companies have completed any project involving earth-moving equipment in the vicinity of buried distribution gas lines. A survey shall also be made following exposure of the pipeline to unusual stresses, such as blasting. The surveyor shall use the most practical leak detection equipment available to cover the project area for possible gas leaks.

1.4.4.2 LEAK DETECTION SURVEY: RECORDS

At a minimum, the leak detection survey records shall contain the following information:

A. A description of the area surveyed.
B. The results of the survey.
C. The name(s) of the surveyor(s).
D. The date(s) of the survey.
E. A description of the gas detection device used for the survey and a statement detailing the date and method of the last instrument calibration.

If a Pipeline leak is detected during the survey, that leak must be graded in accordance with the ASME leak grading table on the following pages.

In order to evaluate the effectiveness of the leak detection survey program, the (designated Frontier management) shall perform the following annual review:

A. Survey schedule - assure that it is adequate to meet 49CFR regulatory requirements.
B. Survey effectiveness - evaluate survey results to assure that a consistent evaluation of leaks is being made.
C. Records - verify adequacy.

ASME GUIDE MATERIAL FOR LEAK CLASSIFICATIONS AND ACTION CRITERIA
LEAK GRADE DEFINITION, PRIORITY OF LEAK REPAIR, EXAMPLES:

GRADE 1 - DEFINITION

A leak that represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until the conditions are no longer hazardous.

PRIORITY OF LEAK REPAIR

Requires prompt action* to protect life and property and continuous action until the conditions are no longer hazardous.

*The prompt action in some instances may require one or more of the following:

A. Implementation of company emergency plan (192.615).
B. Evacuating premises.
C. Blocking off an area.
D. Rerouting traffic.
E. Eliminating sources of ignition.
F. Venting the area, or
G. Stopping the flow of gas by closing valves or other means.
H. Notifying police and fire departments.

EXAMPLES

Leaks requiring prompt action:

A. Any leak which, in the judgment of operating personnel at the scene, is regarded as an immediate hazard.
B. Escaping gas that has ignited unintentionally.
C. Any indication of gas which has migrated into or under a building or tunnel.
D. Any reading at the outside wall of a building or where the gas would likely migrate to the outside wall of a building.
E. Any reading of 80% LEL or greater in a confined space.
F. Any reading of 80% LEL or greater in small substructures not associated with gas facilities where the gas would likely migrate to the outside wall of a building.
G. Any leak that can be seen, heard, or felt and which is in a location that may endanger the general public or property.

ASME GUIDE MATERIAL FOR LEAK CLASSIFICATIONS AND ACTION CRITERIA
LEAK GRADE DEFINITION, PRIORITY OF LEAK REPAIR, EXAMPLES:

GRADE 2 - DEFINITION

A leak that is recognized as being non hazardous at the time of detection but justifies scheduled repair based on probable future hazard.

PRIORITY OF LEAK REPAIR

Leaks should be repaired or cleared in one year but shall not exceed fifteen months from the date reported. If a Grade 2 leak occurs in a segment of pipeline which is under consideration for replacement, an additional 6 months may be added to the 15 months maximum time for repair noted above. In determining the repair priority, criteria such as the following should be considered:

A. Amount and migration of gas
B. Proximity of gas to buildings and subsurface structures.
C. Extent of pavement, and
D. Soil type and conditions, such as frost cap, moisture and natural venting.

Grade 2 leaks shall be reevaluated at least once every six months until cleared. The frequency of reevaluation should be determined by the location and magnitude of the leakage condition. It should be recognized that Grade 2 leaks will vary greatly in degree of potential hazard. There will be some Grade 2 leaks, which when evaluated by the above criteria will justify scheduled repair within the next 5 working days. Others will justify repair within 30 days. These situations shall be brought to the attention of the individual responsible for scheduling leakage repair at the end of the working day.

On the other hand, there will be many Grade 2 leaks, which because of their location and magnitude can be scheduled for repair on a normal routine basis with periodic re inspection as necessary.

ASME GUIDE MATERIAL FOR LEAK CLASSIFICATIONS AND ACTION CRITERIA
LEAK GRADE DEFINITION, PRIORITY OF LEAK REPAIR, EXAMPLES:

GRADE 2 - CONTINUED

EXAMPLES

A. Leaks requiring action ahead of ground freezing or other adverse changes in venting conditions:

1. Any leak, which under frozen or other adverse soil conditions, would likely migrate to the outside of a building.

B. Leaks requiring action within six months:

1. Any reading of 40% LEL or greater under a sidewalk in a wall-to-wall paved area that does not qualify as a Grade 1 leak and where gas is likely to migrate to the outside wall of a building.
2. Any reading of 100% LEL or greater under a street in a wall-to-wall paved area that does not qualify as a Grade 1 leak and where the gas is likely to migrate to the outside wall of a building.
3. Any reading less than 80% LEL in small substructures not associated with gas facilities where gas would likely migrate creating a probable future hazard.
4. Any reading between 20% LEL and 80% LEL in a confined space.
5. Any reading on a pipeline operating at 30% SMYS or greater in Class 3 or 4 locations that does not qualify as a Grade 1 leak.
6. Any leak which in the judgment of operating personnel at the scene is of sufficient magnitude to justify scheduled repair.

ASME GUIDE MATERIAL FOR LEAK CLASSIFICATIONS AND ACTION CRITERIA
LEAK GRADE DEFINITION, PRIORITY OF LEAK REPAIR, EXAMPLES:

GRADE 3 - DEFINITION

A leak that is non hazardous at the time of detection and can reasonably be expected to remain non hazardous.

PRIORITY OF LEAK REPAIR

Grade 3 leaks should be reevaluated during the next scheduled survey, or within 15 months of the reporting date, whichever occurs first, until the leak is regraded or no longer results in a reading.

EXAMPLES

Leaks requiring reevaluation at periodic intervals:

A. Any reading of less than 80% LEL in small gas associated substructures such as small meter boxes or gas valve boxes.

B. Any reading under a street in areas without wall-to-wall paving where it is unlikely the gas could migrate to the outside wall of a building.

C. Any reading of less than 20% LEL in a confined space.

1.4.4.3 LEAK DETECTION SURVEY FOLLOW-UP REQUIREMENTS

For leaks detected during the leak detection survey, the following inspections are required:

A. Grade 1 Leaks: This grade leak will require immediate action consistent with the Emergency Procedures and Pipeline Repair sections of this manual. Follow-up inspections after repair shall be determined by the (designated Frontier management).

B. Grade 2 Leaks: This grade leak must be inspected at least every six months until repaired or otherwise cleared. The leak must be cleared or repaired within 12 months from the time the leak is detected unless the section of the line containing the leak is scheduled for replacement, in which case an additional 6 months may be allowed.

C. Grade 3 Leaks: This grade leak must be inspected during the next scheduled leak detection survey or within 15 months of the leak report, whichever occurs first, until the leak is regraded or no longer results in a reading.

1.4.4 EXTERNAL CORROSION INSPECTION (CATHODIC PROTECTION)

In accordance with 49CFR 192, subpart I, steel pipe throughout the entire Pipeline shall be cathodically protected within one year after construction. The design and installation parameters for the Pipeline cathodic protection system are kept with the permanent pipeline records.

The standard criteria for cathodic protection shall be a minimum negative reading of 0.85 volts from the Pipeline to ground using a copper/copper sulfate half cell. Additional criteria for cathodic protection from 49CFR 192, appendix D may also be used. Deviations from these criteria must be approved by the (designated Frontier management).

Any time a real or potential cathodic protection defect is detected on the Pipeline, remedial action must be taken within 90 days to correct that defect.

In order to determine the adequacy of the Pipeline cathodic protection system, the following inspections shall be performed:

A. In accordance with 49CFR 192.465 a test of the cathodic protection of the entire Pipeline shall be performed at intervals not exceeding 15 months but at least once each calendar year. The test shall include inspection of all flange insulation kits and an evaluation of the protection of all service lines.

B. In accordance with 49CFR 192.465, each cathodic protection rectifier (or other impressed current power source), reverse current switch, diode, or interference bond must be electrically checked for proper performance at least six times per year at intervals not exceeding 2-1/2 months. The pipeline operator will immediately report to the (designated Frontier management) if any of the listed devices are found to not be operating properly.

C. Pipeline casings will also be inspected during the inspections noted above in parts A and B of this section. Cathodic protection test stations are installed at all points where the Pipeline is installed in casing. The pipe was originally isolated from casing with non-conductive centralizers throughout the casing and non-conductive seals on each end of the casing.

If test station measurements indicate that a "short" exists between the pipeline and casing, then within 90 days the "short" must be cleared or if it is not possible to eliminate the short then the casing will be filled with an appropriate di-electric material.

D. In accordance with 49CFR 192.459, whenever buried pipe is exposed for any reason, it shall be examined for evidence of external corrosion. The results of that inspection shall be recorded on the "External Corrosion Inspection Form". If the examination reveals that there is active corrosion, that the surface of the pipe is generally pitted, or that corrosion has caused a leak, further investigation to determine the extent of the corrosion shall be performed. If necessary, remedial action consistent with 49CFR 192.485 or 192.487 shall be taken (see also INTERNAL CORROSION INSPECTION in this section of the manual for further details).

E. All short segments of insulated and cathodically protected steel pipe less than 100 feet long must be potentially surveyed annually on a 10% sampling basis. This means each calendar year a minimum of 10% of these segments distributed over an entire system must be checked. A different 10% shall be surveyed each subsequent year so that all segments are checked in each 10-year period. This includes all separately protected service lines and mains, and pipeline sections less than 100 feet in length.

1.4.4.1 CATHODIC PROTECTION AREA

The number of test points to be established in any Cathodic Protection (CP) Area will vary depending upon the number of independently protected sections there might be within the one CP-Area. If the entire CP-Area is being protected as one section, not less than two nor more than four regular test points are recommended.

Test points which have been established previously may be canceled completely or in favor of a new one whenever:

A. Two previously separately protected sections are joined within a CP-Area and it is determined that only one test point is needed;

B. If an established test point is found to have become ineffective or inaccurate due to some physical changed in the gas system.

1.4.4.2 TEST LEAD STATIONS

Test lead stations are an integral part of a corrosion control program. Their chief function is to allow above ground test points for the purpose of various cathodic protection testing such as pipe-to-soil (P/S) potentials, anode current drain, insulator effectiveness, bonding, etc.

All test lead stations are to be made up according to the following general sketches and installed as indicated on the construction drawings.

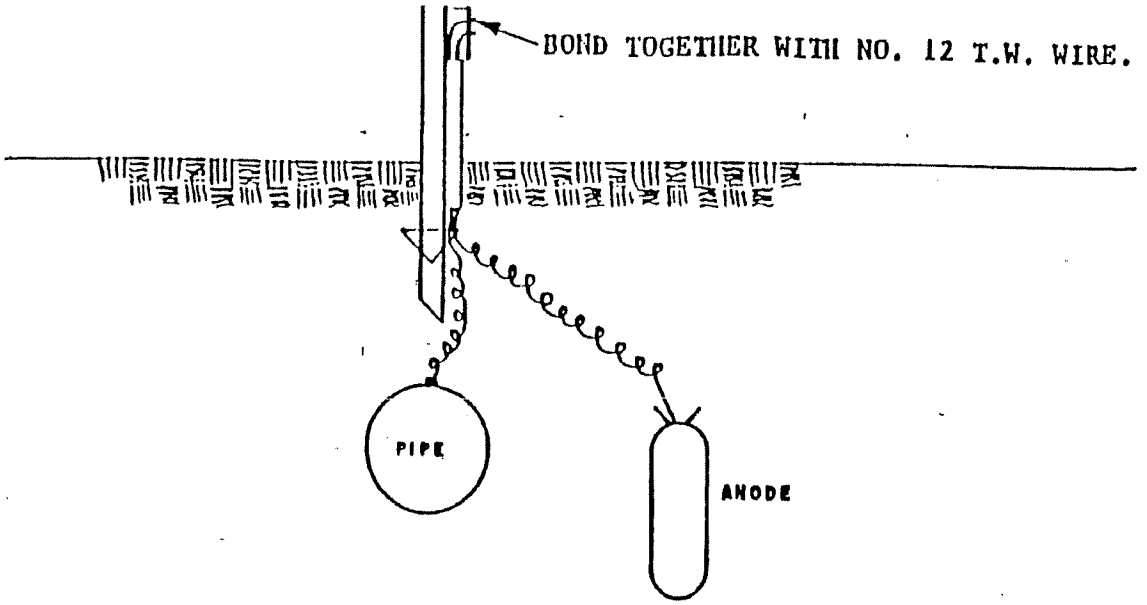
This Pipeline will have five (5) basic types of test stations:

A. Anode Test Stations
B. Line Crossing Test Stations
C. Insulated Fitting Test Stations
D. Single Pipeline Test Stations
E. Cased Crossing Test Stations

1.4.4.3 ANODE TEST STATIONS

Purpose - The anode test station is used to check milliamp current drain to help determine the life of the anodes installed on a particular system. Test lead wires are separated for current drain test and bonded back together for normal operation.

This test station can also be used to obtain a pipe-to-soil P/S potential.

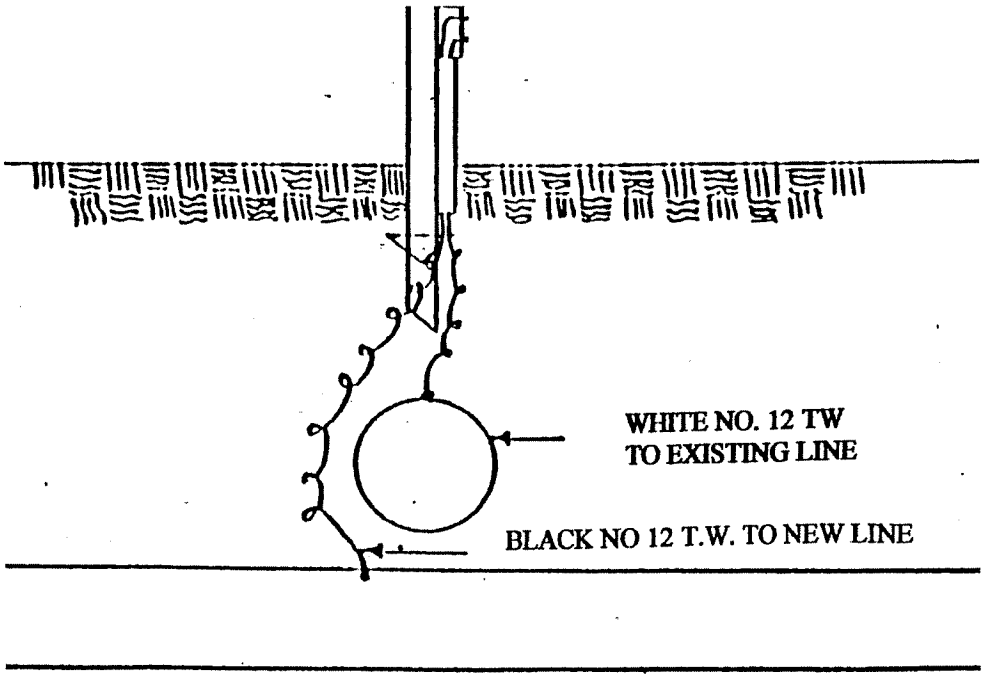


Typical Anode Test Station

1.4.4.4 LINE CROSSING TEST STATIONS

Purpose - The pipeline crossing test station is used to run possible interference (stray current) tests. If interference is found, a resistance bond wire can be installed to alleviate the problem.

The pipeline crossing test station is installed at locations where two company representatives are mutually clearing any interference problems on their respective pipelines.

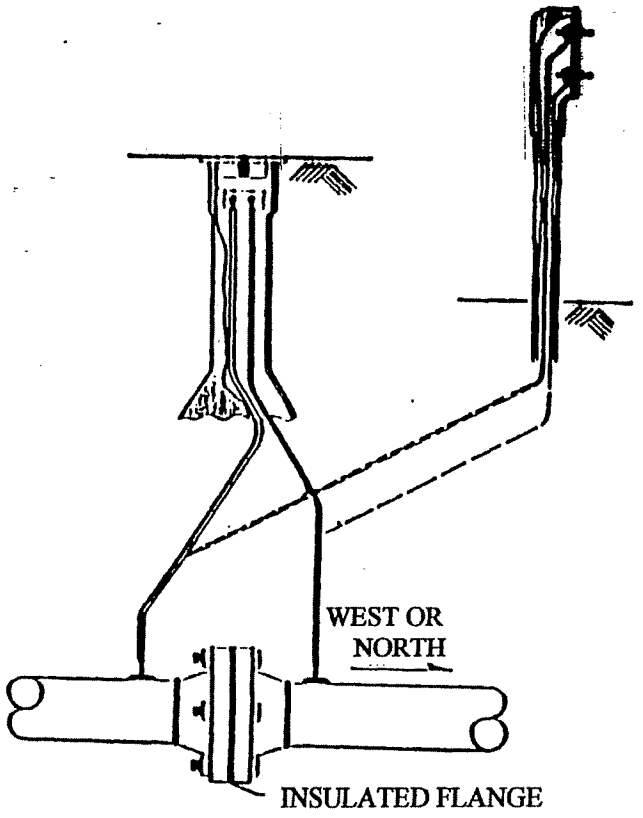


1.4.4.5 INSULATED FITTING TEST STATIONS

Purpose: The insulated fitting test station is installed to allow a periodic check of the effectiveness of an underground insulator.

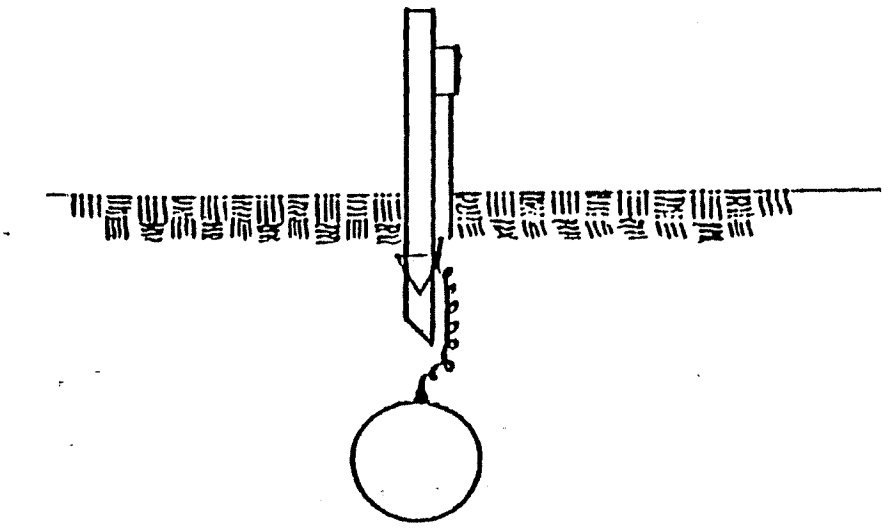
Underground Main Insulators - If a pipeline is north-south in direction, place black No. 12 T.W. wire on south side of fitting and white wire on north side.

If a pipeline is east-west in direction, place green No. 12 T.W. wire on east side of fitting and red wire on west side.



1.4.4.6 SINGLE LINE TEST STATIONS

Single line test stations are installed along a main where there are no above ground facilities (such as a riser) to obtain a pipe-to-soil potential of the pipeline.

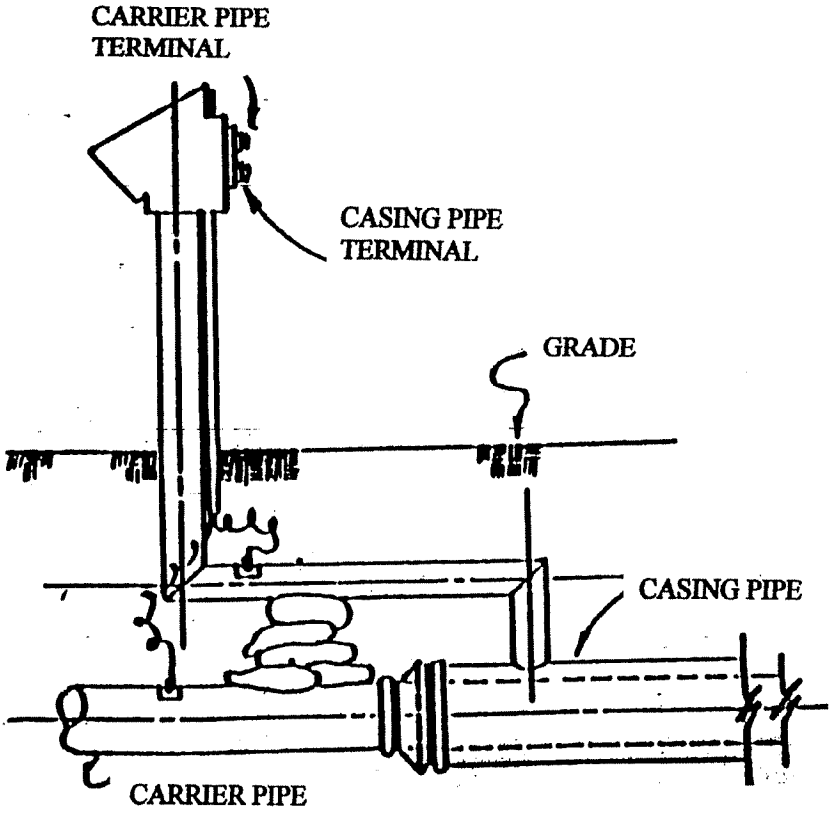


They are used specifically on main branch lines where the pipeline runs farther than a mile without any above ground facilities or on cross country lines for the purpose of running pipe-to soil surveys.

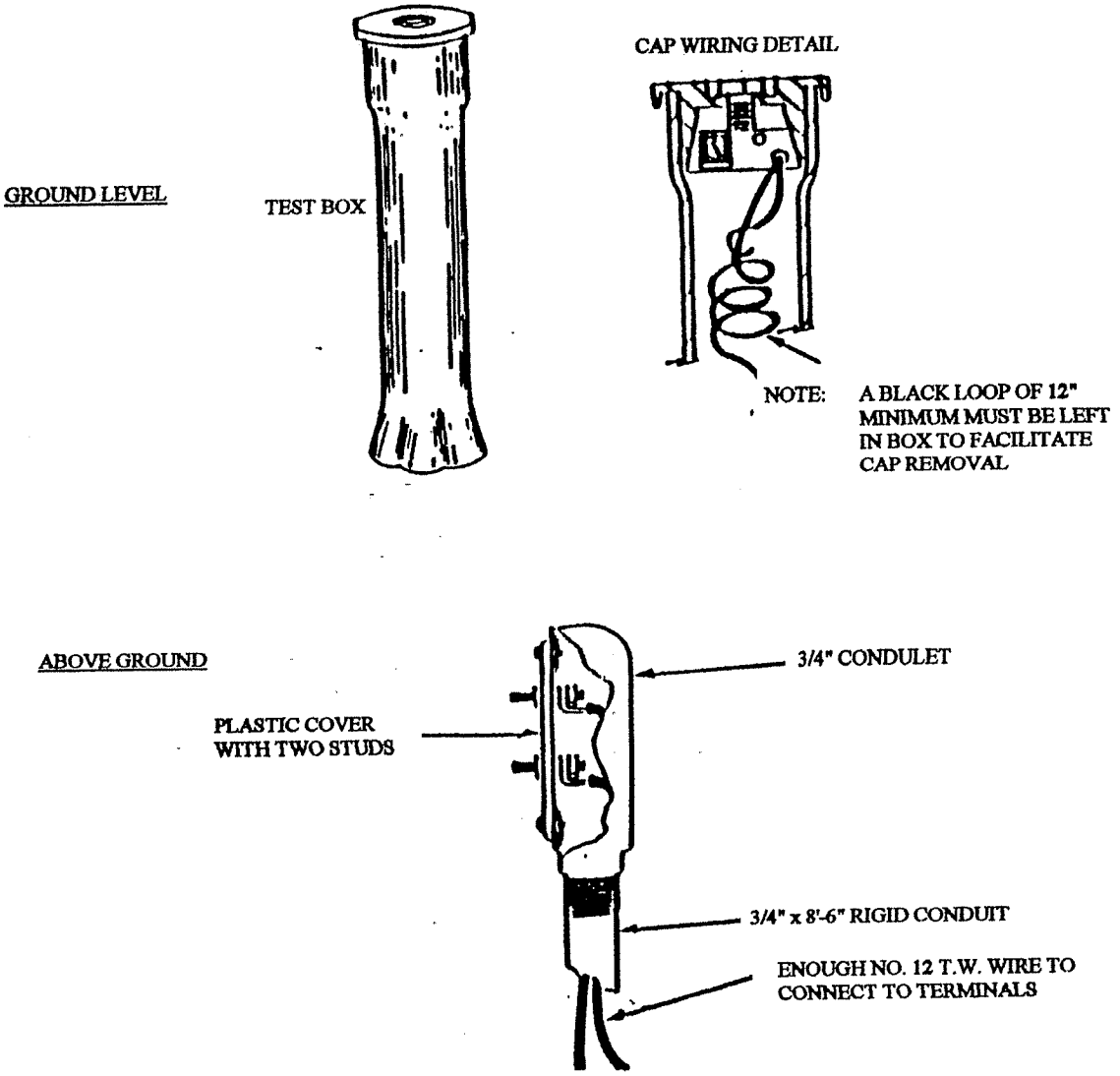
1.4.4.7 CASED CROSSING TEST STATIONS

Cased crossing test stations are installed wherever a casing is required (e.g., at railroad crossings, highway crossings, etc.).

Test Lead Color Code - Place the white No. 12 T.W. wire on the casing vent pipe, the black No. 12 T.W. wire on the carrier pipe. Refer to Figure No. 5 for typical cased crossing test station.



1.4.4.8 TEST STATIONS



1.4.5 ATMOSPHERIC CORROSION INSPECTION

In accordance with 49CFR 192.479, the aboveground sections of the Pipeline were coated with paint during construction in order to prevent atmospheric corrosion. In accordance with 49CFR 192.481, the aboveground sections of the Pipeline shall be inspected at intervals not to exceed 3 years and remedial action shall be taken if necessary to maintain protection against atmospheric corrosion. Results of the inspection shall be recorded on the "Atmospheric Corrosion Inspection Form".

1.4.6 INTERNAL CORROSION INSPECTION: TRANSMISSION AND DISTRIBUTION

As detailed in section 4 of this manual, routine inspection of the Pipeline for internal corrosion is not required.

In accordance with 49CFR 192.475(b), whenever any pipe is removed from the Pipeline for any reason, the internal surface must be inspected for evidence of corrosion. Results of that inspection shall be recorded on the "Internal Corrosion Inspection Form". If internal corrosion is found -

A. The adjacent pipe must be investigated to determine the extent of internal corrosion:

B. For steel transmission lines, replacement must be made in accordance with 49CFR 192.485 as follows:

1. General Corrosion: Each segment of transmission line with general corrosion and with a remaining wall thickness less than that required for the maximum allowable operating pressure of the pipeline must be replaced or the operating pressure reduced commensurate with the strength of the pipe based on actual remaining wall thickness. However, if the area of general corrosion is small, the corroded pipe may be repaired. Corrosion pitting so closely grouped as to affect the overall strength of the pipe is considered general corrosion.
2. Localized Corrosion Pitting: Each segment of transmission line pipe with localized corrosion pitting to a degree where leakage might result must be replaced or repaired, or the operating pressure must be reduced commensurate with the strength of the pipe, based on the actual remaining wall thickness in the pits.

C. For steel distribution lines, replacement must be made in accordance with 49CFR 192.487 as follows:

1. General Corrosion: Each segment of generally corroded pipe with a remaining wall thickness less than 30 percent of the nominal wall thickness must by replaced. However, if the area of general corrosion is small, the corroded pipe may be repaired. Corrosion pitting so closely grouped as to affect the overall strength of the pipe is considered general corrosion.
2. Localized Corrosion Pitting: Each segment of pipe with localized corrosion pitting to a degree where leakage might result must by replaced or repaired.

1.4.7 VALVE INSPECTION

In accordance with 49CFR 192.745 and 192.747, each Pipeline valve necessary for the safe operation of the Pipeline or which might be used in an emergency must be checked, serviced, and partially operated at intervals not to exceed 15 months but at least once each calendar year. The following inspection procedures will be used:

A. Remove any locking devices presently installed on the valve to be inspected.
B. Clear any debris or vegetation from around below grade valve boxes.
C. Inspect the valve for any surface corrosion requiring painting. Note the corrosion on the "Valve Inspection Record".
D. Inspect the valve for leakage at the flanges, bonnet, stem, and any seals or packing.
E. If leakage is found, note that information on the "Valve Inspection Record" and attempt to correct the problem. The (designated Frontier management) shall be promptly notified if the valve leakage cannot be remedied.
F. Partly operate the valve to determine the ease of operation of the gear operator. If necessary, lubricate the gear operator and note that information on the "Valve Inspection Record".

Note: The gear operator should not be turned more than 50% of its travel if by doing so the gas flow will be restricted enough to cause a disruption to the gas flow and customer operations.

All other valves should be inspected and necessary maintenance performed at intervals not exceeding 5 years.

1.4.8 VAULT INSPECTION

In accordance with 49CFR 192.749, each vault housing pressure regulating and pressure limiting equipment and having a volumetric internal content of 200 cubic feet or more must be inspected at least once per calendar year but at intervals not exceeding 15 months.

There are no vaults on the Pipeline.

1.4.9 PRESSURE CONTROL AND RELIEF EQUIPMENT

In accordance with 49CFR 192.739 and 192.743, each pressure regulator and relief valve must be subjected to inspection and tests at intervals not to exceed 15 months but at least once each calendar year to determine that the device is -

A. In good mechanical condition;
B. Adequate from the standpoint of capacity and reliability of operation for the service in which it is employed;
C. Set to function at the correct pressure; and
D. Properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.

Additionally, the following inspections should be made to confirm that -

A. The station is protected adequately from unauthorized entry, tampering or damage from external hazards.
B. All critical valves are functioning properly and lubricated if necessary.
C. All required warning signs are in place.
D. All above-ground piping is adequately protected from atmospheric corrosion.
E. All pressure recording instruments or telemetering equipment is tested.
F. All vents are protected and/or cleared from moisture and will provide unrestricted venting to a safe area.

Regulator Station inspection may require disassembly of regulators and/or relief valves if a pressure lock-up test indicates a problem. Spare parts should be on location before performing regulator lock-up or relief valve tests.

Before the station inspection begins, provide for continuity of service while the equipment is out of service. If the station does not have regulation on the bypass line, additional personnel must be present to operate the by-pass and monitor system pressure during the equipment downtime.

A. Record Inspection: Review the station pressure records since the last inspection. Look for any irregularities that might indicate a potential equipment problem.

B. Pressure Check: Use 1% or greater accuracy pressure gauges for checking and setting station pressures. The gauges selected should be sized so that the maximum scale is no greater than twice the pressure being tested. i.e.: for a 15 Psig pressure, use a 30 Psig gauge.

NOTE: DO NOT use station gauges that remain constantly in service under pressure for these tests. Calibrated test gauges should be installed before beginning any pressure tests. Record the as-found pressures and compare them with the last station inspection report and see if any changes have occurred.

1. General Lock-Up Test Procedure: This test is used to determine the ability of a regulator's to provide a 100% shut-off to prevent station outlet pressure increasing above the regulator set point. This is accomplished by installing a correctly sized pressure gauge between the regulator outlet and the downstream isolation valve. Next, with the regulator in the closed position, close the downstream isolation valve and observe is a pressure build up occurs. If the pressure remains constant, the test indicates that the regulator is operating properly. If the pressure begins to build up, it means there is a problem with the regulator and that regulator must be torn down, repaired, reassembled, and the lock-up-test performed again to assure that the malfunction has been cleared.
2. Regulator Operation Test: Operate the regulator so that the inner valve is stroked from closed to the full open position. Pay particular attention to regulators where the valve travel can be changed by adjustment. Determine by accurate measurement if the valve travel is correct for the existing station design and for the associated overpressure protection equipment.
3. Filter and/or Strainer Inspection: Remove and disassemble each filter and screen. Clean or replace the filter elements and clean the screen strainer elements.

NOTE: Particular attention must be paid to filters installed in regulator pilot lines.

4. Relief Valve Inspection: Check pressure records since the last inspection for any indication of equipment problems. Operate the relief in a manner that will stroke the main valve and also the pilot, if applicable. Make sure the set point is correct and that it will prevent system pressure from exceeding MAOP plus allowed build-up.

C. Returning Station to Normal Operation

Beginning with the regulator inlet and outlet valves in the closed position and no pressure in the piping,

1. Open regulator control line valves.
2. Slowly open the regulator inlet valve and monitor the pressure gauge installed to check for lock-up.
3. When the pressure is stabilized at normal lock-up pressure, slowly open the down-stream regulator outlet valve.
4. Adjust regulator set pressure to desired level.
5. Record regulator set pressure.

NOTE: The procedures listed above should be followed for each regulator run in the station.

1.5 PIPELINE REPAIRS: PREVENTION OF ACCIDENTAL IGNITION

In accordance with 49CFR 192.751, whenever Pipeline repairs are required, every reasonable measure shall be employed to protect the public from accidental ignition of gas and subsequent damages, including but not necessarily limited to the following:

A. Suitable DANGER or CAUTION signs and barricades shall be posted in the vicinity of the repair site.
B. Smoking or open lights shall be prohibited.
C. Flashlights and hand lanterns shall be of suitable type.
D. Electrical equipment not rated for use in hazardous areas shall be de-energized or removed from the area.
E. Prior to welding, a thorough check of the area shall be made to determine the possibility of a combustible gas mixture.
F. Prior to welding or cutting the line, the cathodic protection system shall be turned off.
G. Install a bond across the area to be cut if the cut is to be made by anything other than a cutting torch.
H. The engines of vehicles equipped with catalytic converters shall be turned off if possible or the vehicles shall be removed as far as possible from the repair site. Vehicles equipped with catalytic converters shall not be parked in an area where there is combustible material (grass, weeds, trash) that could be ignited by a hot catalytic converter.
I. In accordance with 49CFR 192.467, insulating devices should not be installed in an area where a combustible atmosphere could be anticipated. When replacing or repairing an existing insulating device, a combustible gas indicator shall be used to determine if a combustible gas mixture is present in the area and work shall not proceed until that combustible gas mixture is cleared from the area.

When a hazardous amount of gas is being vented into open air, each potential source of ignition shall be removed from the area and an adequate number of fire extinguishers shall be provided.

1.5.1 PIPELINE REPAIR PROCEDURES: STEEL PIPE

1.5.1.1 WELDING QUALIFICATION

In accordance with CFR49, 192 subpart E, before performing repair work on the Pipeline, a welder must be qualified under section 3 of API 1104 or section IX of the ASME Boiler and Pressure Code and present acceptable credentials as proof that at least one weld has been destructively tested and found acceptable in the last six months. Otherwise, a welding test must be performed before that welder can perform welding on the Pipeline.

The welder's credentials must specify that one of the following tests (as detailed in this section of the O&M manual) was successfully passed. These procedures apply only to the Frontier Pipeline system:

A-1	Arc welding, v-groove butt joint, under 2" nominal branch
A-2	Arc welding, v-groove butt joint, 2"-12" nominal branch
A-3	Arc welding, fillet joint, under 2" nominal branch
A-4	Arc welding, fillet joint, 2" - 12" nominal branch
G-1	Gas welding, v-groove butt joint, under 2" nominal branch
G-3	Gas welding, fillet joint, under 2" nominal branch

Any deviations from these qualifications or procedures must be approved in writing by the (designated Frontier management).

1.5.1.2 DEFINITIONS

1. Bead The term "bead" shall mean the same as a weldpass.
2. Qualified Welder - The term "qualified welder" shall mean a welder who has demonstrated his ability to produce welds meeting the requirements set forth in this manual
3. Root Bead - The term "root bead" shall mean the first or stringer bead which initially joins two sections of pipe, a section of pipe to a fitting, or two fittings.
4. Weld - The term "weld" shall mean the completed weld joining two sections of pipe, a section of pipe to a fitting or two fittings.
5. Welding Procedure - The term "welding procedure" shall mean a tested and approved detailed method by which sound welds, having suitable mechanical properties can be produced.

1.5.1.3 LIMITATIONS ON USE OF THE WELDING PROCEDURES

Limitations on welding operations and procedures are emphasized so that there will be no misunderstandings. There are three limitations in welding:

A. Limitations on Welders: No welder may weld with a particular welding process unless the welder has used that process within the preceding six calendar months.

B. Process Limitations - An accepted practice for welding 1-1/4" or smaller pipe and on systems that operate at 100 psig or less is oxyacetylene. Do not use oxyacetylene on "hot taps"t of any kind. This includes service tees on live mains.

C. Miter Joint Limitations - DO NOT USE miter joints. DO USE welded fittings for line direction changes.

1.5.1.4 EQUIPMENT SPECIFICATIONS

Use gas and arc welding equipment of sizes and types suitable for the work and keep the equipment in good condition to ensure acceptable welds, proper operation, and to prevent personnel injuries. Operate arc welding equipment within the amperage and voltage ranges given in the welding procedure. Operate gas welding equipment with the flame characteristics and tip sizes given in the welding procedure. Do not use any equipment which does not meet these requirements.

1.5.1.5 DEFECTS AND DENT REPAIR

Repair or Removal of Defects

1) Remove or repair each weld that is unacceptable. Remove a weld if it has a crack.

2) To repair a defective weld, remove the defects, clean metal. Preheat the segment to 250 degrees F, remove defect, preheat again before welding. After the repair, inspect the segment of the weld to insure its acceptability.' If the repair is not acceptable, remove the weld.

1.5.1.6 REPAIR OF PARENT METAL DEFECTS

Make field repairs to gouges, grooves and arc burns in the parent metal by grinding, provided the finished ground area does not reduce the wall thickness at any thickness for all pipe 18" O.D. and smaller.

1.5.1.7 DENTS

Remove a dent (such as a scratch, gouge, groove arc burn) by cutting it out of the pipe. Remove all circumferential welds. Remove all dents, which exceed a minimum depth of 1/4" in pipe 12-3/4" O.D. and smaller or 20% of the nominal pipe diameter in all pipe larger than 12 3/4" O.D., by cutting out the damaged portion of the pipe. DO NOT pound out or jack out dents.

1.5.1.8 INSPECTION OF WELDS

Pipeline inspectors shall visually inspect circumferential butt welds in all piping systems to be assured that the welder is following the procedure specifications (particular process, pipe size, and wall thickness) and that the specifications are understood well enough to qualify for production welding.

1.5.1.9 OPERATIONAL SAFEGUARDS

Before any welding can proceed, all off the measures listed under "PIPELINE REPAIRS: PREVENTION OF ACCIDENTAL IGNITION" must be heeded. Additionally, the following items will help to assure that the work is performed safely:

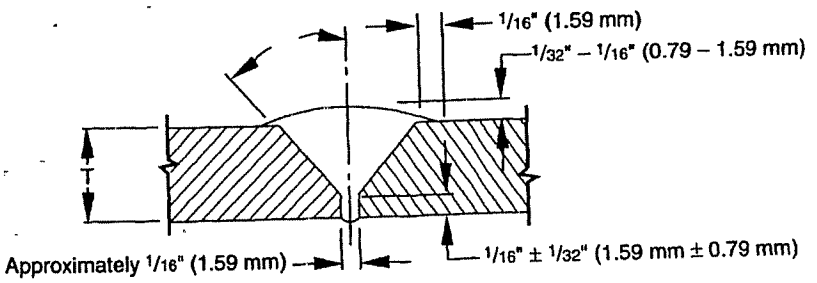
A. Provide a safe working area around the welding area excavation and provide a sloped ramp for entry or exit.

B. Weather changes can occur during welding operations. Take steps to erect wind barriers and tarp shades to prevent moisture from entering the weld area.

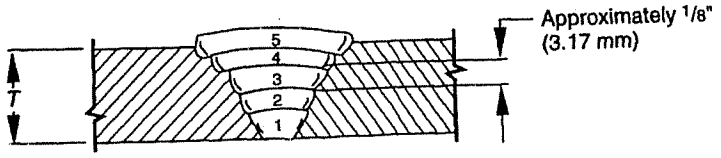
1.5.1.10 STANDARD WELDING PROCEDURES

1.5.1.10.1 "A1"-ARC WELDING PROCEDURE: PIPE DIAMETER LESS THAN 2-3/8" & WALL THICKNESS LESS THAN 3/16"

A. Process: manual shielded metal arc weld (SMAW)
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Diameter and Wall Thickness: less than 2-318" O.D. and less than 3/16" wall thickness
D. Joint Design: single "V" groove, 60 deg. included angle (30 deg. bevel + 5 deg - 0 deg.)



Standard V-Bevel Butt Junt



Sequence of Beads

E. Filler Metal and Number of Beads: electrodes E6010, E6011, E7010, E7011 or other group 1 filler metals per API-1104, table 1, AWS specification A5.1 or 5.5.

WALL THICKNESS	ROD SIZE 3/32"	1/8"	MIN NO. OF BEADS
0.125-.153	2	1	3
0.154-.187	1	2	3

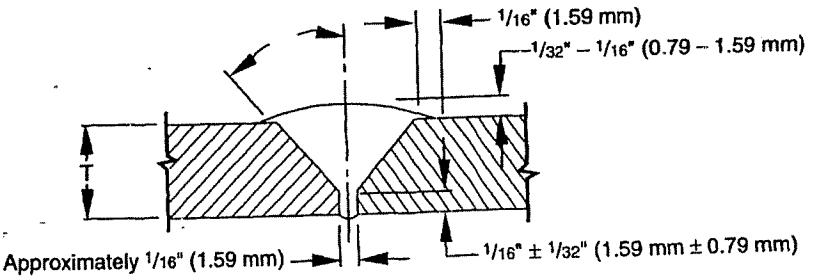
F. Electrical Characteristics: welding current D.C. reverse polarity, electrode positive.

	AMPERES/ ELECTRODE		VOLTAGE/ ELECTRODE	
ROD SIZE	E 6010/11	E 7010/11	E 6010/11	E 7010/11
3/32"	40-75	50-90	22-26	22-26
1/8"	90-120	90-120	24-28	24-28

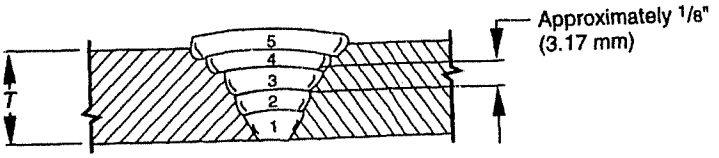
G. Position: position welding
H. Direction of welding: downhill
I. Number of Welders: one
J. Time Lapse between Passes: The second pass shall follow the root bead within 5 minutes, except when UNAVOIDABLE circumstances prevail which make this requirement impractical. The complete weld should be finished before the end of the day.
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)
M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.
N. Preheat, Stress Relief: If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.
O Shielding Gas and Flow Rate: (N/A)
P. Shielding Flux: (N/A)
Q. Speed of travel: 5 to 15 inches per minute

1.5.1.10.2 "A-2" ARC WELDING PROCEDURE: PIPE DIAMETER BETWEEN 2-3/8" & 12-3/4" WITH 3/16" TO 3/4" WALL THICKNESS

A. Process: manual shielded metal arc weld (SMAW)
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Diameter and Wall Thickness: 2-318" O.D. through 12-3/4" O.D. and 3/16" through 3/4" wall thickness
D. Joint Design: single "V" groove, 60 deg. included angle (30 deg. bevel + 5 deg - 0 deg.)



Standard V-Bevel Butt Junt



Sequence of Beads

E. Filler Metal and Number of Beads: electrodes E6010, E6011, E7010, E7011, or other group 1 filler metals per API-1104, table 1, AWS specification A5.1 or 5.5.

WALL THICKNESS	ROD SIZE 3/32"	1/8"	5/32"	3/16"	MIN NO. OF BEADS
0.188-.249	0	2	1	0	3
0.250-.343	0	0	3	1	4
0.344-.436	0	0	3	2	5
0.437-.561	0	0	3	3	6
0.562-.687	0	0	3	4	7
0.688-.750	0	0	3	5	8

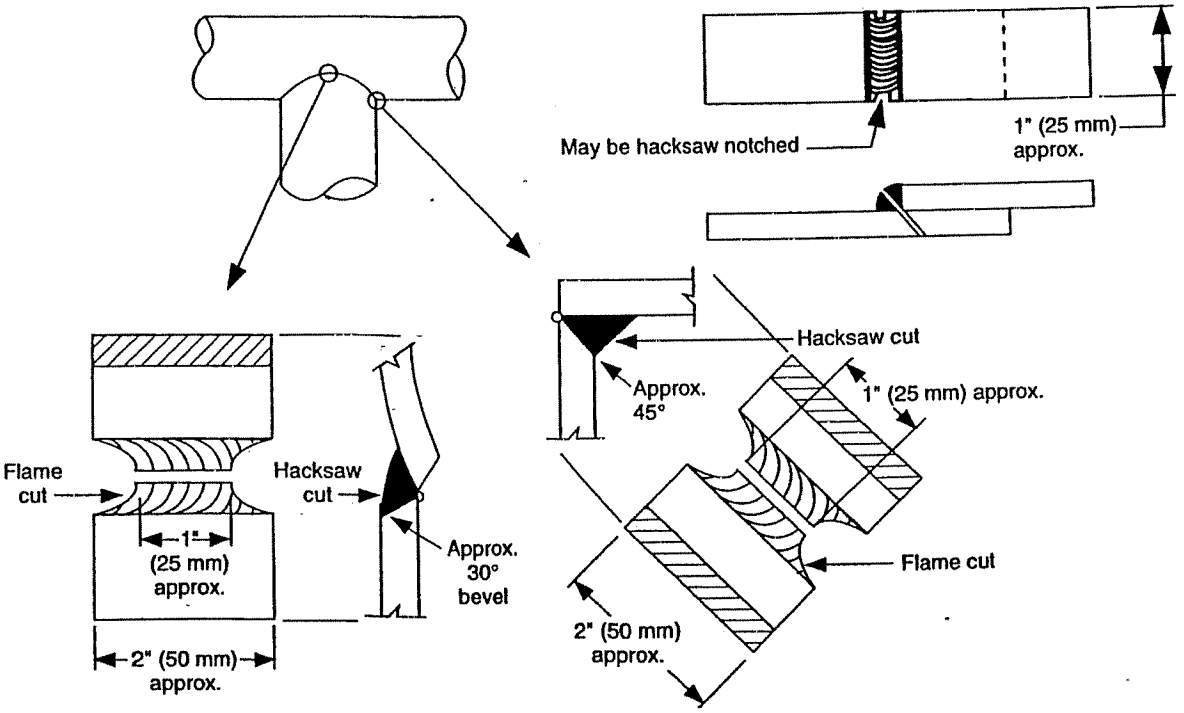
F. Electrical Characteristics: welding current D.C. reverse polarity, electrode positive.

ROD SIZE	AMPERES/ ELECTRODE E 6010/11	E 7010	VOLTAGE/ ELECTRODE E 6010/11	E 7010/11
3/32"	40-75	50-90	22-26	22-26
1/8"	90-120	90-120	24-28	24-28
5/32"	110-160	110-160	24-28	28-30
3/16"	140-190	140-190	28-30	30-32

G. Position: position welding
H. Direction of welding: downhill
I. Number of Welders: one
J. Time Lapse between Passes: The second pass shall follow the root bead within 5 minutes, except when UNAVOIDABLE circumstances prevail which make this requirement impractical. The complete weld should be finished before the end of the day.
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)
M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.
N. Preheat, Stress Relief: Preheat shall be required when the ambient temperature or metal temperature is below 50 deg. F. The minimum preheat temperature is 250 deg. F for 3" on both sides of the weld. If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.
O. Shielding Gas and Flow Rate: (N/A)
P. shielding Flux: (N/A)
Q. Speed of travel: 5 to 15 inches per minute

1.5.1.10.3 "A-3" ARC WELDING PROCEDURE FOR FILLET WELDING OF STEEL PIPE & FITTINGS WITH LESS THAN 3/16" WALL THICKNESS

A. Process: manual shielded metal arc weld (SMAW)
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Wall Thickness Group: all branch diameters with less than 3/16" wall thickness
D. Joint Design: fillet



E. Filler Metal and Number of Beads: electrodes E 6010, E 7010, or other group 1 filler metals per API 1104, table 1, AWS specification A5.1 or 5.5. The first two beads (stringer & hot pass) shall be made with 3/32" electrodes. Additional beads shall be made with 1/8" electrodes. At least three passes shall be made.

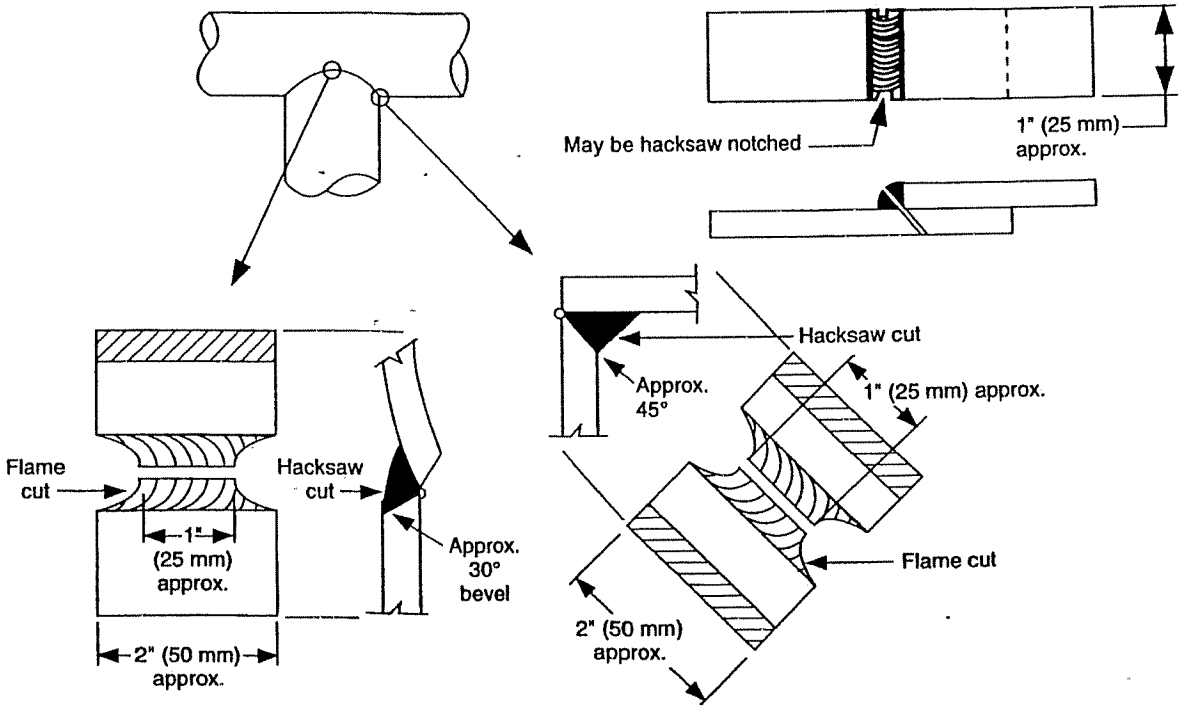
F. Electrical Characteristics: welding current D.C. reverse polarity, electrode positive.

ROD SIZE	AMPERES/ ELECTRODE		VOLTAGE/ ELECTRODE	
	E 6010	E 7010	E 6010	E 7010
3/32"	40-75	50-90	22-26	22-26
1/8"	90-120	90-120	24-28	24-28

G. Position: position welding
H. Direction of welding: downhill
I. Number of Welders: one
J. Time Lapse between Passes: The second pass shall follow the root bead within 5 minutes, except when UNAVOIDABLE circumstances prevail which make this requirement impractical. The complete weld should be finished before the end of the day.
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)
M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.
N. Preheat, Stress Relief: If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.
O. Shielding Gas and Flow Rate: (N/A)
P. Shielding Flux: (N/A)
Q. Speed of travel: 5 to 15 inches per minute

1.5.1.10.4 "A-4" ARC WELDING PROCEDURE FOR FILLET WELDING OF STEEL PIPE & FITTINGS WITH GREATER THAN 3/16" WALL THICKNESS

A. Process: manual shielded metal arc weld (SMAW)
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Diameter and Wall Thickness: all branch diameters with 3/16" to 3/4" wall thickness
D. Joint Design: fillet



E. Filler Metal and Number of Beads: electrodes E6010, E7010, or other group 1 filler metals per API-1104, table 1, AWS specification A5.1 or 5.5.

WALL THICKNESS	ROD SIZE 3/32"	1/8"	5/32"	3/16"	MIN NO. OF BEADS
0.188-.249	0	2	1	0	3
0.250-.343	0	0	3	1	4
0.344-.436	0	0	3	2	5
0.437-.561	0	0	3	3	6
0.562-.687	0	0	3	4	7
0.688-.750	0	0	3	5	8

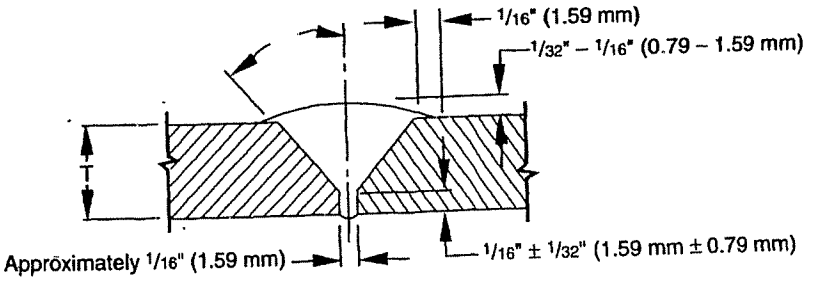
F. Electrical Characteristics: welding current D.C. reverse polarity, electrode positive.

	AMPERES/ ELECTRODE		VOLTAGE/ ELECTRODE	
ROD SIZE	E 6010	E 7010	E 6010	E 7010
3/32"	40-75	50-90	22-26	22-26
1/8"	90-120	90-120	24-28	24-28
5/32"	110-160	110-160	24-28	28-30
3/16"	140-190	140-190	28-30	30-32

G. Position: position welding
H. Direction of welding: downhill
I. Number of Welders: one
J. Time Lapse between Passes: The second pass shall follow the root bead within 5 minutes, except when UNAVOIDABLE circumstances prevail which make this requirement impractical. The complete weld should be finished before the end of the day.
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)
M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.
N. Preheat, Stress Relief: Preheat shall be required when the ambient temperature or metal temperature is below 50 deg. F. The minimum preheat temperature is 250 deg. F for 3" on both sides of the weld. If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.
O. Shielding Gas and Flow Rate: (N/A)
P. Shielding Flux: (N/A)
Q. Speed of travel: 5 to 15 inches per minute

1.5.1.10.5 "G-1" GAS WELDING PROCEDURE FOR STEEL PIPE & FITTINGS LESS THAN 2-3/8" O.D. AND LESS THAN 3/16" WALL THICKNESS

A. Process: manual oxyfuel gas welding (OFW).
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Diameter and Wall Thickness: less than 2-3/8" O.D. and less than 3/16" wall thickness.
D. Joint Design: single "V" groove, 60 deg included angle (30 deg bevel + 5 deg - 0 deg)



E. Filler Metal and Number of Beads: AWS class RG60 specification A5.2. One bead using a 1/8" or 3/16" rod shall be made.
F. Flame Characteristics: neutral flame (A carborizing flame -- two much acetylene -- is characterized by an orange flame. An oxydizing flame -- too much oxygen -- is characterized by a blue flame.) For wall thickness fro 0.109 - 0.139, a head size of 9-12 should be used; for wall thichness from 0.140 - 0.154 a head size of 12-15 should be used.
G. Position: position welding
H. Direction of welding: uphill
I. Number of Welders: one
J. Time Lapse between Passes: (N/A).
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)

M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.

N. Preheat, Stress Relief: If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.

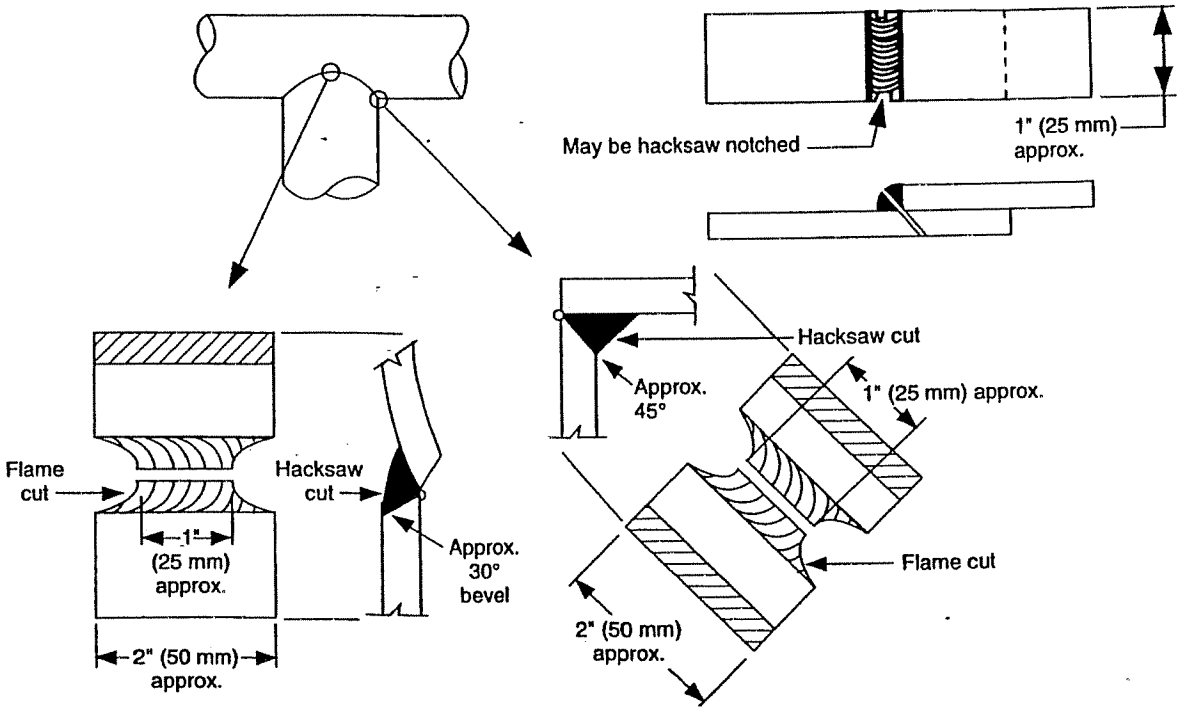
O. Shielding Gas and Flow Rate: (N/A)

P. Shielding Flux: (N/A)

Q. Speed of travel: 5 to 15 inches per minute

1.5.1.10.6 "G-2" GAS WELDING PROCEDURE FOR STEEL PIPE & FITTINGS LESS THAN 3/16" WALL THICKNESS

A. Process: manual oxyfuel gas welding (OFW).
B. Material Specification: group P-1 carbon steel -- API 1104 grade B through X42.
C. Diameter and Wall Thickness: All branch diameters with less than 3/16" wall thickness.
D. Joint Design: Fillet.

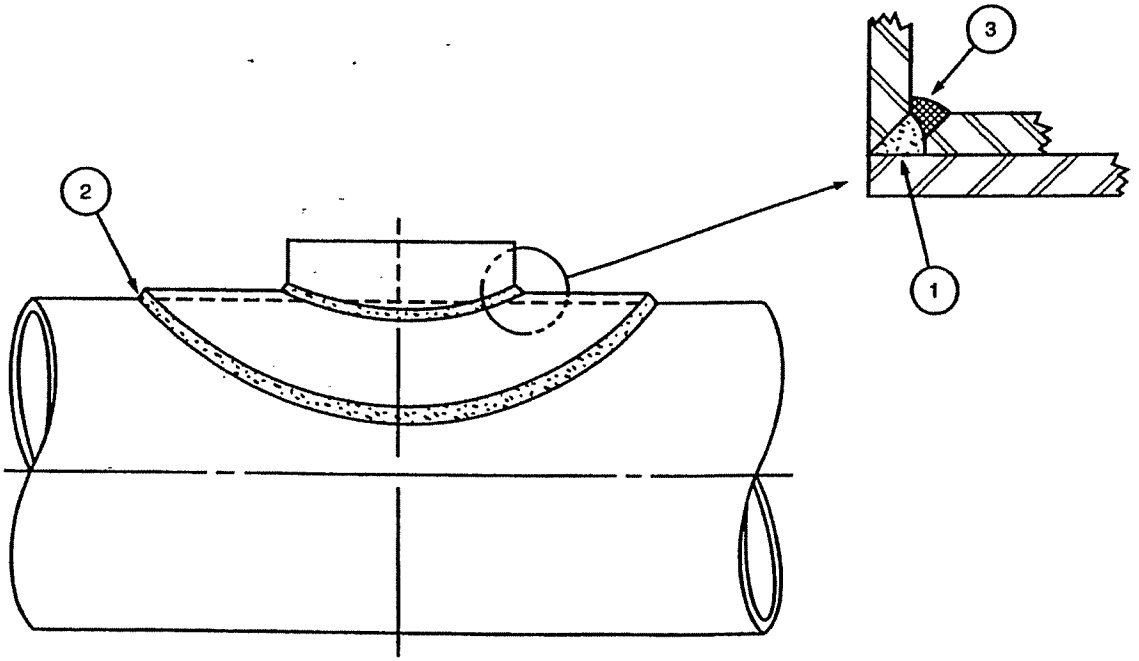


E. Filler Metal and Number of Beads: AWS class RG60 specification A5.2. One bead using a 1/8" or 3/16" rod shall be made.
F. Flame Characteristics: neutral flame (A carborizing flame -- two much acetylene -- is characterized by an orange flame. An oxydizing flame -- too much oxygen -- is characterized by a blue flame.) For wall thickness fro 0.109 - 0.139, a head size of 9-12 should be used; for wall thichness from 0.140 - 0.154 a head size of 12-15 should be used.
G. Position: position welding
H. Direction of welding: uphill
I. Number of Welders: one

J. Time Lapse between Passes: (N/A)
K. Type of Line-up Clamp: external
L. Removal of Line-up Clamp: Uniformly spaced root bead segments covering at least 50 percent of the circumference must be completed before removal of the clamp. (See API 1104, section 4.3.)
M. Cleaning: All rust, dirt, and foreign matter shall be removed from the bevel surface before welding is started; the bevel surface includes that area on the inside of the pipe in the immediate proximity of the pipe end. Slag shall be removed from the bead surface before the next bead is applied. Power tools may be used. Holes must be cleaned with picks or chisels. The finished weld and immediately adjacent pipe surface must be cleaned of all flux, smoke, and weld splatter. No welding shall be done in the rain unless suitable protection is provided.
N. Preheat, Stress Relief: If moisture is present on the parent metal, it shall be driven off by preheating to a temperature at which it will not re-form. Stress relief is not required.
O. Shielding Gas and Flow Rate: (N/A)
P. Shielding Flux: (N/A)
Q. Speed of travel: 5 to 15 inches per minute

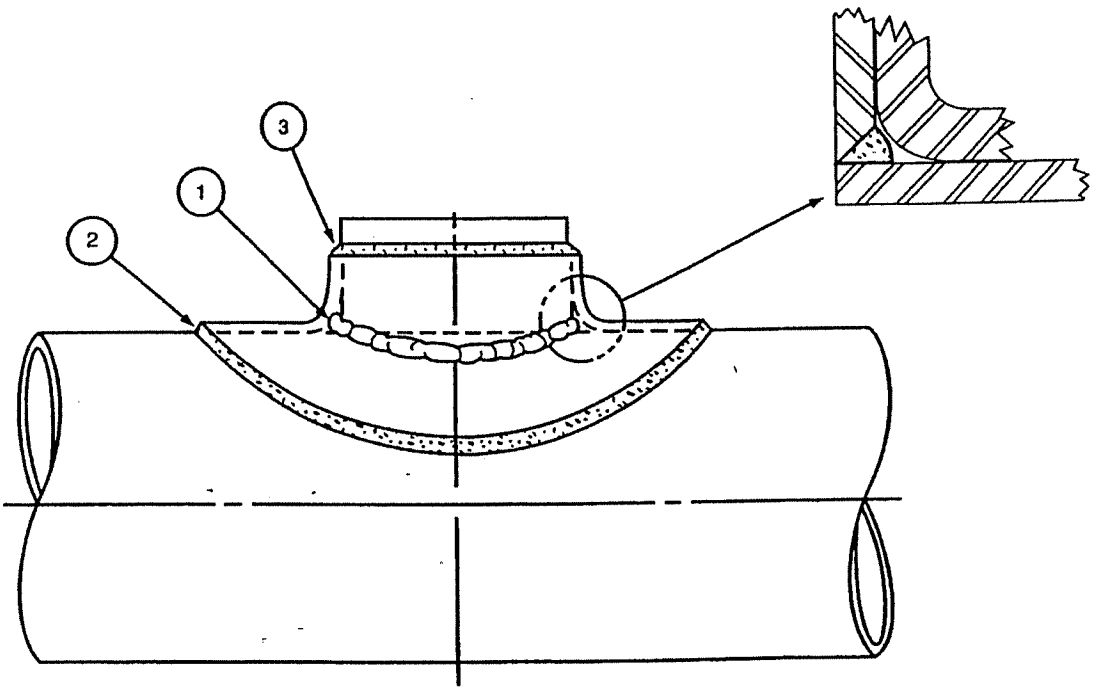
1.5.1.10.7 WELDING INSTALLATION PROCEDURES FOR PADS & SLEEVES

A. Make fillet weld around the entire perimeter of all pads to prevent moisture penetration.
B. Limit size of fillet weld to 1/4".
C. Weld full encirclement sleeves over the entire circumference of the ends and longitudinal groove.
D. Maintain full groove weld and do not penetrate into pipe metal while making the longitudinal groove weld.
E. On new construction, weld all wear pads or sleeves in place before pressure testing the system.



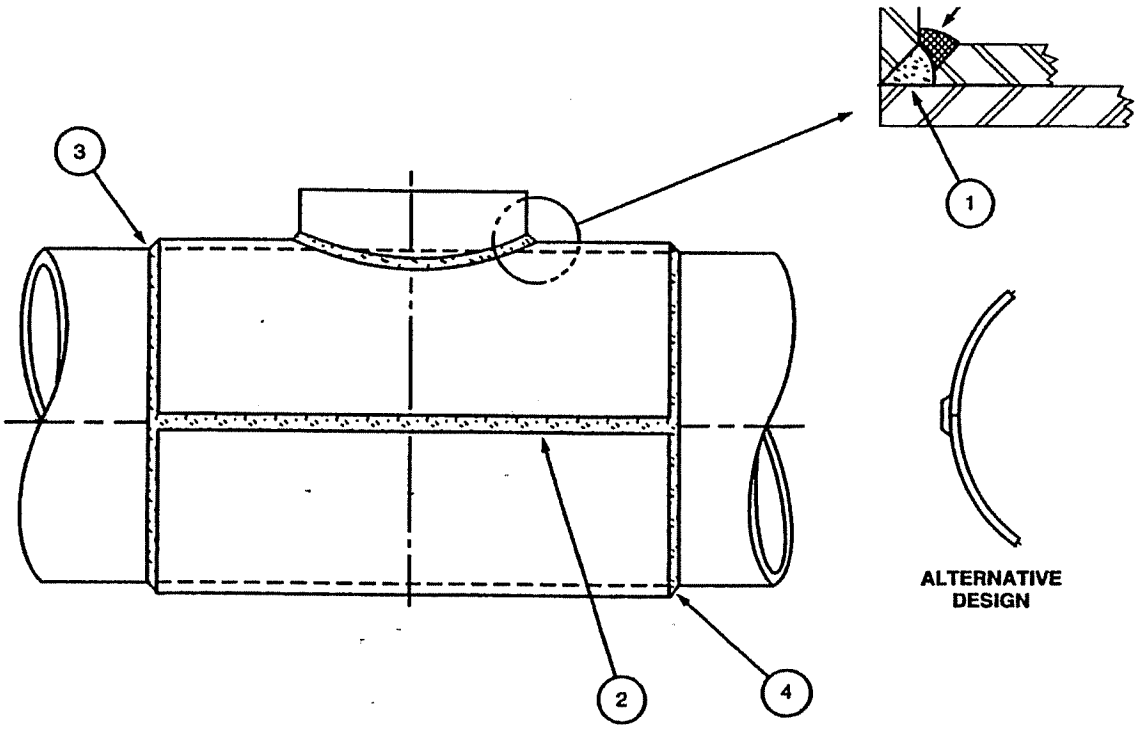
Note: This is the suggested welding sequence; others may be followed at the discretion of the company.

Figure 1: Typical Reinforcing Pad



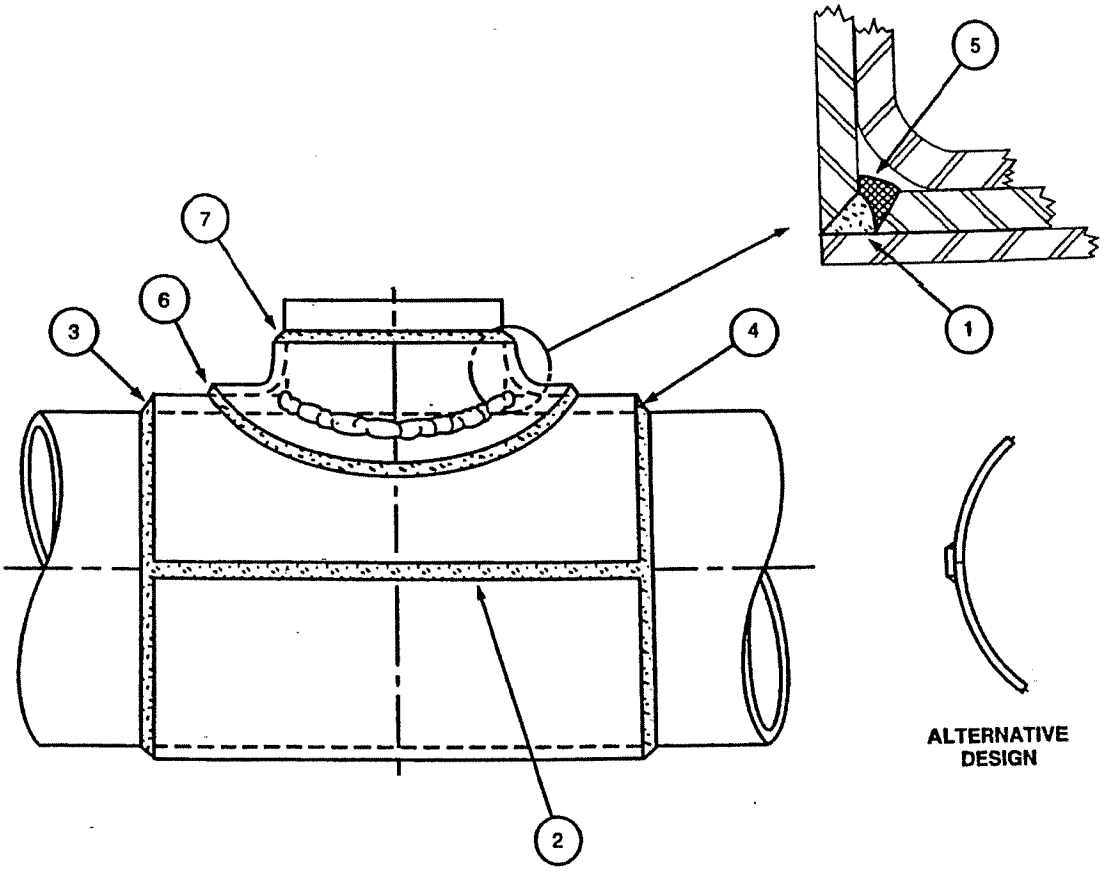
Note: This is the suggested welding sequence; others may be followed at the discretion of the company.

Figure 2: Typical Reinforcing Saddle



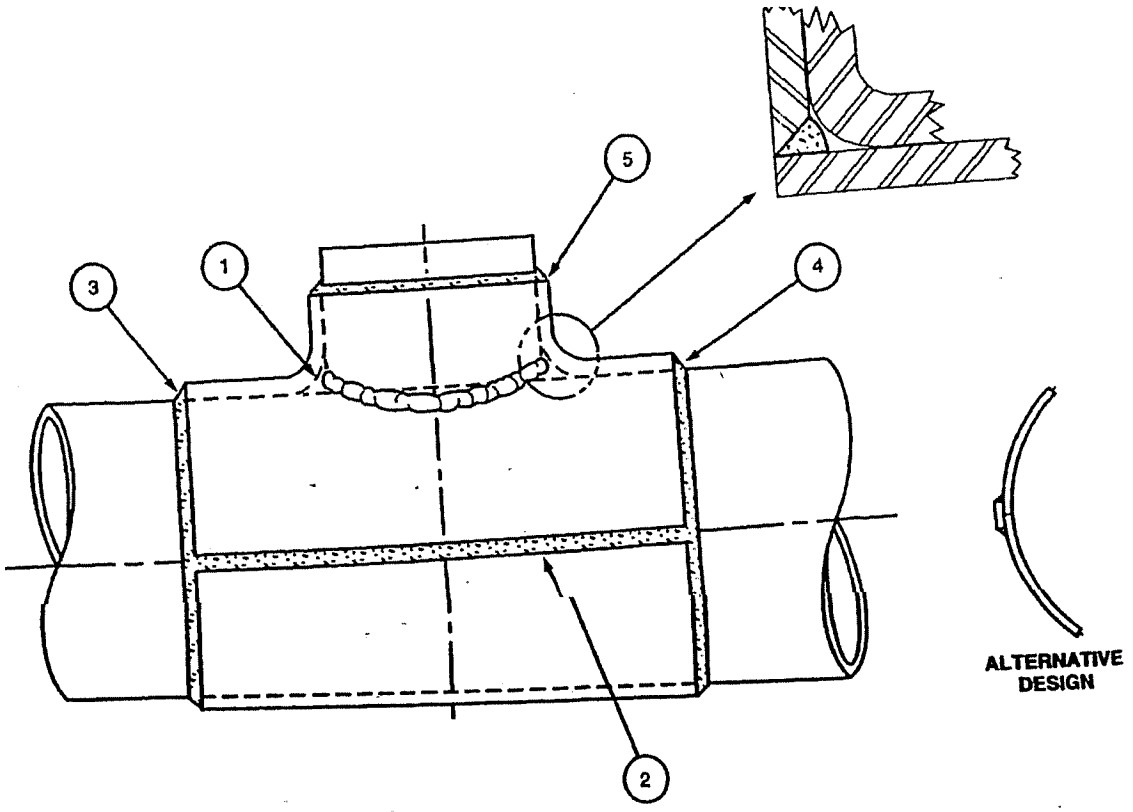
Note: This is the suggested welding sequence; at the discretion of the company, others may be followed and circumferential welds numbers 3 and 4 need not be made.

Figure 3: Typical Full Encirclement Sleeve



Note: This is the suggested welding sequence; at the discretion of the company, others may be followed and circumferential welds 3 and 4 need not be made.

Figure 4: Typical Full Encirclement Sleeve and Saddle



Note: This is the suggested welding sequence; others may be followed at the discretion of the company.

Figure 5: Typical Encirclement Saddle

1.5.1.10.8 WELDING INSTALLATION PROCEDURES FOR FLANGES

Specify forged steel welding neck flanges or forged steel slip-on flanges. Weld slip-on flanges inside and outside.

1.5.1.10.9 WELDING INSTALLATION PROCEDURES FOR VALVES

Install and weld valves in accordance with the valve manufacturer 's recommendations. For example, preheat or postheat for welding, valve in open or closed position during installation.

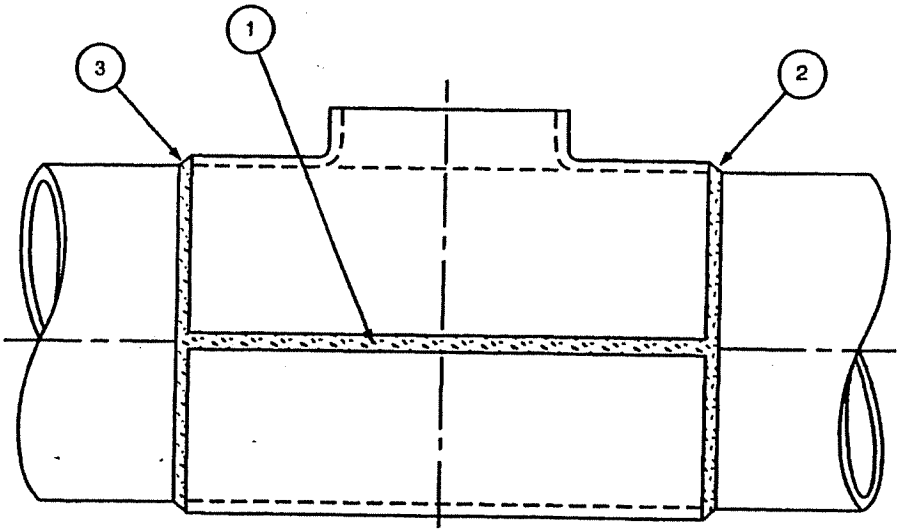
1.5.1.10.10 WELDING INSTALLATION PROCEDURES FOR SPLIT TEE/STOPPER

Position fitting on pipe:

A. Properly align fitting on pipe. Provide a gap (1/8" max.) at the ends of the fitting. Grind, if necessary, to achieve proper gap. If necessary, grind seam weld projection from pipe. But, do not thin pipe wall. Chain boomers or other mechanical means may be helpful to install fitting.
B. Provide a gap 1/16" to 3/16" between the top and bottom fitting. DO NOT fuse the weld to the pipe. A suitable weld gap of 1/16" to 3/16" normally will prevent fusion to the pipe.
C. Tack weld top and bottom fitting halves at longitudinal bevel only: DO NOT TACK TO PIPE.

Welding Sequence

A. Complete longitudinal weld first. Make bead passes with very little weave. Fill the longitudinal weld bevel completely so that the rated fitting pressure can be maintained.
B. Complete the fillet weld at one end of the fitting. Apply only a necessary amount of weld. An excess of weld can be detrimental. The throat thickness of the circumferential fillet weld should be slightly thicker than the pipe wall. Allow fitting to cool.
C. Complete the fillet weld at other end of fitting.
D. Examine weld visually for cracks, lack of fusion and undercuts.
E. Pressure test fitting before hot tapping. Do not exceed internal pressure of pipe.



Notes:
1. This is the suggested welding sequence; others may be followed at the discretion of the company.
2. When in operation, the fitting is at pipeline pressure.

Figure 6: Typical Full Encirclement Tee

1.5.1.10.11 WELDING INSTALLATION PROCEDURES FOR NIPPLES

A. Check the area on the pipe where the fitting is to be installed. Clean pipe thoroughly and check roundness. If the pipe is more than 1/81t out of round, the fitting will require trimming for proper fit up.
B. Clean fitting weld bevels thoroughly. Remove any paint, rust, oil or other foreign matter.
C. Remove the moisture from the pipe by preheating with an oxyacetylene torch.
D. Place fitting on pipe. Center, level, and square the fitting so that its center line will intersect center line of pipe. Fitting must be perpendicular to pipe.
E. Make sure a uniform gap of 1/8" to 1/16" exists between fitting and pipe. Wire spacers can be inserted into the gap before tacking fitting to pipe. Remove spacers after tacking and prior to final welding.
F. Weld fitting to pipe. Fill weld bevel completely so that rated fitting pressure can be maintained. Make a full penetration weld with moderate reinforcement.
G. Examine weld visually for cracks, lack of fusion and undercuts.
H. Pressure test fitting before hot tapping. Do not exceed internal pressure of pipe.

1.5.2 NON-DESTRUCTIVE TESTING

Pipeline repair welds shall be 100% x-ray inspected in accordance with section 6 of API 1104.

1.5.3 REPAIR TECHNIQUES

The Pipeline may be repaired by cutting out the damaged section and welding in a new section, by installing a bolted full encirclement sleeve, or by installing a welded full encirclement sleeve. The Pipeline may not be repaired by installing a patch without prior written approval of the (designated Frontier management).

1.5.4 REPAIR MATERIAL

If a new section of pipe is installed, previously hydrotested pipe shall be used or if none is available, the replacement pipe shall be of material equivalent to the pipe originally installed and tested to the same pressure of the pipe originally installed for at least 1 hour.

1.5.5 PIPELINE COATING

Coating for the replacement pipe shall be equivalent to that used for repairs during construction and shall be approved by the (designated Frontier management) before use.

1.5.6 PURGING GAS OR AIR FROM THE PIPELINE: GENERAL

Safety precautions as detailed under "PIPELINE REPAIRS:PREVENTION OF ACCIDENTAL IGNITION" in this section of the O&M manual shall be reviewed and applied before purging operations commence.

1.5.6.1 PURGING GAS FROM MAINS WITH AIR

Before a repair, it may be necessary to purge the Pipeline of natural gas by the use of air. Inject a moderately rapid, continuous supply of air into the main until gas is not detected at the downstream end with a Combustible Gas Indicator (CGI). The vent pipe at the downstream end should be sized to permit the free escape of purging gas to atmosphere. The vent pipe should extend approximately eight (8) feet above the ground to prevent possible ignition 'from ground sources.

1.5.6.2 PURGING AIR FROM MAINS WITH NATURAL GAS

After a repair, it may be necessary to purge the Pipeline of air by use of natural gas. Gas shall be released into one end of the line in a moderately rapid and continuous flow. In accordance with 49CFR 192.629, if natural gas cannot be supplied in sufficient quantity to prevent the formation of a hazardous mixture, inert gas such as nitrogen shall be released into the Pipeline in a slug of sufficient size to maintain separation between the air being displaced and the natural gas ultimately displacing it.

Natural gas should be released into the main until 100% gas reading is detected with a CGI at the vent line outlet. Continue the purge for a short time to assure that all the air has been purged from the mains. This is particularly important with a header with lateral or loop. Air pockets that may develop can cause pilot outages as well as explosive mixtures.

1.5.6.3 PURGING SERVICE LINES

After repair or before placing in service, all service lines shall be purged with gas to remove all traces of air in the line.

Do Not let gas blow directly into basements or buildings. Use a plastic hose to extend the end of the service line outside and away from the building. Allow the gas to flow for a sufficient length of time to clear the line of any air.

1.5.6.4 TESTING AND REINSTATING SERVICE

Natural gas shall be introduced into the pipeline until the pressure reaches the pressure designated by in writing by the (designated Frontier management). That pressure will be maintained for a minimum of one (1) hour before reinstating Pipeline service. The results of the test shall be recorded on the "Hydrostatic Test Record" form and must be kept with the permanent Pipeline records.

1.5.7 TRENCHING & EXCAVATION OPERATIONS: GENERAL SAFETY

In accordance with 49CFR 192.605 (b) (9), whenever a trench is excavated to perform maintenance or emergency operations on the Pipeline, the (designated Frontier management) shall take adequate precautions to protect personnel from the hazards of unsafe accumulations of vapor or gas, including, but not necessarily limited to, the following items:

A. Placement of one or more LEL gas detectors with an alarm in the trench or on the personnel working in the trench.

B. Measurement of the percent gas level present in the trench before work commences, at appropriate intervals during the work and after each work break.

C. Having present at the work site, if necessary, the following emergency rescue equipment:

1. Breathing apparatus.
2. Rescue harness.
3. Rescue line.

Additionally, no employee shall be in the trench within eight feet of the rear of the digging wheel, chain digger, or backhoe bucket while trenching is going on.

No employee shall approach the trench bank where a slip or a cave-in might carry them into the trencher.

When employees are in excavations of more than 4 feet deep, provide ladders extending from the floor of the excavations to at least 3 feet above the top of excavation, unless the banks are sloped so the worker may walk out of the excavation. The maximum travel distance to a ladder cannot exceed 25 feet.

Employees may not jump into the excavation or use 'the pipe to climb out of the excavation.

1.6 ABANDONMENT OR DEACTIVATION OF PIPELINE FACILITIES: GENERAL

In accordance with 49CFR 192.727, when any portion of the Pipeline is abandoned or deactivated, the pipe must by disconnected from all sources and supplies of gas. The pipe must then be purged with air, water, or another inert substance to eliminate the possibility of a hazardous gas mixture being present in the abandoned pipe. The ends of the abandoned pipe must then be sealed.

1.6.1 DEACTIVATION OF CUSTOMER SERVICE LINES

Customer service lines may be deactivated for administrative (e.g., non-payment of bills, meter tampering, customer request) or safety reasons. An inactive service is a service which is not in use, connected to the main, and may or may not have a connected meter and regulator set. The service shut-off valve on the customer end of an inactive service must be secured in a closed position with a suitable locking device; and if the meter set is removed, the piping must be plugged or capped. If the meter set has not been removed, it may be secured by one of the following methods:

A. Stopcock with lock wing. Install padlock or tubular lock.
B. Stopcock without lock wing. Install sealing device such as "clamshell" type.
C. Combination stopcock-union. Install a blanking disc in union connection
D. Break meter connections and install a blanking disc in inlet meter swivel.
E. Break piping and install rubber expansion plug in piping between stopcock and meter inlet.

Inactive services should be reviewed annually to determine if the status of the service has changed.

1.6.2 INACTIVE MAINS

A main that no longer serves any customers or distribution purposes and that has no foreseeable future use shall be removed or disconnected and abandoned following one or more of the abandonment procedures listed above.

1.7 LINE REINSTATEMENT AFTER ABANDONMENT OR DEACTIVATION

In accordance with 49CFR 192.725, before reinstating service in any segment of the Pipeline after abandonment or deactivation, that segment of the Pipeline must be hydrostatically tested in a manner consistent with that used during original construction.

1.8 CONTINUING SURVEILLANCE

In accordance with 49CFR 192.613, the (designated Frontier management) shall continually review pipeline records for evidence of abnormal operating conditions, maintenance needs, or training requirements.

Additionally, on routine Pipeline patrols, the Pipeline Operator is responsible for monitoring the following items:

A. The effect of atmospheric exposure or of movement on surface facilities.
B. The effect of topography changes on pipeline facilities.
C. The potential for or evidence of tampering, vandalism, or third party damage to pipeline facilities.
D. The effects of encroachment on pipeline facilities.
E. The potential for gas migration into buildings from leaks into sewer systems or other utilities.
F. The determination that the Pipeline is in satisfactory condition. If the Pipeline is in unsatisfactory condition but no immediate hazard exists then the (designated Frontier management) shall develop a program to recondition or phase out the Pipeline segment involved or to reduce the maximum allowable operating pressure in accordance with 49CFR 192.619.

1.9 PLASTIC PIPE JOINING PROCEDURES

In accordance with 49CFR parts 192.281, 192,283, 192,285, and 192.287 this section provides the utilities plastic pipe qualified procedures for making heat fusion joints.

Manufacturer pipe joining specifications are included in the appendices of this manual.

1.9.1 QUALIFIED JOINING PROCEDURES

The utility has chosen to adopt the Plastic Pipe Manufacturer's Qualified Pipe Joining Procedures and Procedures for Qualification of Pipe Joiners. Appropriate Manufacturers' Bulletins describing these procedures are included as a part of this Section.

1.9.2 INSPECTOR

When a contractor is installing or making repairs on plastic pipe, the utility shall have an on-site inspector who has been qualified by appropriate training to evaluate the acceptability of plastic pipe joints.

1.9.3 REPAIR OF PLASTIC PIPE

All imperfections or damaged portions of polyethylene pipe shall be cut out. The use of a patching saddle or repair clamp is not allowed.

1.9.4 QUALIFICATION OF PLASTIC PIPE JOINERS

The candidate for joiner qualification shall complete adequate training and under the guidance of a qualified instructor shall fabricate test assemblies for each group of plastic pipe in use by the Utility. The assemblies shall be fabricated and tested in accordance with the pipe manufacturer's procedures.

The proficiency of qualified personnel shall be reviewed annually. Any person who has not been qualified within twelve months shall be requalified before being authorized to make joints. A person shall remain qualified provided satisfactory field joints for each fusion method made by that person have been evaluated by qualified examiners at intervals of not more than twelve months.

1.9.5 REQUALIFICATION

If a person fails to qualify and it is the instructor's considered opinion the causes were due to conditions other than faulty material, the person shall be given a second opportunity to qualify after the instructor has determined that faulty conditions have been corrected.

1.9.6 JOINER QUALIFICATION DOCUMENTATION

The utility shall retain on file a copy of each joiner's annual certification document.

1.9.7 POLYETHYLENE FUSION PROCEDURES

All pipe fusion joints shall be made in accordance with the pipe manufacturer's qualified procedures.

All butt, socket and saddle fusion joints shall be made with machines designed and manufactured for this purpose. In order to assure the integrity of each heat fusion joint, the pipe manufacturer's procedures and the joining equipment operating procedures are to be carefully followed.

1.9.8 DISSIMILAR FUSION PROCEDURES

The indiscriminate mixing of types of polyethylene pipe is to be discouraged. However, the utility recognizes that mixed system joining may be unavoidable in unusual circumstances.

If mixed types of polyethylene are deemed necessary, the Utility has adopted Qualified Dissimilar Fusion Procedures provided by Plexco Technical Services. These procedures are included as a part of this section.

If dissimilar fusion procedures for pipe types other than the one provided for in this manual are required, special procedures must be developed and fully qualified under D.O.T. regulation, and joiners trained and qualified before the work is started.

1.9.9 PLASTIC PIPE REPAIRS: GENERAL

This procedure is for polyethylene plastic pipe repairs by socket electrofusion in areas where conventional excavation is considered impractical, but may also be used for saddle and normal joining situations.

The Central Plastics electrofusion system and fittings are the equipment and materials approved for use in this joining procedure. Other systems and their fittings may be approved for use according to the manufactures recommendations.

A 110 volt AC power supply capable of supplying the minimum amperages listed in the Central Plastics Electrofusion manual is the minimum acceptable power source. For field operations a 3000 watt generator is the minimum size recommended.

The electrofusion system is not explosion proof so it may not be used in an explosive atmosphere. Escaping gas must be stopped or vented away.

1.9.10 PERSONNEL QUALIFICATIONS

Personnel doing electrofusion shall qualify by making a 2x1 socket fusion. If saddle fusion is to be used they shall also make a 2" saddle fusion joint.

The socket fusion shall be visually examined and cut into three longitudinal straps. The straps shall be inspected for adequate fusion. The saddle fusion shall be cut across the pipe into three sections and inspected for adequate fusion. Persons inspecting joints in plastic pipe must be qualified by training or experience in the procedure to evaluate the acceptability of the joints.

A qualification test shall be required for each person, at least once each calendar year.

1.9.11 JOINER QUALIFICATION DOCUMENTATION

A record shall be kept of each person's qualification test and shall include the name, date, test results and record of electrofusion qualification.

1.9.12 REQUALIFICATION

A person must be requalified under this procedure, if during any 12 month period that person:

A. Does not make any electrofusion joints; or
B. Has 3 joints or 3 percent of the joints made, whichever, is greater, under this procedure that are found unacceptable.

1.10 CENTRAL PLASTICS ELECTROFUSION PROCEDURE

Socket fusion:

A. Cut the pipe ends to insure a square, even surface. Remove any burrs or shavings.

B. Measure the pipe or repair section to fit within 1/16" of the required length.

C. Clean pipe ends inside and out with a clean, dry cloth to remove any dirt or contaminants

D. Scrape pipe ends to remove any oxidation or surface contamination. For best results, secure tool on pipe and make two revolutions. In cases where the coupling fitting stops are removed so the coupling can be slid over the pipe junction the pipe must be scraped a full coupling length on one side and half on the other.

E. Remove scraping tool and clean blade area with a clean, dry cloth. Repeat this procedure several times during the scraping operation to remove build-up of material. Pipe preparation and contamination are very important considerations in the electrofusion process. Therefore, careful attention should be given to proper scraping and cleaning procedures.

F. Continue scraping until surface material is removed and new material is exposed. In the event of out-of-round pipe, it is important to assure an adequate even scrape is achieved around the entire circumference of the pipe. A rubber pipe stopper can be placed in the end of the pipe to aid in rounding the area to be scraped.

G. To determine stab depth on repair sections measure half the length of the coupling and mark the pipe ends an equivalent length. For ease of installation, a stab depth indicator and internal fitting stops are a molded part of Central Plastics electrofusion couplings.

H. To remove internal fitting stops (for repair sections) from the I.D. of the coupling, bottom pipe ends to stops. Apply a sudden thrust to the end of the coupling to cleanly snap out the fitting stops. For best results, you should assure that the stops are completely removed from the I.D. of the fitting.

CAUTION: Some care should be used to avoid damage to internal wire coils. On pipe sizes 2" and larger it is recommended that repair section procedure be used due to the difficulty of stabbing larger diameter pipe.

I. Place pipe ends and coupling together by using the internal fitting stops or place repair section in opening.

J. For repair sections, place coupling on the side with full length scrape and slide coupling over pipe junction until both measurement marks are visible. Measurement marks should not extend more than 1/16" from coupling end. Repeat on opposite end of repair section.

K. Maintaining stab depth, place all pipe junctions into proper clamping tools to secure pipe from movement during the fusion cycle. For best results, alignment clamps should be placed within 3/4" to the fitting and as close to the fitting as possible.

M. Connect the processor to an adequate AC power source with the proper extension cord. (D.C. current can damage the processor). If a generator is used it should be engaged before plugging in the processor.

N. At the completion of an internal diagnostic check "Attach Fitting" will appear on the visual display.

O. Attach leads to fitting terminals. When' the proper connection is made, "Fusion Cycle Time" will appear on the visual display.

P. Press start button to begin fusion cycle. Fusion cycle time will countdown on the visual display. Proper voltage readout should reach and remain between 39.8 and 40.2 volts.

Q. When fusion cycle is complete, "Fusion Complete" and a recommended cooling time will appear on the visual display.

R. Should any diagnostic fault, or other fusion message appear during this process refer to the Central Plastics' manual or the "Fault Message" or "Fusion Messages" tables at the end of this section.

S. Disconnect the leads from the fitting.

T. Clamping device should remain in place to secure pipe and fitting during the recommended cooling time. After removing clamps, additional cooling time should be allowed before subjecting the point to bending, burying, pressure testing, or similar handling and backfill stress. Refer to the "Electrical Requirements and Cooling Times" table at the end of this section or in the Central Plastics manual.

Saddle Fusion:

A. For saddle fusion clean the joining area with a clean dry cloth.

B. Center fitting on pipe and mark length of fusion area. Scrape entire pipe surface required for the fitting following scraping instructions in paragraphs "C" through "E" listed under socket fusion.

C. Position saddle on scraped surface and position saddle clamp on it. Slide clamping tool onto edges of saddle fitting until clamp is squarely aligned beneath the fitting. Tighten clamp to secure fitting in place.

D. Fuse fitting to pipe following instructions in paragraphs "R" through "T" listed under socket fusion.

1.10.1 ELECTRICAL REQUIREMENTS AND COOLING TIMES

FITTING	FUSION TIME IN SEC.	CLAMPED TIME IN MINUTES	TOT COOL TIME	KVA	GENERATOR BREAKER MINIMUM	EXTENSION CORD SIZE 25 ft	50 ft.
COUPLINGS:							
1/2 IPS	20	5	30	1.5	10	#12/3	#10/3
3/4 IPS	25	5	30	1.5	10	#12/3	#10/3
1 CTS	25	5	30	1.5	10	#12/3	#10/3
1 IPS	45	10	30	1.5	10	#12/3	#10/3
1-1/4 IPS	45	10	30	2.0	10	#12/3	#10/3
1-1/2 IPS	120	10	30	1.5	10	#12/3	#10/3
2 IPS	45	10	30	2.5	20	#10/3	#8/3
2-1/2 IPS***							
3 IPS	180	15	30	2.5	20	#10/3	#6/3
4 IPS	120	10	45	3.5	30	#10/3	#8/3
6 IPS	500	20	45	3.5	30	#10/3	#8/3
8 IPS	500	20	45	3.5	30	#10/3	#8/3
REDUCERS:							
3/4 IPS X 1/2 CTS	20	5	30	1.5	10	#12/3	#10/3
1 IPS X 1/2 CTS	25	5	30	1.5	10	#12/3	#10/3
1 IPS X 1/2 IPS	30	5	30	1.5	10	#12/3	#10/3
1 IPS X 3/4 IPS	30	5	30	1.5	10	#12/3	#10/3
1 IPS X 1 CTS	30	5	30	1.5	10	#12/3	#10/3
1 IPS X 1-1/4 CTS	30	5	30	1.5	10	#12/3	#10/3
3 IPS X 2-1/2 IPS	90	10	30	3.5	25	#1013	#8/13
TAPPING TEES:							
1-1/4 X 1	45	10	30	1.5	10	#12/3	#10/3
2 X 1	90	10	30	1.5	10	#12/3	#10/3
3 X 1	90	10	30	1.5	10	#12/3	#10/3
4 X 1	90	10	30	1.5	10	#12/3	#10/3
6 X 1	90	10	30	1.5	10	#12/3	#10/3
BRANCH SADDLES AND HIGH VOLUME TAPPING TEES:							
2 X 2	120	10	30	1.5	10	#12/3	#10/3
3 X 2	120	10	30	1.5	10	#12/3	#10/3
4 X 2	120	10	30	1.5	10	#12/3	#10/3
6 X 2	120	10	30	1.5	10	#12/3	#10/3

Voltages: 110V - 90 Volt Minimum 150 Volt Maximum
220V - 180 Volt Minimum 300 Volt Maximum
Frequency: 50 TO 70 Hz Inverters: Yes (Models B and C)
WARNING: A.C. Current Only

** This fitting was only developed for medium density pipe
*** Industrial use only

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Approved By: _____

1.10.2 FUSION MESSAGES

Message	Description
Central Electrofusion Systems Software Version X.X Model XXX Serial #XXXX	Update parameters for each Individual unit.
Attach Fitting	Operator prompt.
ID #XXXX Fuse Time XXX HH;MM Press Start	Valid fitting time, proceed with fusion.
ID #XXXX Fuse Time XXX HH:MM Release Stop	Stop button depressed, release to continue.
ID #XXXX Time Remaining XXX Current XX.X Voltage XX.X	Displayed and updated each second during fusion cycle
Fusion Complete Clamping Time XX Minutes	Successful fusion. Allow additional time for cooling.
Memory Full	Memory filled. Fusion can be made but will not be stored.
Memory 3/4 Full	Memory is nearing capacity. If computer retrieval of the fusion data is desired, memory should be extracted to Insure all data is retained. (Refer to Field Operations, page 3)

1.10.3 FAULT MESSAGES

Fault/Remedy	Probable Cause
Unknown Interface connector attached Attach Central Plastics connectors only	Incorrect connector or test plug attached to D-25 port.
Unknown Fitting.. try another	Fitting connector or resistor faulty; bad leads.
Processor output voltage fault Processor requires service	SCR's, responsible for voltage regulation, are shorted out.
Fitting amps low check leads Let fitting cool - reattach fitting or Press Stop - cut out fitting	Fitting resistance too high (current less than 2 amps after ramp up); bad leads or bad fitting.
Fault - output voltage out of range Press Stop - cut out fitting	Fitting connector faulty; bad leads
Fault possible bind or short stab Press Stop - cut out fitting	Misaligned pipe; short stab.
Fault - excessive ramp.up time Press Stop - cut out fitting	Insufficient generator power; generator voltage too erratic.
Fitting shorted out Press Stop - cut out fitting	Misaligned pipe: short slab; generator voltage too erratic.
Operator Stop Remove fitting	Operator has engaged stop switch for some reason.
Generator output below 90 volts for 110V units or 180 volts for 220V units.	Extension cord or power source is faulty or inadequate. Cannot guarantee reliable operation
Generator output above 150/300 volts Warning! Unplug Unit Immediately!	Improper voltage source; generator needs repair.

2.0 **ABNORMAL OPERATING PROCEDURES**

2.1 GENERAL

2.1.1 INDICATORS

2.1.2 CONDITIONS CONSTITUTING AN EMERGENCY

2.1.3 INITIATING ACTION

2.1.4 SHUTDOWNS

2.2 RESPONSE PLAN: ABNORMAL OPERATING CONDITIONS

2.2.1 UNINTENDED CLOSURE OR OPENING OF VALVES, OR INABILITY TO OPEN

2.2.2 PRESSURE, TEMPERATURE OR FLOW CONDITION OUTSIDE THE NORMAL OPERATING RANGE

2.2.3 LOSS OF COMMUNICATIONS OR POWER

2.2.4 OPERATION OF ANY SAFETY DEVICE

2.2.5 ANY OTHER MALFUNCTION OF A COMPONENT, DEVIATION FROM NORMAL OPERATION, OR PERSONNEL ERROR WHICH COULD CAUSE A HAZARD TO

2.3 RETURN TO NORMAL OPERATIONS

2.4 INCIDENT INVESTIGATION

2.5 SELF AUDIT

2.0 ABNORMAL OPERATING PROCEDURES

2.1 GENERAL

This section of the O&M Manual was developed in accordance with 49CFR 192.605(c). The Department of Transportation Regulations require that the Pipeline may not be operated at a level of safety lower than that required by the appropriate regulations. Whenever a condition is discovered that could adversely affect the safe operation of the Pipeline, that condition must be corrected within a reasonable time. However, if the condition presents an immediate hazard to persons or property, the Pipeline may not be operated until the unsafe condition has been corrected.

The purpose of this section is to provide responses to any deviation from normal operation on the Pipeline. Beyond immediate response, it also addresses the areas of investigating and correcting all incidents of abnormal operation.

2.1.1 INDICATORS

The Pipeline operator will be alerted to the presence of an abnormal operating condition when indicated by any of the following conditions:

A. Unintended closure or opening of valves, or inability to open or close valves.
B. Pressure, temperature or flow condition outside the normal operating range.
C. Loss of communications or power.
D. Operation of any safety device.
E. Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property.

In addition, the operator must be alert for other situations outside the pipeline system which may require special consideration. Examples of such indicators include:

A. Severe weather reports.
B. Bomb and/or extortion threat.
C. Civil disaster.
D. Civil unrest.
E. Natural disaster.

2.1.2 CONDITIONS CONSTITUTING AN EMERGENCY

Any condition involving a rupture or spill, fire, explosion, injury or death constitutes an EMERGENCY and immediate action shall be taken in accordance with the EMERGENCY PROCEDURE section of this manual.

2.1.3 INITIATING ACTION

The appropriate Response Plan for the abnormal condition shall be initiated immediately upon recognition of such condition. A summary of each abnormal operating incident will be kept on the "Abnormal Operating Condition Incident" form.

Response Plans for Abnormal Operating Conditions and other conditions that may adversely affect the Pipeline operation are included in this manual.

2.1.4 SHUTDOWNS

Except when necessary to protect the safety of the general public or employees, the Pipeline shall not be immediately shut down upon detection of an Abnormal Operating Condition. The Abnormal Operating Condition shall be investigated and the (designated Frontier management) shall determine the need to shut down the Pipeline.

2.2 RESPONSE PLAN: ABNORMAL OPERATING CONDITIONS

The responsibility for detection and notification of an Abnormal Operating Condition exists with the employee that detects that condition. An Abnormal Operating Condition may be detected as follows:

A. Frontier is notified by telephone that someone has detected a problem at Pipeline facilities or on the Pipeline right-of-way.
B. Frontier becomes aware of an abnormal operating condition because of data transmitted by a remote terminal unit.
C. The Pipeline operator detects a problem at Pipeline facilities or on the Pipeline right-of-way.

If an Abnormal Operating Condition is detected as listed in items A or C above, the Pipeline operator shall be notified immediately and that operator will investigate the Abnormal Operating Condition if necessary.

2.2.1 UNINTENDED CLOSURE OR OPENING OF VALVES, OR INABILITY TO OPEN OR CLOSE VALVES

If during a routine Pipeline patrol the Pipeline operator discovers a valve that is not in the proper position, then the operator shall notify the (designated Frontier management). Approval from the (designated Frontier management) must be obtained before that valve is returned to the proper position.

If during routine valve inspection, the Pipeline operator is unable to open or close a valve, the (designated Frontier management) shall be notified and appropriate action shall be taken to promptly repair or replace the improperly operating valve.

2.2.2 PRESSURE, TEMPERATURE OR FLOW CONDITION OUTSIDE THE NORMAL OPERATING RANGE

A. Low pressure indicated by instrumentation at the Supplier delivery station: The Pipeline operator shall investigate the Supplier facilities for possible instrumentation failure.

If the pressure indicator (gauge) at the Supplier facilities is also low then Supplier should be contacted immediately by the operator to determine if Supplier is having a line problem. If Supplier is not having a problem with their line then the Pipeline operator should request that a Supplier operator be dispatched immediately to inspect the Supplier maintained facilities at the pipeline tap.

B. High pressure at the Supplier pipeline tap: Supplier should be contacted immediately and should be requested to dispatch an operator to inspect the Supplier maintained facilities at the pipeline tap. This should not normally be a critical problem because the Frontier line is designed to meet or exceed Supplier's MAOP.

If the Pipeline MAOP is exceeded due to a failure of the Supplier maintained facilities then a Safety Related Condition Report may be required as detailed in section 4 of this manual.

C. Low Pressure anywhere else in the Pipeline: The Pipeline operator must determine from all available information whether any of the following situations have occurred:

1. Line leak.
2. Block valve closed.
3. Failure of a regulator or other piece of equipment.

Until the cause of the low pressure has been determined then the following notifications shall be made: (See Section 4, EMERGENCY AID TELEPHONE NUMBERS for RECEIPT/DELIVERY LOCATIONS).

1. (designated Frontier management).
2. Additional Pipeline operators as necessary to be on standby for further Pipeline investigation.
3. Customers serviced by that section of Pipeline if curtailment is imminent.

If the low pressure condition can be remedied without shutting down the Pipeline then appropriate action shall be taken, otherwise the individuals notified above should be notified that the Pipeline must be shut down and for how long that shut down will occur. The individuals notified above shall be notified again when the low pressure condition has been remedied.

A Safety Related Condition Report or an Incident Report may be required as detailed in section 4 of this manual.

D. High pressure at any point in the Pipeline: The most likely cause for this condition to occur would be failure of the Supplier maintained equipment at the pipeline tap or failure or Frontier maintained equipment at other points in the Pipeline. The Pipeline operator must determine from all available information whether the high pressure indication is the result of equipment failure or instrumentation failure and respond accordingly.

E. Low flow (or no flow) indication at the Supplier pipeline tap:

1. If the flow rates at Frontier's meters are proper, then the Pipeline operator shall investigate the Supplier facilities for a possible meter failure and notify Supplier of the results of that investigation if repairs are required to Supplier maintained equipment.

2. If the flow rate at the Frontier meter is also low, then Supplier shall be notified immediately to dispatch an operator to the pipeline tap facilities.

Depending on the circumstances, telephonic reporting to the MPSC may be required per section 4 of this manual.

F. Low flow (or no flow) indication at a Frontier customer's site:

1. If all other indicators are within normal operating parameters then the Pipeline operator shall investigate the Frontier customer's site for possible equipment failure.

2. If there are other abnormal operating parameters (e.g. low pressure) then the Pipeline operator shall investigate the Pipeline facilities and right-of-way for other possible problems and corrective action and notification shall be made as necessary and consistent with this manual.

Note: Item "G" will be deleted if a line heater is not installed at Supplier's tap

G. High temperature at the Supplier pipeline tap: The most likely cause for this condition would be failure of some component related to Supplier's line heater. The Pipeline operator shall investigate the Supplier pipeline tap facilities and if necessary immediately notify Supplier to dispatch an operator to the pipeline tap. If there is an immediately unsafe condition related to Supplier's line heater then the Pipeline operator shall take appropriate steps (closing valves, turning off the burner gas, etc.) to remedy the unsafe condition.

2.2.3 LOSS OF COMMUNICATIONS OR POWER

The Pipeline operator shall investigate the cause of the problem and if possible repair the problem. If the operator is unable to promptly repair the problem then the (designated Frontier management) shall be notified and the problem shall be repaired as soon as possible.

2.2.4 OPERATION OF ANY SAFETY DEVICE

Relief valves: If notification is received that a Supplier maintained relief valve has opened then Supplier shall be notified immediately to dispatch an operator to the pipeline tap facilities.

If notification is received or any other indication is noted that a Frontier maintained relief valve has opened then the cause of the incident shall be investigated immediately. If there is no apparent cause for the relief valve to have vented gas then that relief valve should be tested for proper operation as soon as practicable.

2.2.5 ANY OTHER MALFUNCTION OF A COMPONENT, DEVIATION FROM NORMAL OPERATION, OR PERSONNEL ERROR WHICH COULD CAUSE A HAZARD TO PERSONS OR PROPERTY

A. Odorant injection system alarm: The Pipeline operator shall investigate the facilities and correct the problem if possible. If it is not possible to immediately correct the problem then the (designated Frontier management) shall be immediately notified.

If the alarm is with the Supplier maintained facilities then a Supplier should be notified immediately to dispatch an operator to repair the equipment.

B. Other conditions: If uncertain whether any other operating condition requires action as detailed in the EMERGENCY PROCEDURES section of this manual then the Pipeline operator shall immediately contact the (designated Frontier management) for further guidance.

Section 4 of this manual should be consulted for guidance regarding telephonic or written notice that may be required to regulatory agencies.

2.3 RETURN TO NORMAL OPERATIONS

If the abnormal operating condition has required that equipment be removed from service, approval from the (designated Frontier management) shall be obtained before returning that equipment to service.

2.4 INCIDENT INVESTIGATION

An Abnormal Operating Condition Incident form shall be completed as soon as possible after an abnormal operating condition has been detected and corrective action has been taken.

2.5 SELF AUDIT

The (designated Frontier management) shall review the previous year's abnormal operating incidents and the response to incidents to determine the adequacy of incident response and reporting. The review should occur at least once a year at intervals not to exceed 15 months.

3.0 **EMERGENCY RESPONSE PROCEDURES AND PIPELINE CONTINGENCY PLAN**

3.1 GENERAL

3.2 PRIORITIES

3.3 EMERGENCY EVENTS

3.4 EMERGENCY NOTIFICATION PROCEDURES

3.5 RESTORATION OF SERVICE TO CUSTOMERS

3.6 PIPELINE REPAIRS: EQUIPMENT & MATERIALS

3.7 ANALYSIS OF DAMAGE/INVESTIGATION OF FAILURE

3.8 EMERGENCY EQUIPMENT

3.9 ADDITIONAL SUPPLIES AND EQUIPMENT

3.10 PURGING, TESTING, AND REINSTATING TO SERVICE

3.11 SELF REVIEW AND AUDIT

3.0 EMERGENCY RESPONSE PROCEDURES AND PIPELINE CONTINGENCY PLAN

3.1 GENERAL

In accordance with 49CFR 192.615, this emergency plan has been prepared to provide data essential in an emergency situation, as detailed below. Copies of this plan will be furnished to the (designated Frontier management) and his operators and such other persons as may be necessary to implement the provisions of this plan.

No emergency plan can cover all situations. There is no substitute for sound judgment of the situation by the Pipeline operator or other personnel that may respond to a Pipeline emergency.

3.2 PRIORITIES

During any emergency, the following priorities shall be observed:

A. Safety of the public and employees.

B. Protection of property, wildlife and ecology.

C. Restoration to normal operations.

3.3 EMERGENCY EVENTS

The following events shall be considered an emergency that will initiate one or more Emergency Response Procedures:

A. The pipeline is leaking hazardous amounts of gas.

B. Gas is detected inside or near a building within 1/4 mile of the Pipeline.

C. Fire is near to or involving the Pipeline or its appurtenances.

D. An explosion has occurred near to or involving the Pipeline or its appurtenances.

E. Natural disaster in the area.

3.4 EMERGENCY NOTIFICATION PROCEDURES

A. A Frontier operator receives a call regarding a problem of some sort involving the natural gas pipeline.

B. The Frontier operator logs the call and all pertinent information to enable the source of the problem to be located on the facility map.

If the call involves a leak inside a commercial building or residence, the Frontier operator will notify the caller to:

1. Extinguish all open flames.
2. Not strike matches.
3. Not turn electrical switches on or off
4. If the caller is using the telephone inside the building with the suspected leak, do not use that telephone again and leave the telephone off of the hook.
5. Open windows and doors if possible.
6. Leave the building on foot and remain a safe distance away from that building until the problem has been investigated.

C. The **Frontier** operator advises the Pipeline operator of a possible problem. The Pipeline operator will proceed to the problem site with an appropriate combustible gas indicator (capable of detecting total percentage gas in air) to evaluate the incident.

On all inside building leak investigations, the first check should be the testing of the room atmosphere with a CGI. Where there is a full or partial basement, test the basement wall area around the gas fuel line entrance. At buildings or premises without basements, test the area around the service or fuel line riser, at any air vents, crawl spaces, and at the service or fuel line entrance on the inside of the building.

If it is determined that a hazardous condition exists, the following steps should be taken:

1. Clear the building of all occupants.
2. Turn off the gas at the meter.
3. Ventilate the building until explosive atmosphere has cleared.
4. Prohibit all possible sources of ignition such as smoking, welding, striking matches, operating electrical switches, etc.
5. Call for assistance and notify police & fire department.
6. If it is determined or believed the source of the leak is from the gas system and of a hazardous nature, all adjacent buildings on both sides of the street shall be checked to determine any additional hazardous conditions.

D. Odorant leak: The Pipeline operator will shut down and isolate the odorant injection system and immediately notify the (designated **Frontier** management)

The (designated **Frontier** management) will determine the need for further emergency contacts. Spill clean-up will be performed at the direction of the (designated **Frontier** management) and in accordance with the odorant MSDS.

E. External gas leak report, fire, explosion, or natural disaster affecting the Pipeline:

The Pipeline operator will proceed to the reported leak location and will assess the situation.

1. Gas leak report with no apparent Pipeline leak:

If the Pipeline operator investigates the vicinity with an appropriate combustible gas indicator (using a bar hole tool if necessary to investigate the ground in the area) and no Pipeline gas leak is found (or a gas leak or odor source other than the Pipeline is found) then the Pipeline operator shall inform the property owner or adult resident of the results of the investigation and request that person to sign the Leak Investigation Report. If the property owner or an adult resident is not available, a letter explaining the results of the investigation shall be sent by first class mail to the person occupying the premises.

The Pipeline operator shall also provide the adult person occupying the premises with an odor sniff card which identifies the odor of natural gas and indicates a name, address, and telephone number to contact if the leak indications are again noticed.

2. Readily apparent Pipeline gas leak, explosion, or fire (as evidenced by strong odor, large gas concentration, or obvious physical damage.

If a threat to public safety is thought to or known to exist, the pipeline operator will notify the (designated **Frontier** management) and appropriate civilian emergency authorities if those steps have not already been taken. The Pipeline operator will then initiate the following steps with the assistance of the (designated **Frontier** management) and civilian emergency authorities:

a. Assess danger to people first then property.
b. Set up the Incident Command Center.
c. Initiate the Emergency Check List.
d. Close the valves as necessary to isolate the emergency area.
e. Determine the exact location of the problem (i.e., gas may be blowing from the ground at some distance from a rupture).
f. Remove from the area all persons not immediately involved in handling the emergency.
g. Remove each potential source of ignition from the area.
h. Determine the repair equipment and materials necessary.
i. Determine the repair schedule.
j. Contact a contractor to assemble the necessary equipment and repair materials.
k. Prevent removal of materials or disturbance of the site after the gas flow has been cut off and prior to an investigation.
l. Notify the DOT and MPSC as detailed in Section 4 of this manual, assemble details and prepare the Transmission or Distribution System Incident report, and assemble an internal investigation team as directed by the (designated **Frontier** management).

3. Line Hit Investigation

   a. Upon arrival, assess damage to line at and near point of impact.
   b. Check surrounding buildings for evidence of gas.
   c. Locate and barhole survey line at 10-foot intervals from point of impact.
   d. If hit is on service line, excavate and visually check service tee for damage.
   e. Make repairs as required.
   f. Recheck within 24 hours of initial investigation.
   g. Complete documentation.

   If a line hit has resulted in a leak, fire or explosion, initiate appropriate emergency actions as detailed above.

Note Regarding Public Emergency Response Personnel:

The gas distribution system is a network of interconnected mains. For purposes of sectionalizing, valves have been installed throughout the system. All main valves are clearly marked on the map records. proper operation of a valve may create a hazardous condition, or make a hazardous condition worse. ONLY authorized utility personnel should operate valves. Fire, police and other officials ARE NOT authorized to operate valves (except meter shut-off valves).

4. Carbon Monoxide Emergency Procedures

   The steps outlined in this subsection should be followed in the event carbon monoxide is detected or suspected in a building.

   a. Move occupants to fresh air outdoors.
   b. Call for emergency help.
   c. Provide first-aid, as required.
   d. Ventilate building.
   e. Shut off offending appliance.
   f. Remedy problem, red tag appliance, or advise customer that appliance must not be used until the faulty condition is repaired.

REFER TO EMERGENCY AID NUMBERS IN SECTION 4 OF THIS MANUAL

3.5 RESTORATION OF SERVICE TO CUSTOMERS

When the supply of gas has been cut off to an area, no gas should be turned on to the affected area until the individual service to each customer has been turned off.

A customer to customer operation will be conducted, in which each customer's service will be turned off at the meter and/or at service valves. If the service valve cannot be located, the service line will be uncovered, a valve installed and shut off.

In restoring service to an affected area, all gas piping and meters will be purged and appliances relighted. Gas must not be turned on at the meter without access to ALL appliances on the customer piping. If a customer is not at home, a card will be left in a conspicuous location, requesting the customer to call the utility to arrange for restoration of service.

Extreme care will be taken in coordinating service restoration to ensure strict compliance with restoration procedures.

3.6 PIPELINE REPAIRS: EQUIPMENT & MATERIALS

The following is a partial list of equipment and materials which will be needed for repairs:

A. Pretested pipe.
B. Back hoe.
C. Arc welding machine.
D. Acetylene cutting torch.
E. Beveling machine.
F. Line-up clamps.
G. X-ray inspection equipment.
H. Lifting equipment--side boom, twin-tandem tractor truck with long gin poles
I. Pipe coating materials.
J. Camera equipment for photographs of the site before repairs are begun.

If pipe must be replaced, it must be uncovered to the first joint lying in soil undisturbed by the break or rupture. Any pipe which has been exposed to fire or which has been subjected to stresses caused by any movement from the break or rupture should be replaced. A single joint which has been pretested for the MAOP of the section involved will be welded into the line and placed in operation after non-destructively examining the welds.

Pipeline repairs shall be performed in accordance with Sections 1 and 5 of this manual.

3.7 ANALYSIS OF DAMAGE/INVESTIGATION OF FAILURE

Certain things should be especially noticed when first surveying the damage. Usually pipe edges will have chevron marks clearly visible to the naked eye. These are indicative of brittle fracture as opposed to a shear-type fracture. Shear is a cleavage along a line 45 degrees to the plane of the plate and is relatively smooth and polished looking. Brittle fracture produces a rougher appearing edge and is more or less square to the plane of the plate. In any case, after finding chevron marks, begin to mentally reassemble the pipe pieces in your mind's eye, keeping track of the direction in which the chevron arrows are pointing. The sets of arrows on either side of the fracture initiation point will point to the spot at which the break began. It is usually desirable to preserve the broken pieces of pipe in as near their condition immediately following the break as possible. If it is raining, they should be covered with a tarp. After repairs are begun, the pieces should be carefully loaded and transported to a secure, dry storage area. Several groups will be interested in this pipe, including the pipe manufacturer, engineers representing an outside consultant, company engineers and possibly government or insurance investigators.

Taking of samples or "souvenirs" of any sort will not be allowed without first receiving written approval from the (designated Frontier management).

If it is determined that the break may have been caused by vandals or third-party damage, the area immediately surrounding the break should be thoroughly searched as soon as possible after the site is found. Careful analyses by corrosion personnel will be required. Samples of coating, soil, and ground water should be taken.

This is the time when all available records concerning the failed pipe section will be needed. Pipe mill test reports, heat analyses, inspectors reports, X-Ray film -- particularly if girth weld is suspected as the cause -- pipeline hydrostatic test records, dates and means of shipment, inspectors reports, dates of installation, dates of any repairs or outside construction activity; all these will be required by the various agencies interested in the investigation. The history of operation will also be required. Items such as pressure records, gas quality, corrosion inspection reports, and outside damage reports will be examined.

If a piece of equipment other than steel pipe has failed, all of the above information also applies. If the failed piece of equipment is removed from the area in which it failed, care shall be taken to keep all pieces of that piece of equipment intact and stored safely and in a dry environment until all investigations are completed.

No physical evidence relating to the investigation shall be disposed of until written approval has been provided by (designated Frontier management).

3.8 EMERGENCY EQUIPMENT

The following emergency materials shall be maintained and readily available for use during an emergency:

Materials	Location
Maps and Drawings	(designated Frontier office)
Records and Reports	As Above
Facility keys (Spares)	See list in Section 4 of this manual
Combustible Gas Indicator	Pipeline operator vehicle
Bar hole tool	Pipeline operator vehicle.
Previously hydrostatically tested line pipe	(to be designated) Frontier storage yard Facility
Warning barricades and barricade tape	Pipeline operator vehicle and/or (to be designated) Frontier storage yard
Camera and film	(designated Frontier management) vehicle, Pipeline operator's vehicle
Line locator	Pipeline operator's vehicle and/or (to be designated) Frontier storage yard
Communication equipment	(designated Frontier management) vehicle, Pipeline operator's vehicle
Sorbent material	(to be designated) Frontier storage yard
Hand tools	Pipeline operator's vehicle
Fire extinguishers	(designated Frontier management) vehicle, Pipeline operator's vehicle

3.9 ADDITIONAL SUPPLIES AND EQUIPMENT

Additional manpower, equipment and supplies can be obtained from:

Contractor/Supplier	Location	Telephone No.

(to be developed)

3.10 PURGING, TESTING, AND REINSTATING TO SERVICE

Purging, testing, and reinstating the line to service shall be performed in accordance with Section 1 of this manual.

3.11 SELF REVIEW AND AUDIT

The (designated Frontier management) shall review these emergency response procedures at intervals not to exceed 15 months but at least once annually for adequacy of procedures and the need for emergency response training.

4.0	**REFERENCES**
4.1	OZARK NATURAL GAS COMPANY GAS PIPELINE
4.1.1	MAOP (MAXIMUM ALLOWABLE OPERATING PRESSURE)
4.1.2	CLASS LOCATION
4.1.3	INTERNAL CORROSION
4.1.4	CONTROLS AND PROTECTIVE EQUIPMENT
4.1.5	ODORIZATION
4.1.5.1	ODORANT
4.1.6	DAMAGE PREVENTION PROGRAM
4.1.7	PUBLIC EDUCATION
4.1.8	JURISDICTION OF PUBLIC AGENCIES
4.2	INCIDENT REPORTS
4.3	SAFETY-RELATED CONDITION REPORTS
4.4	TRANSMISSION SYSTEM ANNUAL REPORT
4.4.1	DISTIBUTION SYSTEM ANNUAL REPORTS
4.5	HANDLING THE NEWS MEDIA
4.5.1	(DESIGNATED FRONTIER MANAGEMENT) OR DESIGNEE
4.6	PUBLIC STATEMENTS
4.7	PUBLIC AGENCY NOTIFICATION PROCEDURE
4.8	FACILITY KEY LIST
4.9	**EMERGENCY AID TELEPHONE NUMBERS**

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4.9.1 LOCAL EMERGENCY PERSONNEL

4.9.2 PIPELINE OPERATIONS

4.9.2 RECEIPT/DELIVERY LOCATIONS

4.9.3 FOREIGN PIPELINE, RAILROAD AND UTILITY CROSSINGS

4.10 CORPORATE STAFF

4.11 REGULATORY AGENCY TELEPHONE NUMBERS AND ADDRESSES

4.12 FORMS

4.0 REFERENCES

4.1 KENTUCKY FRONTIER GAS PIPELINE

This section provides detailed information on the Frontier Pipeline. Further information on the associated facilities and equipment can be found in facility drawings and equipment data books located in facilities at several points on the Pipeline and in the office area of the (designated Frontier management).

4.1.1 MAOP (MAXIMUM ALLOWABLE OPERATING PRESSURE)

The Pipeline consists entirely of (general description of types of pipe).

The Pipeline traverses rural or undeveloped areas, suburban, residential and industrial area, but does not traverse areas of multistory buildings; therefore, each section of the Pipeline is in a Class 1, 2 or 3 location, as defined by 49CFR 192.5. The Pipeline was designed and built as if the entire line was in a class 3 location.

The MAOP of each section of line is as follows:

(to be developed)

4.1.2 CLASS LOCATION

In accordance with 49CFR 192.5, the Pipeline traverses Class 1, 2 and 3 locations. The Class of each section of the Pipeline is noted on the master drawings available in the (designated Frontier management) office.

4.1.3 INTERNAL CORROSION

In accordance with 49CFR 192.477, if corrosive gas is transported in the Pipeline, suitable means of monitoring internal corrosion must by employed.

The gas received into the Pipeline is substantially free of water and contains insignificant amounts of H_2S or CO_2. Therefore, the gas transported is not corrosive and no monitoring for internal corrosion is required. Williams's gas analyses for gas transported through the Pipeline is reviewed monthly for composition changes that may require internal corrosion monitoring.

4.1.4 CONTROLS AND PROTECTIVE EQUIPMENT

The Pipeline relief valves and regulators must be inspected at least once each calendar year with the interval not to exceed 15 months. The record of this inspection must be kept with the permanent Pipeline records. Inspection procedures are detailed in Section 1 of this manual.

Note: The Pipeline operator or other Frontier representative shall witness inspection of Williams maintained regulation or relief equipment and obtain a copy of the inspection record for the permanent Pipeline files.

4.1.5 ODORIZATION

In accordance with 49CFR 192.625 and utility policy, natural gas in the Frontier Pipeline shall be odorized. The Williams line gas is odorized. Frontier will operate additional odorant injection stations as necessary to comply with regulations as determined by odorant level checks.

The odorant must be injected at a rate proportional to flow in a quantity sufficient that the odorant is detectable at a concentration of natural gas in air of one-fifth (1/5) of the lower explosive limit (approximately 1% gas in air) of natural gas in air. The level of odorant in the Pipeline will be periodically checked and the results of that check will be recorded on the Odorant Level Inspection Form.

4.1.5.1 ODORANT

Until further notice, the odorant to be injected into the Pipeline shall be (to be determined)

4.1.6 DAMAGE PREVENTION PROGRAM

In accordance with 49CFR 192.614, Frontier has instituted a damage prevention program as detailed below:

When the Pipeline was installed, continuous warning tape was buried in the ditch approximately 1.5 - 2.5 feet above the pipe to warn anyone excavating over the Pipeline.

In accordance with 49CFR 192.707, Pipeline marker signs containing the words WARNING, CAUTION, or DANGER followed by GAS, in 1" high letters with one-quarter inch stroke and containing the utility name and a 24 hour telephone contact number have been placed on the Pipeline right-of-way as follows:

A. At each crossing of a public road or railroad.
B. At each crossing of a high pressure oil, gas, or natural gas liquids pipeline.
C. At each crossing of a canal, ditch, creek, or other waterway.
D. At each above-ground structure of the Pipeline.
E. At distances apart such that one sign can be seen from another sign.
F. At any other places necessary to identify the Pipeline and reduce the possibility of damage.

Signs that are reported as missing or damaged must be promptly replaced.

Frontier also participates in the ("One Call") system. The operators of the ("One Call") system have complete right-of-way maps of the Pipeline and they notify Frontier whenever an excavation is scheduled to occur near the pipeline. When someone contacts the ("One Call") system requesting a line locate, the ("One Call") system obtains the following information and notifies the caller that a minimum of 48 hours notice is required for a line locate:

A. Contact name, company, and telephone number.
B. Contact address.
C. Date and time of construction activity and/or requested meeting.
D. Location of the construction activity with any special marking details (e.g., is the area of proposed activity staked, flagged, or otherwise marked).
E. Purpose of the excavation activity.
F. Any other pertinent details.

When Frontier is notified of the line locate request details, the (designated Frontier management) shall determine if a line locate is required. If necessary, the Pipeline operator shall locate and mark the line in accordance with LINE LOCATING in Section 1 of this manual. The (designated Frontier management) shall also determine the need to

have the Pipeline operator or another Frontier representative on site during the construction activity. Follow-up inspections of the construction activity shall be performed as detailed in INSPECTION, located in Section 1 of this manual.

4.1.7 PUBLIC EDUCATION

In accordance with 49CFR 192.616, Frontier has developed a public awareness program to notify persons and businesses located along the Pipeline right-of-way of the existence of the Pipeline and of the proper procedures to follow if a Pipeline leak is suspected. The general public will be informed of the presence of the Pipeline through various means including, but not limited to bill inserts and newspaper advertisements.

Frontier has also developed a program to notify potential excavators in the area of the existence of the Pipeline. The list will be updated annually and excavators on the list will be notified of the utility's Damage Prevention Program and how to obtain a line location.

Records indicating the addressees for mailings and the media used for other communications shall be kept with the permanent pipeline records.

4.1.8 JURISDICTION OF PUBLIC AGENCIES

(list to be developed)

The utility shall conduct documented meetings with representatives of the public agencies listed above concerning applicable procedures during an emergency, including contact of the utility in the event of gas related fires, physical damage to pipeline facilities, line hits, suspected leaks, etc. Training or instructional materials that describe the basic properties of natural gas shall also be provided.

4.2 INCIDENT REPORTS

Telephonic reports of the following "incidents" must be made at the earliest practicable moment (DOT prefers not more than 2 hours) to the MPSC and the Department of Transportation:

A. A release of gas from a pipeline that results in one of the following:

1. A death or personal injury necessitating in-patient hospitalization; or
2. Estimated property damage, including cost of gas lost, of the operation or others, or both of $50,000 or more, or

B. An event that is significant, in the judgment of the operator, even though it does not meet the criteria of paragraph 1.

DOT Form RSPA F 7100.1 (distribution) or F 7100.2 (transmisssion) must be completed and submitted to the MPSC and DOT as soon as practicable but not more than 30 days after detection of the incident.

4.3 SAFETY-RELATED CONDITION REPORTS

A "Safety-Related Condition Report" must be filed concurrently with the MPSC and the DOT for the following conditions (telephonic notice is not required):

A. In the case of a pipeline that operates at a hoop stress of 20 percent or more of its SMYS, when corrosion reduces the Pipeline wall thickness to less than that required for the maximum allowable operating pressure, and localized corrosion pitting to a degree where leakage might result.

B. Unintended movement or abnormal loading by environmental causes, such as an earthquake, landslide, or flood, that impairs the serviceability of a pipeline.

C. Any material defect or physical damage that impairs the serviceability of a pipeline that operates at a hoop stress of 20 percent or more of its specified minimum yield strength.

D. Any malfunction or operating error that causes the pressure of a pipeline that causes that pipeline to rise above its maximum allowable operating pressure plus the build-up allowed for operation of pressure limiting or control devices.

E. Any leak in a pipeline that constitutes an emergency.

F. Any safety-related condition that could lead to an imminent hazard and causes (either directly or indirectly by remedial action of the operator), for purposes other than abandonment, a 20 percent or more reduction in operating pressure or shutdown of operation of a pipeline.

A "Safety-Related Condition Report" is not required for Items B through F above if the condition is corrected within the deadline for filing the report. A "Safety-Related Condition Report" is always required for the condition detailed in Item A above.

"Safety-Related Condition Reports" must be filed (received) in writing within 5 working days (not including Saturdays, Sundays, or Federal holidays) after the day a representative of the operator first determines that the condition exists, but not later than 10 working days after the day a representative of the operator discovers the condition.

4.4 TRANSMISSION SYSTEM ANNUAL REPORT

In accordance with 49CFR 191.17, DOT Form RSPA F 7100.2-1 must be submitted to the DOT and MPSC not later than March 15 for the period covering the previous calendar year.

4.4.1 DISTIBUTION SYSTEM ANNUAL REPORTS

In accordance with 49CFR 192.11, DOT Form RSPA F 7100.1-1 must be submitted to the DOT and MPSC not later than March 15 for the period covering the previous calendar year.

4.5 HANDLING THE NEWS MEDIA

All inquiries from legitimate news media and from authorized persons are to be directed to the (designated Frontier management) or his specified designee. This includes on-site inquiries. This person will respond according to the basic procedures provided for in this section.

4.5.1 (DESIGNATED FRONTIER MANAGEMENT) OR DESIGNEE

A. Log in the name of person and agency representing.

B. Provide to the contact:

1. Facts that have been confirmed and are apparent (or public knowledge). You should have this information for the initial media contact and subsequent queries from others. Most incidents, fires, leaks, blowouts, etc., will be apparent and obvious. Calling emergency agencies or personnel is a public knowledge action. Whether an incident, fire, spill, leak, etc., has ceased or not, is obvious in most cases and public. Therefore, enough apparent and public facts are obtainable to avoid a "no comment" situation without speculation.

2. When and where any additional information or a statement will be available and how it will be released.

Be polite, but do not speculate or confirm or deny any facts that have not been cleared. Do not permit or authorize news media on location or within property until the news media can be given explicit instructions. It is preferable that the news media in such case be accompanied by a qualified and responsible person.

C. Record any questions asked but unanswered due to the inability to provide answers without research or clearance.

Typical background questions might include Frontier's annual revenue, expansion project plans, operational areas, etc. The answers to all or some of these questions might be provided at additional media contacts or by a statement after they have been cleared and/or researched.

D. Inform (designated Frontier management) of all news media contacts, what information was provided and what questions were asked.

4.6 PUBLIC STATEMENTS

Public Statements should contain, as appropriate:

A. The nature, time and location of the incident and other facts that are clearly not in dispute.
B. The steps being taken or planned by Frontier or outside agencies to control and/or repair the situation, and to prevent a recurrence. If advisable, an estimate of the time required to repair or to restore operations to normal. This may include a brief description of damage to Frontier property, effect on normal operations, etc.
C. The name of the official Frontier spokesman and general identification of other Frontier personnel involved in the remedial steps.
D. Names, addresses, ages and title classifications of Frontier personnel or others who were victims of the emergency - but only after their families have been notified and such releases seem appropriate.
E. Any other pertinent facts which may have a bearing on public or employee interpretation of the emergency.

Public statements should **never** contain:

A. Speculation on the cause or effect of the emergency.
B. Estimates of the extent of damage or the cost to Frontier or any individual because of the emergency.
C. Any information not cleared for release by appropriate management.
D. Inflammatory or emotional statements which may reflect the state of mind of the individuals involved.
E. Any information which might mislead the public, harm individuals involved or their families, or endanger Frontier's position in legal proceedings at a future date.

4.7 PUBLIC AGENCY NOTIFICATION PROCEDURE

(to be developed)

4.8 FACILITY KEY LIST

Keys for the Pipeline facilities have been distributed as follows:

(to be developed)

4.9 **EMERGENCY AID TELEPHONE NUMBERS**

These telephone numbers shall be reviewed periodically by the (designated Frontier management) and changes shall be made as necessary:

4.9.1 LOCAL EMERGENCY PERSONNEL

All locations on the Pipeline
(Fire, Police, Sheriff, Highway Patrol): 911

(direct dial numbers to be added)

4.9.2 PIPELINE OPERATIONS

(to be developed)

4.9.3 RECEIPT/DELIVERY LOCATIONS

(to be developed)

4.9.4 FOREIGN PIPELINE, RAILROAD AND UTILITY CROSSINGS

(to be developed)

4.10 CORPORATE STAFF

(to be developed)

4.11 REGULATORY AGENCY TELEPHONE NUMBERS AND ADDRESSES

Department of Transportation (DOT) (24 Hours) (800) 424-8802
(Office of Pipeline Safety) Fax (202) 366-7128

Information Resources Mgr.
Office of Pipeline Safety, RSPA
U.S. Dept. of Transportation
Room 8417, 400 Seventh, S.W.
Washington, D.C. 20590

Missouri Public Service Commission

(address and phone numbers to be added)

4.12 FORMS

The following forms are contained in this section: (forms to be added)

(list is not complete)

Abnormal Operating Condition Incident Report
Atmospheric Corrosion Inspection Form
Block Valve Inspection Form
Cathodic Protection Rectifier Maintenance Record (Anodes)
Cathodic Protection Rectifier Maintenance Record (Rectifier)
Cathodic Protection Test Readings Report
DOT RSPA F 7100.1 Distribution System Incident Report
DOT RSPA F 7100.1-1 Distribution System Annual Report
DOT RSPA F 7100.2 Transmission System Incident Report
DOT RSPA F 7100.2-1 Transmission System Annual Report
Emergency Checklist
Equipment Calibration Form
External Corrosion Inspection Report
Frontier Daily Operations Report
Hydrostatic Test Report
Internal Corrosion Inspection Report
Leak Investigation Report
Line Locate Request (Call Before You Dig Notification)
O&M Manual Review Form
Odorant Level Inspection Report
Pipeline Patrol Report
Regulator Inspection Form
Safety Related Condition Report

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5.0 CONSTRUCTION & REPAIR DETAILS

5.1 PRESSURE TESTING

This section covers the utility's standards for pressure testing of all distribution facilities. All distribution facilities shall be tested in accordance with these standards. This includes replacements and extensions to the system for services and mains. This section also includes testing for reinstating service lines.

The procedures in this section were prepared in accordance with 49CFR 192, subpart J and 192.725.

5.2 TESTING SAFETY

Care shall be exercised when releasing the test pressure from a pipe segment under test. No work shall be performed on a segment under test pressure. No work shall be done on any connected service or fitting until the test pressure is released. During pressure tests, no person shall be allowed to stand in front of a cap secured by a compression coupling, or at the end of a pipe segment under test.

5.3 TESTING DISTRIBUTION MAINS AND SERVICES

Steel and Plastic Distribution Facilities - All mains and services operating at 99 Psig or less shall be tested at 100 Psig. All steel mains and service lines operating at a pressure above 99 Psig shall be tested at 1.5 times the maximum allowable operating pressure (MAOP).

5.3.1 DISTRIBUTION FACILITIES TEST DURATION

The test pressure must hold steady for one hour for each 100 cu. ft. of volume unless a means of reading less than 1 psi. increments of pressure is available. No main should be tested for less than one hour and no test should be more than 24 hours. Tests for up to 3 hours may be made using an indicating gauge. For tests requiring a longer duration of time, a recording gauge should be used.

PIPE LENGTH FOR 100 CU. FT. OF VOLUME			
1 1/4"	10,000'	10"	182'
1 1/2"	7,140'	12"	127'
2"	4,340'	16"	76'
3"	1,960'		
4"	1,135'		
6"	498'		
8"	288'		

Individual service lines should be tested for a minimum of 15 minutes but no longer than one hour.

5.3.2 RECORDS

The "Pressure Test Report" must be completed for each pressure test performed. The report should include a description of the facility tested, date test duration, pressure chart (if applicable), test medium used, and name of person who made or witnessed the test.

5.3.4 TESTING FOR REINSTATING SERVICE LINES

Disconnected service lines shall be tested in the same manner as new service lines. If the line is temporarily disconnected from the main, it should be tested from the point of disconnection to the service line valve. However, if provisions are made to maintain continuous service, such as by installation of a bypass, any part of the original used to maintain continuous service need not be tested.

5.4 TRANSMISSION FACILITIES PRESSURE TESTING

In accordance with 49CFR Part 192, Subpart J, this procedure has been prepared for use when hydrostatic pressure testing transmission lines during construction.

Each segment of a steel pipeline must be strength tested to substantiate the proposed MAOP. Where a building which is intended for human occupancy is within 300 feet of a pipeline in a Class 1 or Class 2 location, a hydrostatic test shall be conducted to a test pressure of at least 125% of MAOP on that segment of the pipeline within 300 feet of the building. The test section may not be less than 600 feet unless the length of the newly installed or relocated pipe is less than 600 feet. In a Class 1 or Class 2 location, a compressor station, regulator station, or measuring station shall be tested to at least Class 3 location test requirements.

New segments of pipeline shall not be operated or segments of pipelines that have been relocated or replaced shall not be returned to service until they have been hydrostatically tested to substantiate the proposed MAOP and each potentially hazardous leak has been located, eliminated and retested.

5.4.1 TEST PERIOD

Each pipeline section shall be tested after pressure stabilization as follows:

Facilities operating at a pressure that will produce a hoop stress of 30% SMYS or greater shall:

A.. Be tested for a minimum continuous duration of eight hours;
B. For fabricated units and short sections of pipe where a post installation test is impractical a pre-installation test must be conducted for a continuous duration of four hours.

Facilities operating at a pressure that will produce a hoop stress of less than 30% SMYS and above 100 psig shall be tested for a minimum continuous duration of one hour.

5.4.2 TEST PRESSURE

The test pressure to which a pipeline shall be tested is as follows:

For facilities that will operate at a hoop stress above 30% SMYS the test pressure shall be a minimum of 1.5 times the MAOP.

Note: In situations where 1.5 times the MAOP will produce a hoop stress greater than 70% SMYS, the proper testing procedure must by approved in writing by the (designated Ozark management).

For facilities operating at a hoop stress below 30% SMYS and above 100 PSIG, the test pressure shall be 1.5 times the MAOP or 20% SMYS, which ever is greater.

5.4.3 LIMITATIONS

The procedure, test pressure, duration and instrumentation shall be capable of verifying the structural integrity of the system and/or disclosing potentially hazardous leaks. If a component (such as a valve) other than pipe is the only item being replaced or added to a pipeline or station, a test after installation is not required if the manufacturer of the component certifies it has been tested at a pressure greater than or equal the test pressure required for the facility to which it is being added. Tie in welds made when the valve or other assembly is installed may be required to be radiographically examined but do not need to be strength tested. Testing of the pipeline and station piping may consist of sectional testing or testing the entire system as one project. When tested in sections, the test shall be from test manifold to test manifold. Under no circumstances shall a valve be used as a bulkhead.

5.4.4 HYDROSTATIC PRESSURE TESTING PROCEDURE

The following procedure is presented as general guide for hydro testing. Generally, all of the steps will not be necessary for systems designed and operated below 720 psig. However, for those systems operating in excess of 1,000 psig or when the proposed test pressure will produce a hoop stress in excess of 70% SMYS, the entire procedure may be used. Included is a general sequence of events, details of certain operations, problems which may be encountered and suggested solutions to these problems.

5.4.4.1 GENERAL SEQUENCE OF EVENTS

Pressurizing the line:

A. Fabricate and install manifolds
B. Set up fill equipment as shown in Figure 1.
C. Begin filling operation. Continue pumping until section is full and packed to a pressure equal to the capacity of the centrifugal fill pump.
D. Close all valves and disconnect fill line. Blind flange the fill connection valve.
E. Check all valves and connections for leaks.
F. Connect pressure pump, deadweight and pressure records to manifold. Install other records as required. Check instrumentation calibration and condition.
G. If field testing, connect stroke counter and P-V plotter.
H. Begin pressuring at approximately 10 psig/minute.
I. When pressure is sufficient to cause stress equal to 70% SMYS at the lowest point in the pipeline, begin a P-V plot both by hand and instrument. Continue pressuring until pre-determined test pressure is reached. For an initial test, this will be a pressure which induces a stress equal to a maximum of 100% SMYS at the low elevation and a minimum of 95% SMYS at high elevation.

Monitoring the pressure test:

A. When initial test pressure is reached, shut down pressure pump and begin leak test. The first six hours is the stabilization period. During this time the line is repressured to maximum test pressure if the pressure decreases.
B. An eight-hour leak test is started with the line pressured to maximum test pressure and held without repressuring for the duration of the test. Record hourly pressure readings on the proper form.
C. When the leak test is complete, decrease the pressure to 70% SMYS. Begin pressuring at approximately 5 psig/minute. Hand and mechanical P-V plots to be started at this point. Pressuring and plotting to continue until a 5 psig deviation occurs on the plot or the hoop stress reaches 110% SMYS at the low elevation. This will be the final test pressure. If for any reason pressuring is stopped during :the yield test, bleed back to 70% SMYS and start the test over.
D. When maximum test pressure is reached, disconnect and bull plug the pressure connection.
E. Begin hourly pressure readings and record on proper forms.
F. The test is to be is held for eight hours without repressure.
G. When test period is complete, bleed off pressure and proceed with dewatering operations.

5.4.4.2 DETAILS OF OPERATIONS REQUIRED

A. Initial Planning

1. Determination of Test Pressures

a) Test pressures for yield tests are based on the physical properties of the pipe involved and thus described:

$P = \frac{2\,St}{D}$

Example: Find Max. and Min. T.P. for 16" - 0.250"-X42 pipe

P = Pressure (psig)
S = Specified Minimum Yield (psig)
T = Wall thickness (inches)
D = Diameter (inches)

$P = \frac{2(42{,}000)0.250}{16} = 1312$ psig

1,312 psig is therefore the internal pressure at minimum yield.

Therefore:

1,443	= 110%	SMYS	= max. during yield test
1,312	= 100%	SMYS	= max. at low elev. (initial test)
1,246	= 95%	SMYS	= min. at high elev. (initial test)
919	= 70%	SMYS	= start of P-V Plots

b) An elevation survey must be made for each test section, either by instrument or by using U.S. Geological Survey Maps. Instrument derived profiles are preferred. Upon completion of the survey a profile of the line is plotted and test pressures for each section are then computed based on elevation difference in each section. Test pressures indicated on profile drawings are generally the pressures to be used during the leak test. Further computations must be made in order to determine maximum pressure during the yield or strength test.

Pressures involved is one criteria in the determination of manifold locations.

2. Determination of Fill Sites

   a) Determination of fill sites is based on location along the line, amount of water available, and the ability to withdraw water without interruption from landowners or government agencies.

   b) Permits required for water withdrawal must be obtained before the pressure test begins.

   c) In some cases it will be necessary to obtain samples of fill water to be tested by an independent laboratory. Elements to be determined are pH factor, silt content and saline content. Project Engineer should make decision on usability

B. Manifold Construction

1. Check all valves, flanges, and fittings on manifolds to ensure sufficient pressure rating to withstand pressures to be used for the particular test.

2. Make sure flange bolts are tight and satisfactory gaskets installed.

3. Ensure sufficient room on manifold for adequate valves required for "bleeding in" pigs dewatering and drying.

4. Do not allow use of prefabricated manifold furnished by contractor unless records of previous tests on which they have been used can be obtained. Check for dents and/or other damage.

5. Where Victualic pipe is used for crossovers from one section to another and for fill line from pumps to manifold, make sure all gaskets are in good shape and that all bolts are tight. Bolts that can be loosened by pump vibrations and loose connections are extremely dangerous when pressure is involved.

6. All threaded connections are to be properly doped to ensure against leakage.

C. Manifold Installation

1. Manifolds are to be installed initially as shown on construction drawings. Additional manifolds may be required to sectionalize to facilitate leak location.

2. A recheck of actual manifold elevation as compared to that as shown on the test profile is not practical, but in hilly areas discrepancies may be noted visually. For instance, you may be able to see that a manifold is not located at a specific high or low area that you can definitely identify from the profile. In such cases the engineers should check out the manifold elevation.

It is advisable, but not necessary, that welds on manifolds be x-rayed, except for in station testing where they should always be x-rayed.

D. Instrument Check Calibration & Placement

1. Check of Instruments

a. Check to see that proper charts are available for the particular records being used. Use 2,000 psi pressure charts in all cases.

b. Check deadweight to determine if it is in proper working order. Possible problems with the deadweight are a bent spindle and insufficient oil in the cylinder.

c. Pressure hoses to the deadweight should be filled with oil or during cold weather testing, fill with antifreeze.

d. Recorder clocks often stop during the test period. Recording instruments should be wound or fresh batteries should be installed and the clock rotation should be observed prior to placement so as to give some indication as to the condition of the instrument.

Periodic checks of all recorders should be made during the test. If an instrument has been stopped for a period of time, and cannot be started, replace the instrument, start a new chart, and note the problem encountered on the chart. Save all charts.

e. Be sure pens are filled with the proper ink, i.e. do not use green ink on a green line chart, blue ink on a blue line chart, etc.

f. If a P-V plotter is being used, the technician assigned to this instrument should be entirely responsible for ensuring that the machine is in proper working order.

g. Always have a good thermometer available for use in noting ambient temperatures.

5.4.4.3 CALIBRATION OF INSTRUMENTS

A. Accuracy of the deadweight can be checked with a deadweight tester; however, these are not usually available from pipe-line contractors or in the particular area where the test is taking place. The deadweight must be considered to be accurate.

B. Pressure recorders can be calibrated or adjusted to the pressure indicated by the deadweight by simple adjustment of the pen arm. Once the test pressure has been reached, all pressure recorders should be checked to make sure they agree with the deadweight pressure.

Although a deadweight is not required at the end of the section opposite the pressure pump location, it is advisable that a deadweight reading be taken at the location and the adjacent pressure recorder be adjusted accordingly.

C. Temperature recorders can be field calibrated by the following method:

Fill one thermos bottle with water and ice and one with hot water. Insert a mercury bulb thermometer in each bottle. Insert the recorder bulb into the ice water and leave for five minutes, stirring the water occasionally. Adjust the pen to record as indicated on the mercury thermometer. Insert the recorder bulb into the hot water and repeat the above procedure. Repeat the entire procedure to ensure proper calibration.

Be sure pen is inked during calibration so that pen arc can be observed. Arc variation can cause erroneous readings. Any problem with arc variation should not be corrected in the field but by a technician experienced in this type of work.

Turn the chart by hand to check the ink line.

D. Calibration of the P-V plotter should be made by technician supplied by contractor or by a manufacturer's representative.

5.4.4.4 PLACEMENT OF INSTRUMENTS

A. Deadweights should be placed on a firm, level surface that is protected from the wind. Wind can cause erroneous pressure readings.

B. Pressure recorders are placed at each end of each test section, set level and protected from the wind and from animals if installed in pasture land.

C. Temperature recorders are placed at the 1/3 points on the test section. It is preferable to insulate the bulb from the surrounding backfill. Backfill should be to ground level. Use the same precautions in placement as with the pressure, recorders.

D. P-V plotter must be located inside a shelter to protect it from the elements.

E. Place the mercury bulb thermometer in a location that will be protected from direct sunlight and wind.

5.4.4.5 FILL OPERATIONS: EQUIPMENT

A. The fill pig should be three rubber with cup type rubbers. It is run ahead of the water to attempt to keep the water in a solid column thereby preventing air pockets.

B. The low head pump feeds the main pump and should be set as close to water source level as possible to prevent losing head.

C. Fill pump should be sufficient to supply 1,200 gallon/minute at 0 psig head and to provide 300 to 500 psig pack pressure under normal conditions. Rate will, of course, decrease as the head pressure increases.

D. Filter as described in specs. At a minimum, a 100 mesh screen should be installed that is capable of being backflushed while in service. The filter should be backflushed if the fill source is extremely dirty.

E. The meter should be sized to the fill pipe and capable of minimum 1,200 gallon/minute. Preferably readout should be in gallons rather than cu. ft.

F. Fill pipe with couplings should be in good conditions more especially on the discharge side of the fill pump. On Victaulic pipe, oil should be used as a seal for the rubber gaskets. Pour some oil over each gasket prior to installing clamp.

Make sure all connections are tight. A 20 ft. piece of six inch pipe swinging free under 500 psi pressure is extremely dangerous.

G. Check valve should be installed on suction side of low head pump to prevent backflow in case of shut down.

H. Suction Screen should be placed over water intake pipe to protect against larger debris from passing through the pump.

5.4.4.6 PRESSURE OPERATIONS: EQUIPMENT

A. The pressure pump should be a positive displacement type, preferably with minimum of 0.5 gal/stroke and minimum volume of 5 to 300 gal./minute @ 3,000 psi. The preferred pump is a triplex, with direct drive and a transmission. Belt driven pumps are subject to belt slippage at higher pressures which will cause erroneous information on hand plots.

B. The P-V plotter is to be capable of plotting pressure versus volume across a minimum six-inch wide chart and be read to the nearest 0.03 percent of full scale. This instrument is used only when testing to pressures beyond SMYS.

C. The stroke counter should be an electrical impulse or mechanical device with sufficient lead wire and cumulative counter and is used for producing the hand plot.

D. The hand plot is the development of a curve by plotting pressure as determined by deadweight reading vs. volume as determined by the stroke counter.

The straight line relationship between pressure and volume for points below the elastic limit will establish the base line. All points on the curve are plotted against the base line and should continue along this line until the "elastic limit" (not to be confused with "yield") is reached. The elastic limit is defined as the maximum stress to which a material may be subjected without any permanent strain remaining upon complete removal of stress. At this point, the plotted points will begin to fall below the base line. Generally the first point of initial deviation (if succeeding points continue to fall below the base line). This point is sometimes debatable since points will vary along the base line depending on the accuracy of the persons making the plot and reading the stroke count. Pressuring continues from this point until predetermined pressure or five pound volumetric offset is reached.

Offset is stated in pounds deviation and is the difference between the last point plotted and the base line.

Offset does not usually occur during the leak test, but if it does, pressuring will continue to the minimum test pressure that has been determined for that particular pressure point.

When the plotted points fall above the base line, it is believed that this is caused by air in the line and the plot will be useless.

E. If maximum deviation occurs prior to reaching 100% SMYS contact the project engineer for instructions.

F. Pressuring should be done at a fairly slow rate in order to reduce pressure surges along the line and to enable the person making the P-V plot to produce a more accurate plot.

G. High pressure pipe or hose on discharge side of the pressure pump must be checked for proper pressure rating. "Chicksan" pipe is probably the best but high pressure hose is easier to work with. In either case, all connections must be tight.

5.4.4.7 TEST PRESSURE NOTATIONS

A. Test pressures are to be as noted on profile drawing or as otherwise communicated by the project engineer. When additional manifolds are required for sectionalizing the line because of leaks, new test pressures must be determined.

B. Test Pressure Variations During Test

Changes in ambient temperature and pipe temperature will cause corresponding changes in pressure. The shorter the section and/or the smaller the pipe, the more radical the change.

On short sections of line, during periods of considerable temperature change, it is practically impossible to adhere to the specification relating to repressuring during the stabilization period. Under certain conditions, continual repressuring would be required. This is an area where the test engineer must use his judgment as to how often to repressure.

5.4.4.8 LEAKS AND LEAK DETECTION

A. A variation in pressure during a test can usually be attributed to a flaw in the pipe or weld, changes in temperature or leakage through fittings or valves.

B. In too many cases, the presence of an actual leak is hard to determine. Some of the variables covered in preceding sections explain why. The difficulty naturally increases as the apparent size of leak decreases. A rapid, steady decrease in pressure with no apparent effect from temperature will certainly indicate the presence of a leak. The problem arises when a slow decrease in pressure then a gradual leveling off is experienced. This can be caused by a leak or by reasons already discussed.

C. Many charts, curves and calculations have been developed to aid in determination of presence of leaks, probable size of leaks, pressure-temperature relationship in determining leaks and relative probability of finding leaks.

To use these implements, certain information is required, which appears on various forms that are included in the normal report. Curves and calculations available:

1. Temperature-Pressure Rate: Apparent pressure decrease per degree temperature decrease.
2. Equivalent Leak Diameter
3. Pressure Rate-Small Pipe: Apparent gal./lb./min. for 2" - 14"
4. Pressure Rate-Large Pipe: Apparent gal./lb./min. for 10" - 40"
5. Temperature Rate-Small Pipe: Apparent decrease in volume per degree decrease Gal./deg. F/Mm.
6. Temperature Rate-Large Pipe
7. Change in volume required to effect a 1 psi change in pressure.
8. Size of and Probability of Finding Leaks
9. Section Volume
10. Pipeline volume corrected for water temperature and pressure (calculated).
11. Hydro test calculations: Shows relation between water required and water pumped. Some of the information in these charts and calculations is duplicate but can be compared and average values used in determination of leak presence.

D. If it is felt that a leak definitely exists, various methods are available for attempting to locate the leak.

If the leak is in the magnitude of 20 gallon per hour or greater and the pipe is installed in loam, clay or sandy soil, water should come to the surface but not necessarily at the point of failure. If the leak is on a side hill, the water will generally follow the pipe down the line to the bottom of the hill. Experience has shown that some leaks under tape or X-Tru Coat will not break through at the exact point of failure but flow under the coating to a weak point then escape.

E. Small leaks generally require sectionalizing unless it is located by use of one of the Sonic leak detectors available. Sonic equipment is also required to locate many leaks even after sectionalizing. If it has been established that a leak definitely exists, then sectionalizing must continue until it is located or until a decision is reached that it would be advisable to remove the water and fill the section with gas in an attempt to facilitate locating the leak. Sectionalizing is very time consuming and expensive, -and should be considered only as a last resort.

5.4.5 PRETESTING & STATION PIPING

Pre-tests and usually a considerable amount of station piping are tested with the pipe exposed. This will cause considerable fluctuation in pressure and makes it extremely difficult to produce records that are easy to interpret. The only control over this type of test is to continually bleed off pressure during the period of high temperatures and should the pressure drop below minimum test pressure during the cool periods, the facility should be repressured to keep pressure above minimum. To help control this problem, fabricated assemblies should be sheltered from direct sun if possible.

Visual inspection will generally detect leaks on hydro test; soaping may be required for air test.

5.4.6 DEWATERING AND DRYING

A. Equipment

1. Best equipment for dewatering and drying is the three rubber squeegee with cup type rubbers. The cups expand against the pipe wall to give a larger drying area.

2. Solid disc rubbers work well for drying in that they can be run in either direction without being removed from the line. Our specifications require all drying runs be made in the same direction thereby canceling the real advantage to using disc rubbers. This should be changed.

3. Poly-Pigs work satisfactorily on small lines, say 10" and smaller, but are more susceptible to damage than the squeegee pig.

4. Spheres have been used in the past and have been satisfactory; however, they are also susceptible to damage possibly causing deflation in the line and canceling the effectiveness of the run.

B. Runs

1. Initial dewatering run should b~ made as slow and as steady as possible. Erratic runs will allow back flow behind pigs when they stop. Use gas for dewatering whenever possible. Generally, air cannot be supplied in sufficient quantity to provide a smooth flow of the pigs.

2. Drying runs required will, of course, depend on amount of water on each succeeding run. Specifications require a minimum of two runs consisting of a train of three pigs for each run.

   If no water is visible at the end of a drying run that it is assumed that the line is as a dry as can be accomplished with squeegee runs. This does not mean, however, that the line is completely dry. It is impossible to completely dry a line using pigs due to moisture that is continually wiped along the pipe walls. A long slow purge prior to loading the line will usually cause further drying of pipe walls.

3. If there is any double about moisture left in the line a dew-point measurement can be taken if equipment is available. Acceptable water vapor content is generally considered to be 4-6 pounds per Mmcf at standard conditions.

5.4.7 AIR, NATURAL GAS, INERT GAS TESTING

A. Air or natural gas is generally used to test small diameter lines (3"-4"-6") when relative small volumes are required.

B. Inert gas, usually nitrogen, is mainly used for testing town border stations, measuring stations, short sections of small diameter pipe and some fabricated assemblies.

C. Hoop stress limitations expressed as a percentage of SMYS are as follows:

Class Location	Natural Gas	Air or Inert Gas
1	80	80
2	30	75
3	30	50
4	30	40

5.4.7.1 EQUIPMENT

Determine volume required for sections to be tested and determine if suitable equipment is being provided to give volume and pressure required in a reasonable period of time. Even with large two-stage units this time will naturally vary with size of pipe and length of section.

5.4.7.2 MANIFOLD CONSTRUCTION AND INSTALLATION

A. Manifolds can be made similar to hydro test manifolds except that large connections such as six-inch are not required and space for cleaning pigs is not required. Valves and flanges must be checked for proper pressure rating.

Screw valves are most desirable for air testing. Proper doping of threads and subsequent bull plugging of valves is the best insurance against leaks in valves.

B. Since location of manifolds is of no consequence as far as pressure is concerned, they can be located at the extreme ends of the line being construction; however, consideration should be given to dividing a section if it is of considerable length or if in a gathering field, numerous laterals and measuring stations are involved.

5.4.7.3 INSTRUMENTATION

Instrumentation will be identical to that required for hydro test except that the P-V plotter is not required. Calibration and placement of instruments will also be identical to hydro test requirements.

5.4.7.4 AIR, NATURAL GAS, INERT GAS TEST PRESSURES

A. Test pressures will be indicated on one of the construction drawings since a profile is not required.

B. Temperature changes will generally have a greater effect on air than on water; therefore, as much exposed piping as possible in the case of meter runs and due consideration must be made of the exposed pipe involved when attempting to analyze air test results.

5.4.7.5 TEST LIMITATIONS

A. Test period is 24 hours, repressuring if necessary during the first six hours and holding the remaining 18 hours.

B. Pressure must remain above minimum test pressure for a minimum of eight hours in order to satisfy DOT requirements.

C. Since test pressures are usually stated as 1.5 X design pressure and not including a maximum and minimum, it will be difficult if not impossible to hold a satisfactory test during periods of considerable temperature fluctuation unless the maximum test pressure is determined to be something above 1.5 x design. In this case 1.5 x design would then become the minimum test pressure and pressure must be maintained above this point throughout the 18 hour test period.

5.4.7.6 LEAKS

A. Air test leaks are extremely difficult to find unless a chemical additive has been injected into the air stream. Natural gas leaks are probably easier to find than water or air leaks. This can be accomplished using one of the many detector available.

B. Exposed piping connections, valve stems, etc., are to be soap tested during the test to ensure against leakage at these points.

5.4.7.7 SAFETY

Identical safety measures must be initiated as those required for hydro testing. A rupture during an air or gas test will be much more violent than with water and, of course, the gas would be more serious due to possibility of explosion and fire.

5.4.8 FAILURE

A. Ruptures and leaks occurring in the longitudinal seam should be repaired by replacing the entire joint or joints in which the rupture occurs.

B. When testing in or through a residential area, thought should be given to evacuation of persons residing near the line. This would be during the entire test period. In any event, the line route should be posted with signs stating that a test is in progress. In addition, it would be advisable to request local news media to broadcast information concerning such tests.

C. During certain seasons in agricultural areas, farmers working in fields crossed by the facility being tested should be notified of the test and of the possibility of failure. It would then be his prerogative as to whether he continues to remain in the area.

D. Check all high pressure hoses, pipe fittings, valves and connections to determine insofar as possible the condition of the equipment and determine that material is of a proper pressure rating for the intended test.

E. Be sure that all pressure has been bled off of the section before disconnecting hoses or pipe.

F. When testing a portion of the present system, it is advisable to use a ventilator device to clear the line of gas before cutting into the pipe.

G. Be sure discharge pipe used during dewatering operations is secured to prevent being whipped around especially during the end of the dewater operation when slugs of gas that bypass the pigs and mix with the water sometimes cause a rather violent reaction at the end of the discharge pipe.

5.4.9 COMMUNICATIONS

On large projects where there are numerous test sections of considerable length, communications should be established with at least one unit at each end of the test section. Communications should be continued during all phases of the test operation; filling, pressuring and dewatering.

5.4.10 TEST REPORTS

The basic report shall include all forms as listed in Construction Procedures Manual and in addition the pressure and temperature charts and mechanical P-V plot. Some specific instructions for the various forms include:

A. Be sure that separate forms are completed in their entirety for each test section and that they are signed by the test engineer and Chief Inspector.

B. Pressure and temperature charts must be started at the beginning of leak test and changed at the beginning of the final test and should show the pressure up and bleed-off. The times on the recording charts must correspond to actual time. Always write on each chart the date and time it was put on and taken off and the section number.

Never change charts when a test is in progress unless a recorder becomes inoperative. In this case clearly note on the chart the cause for the change. Note any abnormal fluctuations on the chart and explain on the face of the chart. All pressure charts must show the 91pressure-up" curve and the bleed-down curve.

C. Submit only that part of the P-V plot that pertains on the actual test. Anything additional only clutters up the report.

5.5 CUSTOMER SERVICE LINES

Customer service lines shall be installed in accordance with accepted industry standards and applicable provisions of 49CFR Part 192 Subpart H

5.5.1 SERVICE LINE LOCATIONS

The location of service lines should be approved by an employee of the company or contractor working for the company. Whenever practical, service lines should extend in a straight line to the building at right angles from the main.

5.5.1.1 PROHIBITED LOCATIONS

A. Service lines shall not be installed under buildings, garages, barns or enclosed porch spaces unless installed in a gas-tight conduit;

1. The conduit and the service line must, if the service line supplies the building it underlies, extend into a normally usable and accessible part of the building; and

2. The space between the conduit and the service line must be sealed to prevent gas leakage into the building and, if the conduit is sealed at both ends, a vent line from the annular space must extend to a point where gas would not be a hazard, and extend above grade, terminating in a rain and insect resistant fitting.

B. Service lines should not be installed in the same trench with water services, sewers or other gas service lines or mains.

C. Gas regulator vents and relief vents should be installed as directed in Section 830.1. Note they shall also be located in a manner to prevent ice and snow from blocking the vent.

5.5.2 SEPARATION FROM OTHER FACILITIES

A. When service lines cross other buried facilities or structures, a minimum separation of 6 inches should be maintained.

B. When service lines are installed in a trench with other facilities, the gas service line should be located above all other facilities in the trench, and there 'should be a minimum of 6 inches separation between the gas service line and the other facilities.

5.5.3 JOINT SERVICES

A. An existing service stub should not be tapped to provide service to another customer unless it is impractical to tap the main for the new service stub.

B. No service line on private property should be tapped to provide service to another customer unless it {s impractical to provide service in any other manner.

5.5.4 ABOVE GRADE SERVICE ENTRANCE

A. Residential gas services and/or fuel lines should enter the building above the ground level and above the foundation wall or sill, wherever this is practical.

B. Commercial, industrial and all other services should conform to this practice, wherever feasible.

C. The locations of service line risers and entrances to buildings shall be given maximum consideration to possible hazards.

5.5.5 BELOW GRADE SERVICE ENTRANCE

Each below grade service line and/or fuel line installed through the outer foundation wall of a building must:

A. In the case of a metal service line, be protected against corrosion;

B. In the case of a plastic service line, be protected from shearing action and backfill settlement; and

C. Be sealed at the foundation wall to prevent leakage into the building.

5.5.6 SERVICE LINES TO MOBILE HOMES

A. Service line risers and meter sets should be located where they will not be subjected to damage by moving of mobile homes or vehicles, or protected service line from the possibility of damage.

B. The service line riser should be located alongside and to the rear of the mobile home and planned so as to be compatible with other utility services in the court. Each service line riser shall be provided with and approved valve.

C. Where a meter and/or regulator are installed, a post(s) is required to support the setting. Precautions must be taken if the post(s) is of steel construction to insure that the post does not create a "shorted" condition which would adversely effect cathodic protection. Care must also be taken to insure that the post does not interfere with the service line or other underground facilities.

5.5.7 SERVICE LINE SIZING

The following table is provided for proper service line sizing based on connected load requirements and the length of service line. Service line capacity is given in cubic feet per hour for a distribution system operating at 20 psig and a 10 % pressure drop.

	Service Line - Pipe Size					
Length of Service Line Feet	1/2" CTS	3/4" ips With 1/2" Riser	3/4" IPS	1" IPS	1 1/4" IPS	2" IPS
50 or less	500	1450	2220	3310	7940	15,500
75	420	1370	1090	3050	6660	14,530
100	360	1300	1970	2830	6040	13,680
125	330	1230	1650	2660	5550	12,950
150	300	1180	1530	2510	5160	12,320
175	280	1130	1430	2380	4840	11,760
200	260	1090	1350	2260	4570	11,270
250	230	1010	1220	2080	4130	10,440
300	210	950	1120	1930	3790	9,750

5.6 CUSTOMER METER/REGULATORS

Customer meters and regulators shall be installed in accordance with accepted industry standards, manufacturer's-recommendations, and applicable provisions of the 49CFR Part 192, Subpart H.

5.6.1 METER LOCATIONS

Normal customer meter location is to be outside of the customer's building at a location either facing the main or no more than 2 feet back on either side of the building edge facing the main.

Meter set locations inside buildings are to be located in a ventilated area as near as possible to the service entrance and a minimum of three feet from any source of ignition or heat source that could damage the meter set.

A meter inlet valve shall be located outside buildings with an existing inside meter set. Inside meter sets are not allowed for new or reinstated service.

5.6.2 METER SET PROTECTION

Meter set protection shall be provided for all meter sets exposed to conditions that could damage the meter set. Meter sets where customer's equipment could create pressure variations of back pressure or vacuum will require the installation of automatic devices to protect the meter set.

All regulator vents are to be terminated outside of buildings at an elevation high enough to protect it from flooding and have safety devices designed to provide moisture protection, insect resistance and minimize back pressure. Vents must be located to allow gasses to vent freely and away from any hazardous area.

All pits and vaults must be designed to support traffic that the area may be exposed to.

5.6.3 INSTALLATION

Meter sets will be installed to minimize anticipated stresses on piping or meter set materials. No close all thread pipe nipples or other easily damaged material should be used. Meters must be installed at least 10" above finished grade.

New meter sets are located where they are:

A. clear of electric panels - 3 foot minimum
B. accessible and outside of buildings
C. at least 6 feet away from doors and windows that open
D. at least 6 feet away from outside air intakes
E. protected from vehicular traffic

Meter sets will not be located under decks, porches, stairways or drain spouts. Meters will not be used at more than 67 percent of the manufacturer's shell test pressure. Meter set locations on the front of garages or adjacent to parking areas must be protected. These locations should be discouraged.

5.6.4 OPERATION

When a meter is installed, changed out, or repaired, the regulator must be tested for safety.

A. Conduct a lock up test before the meter set is connected to the customer piping. The lock up test is to be conducted by adjusting the regulator to normal delivery pressure. Establish the manufacturer's recommended flow rate to adjust the regulator. When flow is stable, abruptly shut off flow and observe the lock up pressure for a period of time sufficient to determine if there is a leak in the regulator. If the initial lock up pressure exceeds 1" of w.c. on 3/4" through 1 1/4" service regulators, 3 in w.c. on 1 1/2" or 2" regulator sizes of 1% of absolute delivery pressure on an elevated pressure regulator, the regulator needs repair or the orifice is too large for the inlet pressure.

To test domestic service regulators, a 1/8" hole drilled in the side of a spare capped meter swivel will vent the required flow rate needed. The pressure measuring device (manometer or test gauge) is also to be attached to the capped swivel.

B. A lock in test on the customer's piping shall be conducted each time a customer's service is turned on. A lock in test consists of starting with all appliance valves turned off and the gas turned on and pressurized to normal system pressure. The meter will be observed for a minimum of five minutes. There should be no movement of the meter test hand. When customer piping is installed, replaced or changed, a 10 psi pressure test shall be run for a minimum of 15 minutes in addition to the lock in test.

5.6.5 METER SIZING

DIAPHRAGM METERS - Diaphragm meters operated at 4 oz. should be sized so the normal maximum load will not exceed the 1/2" w.c. meter capacity. Diaphragm meters to be operated at elevated -pressures must be sized by determining the 2" meter capacity at the metering pressure. This information is not available in the manufacture's meter information and assistance in sizing meters operating at elevated pressures is recommended.

Size diaphragm gas meters operating at 4 oz. in the following manner:

A. Determine the BTU input from the manufacturer's nameplate for each gas appliance served. If the name plate is missing, the following table may be used for domestic appliances.

Appliances	Approximate Input - BTU/HR
Space Heating	
Hot Air (per room)	20,000
Steam or Hot Water (per room)	30,000
Water Heaters	
30 to 40 Gallon Tank	45,000
50 Gallon Tank	55,000
Ranges	
Free Standing Single Oven	65,000
Free Standing Double Oven	90,000
Built In Oven/Broiler	25,000
Built In Counter Top Unit	40,000
Clothes Dryer	20,000
Incinerator	35,000
Outdoor Grill	35,000
Fireplace Log	25,000

B. Determine which appliances are base load and which are occasional load:

Base Load Appliances:	Gas Heating Equipment Gas Water Heater
Occasional Load Appliances:	Gas Range Gas Dryer Gas Incinerator Gas Fireplace Log

C. Total the base load input ratings. If only base load appliances are served, proceed directly to Step G.

D. Total the occasional load input ratings.

E. Multiply occasional load total by 0.5.

F. Add the BTU base load total to the adjusted occasional load total.

G. Divide the total load from Step F by 1,000 to find total cubic feet of gas required per hour.

H. Select a meter size larger than the total from Step G. Meter size information is available on the meter badges and from the manufacturer's published data.

(example data)

EQUIMETER	CFH @ 1/2" w.c.	CFH @ 2" W.c.
Model 175	175	--
Model 275	275	--
Model 415	415	900
Model 750	750	1,600
Model 1,000	1,000	2,200
Model 3,000	1,450	3,000
Model 5,000	2,500	5,000
Model 10,000	5,000	10,000

Rotary meters can be operated at maximum dial rated meter capacity. Determine meter size using the same procedure listed for Diaphragm Meters. Two additional steps are required to determine proper rotary meter size.

Determine from the customer load data, the minimum flow rate the meter will operate at and the hours per day for the minimum flow condition.

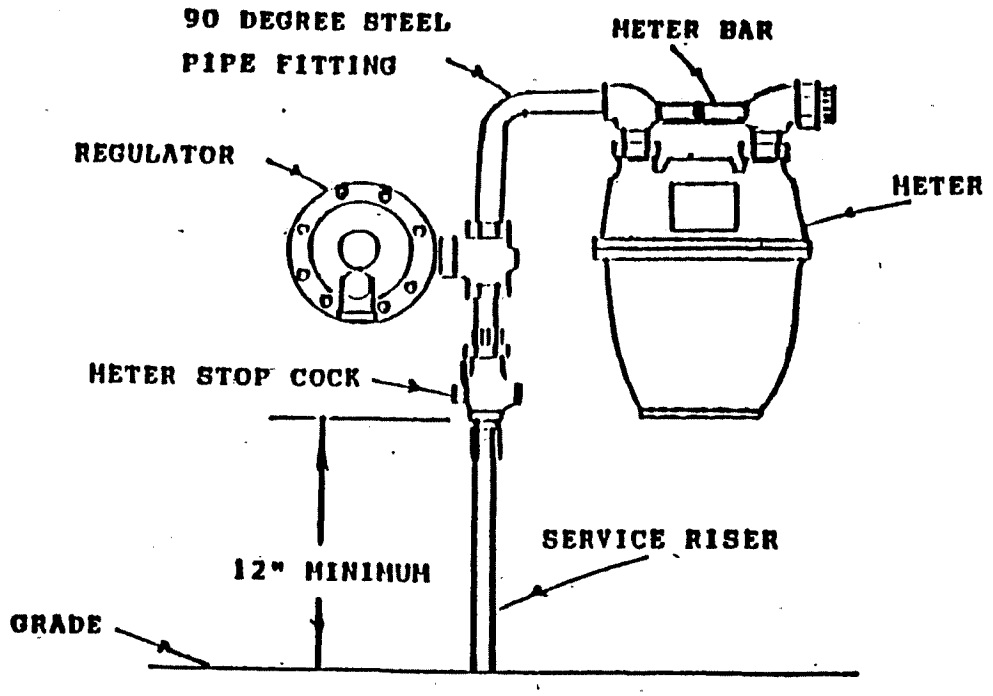
Multiply the rotary meter capacity selected by 0.03. This will be the flow in CFH that may not be measured by the meter. If this is larger than the minimum flow rate, determine the effect of gas volumes not measured to determine proper metering selection.

STANDARD ROTARY METER SIZES

(Roots)	Capacity
3M	3,000 CFH
5M	5,000
7M	7,000
11M	11,000

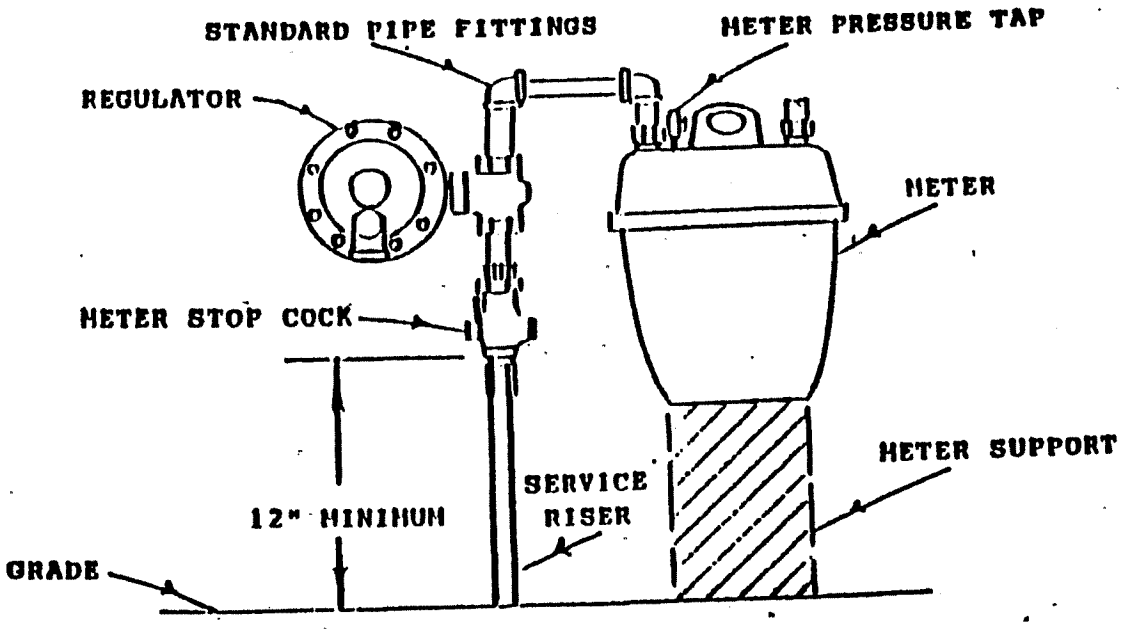
5.6.6 TYPICAL METER SET INSTALLATIONS

A. Diaphragm meter sets



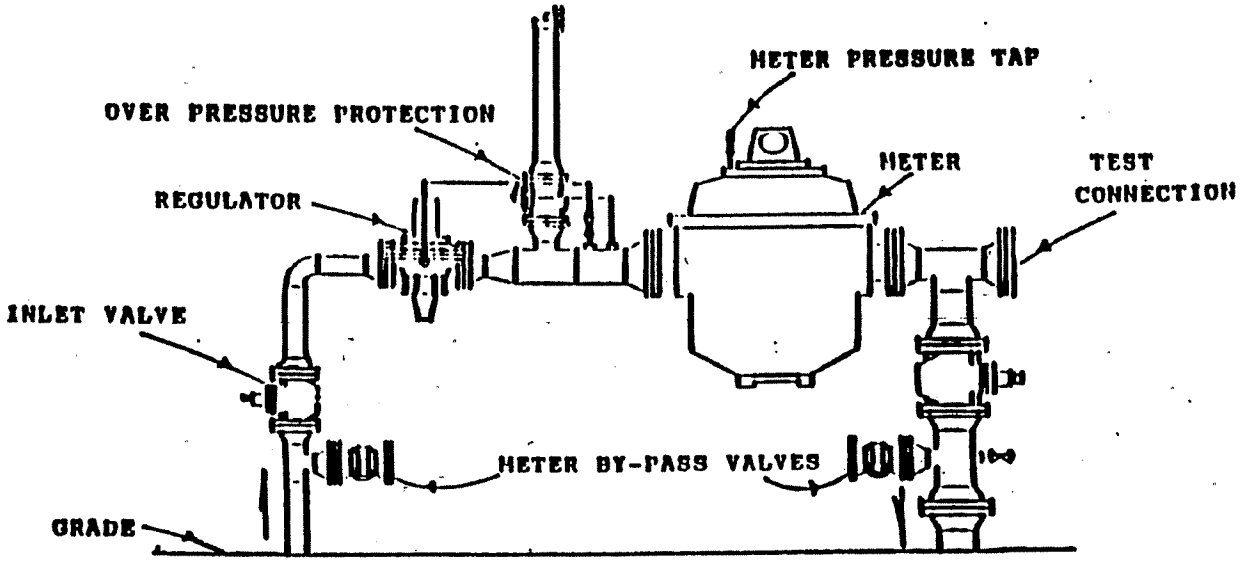
Typical Domestic Meter Set

A. Diaphragm meter sets (continued)



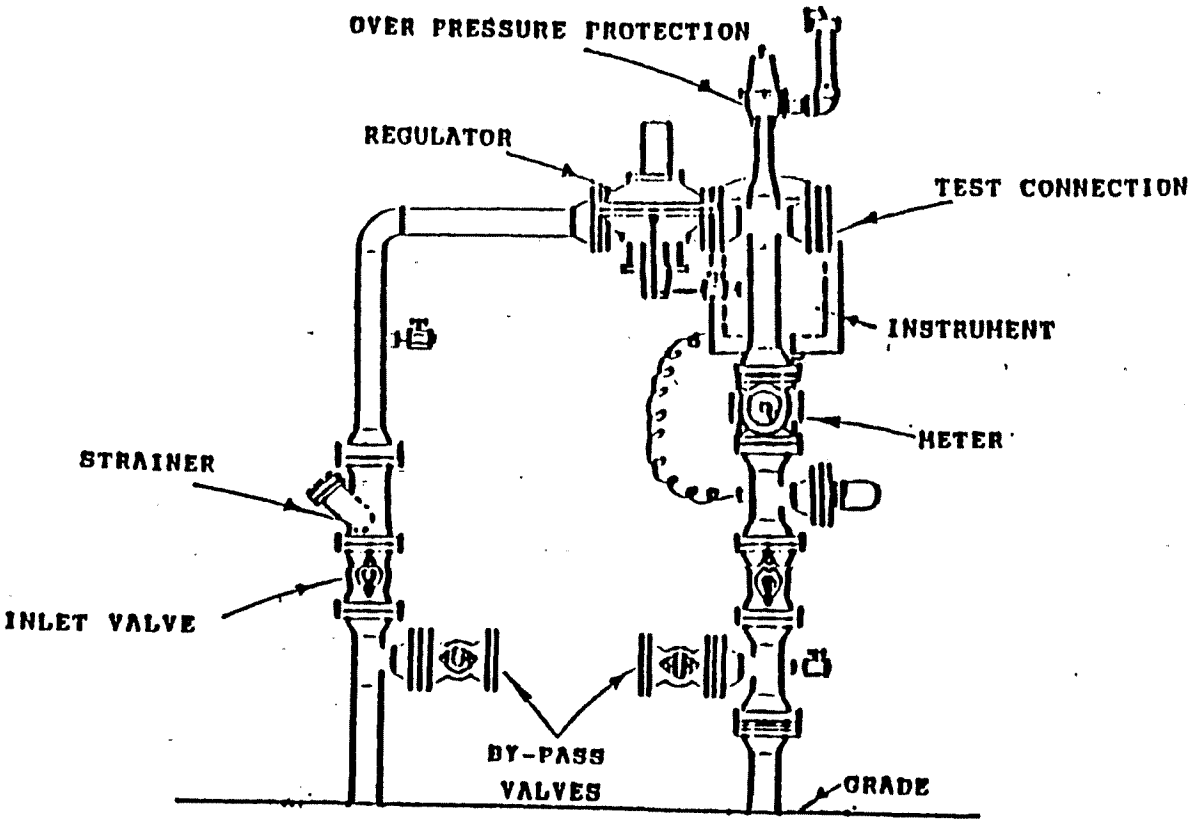
Typical Commercial Meter Set

A. Diaphragm Meter Sets (continued)



Typical Large Volume Meter Set

B. Rotary Meter Sets



Typical Rotary Meter Set

5.6.6.1 MOBILE HOME METER SETS

In new mobile home parks, gas meters will generally be located at the rear property line. In existing parks, the gas meter locations will be determined by the existing conditions.

Mobile home meter sets are typical domestic meters and must meet all of the same requirements. In addition, the meter must be connected to the mobile home with a code approved flexible connector.

5.6.6.2 LARGE VOLUME METER SETS

Large volume meter set is a term that includes any customer with a load that will have a significant impact on the distribution system, operating procedures or revenue. Meter installations for customers that have their own gas supply and where the utility only transports and meters the gas, should be considered special, large volume meter sets.

Large volume meter sets and/or meter sets that require delivery pressures higher than 4 oz. must be designed for the specific customer needs. When a new elevated pressure or a large customer meter set is to be designed.

A. Determine maximum and minimum hourly load requirements.
B. Determine maximum and minimum pressure the customer's equipment will require.
C. Consider the changes this flow will have on the distribution system.
D. Select a measurement design that can deliver the required flow rates, required pressure and acceptable measurement accuracy without affecting system integrity.

5.7 METER SET PRESSURE REGULATION

A. Standard 4 oz. (7" w.c.) Pressure

Use service regulators with internal relief or add an external relief valve to restrict delivery pressure buildup to no more than 18" w.c. to 1.0 Psig.

Install the smallest regulator orifice that will serve the customer requirements at the distribution system minimum pressure. Select spring range that will not exceed 9" w.c.

Use 1" body size service regulators for meter sizes below 500 cfh.

Use 1 1/4" body size service regulators for meter sizes 500 to 1000 cfh.

Use 2" body size service regulators for meters with side connections.

B. Elevated Pressure (above 7" w.c.)

Regulators used with meter sets operating at elevated pressure must be capable of maintaining delivery pressure within 1% of absolute delivery pressure.

Regulator over pressure must be provided as required by the D.O.T. Pipeline Safety Regulations.

5.8 SERVICE WORK ON CUSTOMER'S PREMISES

When setting a meter or executing a "turn-on" order, an employee shall follow established routines as set forth below:

A. Visual inspection shall be made of all inside piping. All open fuel lines shall be capped or plugged. All appliances shall be turned off.

B. A leak test shall be made by observing the meter test hand for at least 5 minutes while the gas is on and all appliances are turned off.

C. All work done on pipes and fittings shall be tested for leaks as soon as the gas is turned on. If a leak is found and cannot be repaired, or if the installation is unsafe to operate, the stop cock shall be shut off and sealed, and the customer is notified.

D. After turning on the meter, pipes must be properly purged of air.

E. Appliances shall be lighted and allowed to burn until all air has been purged, and to insure that the meter is operating properly.

F. When an employee has a turn-off order and no turn-on order, the meter stop cock shall be locked off.

G. Before removing a meter where no meter bar is installed, or any other piping is opened, the piping shall be temporarily bonded across the opening with an automotive battery jumper cable.

When a meter is removed from the premises, both the inlet and outlet piping connections shall be plugged or capped immediately.

If buildings have been burned or torn down, the service shall be disconnected at the main or property line.

5.9 DISTRIBUTION SYSTEM CONSTRUCTION & REPAIR GUIDELINES: GENERAL

This section provides the basic construction and repair guidelines for the Utility's gas distribution system.

The procedures in this section are written in accordance with 49CFR Part 192, Subpart G. and with regards to accepted gas industry standards and practices.

5.9.1 CONSTRUCTION STANDARDS

Each portion of the gas system will be constructed and/or repaired in accordance with standards included in this manual. For projects outside Construction/Repair activities of this manual, written procedures must be prepared and approved by (designated Ozark management) before the work may proceed.

5.9.2 INSPECTION

All pipe and other components will be visually inspected prior to construction to make sure damaged material will not be installed. Approved repair methods contained in this manual will be followed.

Each main or service will be inspected during construction to assure compliance with the appropriate specifications.

5.9.3 GENERAL TRENCHING CONDITIONS

Make the trench wide enough so that the pipe coating will not be damaged, pipe will not be bent, and there is room for backfill around the pipe. Make the trench uniform in grade with the bottom corners crumbed-out. This provides the full ditch width for slack in the pipeline. Be sure that the trench bottom is free of rock, cinders, aggregate, welding rod, wood blocks and other debris. Remove and pile spoil from the trench in a manner that will minimize land owner or public inconvenience and complaints. Avoid covering manhole covers, fire hydrants, mail boxes, etc., with trench spoil. Cut and store sod from established grass so it may be relayed after construction area is restored to final grade.

In distribution systems where trenching across streets, lay temporary bridging across the trench to accommodate vehicles.

Excavate by hand those locations where trees, shrubbery or valuable plants are encountered or where the use of trenching equipment will result in unnecessary damage to the property crossed.

5.9.3.1 TRENCH WIDTH SPECIFICATIONS

Unless otherwise specified on the construction drawings, dig the trench for pipelines/mains and service lines to the depth and width specified in the following tables. Minimum cover dimensions are from the top of the pipe to the top of the finished grade.

	DISTRIBUTION MAINS		
O.D. Pipe	Minimum Width	Normal Cover	Ditched Rock
12"	24"	30"	24"
10"	22"	30"	24"
8"	18"	30"	24"
6"	12"	30"	24"
4"	8"	30"	24"
3"	8"	30"	24"
2"	8"	30"	24"
1-1/2"	3"	30"	24"
1-1/4"	3"	30"	24"
3/4"	3"	30"	24"

	SERVICE LINE		
O.D. Pipe	Minimum Width	Normal Cover	Ditched Rock
4"	8"	24"*	18"
3"	8"	18-24"*	18"
2"	8"	18-24"*	18"
Under 2"	3"	18-24"*	18"

* Service lines within the boundaries of public right-of-way whether paralleled or undercrossed shall have a minimum cover of 30".

At locations where service lines of any size undercross or occupy public R.O.W., such as a street or alley, provide 30" of cover. When trenching in rock, 24" is adequate.

5.9.4 TUNNELING

Avoid tunneling where ever possible. When necessary, tunnels must be kept as short as possible and inspect for safety before employees are permitted to enter. Shore all tunnels.

No employee shall work in a tunnel where gas may be present unless they are wearing a respirator and a lifeline that is manned by another employee outside of the tunnel. Use fans to power ventilate tunnels where gas may be present, during the entire time an employee is in it, or have the employee wear an atmospheric-supplying respirator.

5.9.5 AUGURING

Auguring is preferred for installation of pipe under paved highways, streets, driveways, etc. Auger or push pipe under sidewalks. Do not excavate under the sidewalk with a chain trencher.

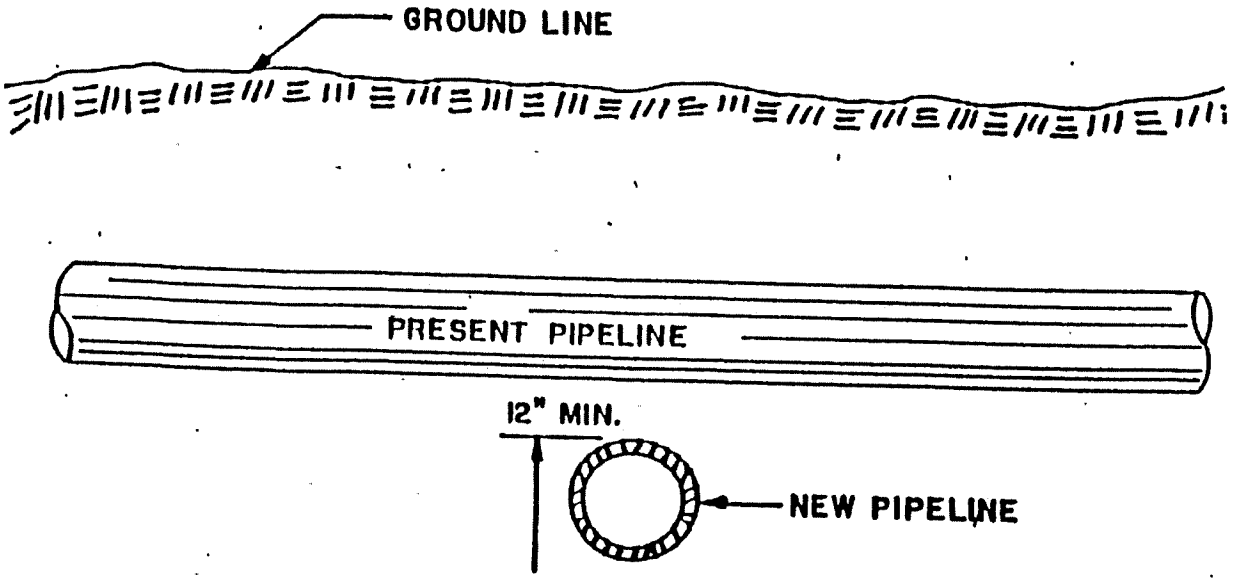
Wear tight-fitting clothing with all loose cuffs, belts, etc., tucked in when working around an auguring operation. Do not make any adjustments on an auger that is operating.

5.9.6 ROCK EXCAVATION

Rock excavation includes the removal and disposal of all boulders, rock material in ledges and bedded deposit using back hoe or pneumatic hammer or in solid rock by drilling and blasting. Excavate to a depth which permits a sand pad and/or rock shield and provides the required cover. When blasting, obtain the necessary permission or permits from local land owners, leaseholders, and all public or private authority having jurisdiction over the affected area. Take necessary precautions to prevent injuries and damage to persons, property and livestock. Take necessary precautions to minimize damage and inconvenience to land owners and tenants, to overhead lines, existing pipelines and other structures.

5.9.7 CROSSING UTILITIES OR UNDERGROUND STRUCTURES

Hand excavate underground pipeline or utility crossings. Dig trench deep enough to allow a minimum clearance of one pipe diameter or 12 inches, whichever is greater, between the top of the pipe being installed and bottom of the facilities being undercrossed.

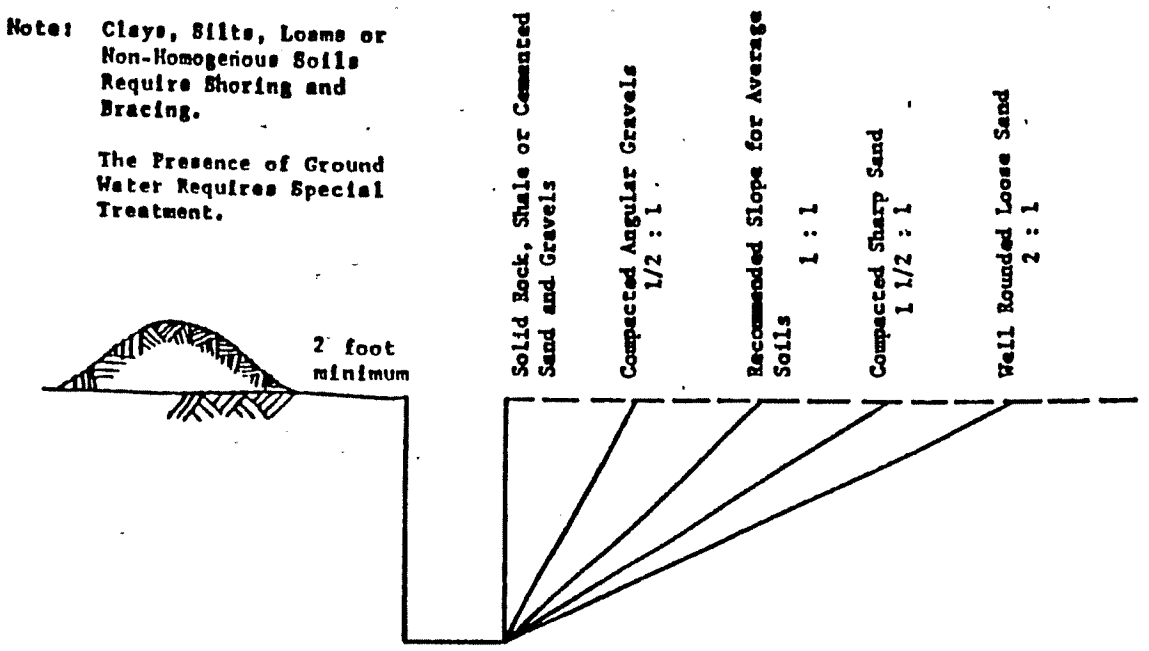


5.9.8 PAVING CUTS AND REPLACEMENTS

Whenever it is necessary to remove concrete or pavement, the broken surface materials are to be hauled away and disposed of. They. are not to be put back in the ditch as backfill.

5.9.9 SHORING AND TRENCH EXITS - TRENCHES 5 FEET OR DEEPER

In any trench or excavation 5 feet deep or deeper where personnel work, the need for shoring must be determined by a qualified person (as defined by OSHA regulations). In general, excavations should be sloped as shown below if possible and excavated material must not be placed closer than 2 feet to the edge of the excavation.



5.9.10 TRANSPORTING STEEL PIPE

Transport single or double random lengths of pipe on a truck or trailer of adequate length to minimize overhang at pipe ends. Do not use pickup or short chassis vehicle to transport pipe. Pad the truck trailer bolster and stakes to prevent damage to the pipe coating. Protect loaded pipe from binder chains and/or straps with adequate padding so that coating will not be damaged.

5.9.10.1 UNLOADING STEEL PIPE

Unload pipe using tongs or belt slings. Do not use chain or cable slings. Exercise care to avoid rough handling of pipe. Do not push or pull over sharp objects. Do not roll pipe off the truck onto the ground. Small diameter pipe may be lifted off the truck by hand. Place pipe on suitable skids in a manner to avoid damage to the end bevels, and minimize the amount of shifting for final alignment.

5.9.10.2 STRINGING STEEL PIPE

String out steel pipe on R.O.W. so that it will cause the least interference with the normal use of the land crossed by the R.O.W. Leave gaps at intervals satisfactory to the property owners to permit use of the land and passage of livestock and equipment. String out steel pipe in towns in a manner that will not obstruct traffic unnecessarily. Do not obstruct driveways, streets, or alleys with pipe. Do not string out more pipe than can be installed in one day. Avoid damage to trees, shrubbery and lawns.

5.9.10.3 ALIGNMENT OF STEEL PIPE

Make the necessary pipe shift along the construction route by carrying the pipe Do not drag pipe into position. When lining up pipe ends, place longitudinal weld seams one quarter of the pipe diameter out of alignment with the adjacent pipe section weld seam. Keep all seams in top half of pipe. Use line up clamps for leveling up pipe ends. Use them only at the coating cut back at the pipe joint ends.

5.9.11 POLYETHYLENE PIPE

Polyethylene pipe is a product which is able to withstand normal installation handling. However, rough handling can damage the pipe wall. Take care to avoid pushing or pulling the pipe over or around sharp projections. The pipe can be damaged by dropping it from excessive heights or dropping heavy objects upon it, particularly, during cold weather. Avoid kinking, scratching or buckling. Cut out any section of pipe which has been damaged in this manner (scratches over a depth of 10% of pipe wall thickness).

5.9.11.1 TRANSPORTING POLYETHYLENE PIPE

Shipping - Fork lift operators are to use caution when unloading or loading polyethylene pipe to prevent damage of the pipe with the forks or tines of the lift truck. Coils of pipe are strapped or palletized for easy unloading or loading. When unloading or loading straight sections of pipe, allow for some bending in the middle of the lift. Position fork lift tines as far apart as possible to reduce the amount of bending. Roll pipe down inclined planks when unloading from a truck bed, to keep damage to a minimum. Do not drop pipe to the ground. Never drop the pipe onto hard pavements or rock terrain from truck beds. This is particularly important when unloading pipe at temperatures below 40 degrees F. Under these conditions, the pipe is stiffer and easily damaged from impact.

When breaking down bulk backs or mini-bundles, take care to stand clear of the pipe while strapping is being cut.

5.9.11.2 STRINGING POLYETHYLENE PIPE

Reel trailers can be helpful when stringing coiled pipe out for direct burial, plant-in, or insertion renewal. When trenching, string coiled pipe out on the ground upon arrival at the job site. This allows time for the coil set to relax and will simplify handling and emplacement of the pipe.

When uncoiling pipe by hand, cut only those straps on the coil which are necessary to unroll outer coils. Cut internal bands whenever necessary as the coil is unrolled.

If silo packs are not to be rehandled and individual coils are used, put the large steel bands which tie the silo pack to the pallet. If the pallet strapping has caused any deformation of pipe, removing the straps will allow deformed areas to return to normal shape. Any damaged sections of pipe 10% of wall thickness, must be cut out.

Inspect the pipe as it is being uncoiled and during installation to make sure no damage to the pipe during shipment and handling to the job site has occurred.

5.9.11.3 COLD WEATHER HANDLING

When handling polyethylene pipe at temperatures below 40 degrees, use extra caution to prevent impact to pipe. Always be careful when cutting the straps on coils of pipe because the outside end of a coil may spring out when the strapping is removed. Uncoil the pipe that is to be installed and let it straighten out prior to installation. This can be done by gradually uncoiling the pipe and covering it with dirt at intervals to keep it from coiling again.

5.9.11.4 MATERIAL STORAGE

Store all material in a manner that will prevent damage or deterioration. Store material with machined surfaces, valves, fittings and coating materials off the ground and out of the weather.

Store all plastic pipe and tubing in a manner to minimize damage from crushing, piercing or cutting. Protect all stored plastic pipe from direct sunlight.

Other precautions - When moving the pipe, continually support it in a way so as to minimize movement of the pipe on its supports. Do not carry supplies or equipment on top of plastic pipe. Avoid damage from sharp edges and other projections. Protect the pipe from excessive heat. Be particularly careful of open flames. Do not place an open flame or torch across pipe surfaces.

5.9.12 STEEL PIPE INSTALLATION

Support in Trench - Support pipe on undisturbed earth, well compacted soil or sand in ditch bottom. Avoid sand pads placed at intervals or the use of sand bags for support under the pipe. Install all over bends so that the pipe at the point of the bend clears the high point of the ditch bottom by at least six inches. At side bends, bend and lower the pipe so it lays against the outside wall at the bottom of the trench. At sag bends, rest the pipe evenly and firmly on the ditch bottom.

5.9.12.1 COATINGS INSTALLATION AND TESTING IRREGULAR FITTINGS AND WELD JOINTS

Coat all weld joints, ends, and other fittings with standard materials applied according to manufacture's procedures and as directed elsewhere in this section of the O&M manual.

5.9.12.2 INSPECTION AND REPAIR OF COATING

All pipe protective coating shall undergo a high voltage electrical inspection with a "jeep" or equivalent device in accordance with NACE Standard RP-02-72. All holidays and defects disclosed by this inspection shall be repaired before the pipe is lowered into the ditch.

5.9.12.3 LOWERING IN OPERATION

Use belt slings, padded calipers, or rubber tired cradles to handle the pipe. DO NOT use chain, wire rope or steel reinforced belting. Do not assemble more pipe than can be handled and positioned in the trench safely.

Take care to prevent damage to the coating. Prevent electrical contacts between the carrier pipe and casing, intersections with other utilities, etc.

5.9.12.4 CORROSION CONTROL

After pipe is placed in the trench and prior to backfill, install corrosion control devices such as magnesium anodes, test leads, insulators. Reference Handling & Installing Magnesium Anode Section and the drawings for detailed installation instructions.

5.9.12.5 NIGHT CAPS

At the end of each day's construction or whenever work is delayed for an extended period of time, plug or cap all open ends of any installed pipe with a suitable cap that will prevent the entry of water, mud, etc. Compression fittings or wooden tapered plugs may be used for this purpose. Do not use rags, tape, etc.

5.9.12.6 ADDITIONAL PROTECTION

Protect each pipe line from washouts, unstable soil, floods, landslides or other hazards that may cause the pipeline or above grade facilities to move or be subject to abnormal loads.

5.9.13 PLASTIC PIPE INSTALLATION - (POLYETHYLENE)

Join polyethylene pipe above grade or in the ditch as the situation dictates. Plan joining in the ditch to insure that you have enough space for proper alignment. Avoid bucking, gouging, and other damage when lowering into the ditch. Lay the pipe so that there are no bends with a radius less than 20 times the pipe diameter and no fusions within 3 feet of any bend.

Align all pipe and fitting fusions straight and flat. Install and tape protective sleeves at all service branches and transition fittings to protect against bending and shear forces. Extremely cold weather makes polyethylene pipe more stiff and increases the likelihood of impact failure. Federal standards require that the installation of polyethylene be far enough away from steam lines, hot water lines, power lines and other sources of heat to avoid temperatures in excess of 140 degrees F. Generally, a 12 inch separation is enough.

Because polyethylene pipe contracts as it cools, snake the pipe in the bottom of the trench. This provides "slack" for the pipeline to cool and contract in the ditch prior to backfilling.

Note: Make final tie-ins or branch connections in the early morning, if possible. At this time, thepipe is cool and has contracted due to the cooler night temperatures. Early morning connections will help minimize stress due to contraction.

5.9.13.1 CONTROL OF STATIC ELECTRICITY ON PLASTIC PIPE

Static electrical charges develop by friction on the surface of plastic pipe in two ways:

A. By physical handling of the pipe in storage, shipping and installation.

B. By the flow of gas containing dust, rust, scale or dirt particles. Static charges present a serious hazard during hot-tapping, purging, tie-in operations and leak repair on plastic pipe because they are proven sources of ignition. The voltage generated by this friction can reach levels in excess of 10,000 volts. This is more than enough current to cause gas to ignite. Before attempting repair on plastic pipe, remove the static charge "voltage" and shut off the blowing gas. Do this in the following manner.

1. Dig a safe work area 5-15 feet upstream of the blowing gas. If the system is fed from both directions, dig a safe work area 5-15 feet on both sides of the leak.

2. Shut off the flow of gas by placing squeeze off tools on the pipe in the work area(s).

3. When the gas has stopped blowing, determine if the area is safe to work in by taking a CGI reading. If the area is not safe to enter, ventilate to a safe working atmosphere.

4. Wet down the pipe in the leak area with a mixture of water and biodegradable soap (mix one ounce soap to one gallon of water).

5. After wetting down the pipe, wet down the work area (ground). When wetting down the pipe and ground area, start at the outside edges of the leak area and move toward the leak.

6. Wrap one end of a cotton rag, burlap cloth or a ground kit (see Purchasing) around the pipe (on both sides of the leak) and allow the other end to contact the ground. During the repair, keep the material wet and in contact with both the pipe and the ground at all times.

7. When the repair is complete, wash off the soapy water with clean water. Soap can have a bad, long term effect if left on the plastic pipe.

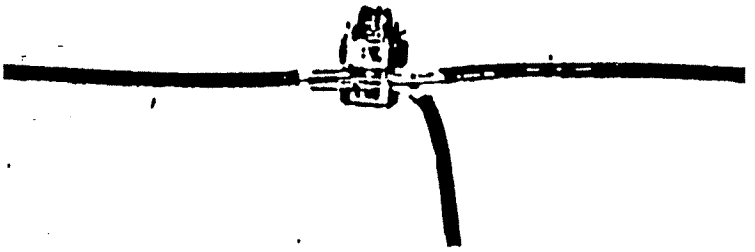
During cold weather, add an ethylene glycol antifreeze to the soap mixture to keep it from freezing. Be sure you wash this off of the plastic pipe when you are through.

5.9.13.2 INSTALLATION OF LOCATING WIRE

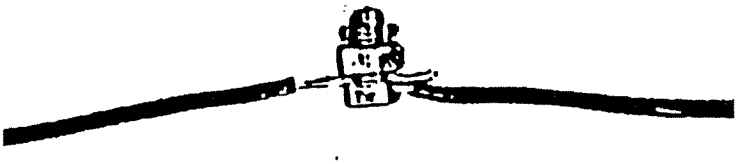
To locate plastic pipe with the use of electronic pipe locator, install a No. 12 TW or THHN coated copper along the pipe approximately 2" to 6" above or to the side of the pipe. The separation is necessary to avoid damage to the pipe in the event that the wire is heated by contact with an electrical circuit or struck by lightning.

When pulling a pipe under a bored crossing, tie and tape the wire to the end of the main so it will follow the pipe. This is the only time the wire is permitted to be in direct contact with the main.

Outside the bore, maintain the 2" to 6" separation of the locating wire and pipe. Make all locator wire splices with crimp or bolt type connectors or resin core solder. These connections prevent the loss of continuity due to corrosion on the surface of the wire. Coat the connection with a dielectric sealant, cold-seal butyl tape or equivalent.



Copper wire connection for tieing into a locating wire at a polyethylene main. Protect the connection with a thick moldable tape without backing.



Copper locating wire splice. Protect the splice with a thick moldable tape without backing.

Extend the locator wire above ground at each meter riser or at specially located junction boxes to provide connection of pipe-locating instruments. Where location wire is extended above ground level at meter sets, place the wire in back of the meter bar post and tape it in place. (An alternative would be to tape the end of the wire in back of the service valve.)

Attach a 1 lb. bare magnesium anode at the end of the locator wire at each main stub end to facilitate pipe locator operation.

When renewing steel mains and services by insertion, exothermic weld No. 12 coated locating wire to steel pipe on both sides of a void, then to old steel service and from old steel service bring wire above ground at the meter riser.

5.9.14 NIGHT CAPS

At the end of each day's construction, or whenever work is delayed for an extended period of time, plug or cap all open ends of installed pipe to prevent the entry of water, mud, etc. Do not use rags, tape, etc.

Where the line is fused into long sections for pulling across highways, railways, streets, etc., cap the inactive end of the pipe while fusing.

5.9.15 ADDITIONAL PROTECTION

Protect each pipe line from washouts, unstable soil, floods, landslides or other hazards that may cause the pipeline or above grade facilities to move or be subject to abnormal loads.

5.9.16 CHANGES IN DIRECTION OF STEEL PIPE

Make changes in direction in steel pipe by using butt welding elbows. Use three radius (3R) butt welding elbows for changes in pipeline direction. Use Transverse sections of welding elbows for smaller bends providing they are larger than two inches in diameter and the arc length as measured along the crotch is a minimum of one inch.

PROHIBITIONS - Do not use wrinkle bend. or miter bend..

5.9.17 CHANGES IN DIRECTION OF PE PIPE

Avoid excessive bending in polyethylene piping systems$_1$ particularly at Joints. Poor pipe laying and backfilling procedures increase the potential for failure and can result in bending stresses which exceed the material Strength. Where pipe end section includes a butt fusion Joint$_9$ the radius (R) is not to be less than 125 times the pipe diameter (figure A),. Where pipe bend section does not include a fusion Joint$_1$ the bend radius (R) may be a minimum of 20 times the pipe diameter.

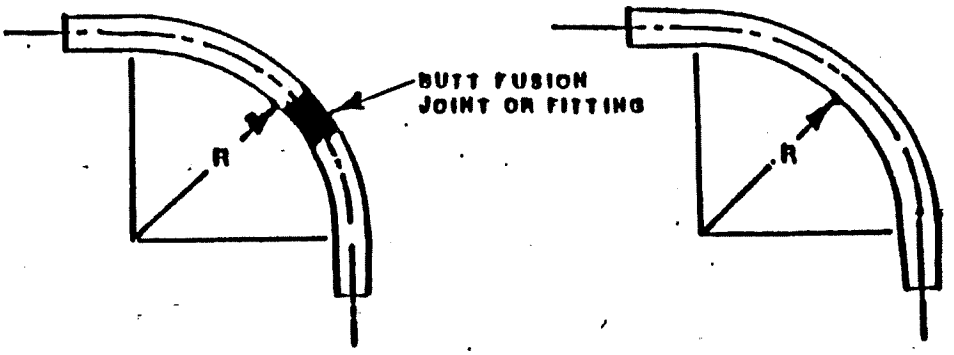


Figure A Figure B

Pipe Size In.	Pipe OD	Max. 90 Radius "A"	Max. 90 Radius "B"
1/2" CTS	.625"	6.5'	1.0'
1" CTS	1.125"	11.7'	1.9'
2" NPS	2.500"	26.0'	4.2'
3" NPS	3.500"	35.5'	5.8'
4" NPS	4.500"	46.9'	7.5'
6" NPS	6.500"	67.7'	10.8'

FITTINGS - Use butt fused fittings to change the direction of the pipe at a 45 degree or 90 degree angle bend.

5.9.18 PE MAINS TO PE SERVICE LINES

To add PE services to PE mains, use an approved saddle fusion service punch tee.

5.9.19 PROTECTIVE SLEEVES

Use protective sleeves for all saddle tees. Sleeves protect the Joint between the service line and the saddle fitting from shearing off. Use electrical tape to secure sleeves to service tee.

Service Tapping Tee Size	ID Size	Protective Sleeve Size
1/2" CTS	1.125"	12" Long
1"	1.975"	20" Long

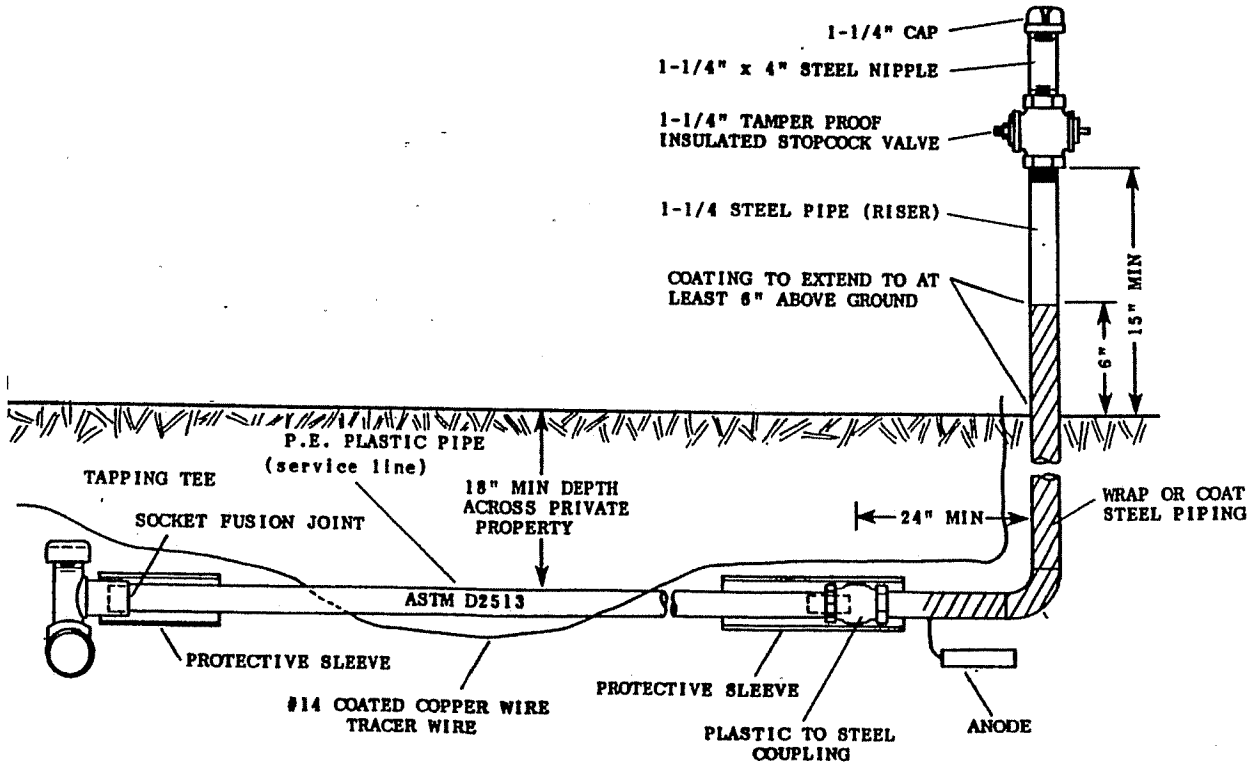


Figure 1: PE Main to PE Service Line

5.9.20 SHUT OFF AND RESTORE SERVICES

To shut off the service, use the punch in the service punch tee.

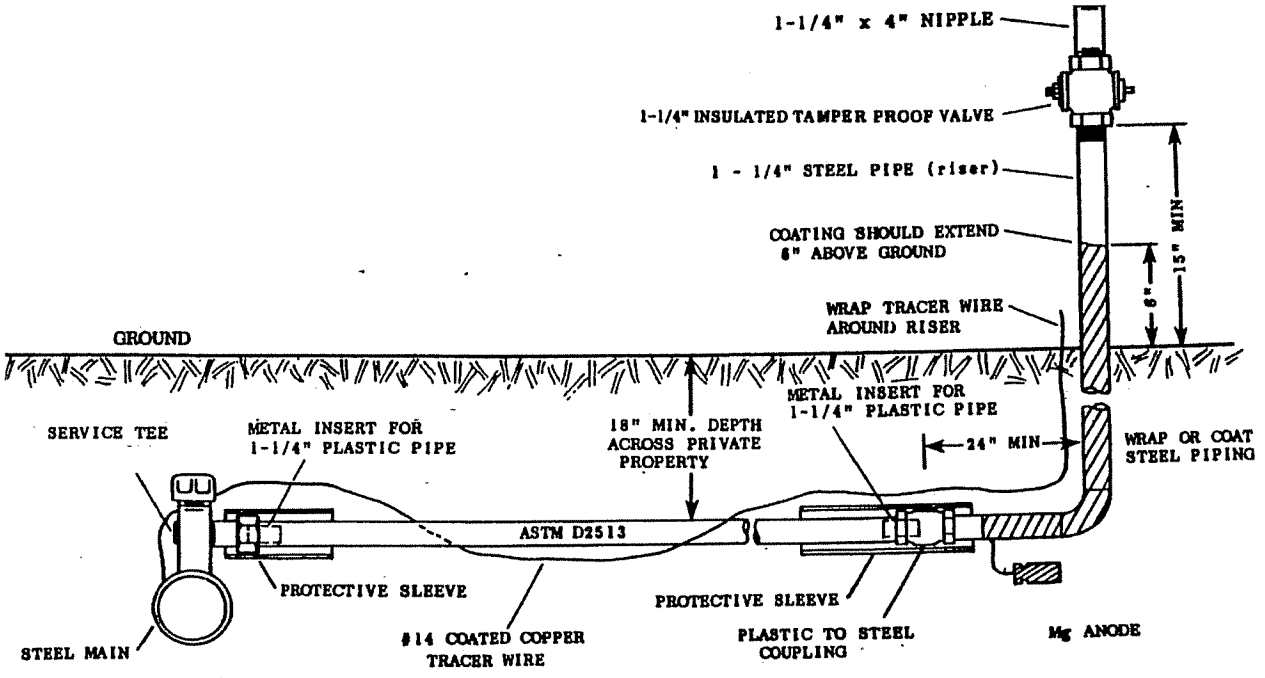


Figure 2: Steel Main to PE Service Line

5.9.21 SERVICE TEE INSTALLATION ON STEEL MAIN

Check the steel service line for alignment prior to welding. Allow the service line pipe to enter the bell hole at the main with a smooth sweeping curve to avoid stress on the service line.

Pressure test service lines before tapping into the main. See Section 5.3 for pressure test requirements.

5.9.22 SERVICE TEE AND SERVICE RISER CONNECTION TO PE SERVICE LINES

After the PE service line length has been established and cut, install the PE tubing to the service tee according to the manufacturer's instructions. Some are to be turned down untill they bottim out against the fittings's body while others require turning until a certain torque is achieved.

Pressure test service lines according to Section 5.3 of this manual.

5.9.23 TAPPING THE MAIN AND PURGING THE SERVICE LINE

After the installation has been tested, tap and purge the service line.

If the service tee is a self-tapping punch-it, use the tee manufacturer's companion tools for tapping. If it is a non-self-tapping tee, us a tapping machine.

Before applying the completion cap on a steel service tee, pipe dope the threads to prevent leakage through the tee's cap or plug.

5.9.24 STEEL MAIN TO STEEL SERVICE LINE

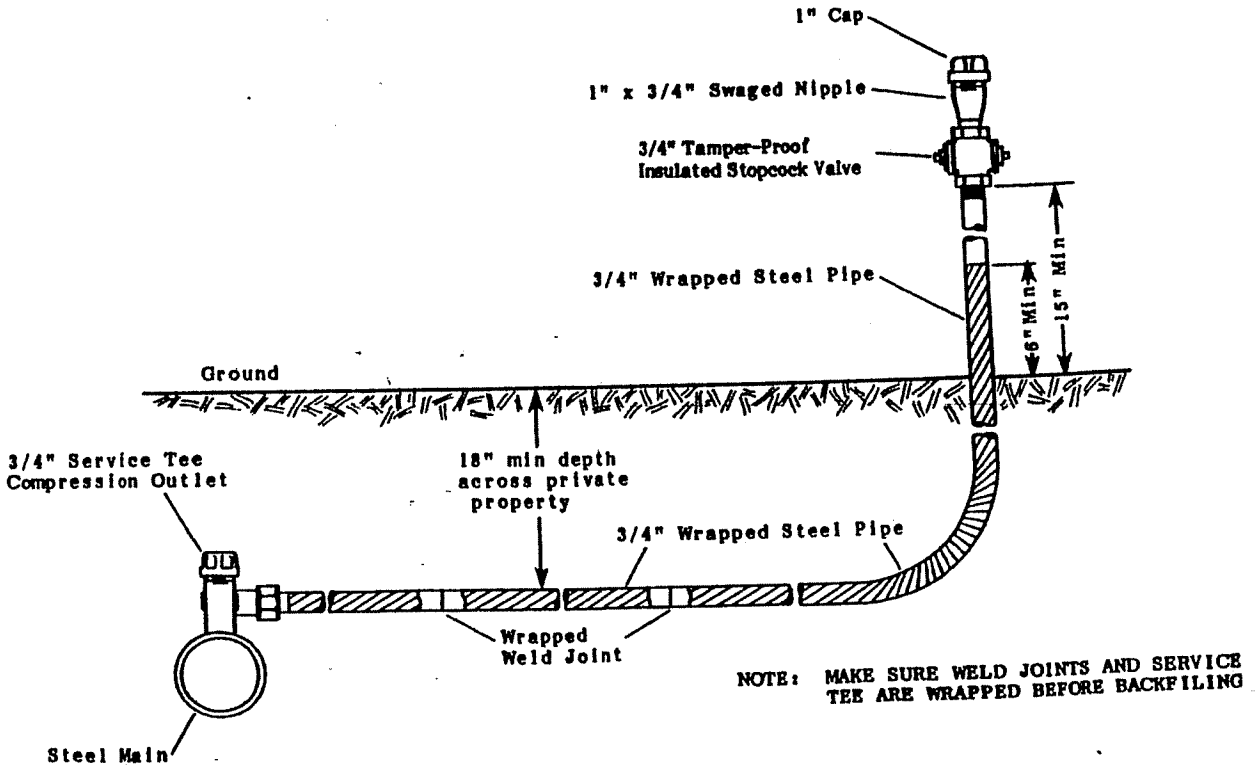


Figure 3: Steel Main to Steel Service Line

5.9.25 PE SERVICE LINE RISER INSTALLATION

Use an approved service riser to connect PE service lines to a meter set.

Installation

A. Meter bracket must support meter, regulator, and service line riser.
B. Terminate service riser 12" above grade with a minimum of 24" below grade.
C. Install a meter stop valve with a locking device. Size to be as per riser outlet size.
D. Follow manufacturer's installation instruction to join the riser to service line.
E. Place service line in trench, keep the service line straight and flat to prevent kinking and pinch off.
F. Pressure test completed service line using testing procedures, Section 660.

Hand backfill and tamp around the houses' foundation and under service riser with enough force to prevent stress and shearing loads on the riser and PE pipe and to prevent settling.

5.9.26 STEEL SERVICE LINE RISER INSTALLATION

Construct the service riser at the meter set as follows:

A. For service line pipe 3/4" to 1", cold-bend the riser to 90 degrees using an 18" radius bending shoe.
B. For service line risers larger than 1", use a long radius weld elbow to make the 90 degree direction change.

Cold bend service line pipe, as follows:

A. Inspect epoxy coated pipe in the bend area for' damage. Repair these areas with approved materials.
B. Remove cold tar coating from all bend areas. Recoat these areas with approved coating materials.

Pressure test the service line before tapping into the main. See Section 660 for Pressure Test Requirements.

5.9.27 CROSSINGS

Do not case pipelines or steel mains which cross the R.O.W. of highways, roads, railroads, or other public thoroughfares except as follows:

A. Cannot attain adequate minimum cover.
B. If installed by the auger method, the carrier pipe is subject to damage due to soil or rock conditions in the road bed.
C. When casing is specified by the NC DOT or other authorities responsible for the construction and maintenance of the highway, road, railroad or other public thoroughfares.
D. When casing is specified by engineering for protection of the carrier pipe.

5.9.27.1 COVER

Use a minimum of 48 inches of cover over the pipe in the ditch line for highways, roads, and railroad crossings. However, if additional cover is required by jurisdictional authorities, meet that minimum.

At locations where open trench crossings are specified, backfill the trench with suitable material and pneumatically tamped back to the equivalent compaction of the adjacent undisturbed earth. If the material excavated from the trench is not suitable for backfill, obtain suitable material from another source. Restore the road surface to its original condition.

5.9.27.2 CORROSION CONTROL VERIFICATION CHECKS

Check to see the carrier pipe is electrically insulated from the casing pipe at the following construction steps.

A. Immediately following installation of carrier pipe in the casing pipe.
B. At completion of tie-in prior to backfill.
C. After backfilling is completed.

NOTE: If a short is detected, correct before construction proceeds.

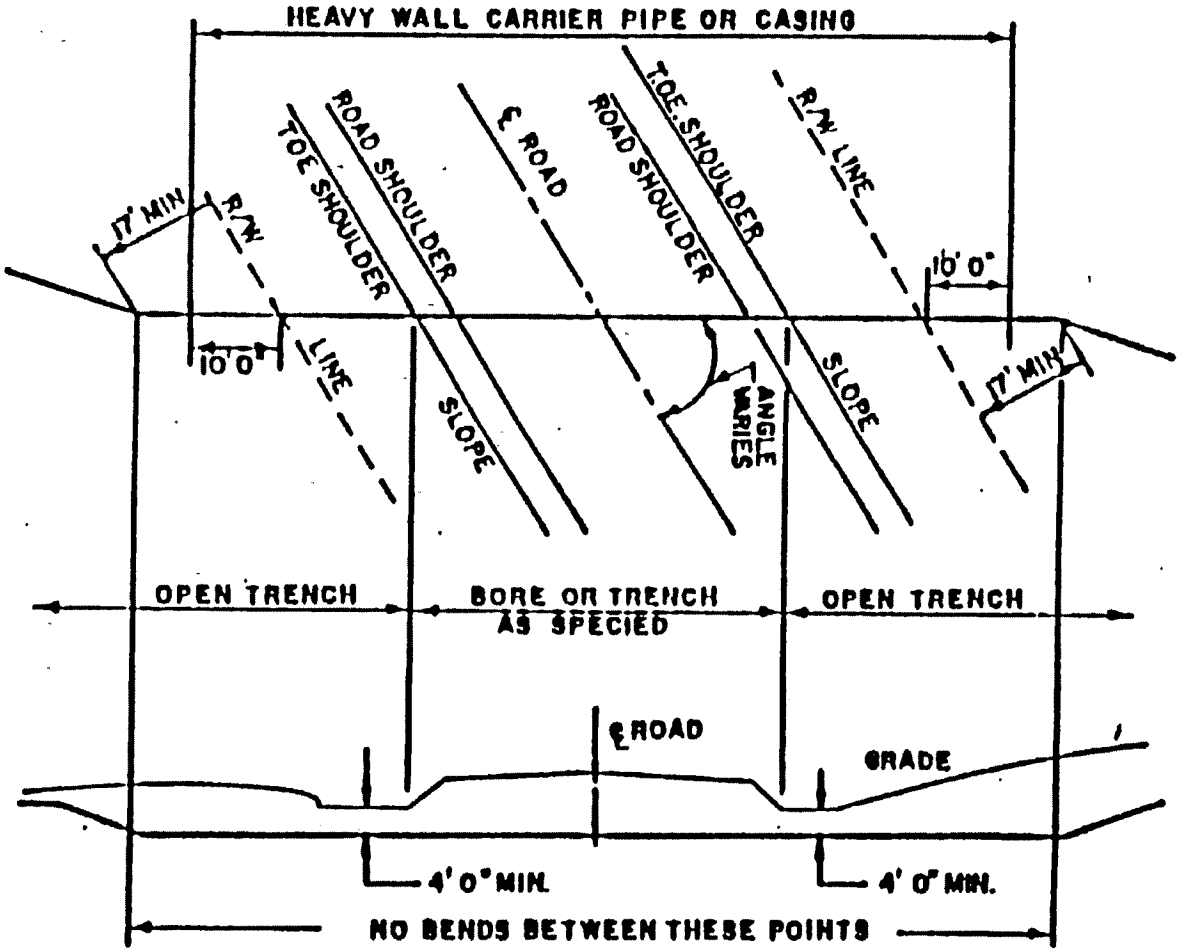
5.9.27.3 RAILROAD CROSSINGS

When required, install pipelines or mains undercrossing railroads in steel casings. Construction of all railroad crossings including all details shall comply with the specifications required by the railroad or other authority having jurisdiction.

5.9.27.4 HIGHWAY CROSSINGS

Construct all highway crossings, including all details, to state highway specifications. for general information, refer to the Railroad and Highway Cased Crossings and Highway Uncased Crossings Minimal Standards, Diagram I.

Diagram I: Road Crossings

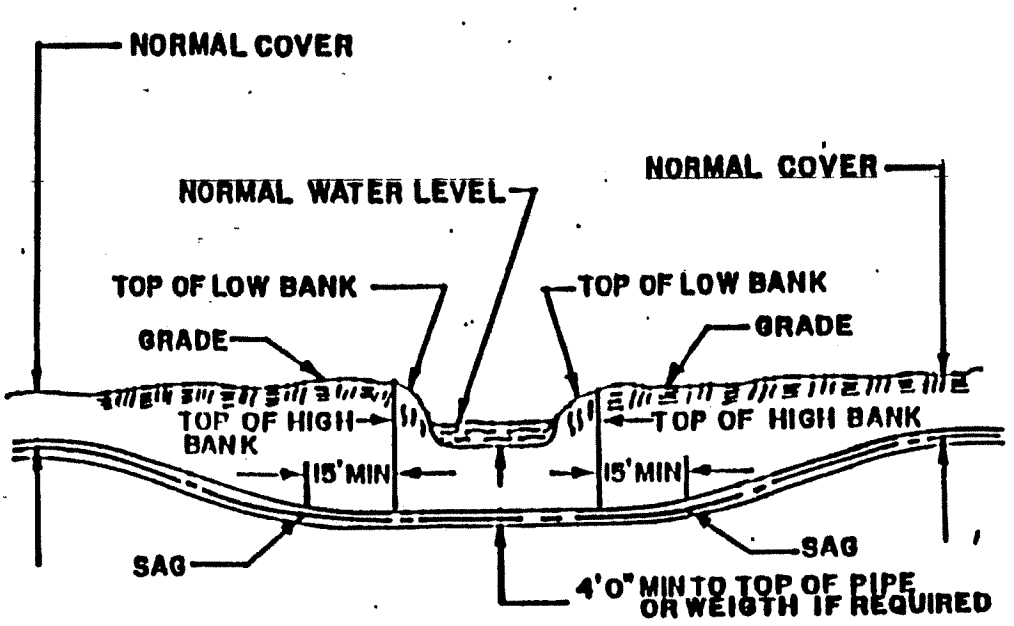


ELEVATION

5.9.27.5 STREAM OR DITCH CROSSINGS

For stream or river crossings, use a minimum cover of ~g inches measured from the lowest part of the existing or proposed channel to the top of, the pipe or river weight. Do not bend line sags within 15 feet either side of the top of the high banks. If sufficient pipe depth can be maintained approaching the banks, use a gentle upward curve rather than a sag bend. Reference General Steam or Ditch Standard, Diagram 2 for detail e)'explanation ion.

Diagram 2: Stream or Ditch Crossing



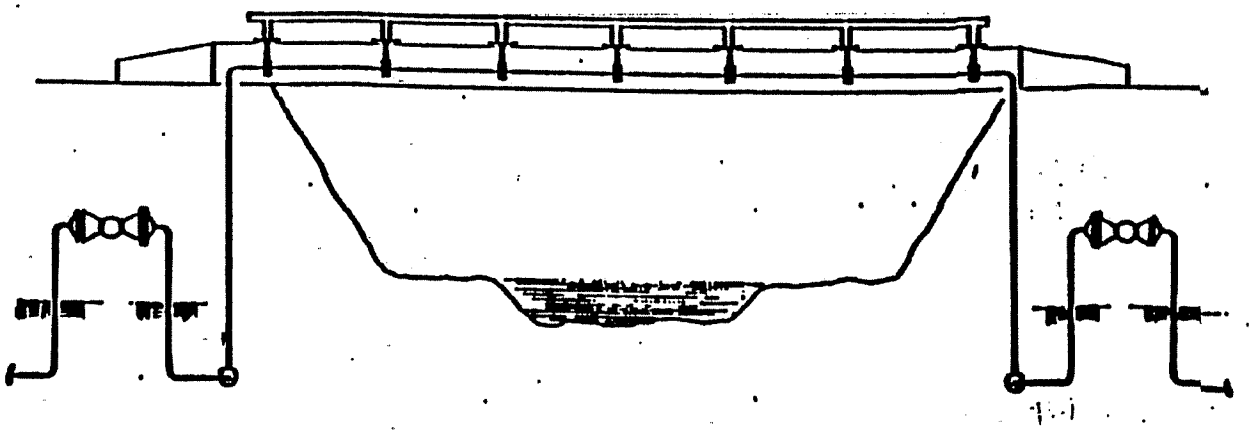
Use precast concrete river weight. to counter pipe floatation in the water way and in the flood plain where frequent flooding occurs. Refer to the construction drawing for specific weight size quantity and spacing requirement

5.9.27.6 BRIDGE CROSSINGS

When a pipe is attached at a bridge crossing it must meet the following conditions

A. Electrically isolate the pipe above grade at each end of the crossing.
B. Install fire valves at the upstream side of the bridge for single feed lines. Install fire valves at both ends of the bridge for looped feed lines. reference typical drawing for general details. Where permits are required, verify and meet specification requirements. for general information, refer to the Bridge Crossing Standard, Diagram 4.
C. On larger crossings where temperature differences can cause the pipe to expand and contract, use expansion Joints or loops.

Diagram 4: Bridge Crossings Standard



5.9.28 BORING (AUGURING)

Bore all railroad crossings and all federal and state highways. Use water boring when permitted. Always get the right approval before boring.

Do not water bore in sandy locations or those locations where voids can readily develop. Reference specific permit requirements regarding boring methods.

A. Fill all voids developed under hard surface (concrete and/or asphalt) using pressure grouting. Grout consists of sand-cement slurry, a minimum of two bags of cement per cubic yard of mix.

B. When voids develop under graded gravel, crushed rock or dirt surfaces, excavate and backfill with a suitable material. Pneumatically tamp to the equivalent compaction of the adjacent undisturbed earth. Replace surface material to original condition.

5.9.29 CONSTRUCTION - PLOWING PLASTIC PIPE

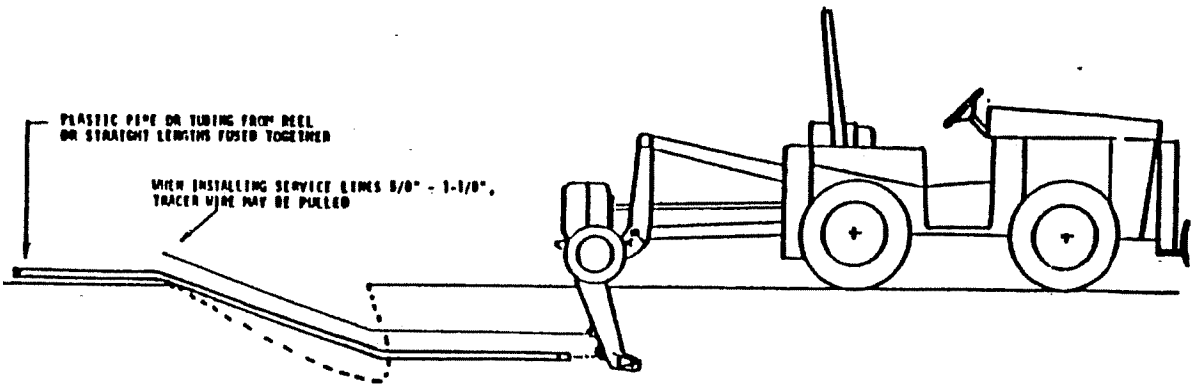
Plastic pipe may be "plowed in" where soil conditions, particularly the absence of angular rocks, and the lack of surface and underground obstructions makes this method practical.

Plastic pipe 2" and larger will be installed by the "plant in" method so that no tension is imparted upon the pipe. Pipe smaller than 2" may be installed using the "pull in" method.

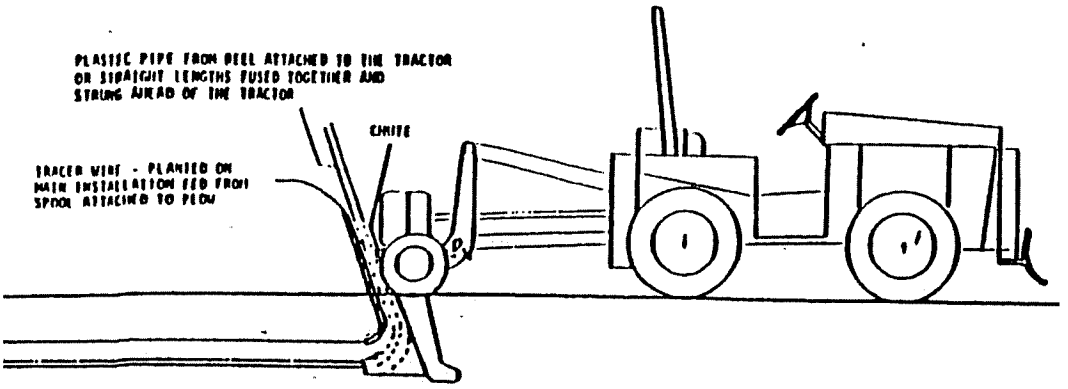
Plastic pipe shall be installed with a minimum cover as specified in Section 5 of this O&M manual.

When pipe manufacturer's installation standards specify other installation standards, those standards must be followed.

A. Drawing 1: Pull-in Method: Pull the pipe through the ground in an oversized hole created by a mole (pull head). The mole is attached to the plow and pulled by a tractor.



B. Drawing 2: Plant-in Method: The pipe is put in place underground by means of a chute which ends at the rear of the plow blade. The pipe is fed through the chute into the ground. Do not drag or pull pipe through the ground.



PLANTING SHOE RADIUS vs. PIPE SIZE

	Planting Shoe Radius	
	25:1 Ratio	30:1 Ratio
1-1/2"	24"*	27"
2"	30"	36"
3"	44"	54"
4"	56"	70"

5.29.30 PLASTIC MAINS (PULL-IN OR PLANT-IN METHOD)

Expose all underground facilities in the path of the proposed main by hand (if necessary) to verify location and depth.

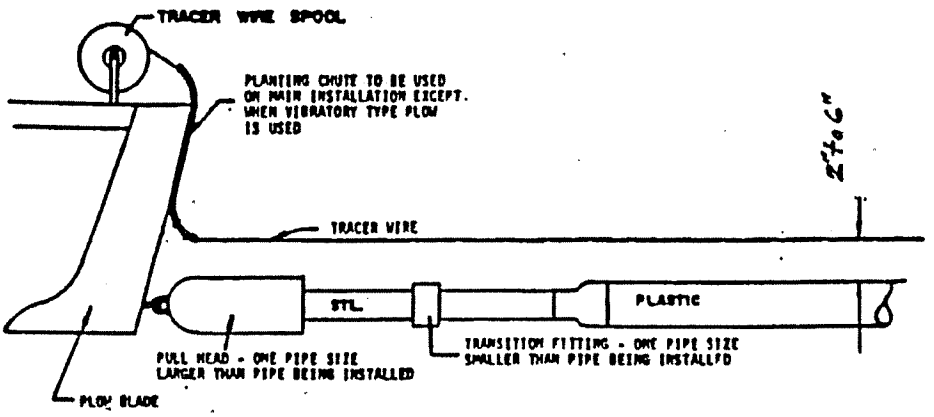
Dig a starting hole deep enough to cover as stated in Sections 820 and 830. If the pipe is to be pulled, slope the trench to provide a ramp for the pipe.

If a vibratory plow if not used, make two preliminary passes at the proposed depth. Make the first pass with only the plow. Make the second pass with a pull head of at least one pipe size larger than the pipe which is to be installed.

If a vibratory plow is used in sandy soil, it may be necessary to make a preliminary pass with the pulling head.

When the pipe is to be pulled, attach the plastic pipe to the pulling head, see Drawings 3 & 4. When the pipe is to be planted, it will be on a reel attached to the tractor or strung on the ground ahead of the tractor. In either case, feed the pipe into the chute at the rear of the plow, see Drawing 2. When couplings are used to join the pipe sections, the shoe should be sized to plant the couplings without damaging them. Take care to prevent kinking or buckling of the pipe. Cut out any cylinder of pipe containing a kink or buckle. Particular care shall be exercised to maintain alignment and prevent "wandering".

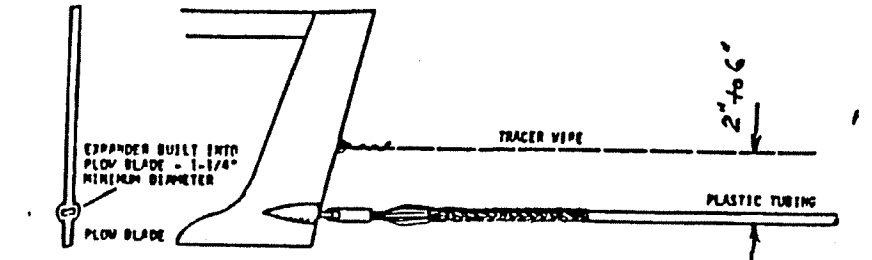
A. Drawing 3: Plastic Pipe With Transition Connection to Plow



Mole Size Table for
Polyethylene Pipe

Size Pipe	Size Pull Head
5/8"	3/4"
3/4"	1"
1-1/8"	1-1/4"

B. Drawing 4: Plastic Pipe Connection to Plow for 1-1/4" and Smaller Pipe



PLASTIC TUBE CONNECTION WITH K GRIP (CHINESE FINGER) 5/8" THROUGH 1-1/3"

Place tracer wire 2" to 6" above plastic mains. Use approved wire and connections and wrap each connection with a moldable sealant. Tracer wire shall be installed simultaneously with the pipe.

Dig inspection holes at a maximum of 250' intervals to inspect for pipe and tracer wire for damage and to check installation depth. Check continuity of the tracer wire with a pipe locator and make any necessary repairs.

If the plastic pipe is installed by the pull-in method and must be tied in at both ends, allow the pipe to stand overnight before making the final tie-in. This will allow the pie to cool to ground temperature and recover from the stretching which occurs during installation. If the pipe is installed by the plant-in method or a tie-in is required a only one end, allow the pipe to stand a minimum of two hours before making the tie-in. Do not allow polyethylene pipe pull-in sections to exceed 700' in length.

Protect plastic pipe from damage while being pulled above ground and in the trench by using padding, dollies, etc.

Keep the soil over the plow line free of vehicles, equipment or foot traffic until the pipe is in place.

After tie-in are made and backfill is complete, the plowed area will be wheel packed by driving the plow/tractor or a vehicle of similar but not greater weight over it.

Record the exact location of the installed pipe.

5.9.31 PLASTIC SERVICE LINES

The procedure for installing plastic service lines is the same as for plastic mains with the following exceptions:

A. Do not have less than 18" of cover above the pipe or tubing on private property.
B. Place tracer wire 2" to 6" above the pipe or tubing. The tracer wire may be planted or pulled when installing service lines.
C. Allow service lines 200' or longer to stand a minimum of two hours before making the final tie-in. Allow service lines of less than 200' to stand a minimum of one-half hour before making the final tie-in.

5.9.32 INSPECTION AND TESTING

Particular caution should be exercised to insure the pipe and any joints (couplings or butt fusions) are not damaged during installation. Sudden jumps of the plow and the presence of sharp rocks are common indications of possible damage. Any suspected damage locations should be investigated.

The plastic pipe will be pressure tested after installation in accordance with Section 660. It is also recommended that the pipe be air tested before installation if manufacturing or handling damage is suspected.

5.9.33 COVER

Install all buried piping with a minimum cover of 30 inches for pipeline/mains (24 inches in trenched rock) and 18 inches for service lines in customer yards or lawns. Reference Excavation, Section 801 for specific details.

Where an underground structure prevents the installation of pipe with minimum cover, provide a casing, bridge or shield to prevent damage to the pipe.

5.9.34 BACKFILLING

After the pipe has been lowered in the trench but prior to backfilling, inspect and remove all welding rod, skids, brush, rocks or any other debris in the trench.

After the lowered pipe in the trench has been inspected and after all coating damage has been repaired and tested, backfill the trench to prevent floating of the pipe, in the event water enters the trench. Conduct the backfill operation so that a minimum amount of trench remains open at any one time.

Backfill material adjacent to the pipe and up to six inches above the pipe shall be of suitable dirt free from rocks, hard clods, cinders and other types of debris. Take precaution in placing and packing the initial backfill so the pipe coating and fittings beneath will not be damaged. If the soil removed from the trench is not suitable for backfill, sand shall be used to bed the pipe up to six inches above the top of the pipe. Rockshield 3/16" minimum thickness may be substituted when suitable backfill is not available.

5.9.35 TAMPING

Machine tamp backfill at all locations required by ordinances, permit specifications or at locations determined by the inspector. Exercise care near the pipe so that the coating and fittings will not be damaged by the tamping operation.

5.9.36 SETTLEMENT PRECAUTIONS

Where the pipe is trenched across roads, backfill the part which crosses the road as soon as possible after the pipe is laid. Backfill these crossing in six inch layers and machine tamp each layer to the equivalent compaction of the adjacent undisturbed soil, or to the specifications by the permit.

5.9.37 WATER PACKING

Backfill in 18 inch layers of dirt and then water saturate. Continue layering to the top of the trench. Grade a dirt crown over the trench and then wheel pack. Where the flushing method is used to consolidate the backfill, exercise care to see that the pipe does not float off the trench bottom.

5.9.38 CROWN

Scrape and crown all loose dirt in the construction area up over the trench in a straight line as far as practical.

5.9.39 PLASTIC PIPE BACKFILLING PRECAUTIONS

Earth loading, except where settling causes bending stress, should not excessively stress PE or PVC pipe in normal installations. Ways to prevent stress are:

A. Join pipe to fittings in straight lines to prevent excessive bending.
B. Grade and backfill evenly to prevent uneven settlement.
C. The use of protective sleeves and proper compaction techniques for service branches and transition fittings.

Material six inches around the top and bottom of the pipe shall be free of all biodegradable items, rocks cinders, 1/2" in diameter or larger dirt clods. Tamp backfill material beneath and around all service connections, fusions or fittings. Complete backfill in connections, fusions, or fittings. Complete backfill in successive layers to uniformly fill the trench without voids.

5.9.40 RESURFACING & RESTORING OF R.O.W.

Replace the cut or damaged areas of all paved or asphalt surfaced areas in a manner approved or specified by the authority having jurisdictional; included are streets, highways, alleys, driveways, sidewalks and any other hard surface undercrossings.

Resurface graded dirt, gravel or crushed rock road crossings to their original condition and in an approved or specified manner by the authority having jurisdiction.

Where the pipeline crosses farming or ranching areas, level out the backfill so the difference in surface elevation between the top of the backfill and the normal surface of the ground does not exceed 12 inches. Make an opening in the crowned backfill to permit drainage and prevent the damming water.

After construction, restore all roads, hillsides, creek banks, levees and other areas to the original condition or profile, unless other arrangements are agreed to by both the land owner or the authority having jurisdiction and the company.

Protect backfill area from erosion. Where erosion is possible, construct dams or dikes with earth-filled sacks and seed construction area with rye grass or other quick growing grasses.

Restore surface drainage into the original channels it followed prior to construction.

5.9.41 CLEAN-UP

Keep the right-of-way skids, defective materials, and all other construction debris immediately behind the operation.

Scrape and crown up all loose dirt on the right-of-way over the ditch in a straight line as far as practical rust, scale and mud. If the surface is oily or greasy, use a solvent and wipe clean. Then dry with clean paper towels or rags.

5.10 CONSTRUCTION - PIPE COATINGS

Handle and install pipe so that mill-applied coating is not damaged. Pipe in the yard must be handled with slings and padded forklifts. During transport, pipe must be padded and separated and kept off the ground by use of timbers or tires at the job site.

Field coat all bare or damaged coated steel pipe, metal fittings, and copper locating wire connections that are used in below-grade installation. Clean the pipe and apply coating as per manufacturer's instructions.

5.10.1 COLD-APPLIED TAPE APPLICATION

This procedure presents the method and suggested techniques for application of cold applied coating tapes to steel pipe and various metal fittings. Use filler tapes to build up, fill voids, or smooth out areas for an even outer tape coat.

5.10.2 SAFETY PRECAUTIONS

Wear eye protection when removing rust and scale from piping and when applying primers.

Wear gloves when using hot applied tape.

All other precautions as detailed in the manufacturer's Material Safety Data Sheet shall be heeded when applying pipe coatings.

5.10.3 SURFACE PREPARATION

Prepare all surfaces by using a wire brush and a file to remove rust and scale. Power brushing is preferred. Trim damaged coating so that no high or sharp edges exist which will cut into the cold applied tape. Wipe area clean and dry with paper towels. Be sure all surfaces are free of loose coating dirt, rust, scale and mud. If the surface is oily or greasy, use a solvent and wipe clean. Then dry with clean paper towels or rags.

Stir the primer according to the manufacturer's specifications. Apply the primer with a 2" or 3" wide paint brush. Use smooth brush strokes without any large accumulations of primer.

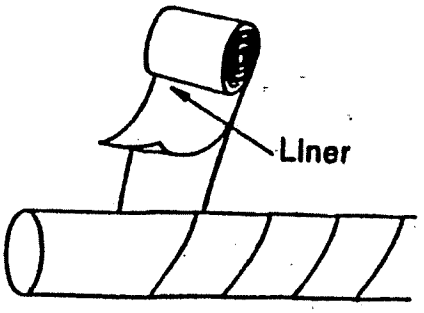
Allow the primer to cure to manufacturer's specifications.

5.10.4 PIPE WRAPPING PROCEDURE

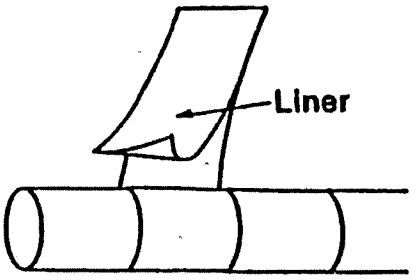
When the primer cures to manufacturer's specifications, begin applying the tape using either the straight wrap (cigarette wrap) or spiral method. Concentrate on the tightness of the tape and an overlap of 1/2" to 1" to prevent voids between tape passes. When spiral wrapping, make one complete straight wrap. before the spiral begins, and do not wind tight. The straight wrap will anchor the tape and prevent it from sliding. Wind the last wrap straight and again, do not wind tight. In tight spots,. or with close clearance under the main, first cut a length of tape and reroll it into a smaller roll.

While wrapping, pull the separator strip covering the tar and tape away just before the tape touches the fitting or pipe to protect the surface from dirt or water. When the length of the paper separator gets excessive, discard and tear it off with one hand while holding slight tension on the tape with the other hand.

1. Spiral Wrap



2. Cigarette Wrap



5.10.5 REPAIR CLAMPS WRAPPING PROCEDURE

Wrap all fittings with tape of 2" width to reduce the possibility of forming folds or creases. Use a filler tape to fill in voids before applying tape. Wrap irregularly shaped fittings, such as nut-type compression couplings, compression ells, couplings, band clamps and split sleeves as follows:

Clean and prime the fitting and all bare pipe as described in Surface Preparation. Apply the primer at least 4" onto existing coating. Use a filler tape to fill in voids and irregular surfaces to give a smooth surface for the overwrap tape. Beginning at either end (at a point 4" onto the existing coating), spiral wrap toward the fitting (wrap from large to small on fittings that change diameters). When the leading edge of the fitting is reached, stretch the tape enough so that it conforms to the increased diameter of the fitting. Continue wrapping the length of the fitting and 4" onto the existing coating o~ the other side. During the wrapping process, each pass should overlap the previous pass by at least 1/2" to 1".

(See illustrations 1 through 4 for Wrapping Procedures).

When wrapping steel or iron used with plastic pipe or tubing, use the same procedure. However, DO NOT APPLY the primer or tape on the plastic pipe.

ILLUSTRATION I

Straight wrap, mold, and smooth out each end or protruding bolts with a filler tape.

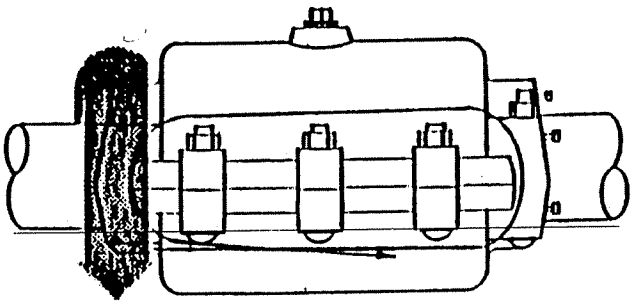
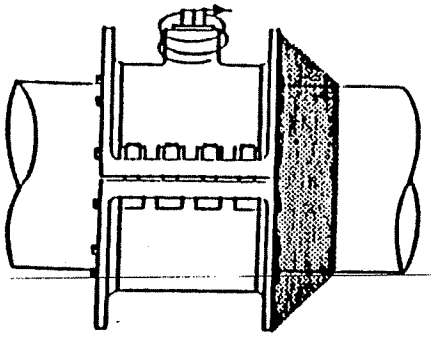


ILLUSTRATION 2

Wrap, build up, and smooth out the outlet area and ends with a filler tape.



Use filler tape to wrap nut and ends of each bolt. build up the filler tape to provide for a smooth surface for the outer wrap.

ILLUSTRATION 3

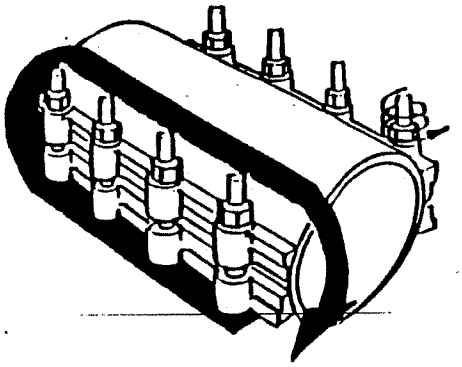
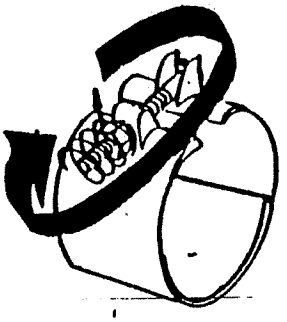


ILLUSTRATION 4



5.10.6 FINAL SPIRAL WRAPPING

Beginning at a point onto the existing pipe coating, apply one complete straight roll around piping. Start spiral method with the second pass wrapping toward the fitting and continue wrapping the length of the fitting until the wrapping overlap. 4" onto the existing pipe coating on the opposite side.

5.10.7 SERVICE TEES WRAPPING PROCEDURE

WELDED TEE - Clean and prime main, branch piping and tee. Cut six pieces of filler tape from the roll. The length of the pads will vary according to the steps described below:

A. Place filler tape in the following manner: (see illustration 5)

1. Crotch at the back of tee base.
2. Crotch at the front of tee base.
3. Form bottom crotch by tee body and outlet.
4. Form top crotch by tee body and outlet
5. Over cap of tee extending 2" down the body.
6. Under main extending from one side of tee base around the main to other side of tee base.

B. Wrapping: (see illustration 5)

Cut tape strips and spiral wrap the tee outlet and body, the uncoated portion of the main, and the uncoated portion of the branch line. Completely cover the pads.

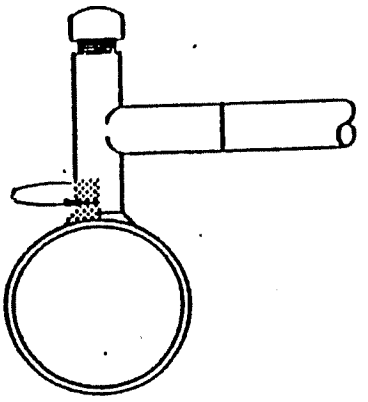
For the final layer of tape, start at one end of the cutback area on the main overlapping the tape 4" onto the existing coating. Spiral wrap toward tee. When the tee is reached, cross the tape on each side of the base. Continue part the tee to a 4" overlap on the other end of the cutback area. This technique results in double layers of tape on the main, in the crotch areas of the tee, and at the threaded cap of the tee.

MECHANICAL SADDLE TEE Clean, prime and wrap saddle tees in the same way as welded tees. Place filler tape in the crotch areas of the tee and over the cap. Spiral wrap the tee making certain to completely cover the pads. Use filler tape to fill in Irregular surfaces and hollow spots. Using strips of 4'~ tape, and starting at one side of the tee, wrap the saddle over the hinge$_1$ around the main, over the bolt and back to the tee.

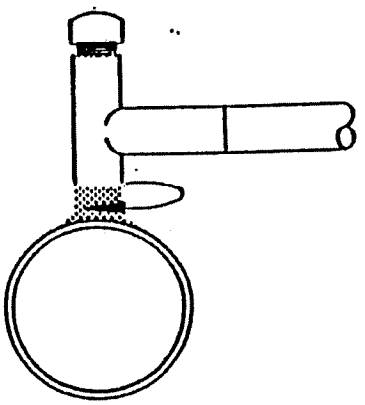
When the tee has been completely wrapped, spiral wrap the main.

ILLUSTRATION 5

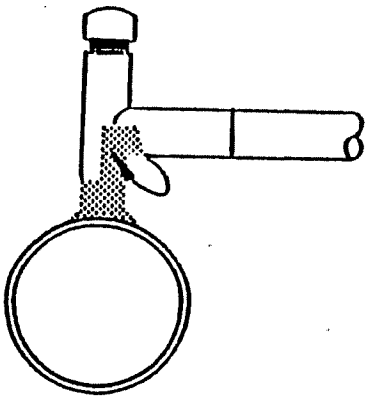
1. Back Tee Base Pad:



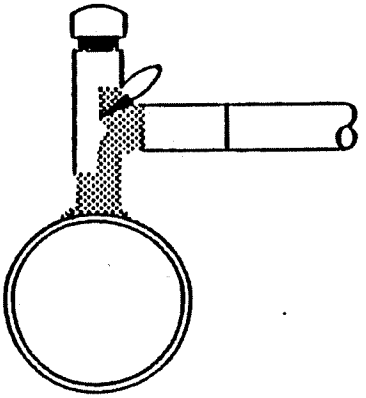
2. Front Tee Base Pad:



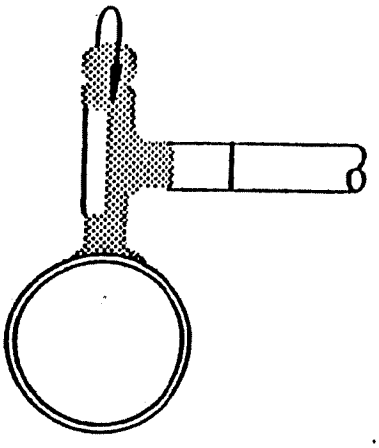
3. Bottom Outlet Crotch Pad:



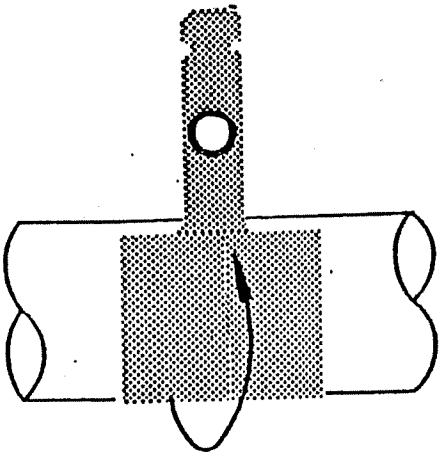
4. Top Outlet Crotch Pad:



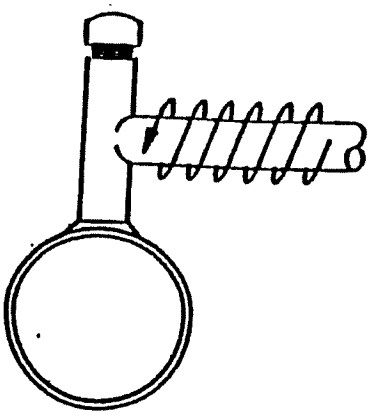
5. Cap Pad:



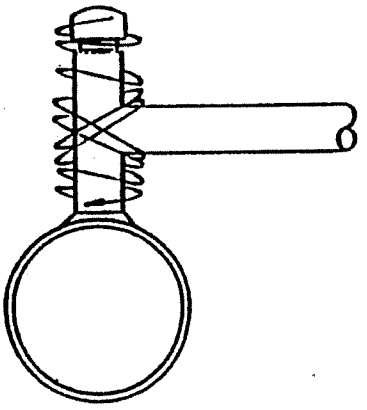
6. Main Pad:



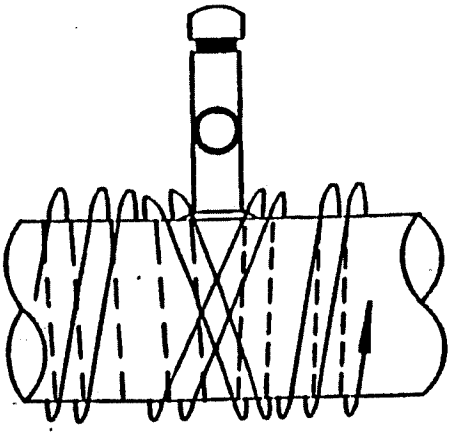
7. Tee Outlet:



8. Tee Body:



9. Final wrapping of Main. Dotted lines indicate primary wrapping.



5.10.8 REPAIRING DAMAGED PIPE COATINGS

Repair coating damages of a large size pipe by using the spiral wrap method. Clean and prime the pipe, including the damaged area, around its entire circumference, applying the primer over the damaged area and about 4" each side of the damaged area. Starting 4" on one side of the damaged area on the existing coating, apply one complete straight wrap to anchor the tape.

Start the spiral method with the second pass and continue wrapping over the primed area until 4" of existing coating is wrapped. Concentrate on the tightness of the tape and the overlap of each pass. Each new pass should overlap the previous pass by at least 1/2" to 1". Repair very small damaged areas with a straight wrap around the pipe.

5.10.9 WRAPPING PROCEDURES FOR BUTT WELD JOINTS

Allow the pipe temperature to cool below 120 degrees F. (warm to the touch). Clean and prime the bare area and the existing coating 4" on each side completely around the circumference of the pipe. Use the spiral wrap method and apply the tape as described in General Wrapping Procedures.

NOTE: For ease of installation on both large area coated damages and welded joints, use 2" wide tape on pipe 4" or less in diameter, 4" wide tape on pipe 6" through 16", and 4" or 6" wide tape on pipe over 16" in diameter.

5.10.10 JOINT WRAP PRECAUTIONS

A. The effectiveness of wrapping tape depends greatly on the bond between the metal surface and the primer, and the bond between the primer and the tape. The technique outlined reduces the possibility of voids, pockets, or gaps between passes of the tape. It is extremely important that: the surface (to be wrapped) is as clean as possible. Apply the primer as directed. Keep all foreign matter off of the primer after application and make all passes of the tape with a 1/2" to 1" overlap on the previous pass. The key to a successful application to the tape over the primed surface is to maintain a steady tension on the tape as the wrapping proceeds.

B. There will be situations when wax coating and paper wrappers have been removed from steel pipe or fittings. They must be recoated. Before using cold applied wrapping tape to recoat, prepare the surface of the pipe and fitting.

C. In other situations, it may be necessary to coat over existing wax and paper wrapper coating. In such cases, cold applied tape will form a bond if the wax and paper wrapper have been properly applied. However, if any loose wrapper or wax is present, remove it prior to applying the cold tape.

5.10.11 HOT-APPLIED TAPE APPLICATION

This procedure presents the method and suggested techniques for the application of hot applied tape to bare steel pipe, welded joints and cut back or damaged areas of coated steel pipe.

5.10.12 MASTIC APPLICATION

APPLICATION PROCEDURE - This procedure presents the method and suggested techniques for the application of mastic to irregular shaped fittings.

A. Prepare all surfaces by using a wire brush and a file to remove rust and scale. Use a power brush when available. Trim damaged coating so that no high or sharp edges exist. Wipe area clean and dry with paper towels. Be sure all surfaces are free of loose coating dirt, rust, scale and mud. If the surface is greasy, use a solvent, if necessary, and wipe it clean with a clean dry paper towel or rags.

B. Use primer when recommended by the manufacturer. Stir the primer according to the manufacturer's specifications. Apply the primer with a 2" or 3" wide paint brush. Use smooth brush strokes without any large accumulations of primer. Allow the primer to cure to manufacturer's specifications before applying 'mastic.

C. Stir mastic thoroughly before using.

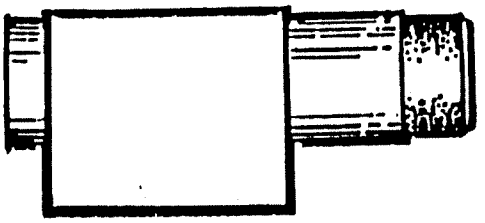
D. Apply mastic when primer is cured. Use a brush or apply by hand (using a glove). When applying, work the mastic until it begins to thicken. The mastic should be at least 1/32" thick.

E. Allow the mastic to dry before applying the second coat.

F. Install a plastic sheet outerwrap for protection against backfilling.

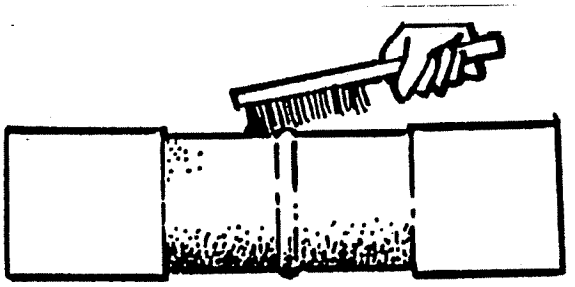
5.10.13 HEAT SHRINKABLE SLEEVE APPLICATION

JOINT PREPARATION - This section provides only general procedures and precautions. Be sure to check manufacturer's instructions for specific installation details.

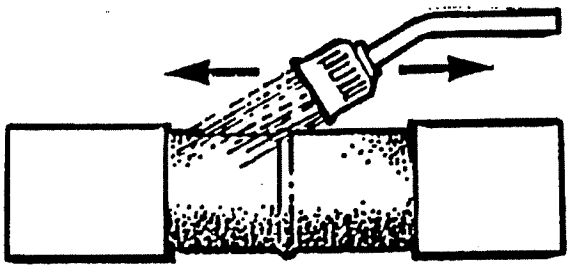


A. Before welding the pipe, slide the sleeve over one end and move it at least 3 feet away from the joint to prevent damage from weld spatter.

B. After the weld has cooled, clean off any loose rust and weld scale with a wire brush. A rotary power brush is preferred.

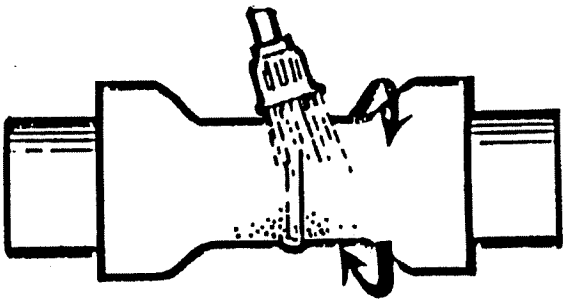


C. Using a propane or butane torch, pre-heat the joint and adjacent coating to about 115 degrees F. to remove any moisture. This will assist flow-out and bonding of the adhesive.

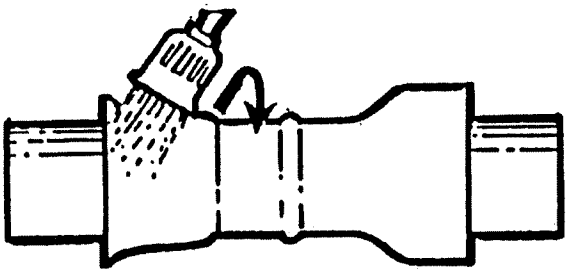


INSTALLATION

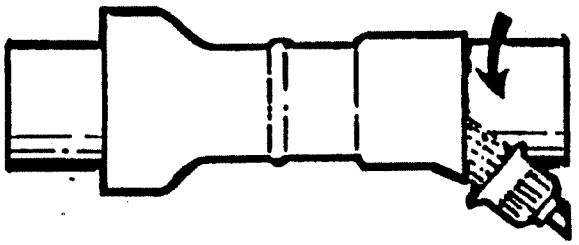
A. Center the sleeve over the joint and begin heating it with a propane or butane torch having a broad, strong flame. Start at the top center of the sleeve, and shrink it all around the diameter of the pipe, using broad, circumferential strokes. Keep the torch moving to avoid burning the sleeve.



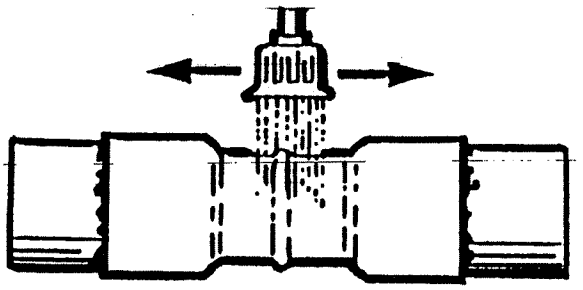
B. Continue shrinking the sleeve toward one end until about 2 inches is left.



C. Aim the torch inward toward the underside to bring the last 2 inches down.



D. Repeat steps 2 and 3 on the other end of the sleeve.



E. Using broad end-to-end strokes, complete heating the sleeve until it is tight or changed to the recommended color, and stays that way for several seconds after removing the torch.

5.10.14 LOWERING IN AND BACKFILLING

Allow the joint and sleeve to cool for at least 30 minutes (recommend 1 hour) before lowering in. Use selected backfill containing no large or sharp stones to avoid damaging the sleeve or coating during the backfilling operation.

5.10.15 RECOATING AFTER EXOTHERMIC WELDING

Clean exposed pipe and exothermic weld area. Wrap with a material compatible with the surrounding pipe coating.

5.10.16 HANDLING PROCEDURES

Do not move or lower anodes by using the anode lead wire. Copper wire is easily stretched and could be pulled loose where it connects to the steel core of the magnesium bar.

Store anodes in dry building and place them on a wooden pallet to help prevent absorption of moisture into the backfill which surrounds the anode.

5.11 ANODE REQUIREMENTS

The number and size of anodes to install on all coated and wrapped mains or services can be determined by the surface area of the pipe to the protected.

A. Coated and Wrapped Mains

The anode requirement table and graph for coated and wrapped mains are based on 5% exposed pipe (holidays, skid marks, etc.) at 1 milli-amp of current per square foot.

Surface Area*	Install
0-147 Square Feet	one - 3 pound packaged anode
148-249 Square Feet	two - 3 pound packaged anode
249-2,500 Square Feet	one - 17 pound packaged anode

B. Coated and Wrapped Steel Service Lines

The anode requirement table and graph for coated and wrapped service lines are based on 10% exposed pipe at 1 milli-amp of current per square foot. (The reason we used 10% exposed for service lines is due to the amount of hand coating and irregular shaped fittings involved.)

Install magnesium anodes on all coated and wrapped service lines that are insulated from the main to which they are connected.

Determine number of three pound anodes by use of the tables below:

Nominal Pipe Size	Lineal Feet Service Pipe	Number of Three Pound Anode
3/4"	1,800'	one 3 pound anode
1"	1,500'	one 3 pound anode
1 1/4"	1,100'	one 3 pound anode

C. How to determine anode requirements - To determine the square feet of pipe surface area, multiply the lineal feet of pipe by the lineal foot factor set out in the following table:

Formula for Square Ft./Lineal Ft. Factors

$$\frac{\text{Outside Pipe Diameter} \times (3.1416)}{12}$$

Nominal Pipe Size	Square Ft. Per Lineal Ft. Factor
5/8"	.164
3/4"	.275
1"	.344
1 1/4"	.434
1 1/2"	.497
2"	.622
2 1/2"	.766
3"	.916
4"	1.178
5"	1.457
6"	1.734
8"	2.258
10"	2.814
12"	3.338
14"	3.927
16"	5.522

D. Example:

Problem - Determine number and size of anodes to install on 1,000 feet of 2 inch coated and wrapped main extension to serve ten houses. (Service line 3/4" coated and wrapped with average length of 80 feet per service).

Main - 1,000 feet of 2-inch times .622 factor for 2 inch pipe. Multiplying 1,000 X .622 equals 622 square feet of pipe surface.

Services - 10 X 80 equals 800 lineal feet of 3/4 inch. 800 lineal feet of 3/4 inch times .275 factor for 3/4 inch pipe. Multiplying 800 X .2755 equals 220.0 square feet pipe surface.

Answer - 622 plus 220 equals 842 square feet pipe surface. 842 is more than 250 and less than 2,500. Install one 17 pound packaged anode.

5.11.1 ANODE LOCATION

The choice of location for an anode installation is important. A poor location is sure to result in poor current flow from the anode.

An anode should, therefore, be located in areas having high sub-soil moisture such as creek beds, drainage ditches, etc., or soil showing mixed alkali deposits, decayed plant growth, or ash deposits.

On short-main replacement jobs where no desirable location as defined above exists, install the anode at or as near as possible to the location of the leak on the section being replaced.

On large, new-construction or replacement jobs, after primary consideration is given to choice of location, secondary consideration shall be to locate the anode installation near the center of the extension or replacement. if more than one anode is involved, equalize spacing between installations.

Areas having below-normal sub-soil moisture, extensive tree roots, hard-surfaced roadways, gravel beds, or hilltops should be avoided.

5.11.2 ANODE INSTALLATION PROCEDURES

Anodes can be installed with a backhoe, trenching machine or auger.

Anodes can be installed horizontally or vertically.

Put the anode deeper in the earth (at least one foot) than the pipeline. This will generally insure that the anode will be
in more moist soil than the pipeline.

Firmly tamp earth around all sides of the anode to insure better electrical contact between the anode and the earth. This will allow more current to flow from the anode to the pipeline.

After anode has been tamped, but not completely backfilled, water the tamped earth around the anode to help activate the anode.

Locate the anode at least three to five feet away from the coated pipeline and ten feet away from a bare pipeline. (Do NOT install anode in same ditch as pipeline unless you can obtain proper distances.)

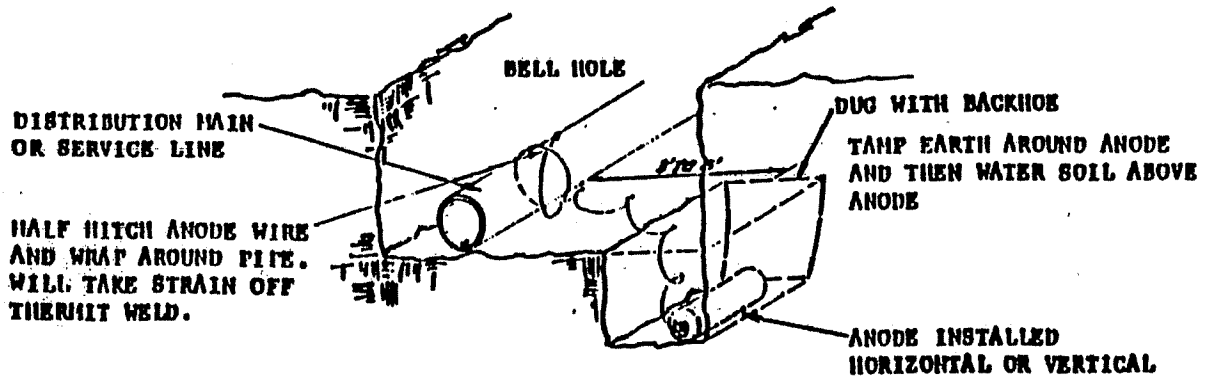
Use Exothermic Weld process to connect anode lead wire to the pipeline. (Refer to Exothermic Welding Section 860).

Repair the damaged coating at anode lead connection with an approved type wrap joint, such as not applied tape.

See Figures 1 and 2 for anode installation on coated and wrapped pipe.

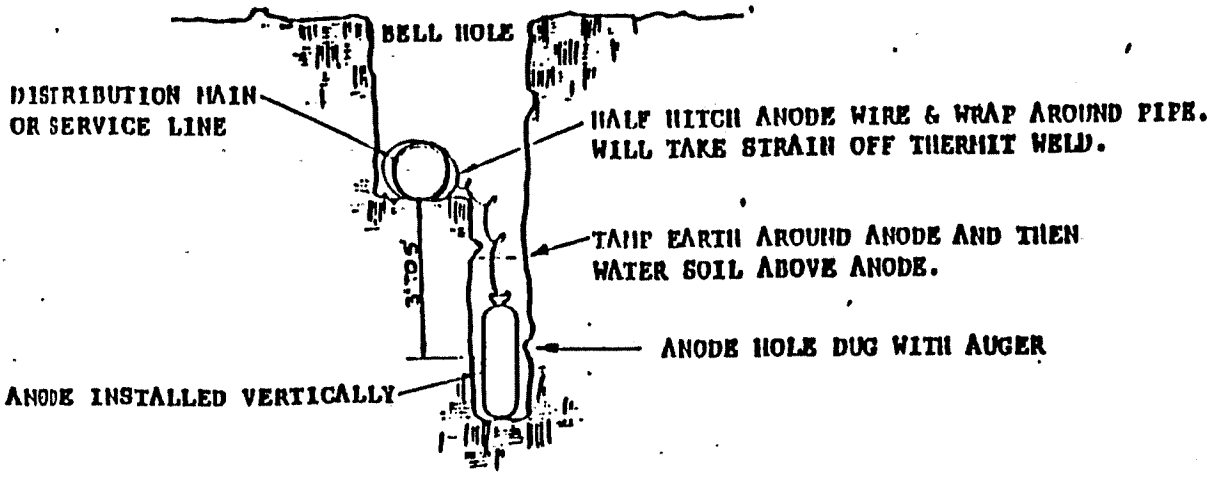
See Figures 3 and 4 for anode installation on bare pipe.

See Figure 5 for corrodible service line riser anode installations coming off plastic service lines.



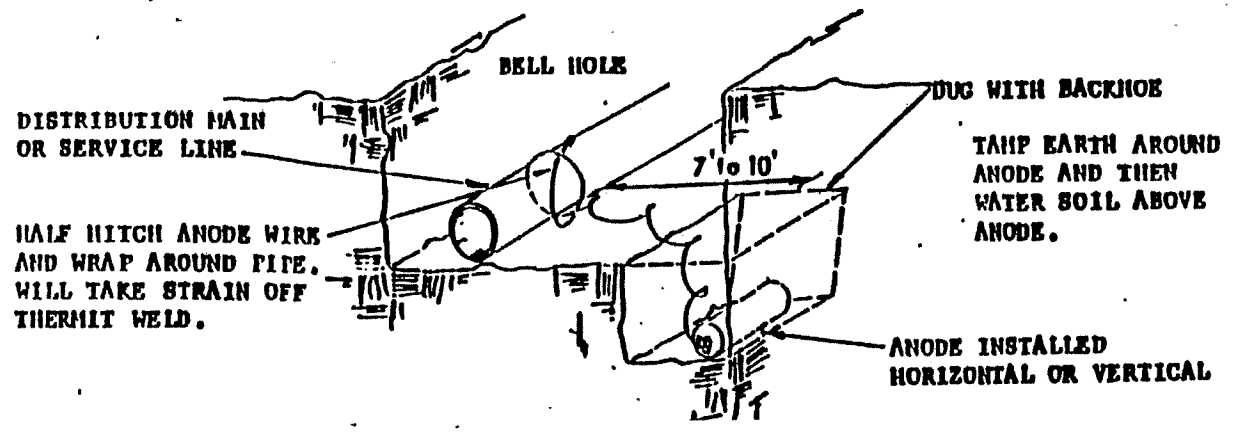
Single Anode Installation on Coated & Wrapped Pipe

Figure 1



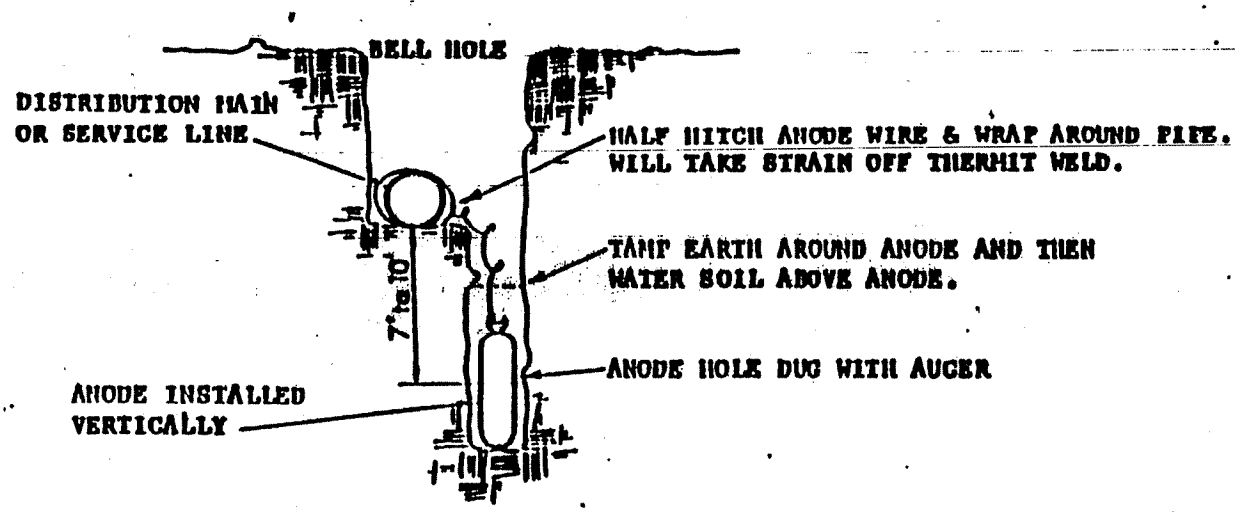
Single Anode Installation on Coated & Wrapped Pipe

Figure 2



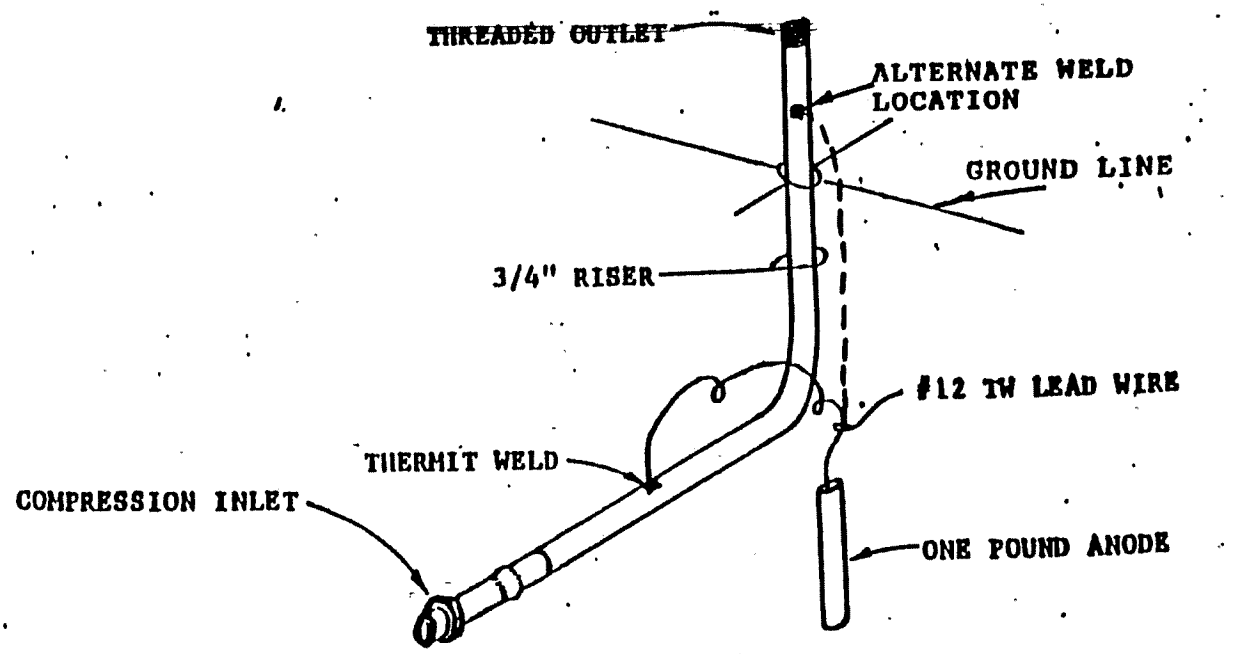
Single Anode Installation on Bare Pipe

Figure 3



Single Anode Installation on Bare Pipe

Figure 4



Corrodible Service Line Riser Anode Installation

Figure 5

5.11.3 CONSTRUCTION - CORROSION CONTROL TEST LEADS

Electrically connect copper wire test leads, anode leads and bonding lead wires to steel pipelines by the soldering technique on light wall pipe and the exothermic weld process on steel pipelines operating at pressures below 100 psig.

5.11.4 SOLDERING

A. Remove pipe coating approximately 3" to 4" square.
B. File the pipe to a bright, clean and dry surface to obtain good electrical bond.
C. Strip the insulation far enough back to make a small diameter loop about the size of a dime to provide more soldering surface. (Refer to Figure 1)
D. Stir flux thoroughly before using and applying a thin coat to the areas to be soldered.
E. Tin the pipe and the looped wire.
F. Heat pipe to "puddle" solder.
G. Insert looped wire in solder puddle; hold steady until solder is set.
H. Test for positive bond by tapping connection with a hammer.
I. Clean exposed pipe and solder area and coat with a compatible coating material.

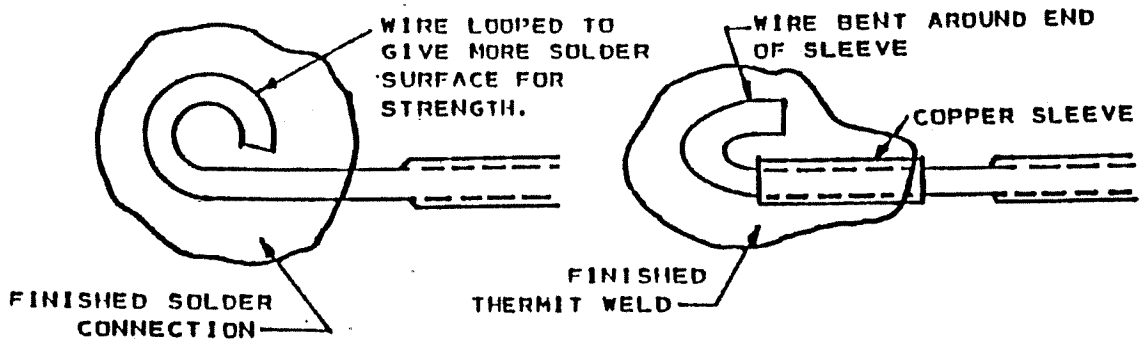


Figure 1: Top View Detail

Recommended Materials: Eutec Rod 157 - 1/8" diameter w/Eutec Flux 157 (or equal)

5.11.5 EXOTHERMIC WELDING (Cadweld - Thermit Weld)

When welding, keep the following three points in mind:

A. All exothermic charges should be limited to 15 grams.
B. The use of exothermic welds should be avoided in high stress areas such as elbows, tees, etc.
C. If more than one exothermic weld is required, the minimum spacing between welds should be four inches to avoid stress areas.

Guidelines for Exothermic Welding:

A. Remove coating approximately 3" to 4" square.
B. File the pipe to a bright, clean and dry surface to obtain good electrical bond.
C. Strip the insulation far enough back to allow enough wire to protrude through the copper sleeve, so a bend in the wire can be made with the flat jaws of a pliers (refer to Figure 1). This provides additional bond strength to the weld and prevents possible pull out.
D. Place mold over cleaned surface and insert the wire until it is under the center of the tap hole (refer to Figure 3).
E. Cover the tap hole with the steel disk.
F. Dump the cartridge in the crucible and close the cover. (Tap the bottom of the cartridge to be certain the starting powder is emptied into the crucible). Replace empty cartridge in the box as an aid to keep unused cartridges in an upright position.
G. Hold firmly down on the exothermic welder unit to prevent leakage and ignite the starting powder with a flint gun. Immediately pull the flint gun away to avoid fouling.
H. Hold exothermic welding in place about ten seconds until molten weld metal becomes solid.
I. Test for positive bond by tapping connection with a hammer.
J. Clean the weld from slag and coat with a compatible coating material.
K. Also clean slag from the exothermic welder mold before making the next weld.

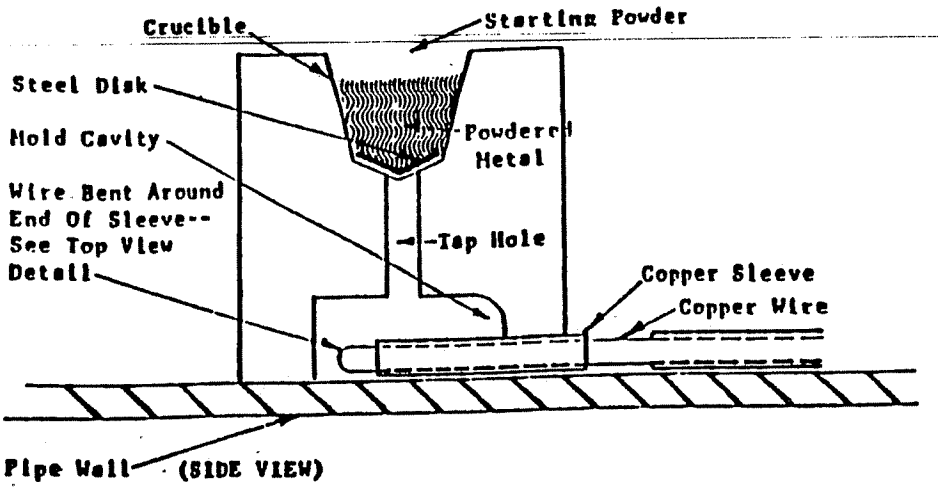


Figure 2: Side View Thermit Welding

5.11.5.1 RECOATING AFTER EXOTHERMIC WELDING

The entire exposed area around the exothermic weld connection is to be recoated with an approved compatible pipe coating.

5.12 PAINTING AND SURFACE PREPARATION

This section was written in accordance with 49CFR 192.479 and 192.481 to provide general standards and procedures for painting and surface preparation. This section will cover metal surfaces in a TBS, DRS, meter station, odorizer, propane air plant, bridge crossing, distribution meter setting, pipeline valve setting, and in general, all above-ground facilities.

Painting and surface preparation shall also comply with specific paint manufacturer's instructions.

5.12.1 ITEMS NOT TO BE PAINTED

Various items are not to be painted because of natural corrosion resistant properties or because of an adequate factory applied coating. These are non-ferrous (other than steel or iron) parts (such as specification tags, plastic parts and pipe, brass valves, regulators or relief valves); factory coated meters, regulators and instruments.

Do not paint stainless steel parts. This includes stainless steel tubing on odorizers, instruments, DRS and TBS.

5.12.2 SURFACE PREPARATION GUIDELINES (PRESENT CONDITION)

The following procedures apply to above ground facilities.

5.12.3 POWER TOOL CLEANING

Scope - The following procedures explain the requirements for power tool cleaning of steel surfaces before painting.

Power tool cleaning is a method of preparing metal surfaces for painting. Remove loose mill scale, loose rust, and loose paint with power wire brushes, power impact tools, power grinders, power sanders, or by a combination of power tools.

It is not intended that all mill scale, rust and paint be removed by this process. It removes the loose mill scale, rust, paint and other harmful foreign matter. Power tool cleaning does not remove any heady deposits of oil or grease.

Power impact tool cleaning is important especially when using power driven chipping and scaling hammers, rotary scalers, single or multiple piston scalers, or other similar impact cleaning tools. Keep cutting edges of such tools in good condition.

5.12.4 PROCEDURES

Power tool cleaning shall follow these series of operations:

A. Remove heavy deposits of oil or grease by a volatile solvent.
B. Remove rust scale by power impact tools.
C. Remove all loose mill scale, non-adherent rust and paint by the following methods:
D. when power wire brushing, use only rotary, radial, or cup brushes of a suitable size.

The power brush must enter and clean all openings, angles, joints, and corners

The steel wire of wire brushes shall:

A. Be of sufficient rigidity to clean the surface.
B. Be kept free of excessive foreign matter.
C. Be discarded when they are no longer effective.
D. Be selected to clean the surface but not burnish it.

Preparation for repainting:

A. Before repainting, remove all loose paint. Feather the edges of the remaining old paint so that the repainted surface can have a smooth appearance. The remaining old paint shall have sufficient adhesion so that it cannot be lifted as a layer by inserting the blade of a putty knife under it.
B. Remove all accessible weld flux and splatters by power tools.
C. Before assembly, clean all portions of steel members. Clean new work areas which will be impossible to reach after assembly.
D. Clean rivet heads, corners, cracks, crevices, lap joints and fillet welds by the use of power wire brushes, sharp chisels (used in chipping), or scaling hammers, rotary grinders, or sanders, or by a combination of such tools.
E. There shall be no burns, burrs, or sharp ridges left on the surface. No sharp cuts into the steel are allowed.

Hand clean areas impossible to get at by power tools.

After cleaning operations are completed, remove all dust and loose matter from the surface.

Apply the primer coat as soon as possible after cleaning. Do this before any further corrosion or contamination occurs. If not, remove all corrosion or contaminates before priming.

5.12.5 SAFETY PRECAUTIONS WHILE POWER TOOL CLEANING:

A. Take proper precautions before any work is done when fire or explosion hazards are present. If the structure is used to contain flammable materials, purge it. If the structure being cleaned is near flammable materials or fumes, use non-sparking tools.
B. Wear safety goggles when operating power cleaning tools.
C. Wear filter type air respirators when dust hazards are present.

5.12.6 HAND TOOL CLEANING

The following procedures explain the requirements for hand cleaning steel surfaces before painting.

Hand cleaning prepares metal surfaces for painting by removing loose mill scale, loose rust, and loose paint by hand brushing, hand sanding, hand scraping, hand chipping, hand impact tools, or by a combination of the tools.

It is not intended that all mill scale, rust, and paint be removed by this process. It removes loose

5.12.7 PROCEDURES

Hand cleaning shall follow these series of operations:

A. Remove heavy deposits of oil or grease by a volatile solvent.
B. Remove rust scale by hand hammering, chipping, or impact tools, or any combination of the tools.
C. Remove all loose mill scale, non-adherent rust, and paint by the following methods:
D. The hand wire brush must enter and clean corners, angles, joints and openings.
E. The steel wire of the wire brushes shall:
   1. be of sufficient rigidity to clean the surface.
   2. be kept free of excess foreign matter.
   3. be discarded when they are no longer effective.
F. Hand scrapers shall be of a suitable material, kept free of excess foreign matter, and sharp enough to be effective.
G. Before repainting, remove all loose paint. Feather thick edges of the remaining old paint so the repainted surface can have a smooth appearance. The remaining oil paint shall have sufficient adhesion so it cannot be lifted as a layer by inserting a putty knife blade under it.

H. Remove all accessible weld flux and splatter by hand scraping or impact tools, then follow by a wire brushing.

I. Before assembly, clean all portions of steel members. Clean new work areas which will be impossible to get at after assembly.

J. Clean rivet heads, corners, cracks, crevices, lap joints and fillet welds by the use of power wire brushes, sharp chisels used in chipping, or scaling hammers, rotary grinders, or sanders, or by a combination of such tools.

K. There shall be no burns, burrs, or sharp ridges left on the surface. No sharp cuts are allowed in the steel.

L. After cleaning operations are completed, remove dust and other matter from the surface.

Apply the primer coat as soon as possible after cleaning. Do this before any further corrosion or contamination occurs. If not, remove all corrosion or contaminates before priming.

Safety Precautions While Hand Cleaning - Take proper precautions before any work is done when fire or explosion hazards are present. If the structure is used to contain flammable material, purge it. If the structure being cleaned is near flammable material or fumes, use non-sparking tools.

Wear safety goggles when engaged in cleaning operations hazardous to eyes.

5.12.8 SOLVENT CLEANING

The following procedure explains the requirements for solvent cleaning of structural steel surfaces (removing mill scale, rust or paint) before painting. Solvent cleaning is a procedure for removing matter such as oil, grease, soil, drawing and cutting compounds, and other contaminants from steel surfaces by the use of solvents.

Use solvent cleaning, if specified, prior to painting and other specified surface preparations. Use solvent cleaner for the removal of rust, mill scale, or paint.

Procedures - Solvent cleaning shall follow these series of operations:

A. Remove soil, cement splatter, marking compounds, salts, or any other foreign matter (other than grease and oil) by brushing (with a stiff fiber or wire brush), scraping, or cleaning with alkaline cleaning solutions. Use alkaline cleaners if they are followed by a fresh water rinse (preferably hot or both).

B. Solvent may be applied by rags, brushes or spraying the surface with solvent. The final wiping or spraying shall be done with clean solvent rags or brushes.

C. Solvent cleaning may be done by submerging the item in a tank (or tanks) filled with solvent. If a series of tanks are used, the solvent in the last tank shall not contain any noticeable amounts of contaminant.

D. Prime or prepare solvent cleaned surfaces as specified before any corrosion or contamination occurs. If not, remove all corrosion or contaminants before priming.

5.12.9 SAFETY PRECAUTIONS TO USE WHILE SOLVENT CLEANING

Fire and explosion hazards are always present with solvent cleaning operations.

No work shall begin until you have safe working conditions.

Use non-flammable solvents for cleaning. A flammable safety solvent may be used but only if it has a minimum flash point of 100 degrees F. If aromatic solvents are used, such as Xylol or Toluol, provide adequate ventilation to keep vapor content in air well below minimum toxic or flammable concentrations.

Never use gasoline and benzene. These hydrocarbons are highly toxic.

If detergents or alkali are used (such as in steam cleaning), wear safety goggles, safety clothing, and waterproof gloves to prevent burns.

5.12.10 GENERAL PAINT APPLICATION

The following procedures explain the requirements for the application of paint to all surfaces. This includes shop, field, and maintenance painting. Surfaces requiring paint are to be cleaned and primed.

All painted surfaces shall be free of runs, bubbles, and be smooth according to professional painting methods.

Take precaution to protect other surfaces from splattering, spraying, dripping, overlapping, etc.

It is not necessary to paint non-ferrous parts. If painting is desired, a primer is not necessary, paint with one finish coat.

5.12.11 CLEANING METHODS

Remove prior to painting, any oil, grease, soil, dust or foreign matter deposited on the surface after the surface preparation is completed. In the event that rusting occurs after completion of the surface preparation, clean the surfaces again according to the specified method.

Before painting, prevent the contamination of the cleaned surfaces with salts, acids, alkali, or other corrosive chemicals. Remove such contaminants from the surface before painting. Apply the primer coat immediately after the surface has been cleaned. Apply succeeding coats before contamination on the surface occurs.

General Application - Non-ferrous materials do not require painting according to D.O.T. codes, but may be painted for other reasons. Examples of non-ferrous materials are brass valves, gauges, specification tags, plastic parts and pipe, or factory coated instruments.

Clean stud bolts by solvent cleaning and coat by brush prior to spray paint application.

Damaged factory coating should first be wire brushed and sanded. Apply a suitable primer coat. Finally, apply the finishing coats.

Apply paint by brushing, roller, spraying, or a combination of these methods.

All painting shall be done under the best conditions possible.

A. In general, do not apply paint when the atmospheric temperature is below 40 degrees F., or when the temperature is expected to drop below 32 degrees F. before the paint is dried.
B. In hot weather, take precautions to obtain the specified paint thickness.
C. Do not apply paint to steel with a temperature over 125 degrees F., or at a temperature which will shorten the life of the paint.
D. Do not apply paint in rain, fog, mist or snow.

Let each coat of paint dry according to the manufacturer's specifications before applying the next coat. Consider paint dry when application of the next coat will not move, wrinkle, bunch or cause any irregularities to the previous coat of paint.

Shade the first primer coat and the first coat if scratched or damaged. Apply a finish coat only when damaged areas have been cleaned or reprimed.

5.13 CONSTRUCTION - SYSTEM/LOCATION RECORDS

5.13.1 CONSTRUCTION MEASUREMENTS

Scope: This section points out what dimensions are needed for records.

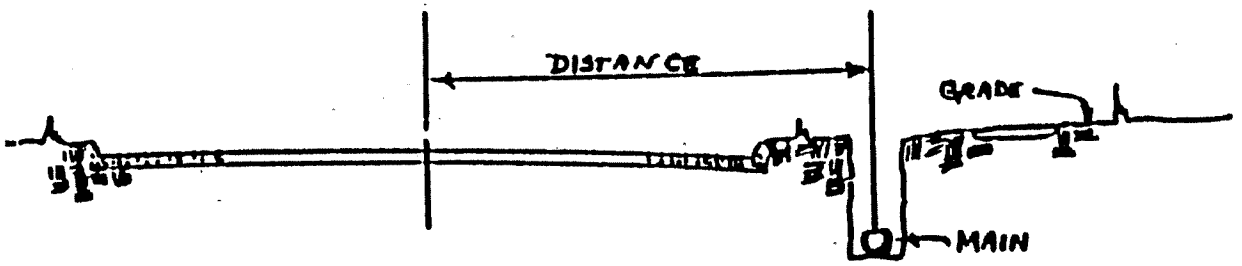
Locating buried facilities is sometimes extremely difficult. Therefore, measuring and recording dimensions to locate buried facilities is important.

To develop accurate records, measure new construction immediately after or during construction. If measuring distances and recording materials are put off until after the lines have been backfilled, it is nearly impossible to make accurate records.

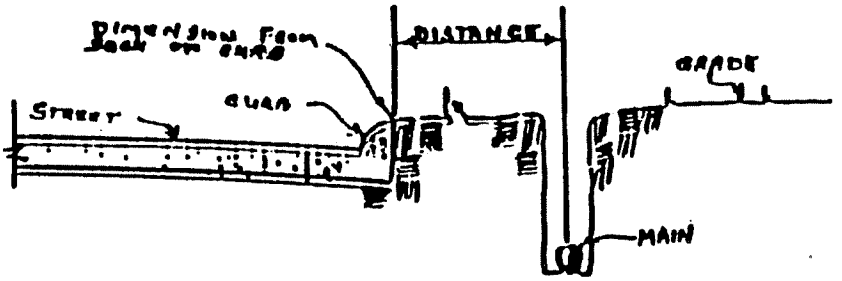
5.13.2 MAINS: FROM PARALLEL LANDMARKERS

Obtain dimensions from permanent landmarks near the street, road, alley or property line. The following are examples of possible landmarks.

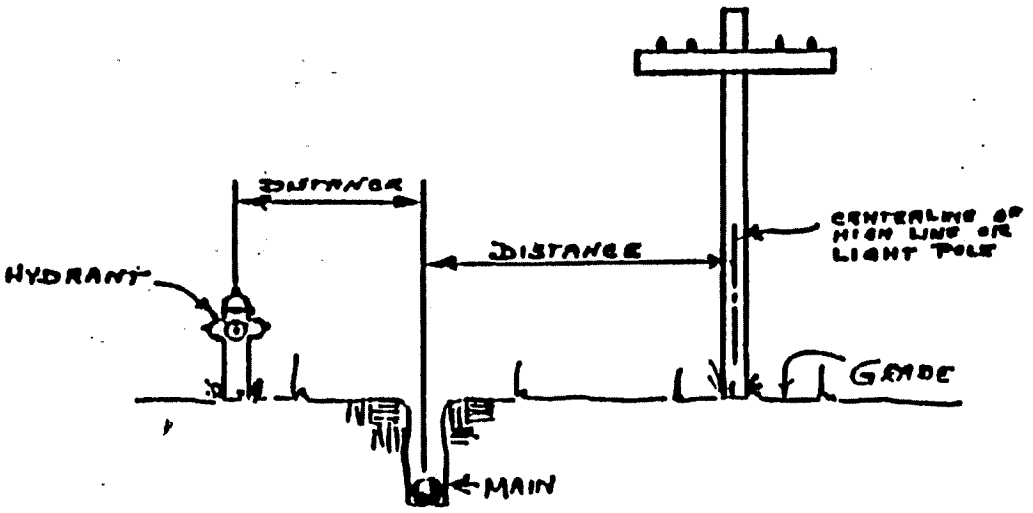
A. FROM MAIN TO CENTER LINE OF STREET OR ALLEY



B. FROM MAIN TO CURB



C: FROM MAIN TO OTHER ABOVE GROUND UTILITY STRUCTURES



Measure location every 100' to 200' along the line. Do this even if the distance looks the same for every 1000'. By dimensioning every 100' to 200', nothing will be assumed. Dimension and detail any definite jogs in the line (example: a manhole).

Obtain distances all above ground facilities, such as district regulator stations and odorizers.

NOTE: Remember, these are the line locating dimensions that are important for future work. Measure and record all the dimensions that are necessary to locate the line.

When measuring the length of mains, measure and record distances from recognizable and permanent landmarks. Center lines of streets and alleys are the best for subsectioning these lengths.

5.13.3 MATERIALS

During construction, record materials as they are installed on the rough field drawing at the time of measurement.

5.13.4 "AS-BUILT" DRAWINGS, MEASUREMENTS

An "As-Built" drawing is either a sketch, marked up copy, or a print showing exactly how a facility was built.

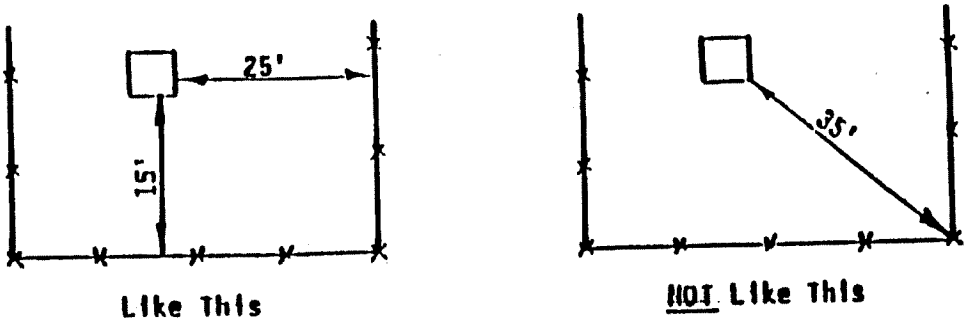
A. "As-Built" drawings shall contain the following information:

1. Marked "As-Built"
2. Completion date
3. Person(s) doing the "As-Built" drawing
4. Who constructed the facility

B. All changes on "As-Built" drawings shall be neat and legible. All changes shall be made in red. Changes also include deviations of material and given dimension.

C. Explanatory sketches shall be one-line drawings.

D. On facilities, dimensions should be parallel and perpendicular to the facility.



Show overall dimensions and riser to riser centerlines on facility settings.

Measure lineal dimensions from fitting to fitting on pipeline projects. Note any change in direction or cathodic protection device (includes: anode, test lead, insulating fitting).

On pipeline projects outside of city limits, measure dimensions from known landmarks to the centerline of the pipe. Preferred landmarks are centerline of roads, section lines (at a minimum of 400 ft. intervals), surveyor's bench marks, etc.

5.13.5 SERVICE LINE AS-BUILT DRAWINGS

Scope: Service line as-built drawings are required to illustrate and report the physical location and other related data on completed service line construction.

The section will cover how to complete the service line as-built drawings. Record only one service line installation per as-built drawing.

The drafting area of these two forms are preprinted with a dotted grid network. By using the background patterns, field drawing time is reduced by freehand drawing. A street and alley, with centerline, are also preprinted on the form. Indicate NORTH on all drawings.

5.13.6 BASIC DRAWING REQUIREMENTS

All service line As-Built drawings shall have:

A. Direction of North
B. The horizontal service line length, and if regularly routed, the component distances
C. The street name, if not identified in the data block
D. Location of meter set
E. Fill in all information required on record, i.e., type of material, test pressure, etc.

QQ Guide

For Small Distribution Systems

ACKNOWLEDGEMENTS

The Small System Operator Qualification Guide Material Project was part of a national effort initiated by the United States Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety.

In April of 2003, a team of individuals representing the liquid pipelines, natural gas industry, and regulatory representatives from around the country, were tasked with development of guidance for small system operators of liquid and natural gas systems, to comply with the Operator Qualification (OQ) Rule. The Small System Operator Task Force (SSOQ) in this document has developed:

- A list of definitions which may be helpful in understanding the OQ Rule,
- Model Plan for compliance to OQ Rule,
- A "How to Guide" to comply with OQ,
- Guidance material which explains OQ audit protocols, which will be used to review an operator's OQ program.

The following SSOQ members are recognized as experts in their fields and have given generously of their unique knowledge. They were directly involved in the development of this guide material.

Richard G. Marini – Co-Chair – New Hampshire – Regulatory
Michael Comstock – Co-Chair – City of Mesa, Arizona – Municipal
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Jim Hotinger – Virginia Regulatory
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Lane Miller – Transportation Safety Institute – Regulatory
Mike Bostic – Dennbury Company – Liquid
Massoud Tahamtani – Virginia Regulatory
Phil Bennett – American Gas Association
Rudy Parcel – Iowa Municipal Organization
Stanley Kastanas – OPS – Regulatory
John Erickson – American Public Gas Association

This guidance material was implemented under the sponsorship of the U.S. Department of Transportation. The material relies on sources representing the best opinion on the subject at the time of publication. However, it should not be assumed that all acceptable safety measures and procedures are mentioned in this manual. The reader is referred to the Code of Federal Regulations (49 CFR Parts 190-199, Part 40 and also NFPA 58 & 59) for the complete pipeline safety requirements.

CHARACTERISTICS OF A SMALL SYSTEM OPERATOR

All stakeholders in the pipeline industry fully support the operator qualification (OQ) protocols developed by the U.S. Department of Transportation's Office of Pipeline Safety (OPS) in response to the Pipeline Safety Improvement Act of 2002. It is also recognized there is a need for effective guidance for small system operators (i.e., those with less complex gas distribution systems) about how to comply with the protocols. In response to this need, federal and state pipeline safety regulators as well as representatives of small systems committed to develop that guidance and a set of criteria to assist operators who operate less complex pipeline systems.

The one constant and underlying goal of the group developing the characteristics of a small system operator, and their protocols, was to ensure that the level of safety provided by OPS' OQ process was maintained and the effectiveness of the rule was not compromised.

The fundamental rationale for having a different set of criteria for small system operators is that many of these operators have a less complex system and management structure. Therefore, such an operator does not need many of the processes and formal management structure described in the current OQ protocols. Both pipeline safety regulators and the regulated industry need to share a common understanding of the "general characteristics" of a small system operator to ensure appropriate protocols application during a compliance audit.

A number of system characteristics were discussed by the government-industry team in determining—what is a "small system operator?" To provide general guidance, two characteristics are discussed below.

1. ***Resources***. Smaller systems have fewer resources available than larger systems, however all operators must comply with the same pipeline safety regulations. Smaller systems have:
   - (i) Less complex systems than larger operators;
   - (ii) Fewer individuals;
   - (iii) Less complex management structures;
   - (iv) Few layers of management, if any, between the OQ Plan Administrator and its personnel performing covered tasks.

2. ***Number of employees performing covered tasks***. While this is part of Characteristic 1 above, the government-industry task force agreed that a system with five or fewer individuals performing covered tasks is likely to be a "small operator." The government-industry task force also agreed that, depending on other relevant factors, a system with more than 10 individuals performing covered tasks could be determined to be a "small operator."

These factors are not exclusive in determining a "small operator." It is important to remember guidance material which applies to large operators also applies to small operators. In providing this supplemental guidance for small operators, the team recognized that the state program managers have the authority and must also have the flexibility in making that final determination in a fair consistent manner.

Again, the elements of OQ compliance should be the same regardless of size; none of OPS' criteria has been eliminated. The small system operator's protocol elements have been structured to reflect that smaller operators require less formal and less complex OQ compliance programs.

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CHAPTER I

GUIDELINES FOR DEVELOPING AN OPERATOR QUALIFICATION PROGRAM

INTRODUCTION

These guidelines were prepared by a team of industry and government pipeline safety and training experts to assist small operators and master meter system operators to develop programs to ensure that individuals who operate and maintain these systems are qualified for the work they perform. Operators are required to prepare and follow an OQ program by federal regulations at 49 CFR 192 Subpart N and 49 CFR 195 Subpart G, as well as regulations adopted by some states.

OQ programs must identify each individual, whether it be an employee of the operator or an employee of a contractor hired by the operator, who performs covered operations or maintenance activities on the piping system. The OQ program must also identify the "covered tasks" that each individual performs and ensure that each individual is tested to ensure they have the necessary knowledge, skills and abilities to perform each task, as well as to recognize and react to emergencies that may arise while performing these tasks. The process the operator follows to accomplish these objectives must be in writing. Records of the tests and other actions required in the plan must be made available for inspection by state and federal pipeline safety inspectors.

The following steps should be considered when preparing an operator qualification program.

PREPARE A WRITTEN OPERATOR QUALIFICATION PLAN

The regulations require that you prepare and follow a written OQ plan that at minimum includes the following eight provisions:

1. Identify covered tasks (operation and maintenance activities affecting the integrity of the pipeline and required by the safety code);
2. Evaluate individuals performing covered tasks to prove that they are qualified;
3. Allow individuals who are not qualified to perform a covered task if directed and observed by an individual who is qualified;
4. Evaluate an individual if there is reason to believe that the individual's performance of a covered task contributed to an incident;
5. Evaluate an individual if there is reason to believe that the individual is no longer qualified to perform a covered task;
6. Communicate changes that affect covered tasks to individuals performing those covered tasks;
7. Establish re-evaluation intervals; and
8. Describe how training will be used in the OQ program where appropriate (new hires, refresher training for existing employees who transfer to new jobs or fail re-valuations, etc.).

In addition to these minimum requirements, the written OQ plan should:

1. Name the person who will be responsible for ensuring that the requirements of the plan are carried out;
2. Identify records necessary to carry out the program and where those records will be kept.

IDENTIFY COVERED TASKS

A covered task is defined as any task that:

1. Is performed on a pipeline facility;
2. Is an operations or maintenance task;
3. Is performed as a requirement of this part (Part 192 or Part 195); and
4. Affects the operation or integrity of the pipeline.

The first step in identifying covered tasks is to identify tasks performed on pipeline facilities. "Pipeline facilities" means all underground piping and outdoor aboveground piping; it generally does not include piping inside customer buildings, although if gas is sold to the customer through a gas meter located inside the building, "pipeline facility" extends inside up to the outlet of the meter.

A good source to identify tasks performed on a pipeline facility is the Manual for Operations, Maintenance and Emergency Response. This will describe operations and maintenance tasks performed on a system.

The following is a list of common operations and maintenance tasks. Not all of these tasks may apply to every system, and there may be additional tasks performed on other systems that meet the definition of a covered task that are not listed here:

Investigating leak/odor complaints
Locating and marking lines
Controlling and monitoring pipeline pressures and product flows
Operating an odorizer
Monitoring natural gas odorization levels ("sniff tests")
Repairing leaks
Inspecting and testing pressure regulator station and overpressure protection
Tapping pipelines under pressure
Conducting leakage surveys
Joining pipe for maintenance
Inspecting critical valves
Welding on a pipeline for maintenance
Excavating and backfilling
Repairing coating on existing steel pipelines
Measuring pipe-to-soil potential

Coating aboveground piping
Inspecting for atmospheric corrosion
Inspecting the condition of exposed pipe or pipe coating
Installing/replacing a rectifier
Installing/replacing an anode or test station
Inspecting a rectifier
Visually inspecting for internal corrosion
Purging
Patrolling
Isolating sections of pipe or stopping off or otherwise controlling the flow of gas or product to a work site

Certain critical tasks fall outside the scope of the OQ Rule. Relighting appliances and other work performed on gas piping or equipment inside the residences are not covered tasks since they are not performed on a pipeline facility as defined above. Conducting meter dial tests for leaks of internal piping also fall in this category. While individuals performing these tasks are not subject to the OQ program, operators should ensure that competent people to do this work since mistakes can lead to accidents. OQ does not exempt anyone from the general good business practices to use competent individuals for all tasks that are important for the safe operation of your system.

Covered task lists may also be purchased from many industry trade associations and other vendors. If one of these lists is utilized, it must be carefully reviewed to ensure that it includes all the tasks performed on the system. Any tasks that are not performed on your system should also be deleted.

EVALUATE INDIVIDUALS WHO PERFORM COVERED TASKS

Evaluating means testing a person through written tests, oral exams, observation while performing the task on the job or in a classroom or simulated setting, or any other documented method that can prove the individual possesses the necessary knowledge, skills and abilities to perform the covered task and recognize and react to "Abnormal Operating Conditions (AOCs)." A checklist is required if observation on the job or a simulation is used for evaluation. To be acceptable, each evaluation must include a document that states what is pass or fail for each step in the evaluation and indicates what knowledge, skills, abilities or AOC's were tested or observed.

An OQ plan must list the specific evaluations (tests, observations, etc.) that will be accepted as evidence of qualification in each covered task. The list may include more than one acceptable means of qualifying individuals for a task. For example: An operator may adopt their contractors' evaluations or evaluations by third parties (e.g., associations, vendors, state and local governments) however the operator is responsible to show that the evaluations are appropriate for the way the task is performed on the system.

The operator should be able to demonstrate that the evaluations accepted for each covered task measure the knowledge, skills and abilities required for the task. The evaluations should address critical skills and abilities in addition to critical knowledge needed to perform each task. For example, certain tasks require physical abilities and physical skills critical to accomplishing the

covered task, in addition to knowledge of how to perform the task. In that instance, it must be ensured the evaluation includes a test to address the physical ability of the individual to perform the task. The actual evaluation may involve a knowledge-based test, plus a practical application in the field or classroom simulation to demonstrate physical ability and proficiency.

Further, the testing for covered tasks included in the qualification program must also include questions or hands-on demonstrations on abnormal operating conditions (AOCs) associated with the task to both recognize and react to the AOCs. Abnormal operating condition means a condition 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.

For example, a leaking gas pipe is a malfunction of the pipe (it's not supposed to leak) and can result in a hazard to persons and property.

Some typical AOCs include:

Fire
Odor report
Leaking gas or product
Component failure
Operation of a safety device
Unintended valve closure
Overpressure
Under-odorized gas

Some AOCs are specific to certain covered tasks (e.g., component failure could be failure of a valve, regulator, relief valve, rectifier, etc., depending on the task). Other AOCs are general and apply to many, if not all, tasks (e.g., anyone performing operations or maintenance tasks should be able to recognize and react to gas odors, leaking product or spills).

Operators must determine credible AOCs and identify how personnel are expected to react to these. Evaluations used by the operator should address how to recognize and react to abnormal operating conditions. AOC evaluations may be broken out into a separate section of the evaluation or may be incorporated within those portions of the evaluations that address routine knowledge, skills and abilities. Operators should be able to demonstrate that all abnormal operating conditions that can reasonably be anticipated to be encountered and related to the task being performed are addressed in the evaluations for that task, particularly if off-the-shelf evaluations are being used.

Some conditions such as recognizing low pipe-to-soil potentials or corroded pipe could be considered abnormal operating conditions or could be considered part of the routine knowledge, skills and abilities for covered tasks such as measuring pipe-to-soil potentials or inspecting pipe condition. For OQ compliance purposes, as long as the evaluations for the covered task address how to recognize and react to these conditions, it does not matter if these are classified as AOCs or normal conditions.

If an operator elects to accept evaluations developed by others, e.g., your contractors, state plumbers licenses, associations or other vendors, that operator must ensure that these evaluations address the knowledge, skills and abilities necessary to perform the task and recognize and respond to AOCs according to the OQ program procedures.

While not specifically required by the regulation, the written OQ plan should address the qualifications of the individuals who will evaluate your employees and contractors. If the evaluations chosen require the evaluator to make a judgment whether the task was performed correctly, then the evaluator should possess adequate knowledge about proper performance of the task so that a proper judgment can be made when evaluating the task.

ALLOW UNQUALIFIED INDIVIDUALS TO PERFORM A COVERED TASK IF DIRECTED AND OBSERVED BY AN INDIVIDUAL WHO IS QUALIFIED

Operators may allow individuals who have not met the evaluation criteria listed in the OQ plan to perform covered tasks under controlled conditions. A written OQ plan must spell out the conditions under which individuals who have not met the qualification criteria may perform tasks while under the observation and direction of a qualified individual. This is intended to allow on-the-job training and temporary labor work teams. The operator must ensure that non-qualified personnel are watched by a person qualified in the covered task being performed and the observer should be prepared to take immediate corrective action should he/she observe work being done that is not in accordance with the operator's procedures, or is being done in an unsafe manner. Supervising from a remote location is NOT acceptable – the qualified individual must be on-site, watching the task and ready to intervene immediately should it be necessary. The written OQ plan should provide guidance on how many non-qualified workers can be directed and observed at one time by a qualified individual and a list of any tasks non-qualified persons will not be allowed to perform (e.g., hot taps).

Operators may specify in the OQ plan that only qualified individuals may perform covered tasks, in which case on-the-job training for covered tasks may not be used even with a qualified individual directing and observing the non-qualified individuals.

POST ACCIDENT/INCIDENT EVALUATION

The OQ plan must specify that the operator will re-evaluate anyone whose performance of a covered task may have contributed to an accident (for hazardous liquid pipelines) or incident (for gas pipelines), either caused it, failed to respond appropriately or made it worse by responding inappropriately. For example, if an accident/incident occurs because a pipeline location was inaccurately marked, the individual who marked the line may have contributed to the accident/incident. Similarly, if an individual opens a valve that should remain closed and that causes an accident/incident to be worse, that contributes to the severity of the accident/incident. The OQ plan must specify the process used re-evaluate these individuals. Re-evaluation need not be by the same methods you used to initially evaluate the individual, but if the operator intends to use a different method, this method must:

1. Address the knowledge, skills, abilities and AOCs for the task, and
2. Be listed in the written OQ Plan as an accepted evaluation for the covered task.

FOR CAUSE EVALUATION

The OQ plan must include provisions on how to re-evaluate persons for whom there are reasons to believe that they are no longer qualified. The plan should include some guidance for supervisors to recognize and react to behavior that would trigger these provisions. Reasons could include observation of the person not following procedures, injury or illness that reduces motor skills.

COMMUNICATION OF CHANGES

The OQ plan must specify how changes to policies, procedures, equipment or regulations are to be communicated to anyone who performs covered tasks affected by the change. Re-evaluation may be required if the changes affect the knowledge, skills and abilities required for the task. For example, when purchasing a new leak detection instrument, an operator should consider whether the new instrument is basically the same as the old instrument it replaces, in which case you need only communicate to the persons using the device that it has been replaced. If, however, the new instrument operates on a different principle than the one it is replacing, it may be necessary to retrain the persons using it, develop new evaluations for the new equipment and re-evaluate the persons using it. The OQ plan should also spell out conditions under which re-evaluation will be required such as new tools, equipment and materials or when changes to policies, procedures, etc., require it.

ESTABLISH RE-EVALUATION INTERVALS

To continue to be qualified, individuals performing covered tasks must be periodically re-evaluated. Re-evaluation intervals should be based on factors such as:

1. How frequently is the covered task performed? More frequent performance may justify longer re-evaluation intervals;
2. How complex is the covered task? More complex tasks may require shorter re-evaluation intervals; and
3. What might the consequences be if the task is performed improperly? What is the worst that could happen if the covered task is not performed correctly, with "catastrophe" justifying shorter re-evaluation intervals and "nothing" justifying longer intervals?

Three years is the commonly accepted interval for most tasks. Intervals over 5 years will require justification. Tasks that are performed infrequently may require re-evaluation prior to performance.

Re-evaluation need not be by the same process as initial qualification but must address the knowledge, skills, abilities and AOCs for the task.

TRAINING

The OQ plan should describe how training fits into an operator's OQ program. While qualification is accomplished through evaluation, not training, some individuals will require training to provide them with the knowledge, skills and abilities necessary to pass the evaluations for a covered task. Some examples of individuals requiring training are:

1. New hires
2. Individuals taking on new tasks (transferred or promoted)
3. Individuals who fail one or more evaluations

Refresher training should also be considered for individuals who require post incident or for cause re-evaluation. This does not mean that every individual who performs a covered task needs to go through a training program before the individual can be re-evaluated. In fact, a common misconception is that training counts as evaluation for a task. Attendance records, certificates of completion, etc., from training classes are not evaluation records and cannot be used as the basis for qualifying an individual for any task. Where a training course includes written or oral exams, observations on-the-job or in a classroom simulation it is the records of these exams and/or observations that can be counted as evaluations for a covered task as long as they address the knowledge, skills, abilities and AOCs for the task.

RECORD KEEPING

An operator must maintain records to prove that the written OQ plan is being followed. For each individual who performs a covered task on your system, an operator must be able to produce a record of the date the individual passed each evaluation required for each covered task the individual performs, the tasks for which the individual is qualified and the method used to qualify the individual. Records of re-evaluations for cause, post incident and when required by re-evaluation intervals must also be maintained. The method may include any combination of written or oral tests, observation in classroom, on-the job or simulation, or other methods specified in the OQ program as accepted for the covered task. An operator should be able to provide federal or state inspectors with copies of the evaluation methods, e.g., tests or observation checklists used to qualify a person for the task, so that the inspector can determine if the evaluations address the appropriate knowledge, skills and abilities for the covered task. You can make an inspection easier on both you and the inspector by having a list of the knowledge, skills, abilities, AOCs and identifying where each is addressed in your observation checklists, test questions and other evaluation tools.

RECORD RETENTION

Records must be maintained for 5 years after the evaluation is no longer required for current qualification for any covered task. In other words, the record retention period is 5 years PLUS the re-evaluation interval specified in an operator's OQ plan for the covered task. For example, if an operator has a 3-year re-evaluation interval for a covered task, and an individual passes an evaluation on October 28, 2002, then re-passes the evaluation on October 28, 2005, the operator must maintain the record of the October 28, 2002 evaluation until October 28, 2010, since the date October 28, 2005, is the date on which the operator ceases to rely on the October 28, 2002 evaluation for qualification.

CONTRACTORS

Many operators use contractors to perform covered tasks on their pipeline systems. The operator qualification regulation requires that any individual who performs a covered task on a pipeline system be qualified for that task according to THE OPERATOR'S OQ plan. If an operator uses contractors for any covered task, the operator is responsible to ensure that each contractor employee who performs one or more covered tasks on your system is qualified for that task or is

being directed and supervised by a qualified individual (if the operator's OQ plan allows for this).

Below are four approaches to handling contractor qualification:

1. Operator evaluates the contractor individuals using company evaluations.
2. Operator allows the contractor to evaluate its personnel using either the operator's evaluations for the tasks or the contractor's evaluations for the tasks. In the latter case, the operator should obtain copies of the contractor's evaluations and ensure they address the same knowledge, skills, abilities and AOCs as the operator's evaluations for the same tasks. Evaluations must be documented, e.g., test questions are written and observation evaluations include checklists indicating what is observed. These evaluations must listed in the operator's OQ plan as evaluations accepted for these tasks.
3. Require the contractor to be evaluated by a third party (e.g., NACE, NCCER, etc.). The operator should contact the third party, obtain copies of the evaluations and verify that they address the same knowledge, skills, abilities and AOCs as the operator's evaluations for the same tasks. Evaluations must be documented, e.g., test questions are written and observation evaluations include checklists indicating what is observed. These evaluations must be listed in your OQ plan as evaluations you accept for these tasks.
4. Do not qualify contractor personnel; have one of the operator's qualified individuals observe and direct non-qualified contractor personnel.

RECORD KEEPING FOR CONTRACT PERSONNEL

If contractor personnel are used to perform a covered task, the operator must be able to produce records that the contractor personnel are qualified for the covered tasks they perform. The record requirements for contractors are exactly as described above for company personnel. The records must indicate the date the individual was qualified, the task(s) for which he/she is qualified and the method of qualification. The method must be a method listed in the operator's OQ plan as accepted under the OQ plan for the covered task(s) the individual performs.

Contractor qualification records can be kept by the operator, by the contractor or by a third party. If the operator elects to have the contractor or a third party keep the records, ensure that there are provisions for the operator to obtain the records should the contractor or third party go out of business. The operator must be able to produce these records for review for up to 5 years after the last date an individual performs a covered task on your system.

ENFORCEMENT PROTOCOLS

Included in Chapter III are the OQ enforcement protocols. These will be used by state and federal regulators to audit compliance with the OQ regulation. Included in these protocols are questions and guidance that provide insight into what the regulators expect to see when they audit an operator's OQ program. These protocols can be used to conduct a self-assessment of operator's OQ programs to ensure that the program addresses all the important components that the regulators expect to see in an acceptable OQ program.

CHAPTER II

DEFINITIONS

A number of terms contained in the OQ Rule and its implementation found in 49 CFR Part 192, Subpart N and in Part 195, Subpart G, may be unclear and subject to different interpretations by operators and regulatory representatives. The following definitions have been obtained through consideration of gas and liquid pipeline regulations, dictionary definitions of a word or term, operator OQ plans, or other sources.

Ability

The capacity to do or act, physically and/or mentally.

Abnormal Operating Condition (AOC)

As defined in §§ 192.803 and 195.503, ***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.

[Note: To be qualified, an individual must be able to properly perform assigned covered task(s) and be able to recognize and react appropriately to any AOC that may (reasonably be expected to) be encountered while performing the covered task – whether the condition arises as a direct result of his/her work performance (e.g., be specific to the covered task being performed) or not (e.g., be generic in nature, but still observable because the individual is present on site).]

Accident

As defined in §195.50, an ***accident*** is a failure in a pipeline system which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:

(a) Explosion or fire not intentionally set by the operator.

(b) Release of 5 gallons (19 liters) or more of hazardous liquid or carbon dioxide, except that no report is required for a release of less than 5 barrels (0.8 cubic meters) resulting from a pipeline maintenance activity if the release is:

(1) Not otherwise reportable under this section;

(2) Not one described in §195.52(a)(4);

(3) Confined to company property or pipeline right-of-way; and

(4) Cleaned up promptly;

(c) Death of any person;

(d) Personal injury necessitating hospitalization;

(e) Estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

Activity

A specific deed, action, function, or sphere of action.

Affects the Operation or Integrity of the Pipeline

Any activity, or omission of an activity, that could directly or indirectly result in a hazard to persons, property or the environment. As used in the safety context of the OQ rule, the phrase indicates activities that could result in an AOC that in turn could result in an unsafe operating condition.

Benchmark

A standard of measurement or evaluation.

Communicate

To convey information about; make known; to reveal clearly.

Compliance

Activity(ies) in accordance with a rule.

Contributed

Determined to be a factor.

Contributed to

A judgment by designated operator personnel, that the action or inaction of an individual(s) was a factor in the occurrence of an incident/accident.

Covered Task

As defined in §§ 192.801 and 195.501, 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.

Criterion

A standard upon which a judgment is based.

Current

Belonging to the present time; now in progress.

Demonstrate

Provide tangible evidence.

Determine

To conclude after consideration, investigation, or calculation.

Direct

To take authoritative charge of or supervise; to control, order or command.

Direct Observation

Observation of an unqualified individual(s) during the performance of a covered task by an individual who is qualified to perform the task at hand. The observer must be in direct visual and verbal contact with the individual(s) and must be able to take immediate and effective corrective action if incorrect procedures or AOCs are observed.

Document

Prepare a retrievable record.

Emergency Response

(1) OQ requirements for emergency response are limited to that portion of the response performed on the pipeline facility, rather than at offsite locations remote from the facility (e.g., deploying booms miles away is not a "covered task").

(2) Fire departments and other public responders are not required to be qualified and *(if not qualified)* must not perform covered operations or maintenance tasks on the pipeline facility.

(3) All other individuals employed by the operator shall be qualified to perform their assigned covered tasks or shall be under the direct observation of a qualified individual.

(4) Covered emergency response tasks are those tasks listed in §§ 192.615(a) and 195.402(e) that meet the four-part test specified in §§ 192.801 and 195.501.

Evaluation

As defined in §§ 192.803 and 195.503, ***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.

[Note: Any evaluation of an individual's qualifications must follow an objective, consistent process that documents the individual's ability to perform the covered task, including the ability to recognize and react to AOCs.]

Evaluator

Persons performing evaluations should possess the required knowledge (1) to ascertain an individual's ability to perform the covered tasks, and (2) to substantiate an individual's ability to recognize and react to AOCs that might surface while performing those activities. This does not necessarily mean that the person performing the evaluations should be physically able to perform the covered tasks themselves.

Excavation within a Pipeline Facility

Qualification for this covered task does not require the operator=s employee or contractor employee to be proficient in the operation of excavation equipment. Covered tasks requiring qualification shall include:

- $ Verification of line location and depth
- $ One-call and underground facility owner/operator notifications
- $ Sloping/shoring
- $ Water removal
- $ Inspection

Third-party excavations that take place on the operator=s pipeline facility shall be handled in accordance with the operator's damage prevention program requirements.

Identify

To establish the identity of; to ascertain the origin, nature, or definitive characteristics of.

Immediate Corrective Action

Taking steps to correct mistakes or abnormal or hazardous conditions without delay.

Incident

As defined in §191.3, ***incident*** means any of the following events:

(1) An event that involves a release of gas from a pipeline or of liquefied natural gas or gas from an LNG facility and

(i) A death, or personal injury necessitating in-patient hospitalization; or

(ii) Estimated property damage, including cost of gas lost, of the operator or others, or both, of $50,000 or more.

(2) An event that results in an emergency shutdown of an LNG facility.

(3) An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2).

Individual

A person who, on behalf of the operator, performs one or more covered tasks on a pipeline facility operated by the operator. This includes contractors, subcontractors, and operator employees.

Integrity

The ability of a pipeline to operate safely and to withstand the stresses imposed during operations.

Interval

The amount of time between two specified instants, events, or states.

Knowledge

Understanding gained through experience or study.

Knowledge, Skills, and Abilities (KSAs)

An appropriate combination of information, craftsmanship, and proficiency that allows an individual to perform covered tasks in a competent manner.

Maintain

To keep in a condition of good repair or efficiency.

Maintenance

The act of maintaining or the state of being maintained; the work of keeping something in proper condition; upkeep.

Observe

The act of watching; to watch or perceive. For purposes of conducting qualification evaluations using on-the-job (OTJ) performance, observations must include the interaction of the evaluator and qualification candidate to ensure that the candidate's knowledge of the procedures (and the reasons for the key steps therein) is adequate to ensure the continued safe performance of the task.

Operate

Starting, stopping and/or monitoring a device or system.

Operation

Actions taken to facilitate storage or movement of product through a regulated pipeline.

Operator

As defined in §§ 192.3 and 195.2, ***operator*** means a person who engages in the transportation of gas.

Perform

To begin and carry through to completion; to demonstrate in accordance with the requirements of; to accomplish (a covered task) in the proper, customary or established manner.

Person

As defined in §§ 192.3 and 195.2, ***person*** means any individual, firm, joint venture, partnership, corporation, association, State, municipality, cooperative association, or joint stock association, and includes any trustee, receiver, assignee, or personal representative thereof.

Pipeline

As defined in §§ 192.3 and 195.2, ***pipeline*** means all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

Pipeline Facility

As defined in §§ 192.3 and 195.2, ***pipeline facility*** means new and existing pipeline, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.

Prior

Preceding in time or order.

Process

A systematic series of actions directed to some end.

Program

A written description of processes to be followed; a clear delineation of authorities and responsibilities there under and the specific results expected to be achieved for the implementing organization.

Protocol

A standard methodology used to conduct inspections of regulated entities to determine conformance to specific or implied requirements prescribed by regulation.

Provision

The written description of the element(s) or approach employed by an operator to satisfy the requirements of the OQ Rule in §§ 192.805 and 195.505.

Pursuant

In accordance with (or) as a follow-up.

Qualified

As defined in §§ 192.803 and 195.503, ***qualified*** means that an individual has been evaluated and can:

(a) Perform assigned covered tasks; and

(b) Recognize and react to abnormal operating conditions.

Records

Recorded information or data on a particular subject, collected and preserved to demonstrate compliance with a rule or process requirement.

Regulation Construction

The regulatory structure consists, sequentially, of Title, Part, Subpart, Section, Paragraph, and Subparagraph.

Retain

To keep possession of, in a retrievable and useable condition.

Skill

A demonstrable competency to perform a given task well, arising from talent, training or practice.

Subject Matter Expert (SME)

An individual recognized as having a special skill or specialized knowledge of a process in a particular field, or of a piece of equipment.

Standard

A written document which is commonly used and accepted as a basis for judging acceptability of performance in the areas addressed.

Task

A piece of work assigned to or expected of an individual(s).

Training

An educational or instructional process (e.g., classroom, computer-based, or on-the-job) by which an individual's KSA level is improved. While not currently required by the OQ Rule, training is nonetheless fundamental to implementing many of the OQ Rule's requirements.

Work Performance History Review (WPHR)

A process established by the operator to ascertain the previously demonstrated competency of an individual to perform a covered task. Evaluation parameters should include:

- A search of existing records for documentation of an individual's satisfactory performance of the covered task in the past.
- Verification that the individual's WPH contains no indications of substandard work or involvement in an incident or accident to which the individual may have contributed by committing an error in the performance of a covered task.
- Verification and documentation that the individual has satisfactorily performed the covered task on a regular basis prior to October 26, 1999.

Written

To set down in writing.

CHAPTER III

OPERATOR QUALIFICATION PROTOCOLS FOR COMPLIANCE INSPECTION PROCESS

August 6, 2003

(Guidance for Small System Operators Material Included)

Statement on the Role of Protocols

The following protocols have been written to assist federal and state pipeline inspectors who are evaluating operators OQ programs. The protocols are not intended as enforcement instruments or to provide inspectors with additional enforcement authority, but rather are intended to provide inspectors with a template that they can use in the course of their inspections to ensure that operators comply with all elements of the OQ Rule. The objective of the protocols is to ensure that the prescriptive requirements of the rule have been followed by operators. This objective will be accomplished by rigorously inspecting each operator's records to ensure that all persons performing covered tasks on pipeline facilities are properly qualified and that sufficient documentation is maintained for these individuals. Proper record keeping is a key component of the OQ Rule. It Is, therefore, important that inspectors be able to verify that records are maintained for all individuals performing covered tasks.

The OQ inspection form is organized around nine elements, including one for field verification. Each element has one or more associated protocol. Each protocol consists of 4 boxes: (1) a protocol number accompanied by the protocol subject or topic; (2) a protocol question(s) (sometimes followed by "Verify" statements); (3) guidance topics; and (4) the relevant rule language. The protocol topics have been structured into "Protocol Question(s)" to guide inspectors through the OQ inspection process. Each protocol question is followed by "Guidance Topics." The guidance topics list characteristics that the regulator would typically expect to find in an effective OQ program, and that are consistent with the intent of the regulatory language that accompanies each protocol. Some, all, or none of these characteristics may be appropriate depending on factors unique to each operator's OQ program and pipeline assets. Operators should be prepared to demonstrate that their programs address each of these characteristics or to describe how their program will be effective in their absence.

Many of the protocol questions are followed by "Verify" statements. These statements have been included because they can be directly traced to specific rule language. Therefore, compliance with each "Verify" statement should be confirmed. Many "Verify" statements (and protocol questions) are followed by a parenthetical statement that indicates that the statement or question is either "enforceable" or "non-enforceable". If the "Verify" statement or protocol question is listed as non-enforceable, the statement or question is not enforceable under the rule, but is nonetheless an important consideration for the operator. Finally, should the inspection process reveal violations of prescriptive requirements of the rule, regulators will take appropriate enforcement actions. Should deficiencies be identified in how operators address program characteristics, inspectors will seek evidence of violations related to these deficiencies. Significant inquiries seeking further information related to program characteristics will be communicated to the operator as an integral part of the inspection process.

ELEMENT 1
DOCUMENT PROGRAM PLAN, IMPLEMENTING PROCEDURES AND QUALIFICATION CRITERIA

Scope: This element addresses the characteristics of the operator's OQ program and written plan, and considers how the operator developed its program, how contractors are considered when performing covered tasks, the treatment of AOCs, and the function of training in the initial and continuing qualification of individuals performing covered tasks.

Protocol #1.01	**Application and Customization of "Off-the-Shelf" Programs**
Protocol Question	Does the operator's plan identify covered tasks and does it specify task-specific re-evaluation intervals for individuals performing covered tasks? **[Enforceable]**
Guidance Topics The rule requires that operators have a written qualification program that includes provisions to identify covered tasks and the intervals at which re-evaluation of the individual's qualifications is needed. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met: 1. The source of any off-the-shelf listing of covered tasks used by the operator; 2. The basis for the operator accepting or modifying any off-the-shelf listing of covered tasks; 3. Whether the operator has identified task-specific re-evaluation intervals; 4. The basis for the task-specific re-evaluation intervals.	
Small Operator Guidance Has the operator established re-evaluation intervals for each task? Are these intervals consistent with those of other operators? Small operators are likely to accept re-evaluation intervals developed by associations, consortia or other vendors.	
Available Material/Information 1. Covered task list 2. Re-evaluation intervals for each covered task 3. Manual for Operations,Maintenance and Emergency Response.	
Rule Requirement	§§ 192.805/195.505 Each operator shall have and follow a written qualification program. The program shall include provisions to: (a) Identify covered tasks; ..... (g) Identify those covered tasks and the intervals at which evaluation of the individual's qualifications is needed.

Protocol #1.02	**Contractor Qualification**
Protocol Question	Does the operator employ contractor organizations to provide individuals to perform covered tasks? If so, what are the methods used to qualify these individuals and how does the operator ensure that contractor individuals are qualified in accordance with the operator' s OQ program plan?
	Verify that the operator' s written program includes provisions that require all contractor and subcontractor individuals be evaluated and qualified prior to performing covered tasks, unless the covered task is performed by a non-qualified individual under the direction and observation of a qualified individual. **Enforceable]**
Guidance Topics The operator is responsible for ensuring that all individuals, whether employees or contractors, are qualified to perform covered tasks. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:	

1. Methods have been approved by the operator to qualify contractor individuals to perform applicable covered tasks.
2. Provisions have been established and documented to ensure contractors are required to perform covered tasks consistent with the operator's requirements.
3. Provisions have been established and documented to ensure qualification program requirements are followed by contractors.
4. Provisions have been established and documented to ensure contractor individuals performing the operator's covered tasks are qualified.
5. Provisions have been established and documented to ensure the availability and maintenance of qualification records for contractor individuals performing covered tasks for the operator.

Small Operator Guidance

Does the operator's written program include provisions to ensure that any contractor organizations used by the operator to perform covered tasks will have completed qualification of individuals prior to task performance?

Does the operator accept evaluations developed by its contractors or third parties? If yes, do these evaluations address the knowledge, skills, abilities and AOCs required for the task? If contractor or other third-party evaluations are accepted, operator should be able to produce copies of samples of each evaluation accepted for any covered task within a reasonable # of days. The operator should be able to demonstrate that the evaluations it is accepting address the same or equivalent knowledge, skills and abilities and AOCs as the operator's own evaluations for the covered task.

Available Material/Information

1. Written operator qualification plan
2. Sample evaluations from contractors and other 3rd parties accepted by the operator for any task

Rule Requirement	§§ 192.803/195.503 Qualified means that an individual has been evaluated and can: (a) Perform assigned covered tasks; and (b) Recognize and react to abnormal operating conditions.
	§§ 192.805/195.505 Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

Protocol #1.03	**Management of Other Entities Performing Covered Tasks**
Protocol Question	Has the operator's OQ program included provisions that require individuals from any othe entity performing covered task(s) on behalf of the operator (e.g., through mutual assistanc agreements) be evaluated and qualified prior to task performance?
	Verify that other entities that perform covered task(s) on behalf of the operator are addressed under the operator's OQ program and that individuals from such other entities performing covered tasks on behalf of the operator are evaluated and qualified consistent with the operator's program requirements. **[Enforceable]**

Guidance Topics

The rule requires that individuals performing covered tasks are evaluated and qualified to the requirements of the operator' s program. This applies to operator employees, contractors hired by the operator, or agents such as another entity that perform the covered tasks. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

The operator either (a) identifies provisions for assessing the evaluation criteria and methods used by other entities performing covered tasks to qualify an individual and to determine if the qualification is consistent with operator requirements, or (b) requires these individuals to be reevaluated.

Small Operator Guidance If the operator is party to any mutual aid agreements, has the operator determined whether individuals borrowed from the other operators are qualified if they are to perform covered tasks? The operator should be able to demonstrate that the evaluations administered by the other operators address the knowledge, skills and abilities and AOCs that the operator addresses in its own evaluations for the covered task.	
Available Material/Information Samples of evaluations from other operators accepted by the operator for any task	
Rule Requirement	§§ 192.803/195.503 Definitions *Qualified* means that an individual has been evaluated and can: (a) Perform assigned covered tasks; and (b) Recognize and react to abnormal operating conditions.

Protocol #1.04	**Training Requirements (Initial Qualification, Remedial if Initial Failure, and Reevaluation)**
Protocol Question	Does the operator's OQ plan contain policy and criteria for the use of training in initial qualification of individuals performing covered tasks, and are criteria in existence for re-training and re-evaluation of individuals if qualifications are questioned? **[Non-Enforceable]**

Guidance Topics

Training is not a required action under the provisions of the OQ Rule. However, training is a means to ensure that an individual performing a covered task has the necessary knowledge and skills needed to perform the task in a manner that ensures the safe operation of pipeline facilities, as required by the Pipeline Safety Act. As such, it should be incorporated in practices leading to the development and qualification of new employees, as well as in refreshing the knowledge and skills of individuals with considerable experience. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

The role represented by training in the qualification of individuals to perform covered tasks in:

- Development of new hires,
- Correction of problems encountered in evaluation or re-evaluation processes,
- Correction of individual performance problems (e.g., contributing to an incident or accident through performance of covered tasks),
- Managing changes in practices or procedures used in performing covered tasks.

Small Operator Guidance

The operator should be prepared to identify resources it uses to provide training to new employees or existing employees if necessary? This may include lists of courses offered in-house or by 3rd parties, (e.g., training entities, training providers, outside sources) as necessary. Any lesson plans, criteria for completion, etc., for OJT training should be available for review. The operator should be prepared to discuss how it identifies and addresses the need for re-evaluation of its personnel should their qualifications become suspect.

Available Material/Information

Training might include in-house, 3rd party or on-the-job training for any of these types of training:

1. List of the types of training
2. Outlines of the classes
3. Lesson plans
4. Criteria for completion
5. Evaluation methods

Rule Requirement	§§ 192.803/195.503 Definitions *Qualified* means that an individual has been evaluated and can: (a) Perform assigned covered tasks; and (b) Recognize and react to abnormal operating conditions.
	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

Protocol #1.05	**Written Qualification Program**
Protocol Question	Did the operator meet the OQ Rule requirements for establishing a written OQ program and completing qualification of individuals performing covered tasks?
	Verify that the operator' s written qualification program was established by April 27, 2001. **[Enforceable]** Verify that the written qualification program identified all covered tasks for the operator's operations and maintenance functions being conducted as of October 28, 2002. **[Enforceable]** Verify that the written qualification program established an evaluation method(s) to be used in the initial qualification of individuals performing covered tasks as of October 28, 2002. **[Enforceable]** Verify that all individuals performing covered tasks as of October 28, 2002, and not otherwise directed or observed by a qualified individual, were qualified in accordance with the operator's written qualification program. **[Enforceable]**

Guidance Topics

The rule requires that the operator meet certain prescriptive requirements for establishing a written qualification program, identifying covered tasks, and qualifying individuals to perform the identified covered tasks. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Clear responsibilities for implementing the elements of the program (e.g., evaluation & qualification, training, record keeping, contracting) have been established and communicated to managers and supervisors within the organization.
2. The OQ program requirements have been consistently implemented by the operator' s organization.
3. Key terms have been defined and provided to all entities involved in implementing the OQ program to avoid ambiguities and misinterpretations.

Small Operator Guidance The operator (or the person responsible for its OQ plan, the "OQ manager") should be prepared to demonstrate knowledge and understanding of the provisions of its OQ plan. The operator should be able to explain how each of the provisions of the OQ plan will be implemented. Available Material/Information If the operator has chosen an off-the-shelf program, the operator may need to consult with the provider of the program for explanations and justifications to explain the provisions of the program.	
Available Material/Information Written operator qualification plan	
Rule Requirement	§§ 192.809/195.509 General (a) Operators must have a written qualification program by April 27, 2001. (b) Operators must complete the qualification of individuals performing covered tasks by October 28, 2002.

ELEMENT 2
IDENTIFY COVERED TASKS AND RELATED EVALUATION METHODS

Scope: This element addresses the operator's development of its covered task list and the evaluation methods employed to perform qualification of individuals.

<table>
<tr><td>Protocol #2.01</td><td>Development of Covered Task List</td></tr>
<tr><td rowspan="2">Protocol Question</td><td>How did the operator develop its covered task list?</td></tr>
<tr><td>Verify that the operator applied the four-part test to determine whether 49 CFR Part 192 or 49 CFR Part 195 O&M activities applicable to the operator are covered tasks. [Enforceable]

Verify that the operator has identified and documented all applicable covered tasks. [Enforceable]</td></tr>
<tr><td colspan="2">Guidance Topics
The rule requires that the operator identify covered tasks, which are those tasks covered by regulations that meet the four-part test set forth in the OQ Rule. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. The method used by the operator to develop its covered task list was thorough, documented, and considered all tasks performed to meet applicable regulatory requirements by employees and contractors.
2. The operator understands the personnel qualification-related activities that pose significant risk to the integrity of pipeline facilities (e.g., excavation and backfilling) and has considered them in the development of its covered task list.
3. The operator identifies how it ensures the addition, revision, or deletion of covered tasks to incorporate changes to operations or regulations.
4. The operator definition of operations and maintenance is consistent with regulatory requirements as they are applied to pipeline facilities.
5. The operator identifies the individuals who are qualified to perform the covered tasks.</td></tr>
<tr><td colspan="2">Small Operator Guidance
The operator should be able to show they have ensured its list of covered tasks performed on its system is complete. Has the operator ensured the covered task list that has been developed fits the operation and maintenance of the system?</td></tr>
<tr><td colspan="2">Available Material/Information
List of covered tasks</td></tr>
<tr><td rowspan="2">Rule Requirement</td><td>§§ 192.801/195.501 (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.</td></tr>
<tr><td>§§ 192.805/195.505 Each operator shall have and follow a written qualification program. The program shall include provisions to:
(a) Identify covered tasks;</td></tr>
</table>

Protocol #2.02	**Evaluation Method(s) (Demonstration of Knowledge, Skill and Ability) and Relationship to Covered Tasks**
Protocol Question	Has the operator established and documented the evaluation method(s) appropriate to each covered task?
	Verify what evaluation method(s) has been established and documented for each covered task. **[Enforceable]** Verify that the operator's evaluation program ensures that individuals can perform assigned covered tasks. **[Enforceable]**

Guidance Topics

The operator is responsible for ensuring that all individuals whether employees or contractors, have been evaluated using one or more of the evaluation methods identified in the OQ Rule and can perform the covered tasks assigned to them. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. The evaluation methods used for qualification of individuals performing covered tasks are derived from the requirements of the covered tasks, and consider any unique needs (e.g., the inability to read) of the individuals being evaluated.
2. Evaluation methods are consistently applied across the operator's organization such that all individuals performing the same covered task are evaluated using consistent methods.
3. Evaluation methods of operator employees and contractors include the evaluation of an individual's knowledge, skills, and abilities to ensure that the individual can perform the assigned covered tasks.

Small Operator Guidance

Does the operator's plan list the evaluations that it will accept as evidence of qualification for each covered task?

The operator should be prepared to produce copies of the evaluations (tests, observation checklists, etc.) used to qualify individuals for each covered task and O&M procedures. The former need not be in the operator's possession, however should be able to be produced within a reasonable # of days following an audit.

The operator should ensure the evaluations address critical skills and abilities in addition to critical knowledge needed to perform each task. For example, certain tasks require physical abilities and physical skills critical to accomplishing the covered task in addition to knowledge of how to perform the task. In that instance, the Operator should ensure its evaluation includes a test to address the physical ability of the individual to perform the task. The actual evaluation may involve a knowledge-based test, plus a practical application in the field to demonstrate physical ability and proficiency. Further, the testing for covered tasks included in the qualification program should also include questions on AOCs associated with the task to both recognize and react to the AOCs.

The operator should validate that:

- Evaluations address the knowledge, skills and abilities required to perform the routine aspects of the task,
- Evaluations are appropriate for the task as described in the operator's O&M procedures for the specific types of equipment on which the task is performed,

Available Material/Information

1. List of evaluations accepted for qualification for each covered task
2. Samples of each evaluation listed in #1

Rule Requirement	§§ 192.803/195.503 Qualified means that an individual has been evaluated and can: (a) Perform assigned covered tasks; and (b) Recognize and react to abnormal operating conditions. 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; or (e) Other forms of assessment.
	§§ 192.805/195.505 Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

ELEMENT 3
IDENTIFY INDIVIDUALS PERFORMING COVERED TASKS

Scope: This element addresses the operator's documentation of an individual's evaluation and qualification for performing a covered task and assurance at the job site that only qualified individuals are performing covered tasks. The element also addresses the operator's development of provisions for performance of a covered task by an unqualified individual under the direction and observation of a qualified individual.

Protocol #3.01	**Development and Documentation of Areas of Qualification for Individuals Performing Covered Tasks**
Protocol Question	Does the operator's program document the evaluation and qualifications of individuals performing covered tasks, and can the qualification of individuals performing covered tasks be verified at the job site?
	Verify that the operator's qualification program has documented the evaluation of individuals performing covered tasks. **[Enforceable]** Verify that the operator's qualification program has documented the qualifications of individuals performing covered tasks. **[Enforceable]**

Guidance Topics

The rule requires that the operator ensure through evaluation that individuals performing covered tasks are qualified, and that records supporting an individual's current qualification be maintained while the individual is performing a covered task. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Documentation of the qualification of individuals (including contractors) performing covered tasks is maintained and retrievable by work supervisors to support assignment of individuals to perform covered tasks.
2. Methods such as a current hard copy list, qualification card, central electronic database, or other forms of covered task qualification information are used at the job site to verify the qualifications of individuals performing covered tasks.

Small Operator Guidance

Can the operator produce the evaluation records for all individuals, employee and contractor, who performed a covered task on its system over the past 5 years (or October 28, 2002, whichever is later)? The operator should be able to provide dates that each individual passed each of the required evaluations, the name of the person who conducted the review, and a copy of a sample evaluation for review. Records may be kept by the operator, a contractor or a third party.

Is information on individuals and the tasks for which they are qualified available to supervisors? Lists should be available. Lists may be hardcopy, on-line, computer or any other media that provides current qualification information to supervisors. Lists need not be maintained at the job site as long as the documentation proves that the individuals performing the task are qualified or being directed and observed by a qualified person.

Available Material/Information

1. For each individual who performs covered tasks, written or electronic records of the date each individual completed each evaluation required for a task and the name of the person who administered the evaluation.
2. Samples of each evaluation listed in #1.

Rule Requirement	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

	§§ 192.807/195.507 Recordkeeping 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 the 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.

Protocol #3.02	**Covered Task Performed by Non-Qualified Individual**
Protocol Question	Has the operator established provisions to allow non-qualified individuals to perform covered tasks while being directed and observed by a qualified individual, and are there restrictions and limitations placed on such activities?
	Verify that the operator' s program includes provisions for the performance of a covered task by a non-qualified individual under the direction and observation by a qualified individual. **[Enforceable]**
Guidance Topics The rule allows the performance of a covered task by a non-qualified individual if that individual is directed and observed by an individual qualified to perform the covered task. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met: 1. Consideration has been given to tasks that cannot or should not be performed by non-qualified individuals under the direction and observation of a qualified individual, due to their complexity or due to the critical nature of the task. 2. For tasks where appropriate, guidance on the span of control by qualified individuals of non-qualified individuals has been established on a task-specific basis.	
Small Operator Guidance Operators should ensure that non-qualified personnel are watched by a person qualified in the covered task being performed, who would be capable of interrupting the activity to take immediate corrective action should an unsafe action occur. The guidance above for larger operators also applies to small operators, The operator should be prepared to discuss this issue.	
Available Material/Information 1. Written operator qualification plan. 2. If available, any written guidance to supervisors on how to direct and observe non-qualified individuals.	
Rule Requirement	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provision to: (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;

ELEMENT 4
EVALUATE AND QUALIFY INDIVIDUALS PERFORMING COVERED TASKS

Scope: This element addresses the operator's use of work performance history review (WPHR) as the sole method for initial evaluation of an individual's qualification to perform covered tasks, and the identification of additional methods of evaluation to be used in addition to, or in place of, work performance history review subsequent to October 28, 2002. The element also addresses the operator's development of AOCs for covered tasks and the methods employed to communicate AOCs for the purpose of qualification.

Protocol #4.01	**Role of and Approach to "Work Performance History Review"**
Protocol Question	Does the operator use WPHR as the sole method of qualification for individuals performing covered tasks prior to October 26, 1999, and does the operator's program specify that work performance history review will not be used as the sole method of evaluation for qualification after October 28, 2002?
	Verify that after October 28, 2002, WPHR is not used as a sole evaluation method. **[Enforceable]** Verify that individuals beginning work on covered tasks after October 26, 1999, have not been qualified using WPHR as the sole method of evaluation. **[Enforceable]**

Guidance Topics

The rule requires that the operator ensure through evaluation that individuals performing covered tasks are qualified, and that one or more of the methods identified in the rule are used for evaluation. WPHR is an allowed evaluation method for initial qualification of individuals performing covered tasks prior to October 26, 1999, but may not be used as a sole method of evaluation for subsequent evaluations, or for initial evaluations for qualification after October 28, 2002. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. The operator has established criteria for the use of WPHR as an evaluation method.
2. The operator did not use WPHR as an initial evaluation method, or used it sparingly and with documented justification.
3. The operator' s written program plan and/or evaluation documentation identifies that after October 28, 2002, WPHR will not be used as the sole method of evaluation for qualification, and that WPHR will not be used as a sole evaluation method for subsequent qualification.

Small Operator Guidance

If the operator uses WPHR as the sole method of qualifying individuals, were these evaluations performed prior to October 28, 2002?

Does the WPHR documentation verify that the individual performed the task prior to October 26, 1999?

Has a review of WPHR documentation verified that there is no reason to question an individual's qualification for the task (e.g., records were searched, supervisors were interviewed and no evidence of lack of competence was found)?

WPHR documentation should include:

1. The date and name of the person who conducted the review.
2. Records dated prior to October 26, 1999, showing a person performed a covered task.
3. Statements by supervisors, if supported by documentation, are acceptable if they address whether individuals had accidents attributable to them.
4. Reviews that shown the individual has followed the company's operating procedures.

5. The individual has the ability to recognize and react to AOCs. Additional Information could include: 1. Written performance appraisals showing no reason to suspect the person is not qualified. 2. That training and follow-up reviews have taken place.	
Available Material/Information Records of WPHR, including the date the review was conducted, the name of the person conducting the review, the covered task for which the individual is being qualified.	
Rule Requirement	§§ 192.803/195.503 Definitions 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; or (e) Other forms of assessment.
	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;
	§§ 192.809/195.509 General (c) Work performance history review may be used as a 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.

Protocol #4.02	**Evaluation of Individual's Capability to Recognize and React to AOCs**
Protocol Question	Are all qualified individuals able to recognize and react to AOCs? Has the operator evaluated and qualified individuals for their capability to recognize and react to AOCs? Are the identified AOCs those that the individual may reasonably anticipate and appropriately react to during the performance of the covered task? Has the operator established provisions for communicating AOCs for the purpose of qualifying individuals?
	Verify that individuals performing covered tasks have been qualified in recognizing and reacting to AOCs they may encounter in performing such tasks. **[Enforceable]**
Guidance Topics The ability to recognize and react to AOCs is required for qualification of individuals to perform covered tasks, whether the individuals are employed by the operator or are contractor individuals. The operator must demonstrate that the ability to recognize and react to AOCs is a part of each individual's evaluation for qualification. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:	

1. AOCs used for evaluation of individuals performing covered tasks consist of those AOCs that the operator can reasonably anticipate the individual will encounter while performing the covered task.
2. In addition to task-specific AOCs (i.e., those that may be caused by performance of the task), generic AOCs (i.e., those that may reasonably be encountered during performance of the task) have been identified and used in qualification in cases where special requirements and conditions for the task being performed must be considered.
3. Evaluation methods for both employees and contractor individuals include evaluation of the appropriate reaction of an individual upon recognition of an AOC.
4. The operator utilizes incident/accident investigations, employee feedback programs, or other approaches to ensure that the AOCs identified and used in evaluating individuals are representative of those that could reasonably be anticipated during performance of covered tasks.

Small Operator Guidance

The operator should have evaluated its systems and operations to determine credible AOCs and identified how it expects its personnel to react to these.

Evaluations used by the operator should address how to recognize and react to AOCs.

AOC evaluations may be broken out into a separate section of the evaluation or may be incorporated within those portions of the evaluations that address routine knowledge, skills and abilities.

The operator should be able to demonstrate that all AOCs that can reasonably be anticipated to be encountered related to the task being performed are addressed in the evaluations, particularly if off-the-shelf evaluations are being used.

Available Material/Information

1. Samples of the evaluations used to qualify individuals for covered tasks.
2. Only if the operator has identified AOCs, a copy of the AOC list.

Rule Requirement	§§ 192.803/195.503 Definitions 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 individuals, property, or the environment Qualified means that an individual has been evaluated and can: (a) Perform covered tasks; and (b) Recognize and react to abnormal operating conditions.

ELEMENT 5
CONTINUED/PERIODIC EVALUATION OF INDIVIDUALS PERFORMING COVERED TASKS

Scope: This element addresses the operator's review of individuals performing covered tasks when the individuals were involved in an incident or accident, or when an individual is determined to be no longer qualified or the qualification of an individual is questionable. The element also addresses the re-evaluation interval for individuals performing covered tasks.

Protocol #5.01	**Personnel Performance Monitoring**
Protocol Question	Does the operator's program include provisions to evaluate an individual if the operator has reason to believe the individual is no longer qualified to perform a covered task based on: 1. Covered task performance by an individual contributed to an incident or accident? 2. Other factors affecting the performance of covered tasks?
	Verify that the operator's program ensures evaluation of individuals whose performance of a covered task may have contributed to an incident or accident. **[Enforceable]** Verify that the operator has established provisions for determining whether an individual is no longer qualified to perform a covered task, and requires re-evaluation **[Enforceable]**

Guidance Topics

The rule requires that the operator 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 or an accident as defined in Part 195, or evaluate an individual if the operator has reason to believe that the individual is no longer qualified to perform a covered task. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Methods and documentation exist to determine if individuals are performing covered tasks properly. These methods may include, but not be limited to: internal audits, third-party audits or inspections, assessments of procedure compliance, supervisor reviews, or assessment by a technical specialist.

2. The operator has addressed the rule requirements in the written program plan and has established implementation requirements that include criteria and documentation requirements.

Small Operator Guidance

The operator's plan should include provisions to:

1. Re-evaluate an individual involved in an accident,
2. Re-evaluate an individual if the operator has reason to believe that the individual is no longer qualified.

Reasons an individual may no longer be qualified may include:

- Injury or physical limitation,
- Procedures seldom or rarely used by the individual,
- Observation of an error or incorrect procedure,
- An incident near-miss,
- Evidence of an error or incorrect procedure,
- Any other evidence the individual may need to be re-evaluated and re-qualified.

If not spelled out in the written plan, the operator should be prepared to show how it implements these provisions. If the operator has had to conduct any such re-evaluations, the operator should have records and the reason the re-evaluation was believed necessary.

Available Material/Information

1. Written operator qualification plan.
2. If available, any other documentation the operator has developed to implement these provisions.

Rule Requirement	§192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provisions to: (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/accident as defined in Part 195; (e) Evaluate an individual if the operator has reason to believe that the individual is no longer qualified to perform a covered task;

Protocol #5.02	**Reevaluation Interval and Methodology for Determining the Interval**
Protocol Question	Has the operator established and justified requirements for re-evaluation of individuals performing covered tasks?
	Verify that the operator has established intervals for re-evaluating individuals performing covered tasks. **[Enforceable]**

Guidance Topics

The rule requires that an operator identify covered tasks and the intervals at which evaluation of the individual' s qualification is needed. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Basis for the re-evaluation intervals considering regulatory practice and/or WPHR for similar tasks,
2. Consideration of the need for task-specific re-evaluation intervals,
3. Justification of re-evaluation intervals considering at a minimum, the risk inherent in the task and the time between successive performances of the task by a qualified individual.

Small Operator Guidance

Has the operator established re-evaluation intervals for each task? Are these intervals consistent with those of other operators? Particularly if the small operator has accepted re-evaluation intervals developed by associations, consortia and other vendors, the operator should be able to justify the re-evaluation intervals it is using for its personnel are reasonable to retain needed skills for the function.

Available Material/Information A list of re-evaluation intervals for each task.	
Rule Requirement	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provision to: (g) Identify those covered tasks and the intervals at which evaluation of the individual's qualifications is needed.

ELEMENT 6
MONITOR PROGRAM PERFORMANCE; SEEK IMPROVEMENT OPPORTUNITIES

Scope: This element addresses the operator's plans for continued improvement of the OQ program and investigates mechanisms established for periodic review and revision of the program when warranted.

Protocol #6.01	**Program Performance and Improvement**
Protocol Question	Does the operator have provisions to evaluate performance of its OQ program and implement improvements to enhance the effectiveness of its program? **[Non-Enforceable]**

Guidance Topics

Although there are no specific requirements in the rule for the operator to review the OQ program periodically and seek to implement improvements over time, it is reasonable that improvements will be identified that should be incorporated into the program as the program matures and the operator gains valuable feedback through a continuing review of performance trends. This item investigates whether the operator has anticipated the evolutionary nature of its program and has established provisions to identify and assess improvement opportunities and implement those that will result in greater program effectiveness and an increased level of safety. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. The operator has documented in its OQ plan a periodic requirement for program review.
2. The operator is actively involved in industry groups that seek to improve OQ programs and establish practices that will be identified and documented in consensus standards.
3. A review process has been established by the operator to assemble feedback on program effectiveness and needed improvements, and to periodically assess the feedback to identify improvements that should be made to the OQ program.

Small Operator Guidance

The person responsible for the OQ program should periodically review the adequacy of the written OQ plan provisions. The operator should be prepared to change and update the plan as deemed necessary. The person responsible for managing the OQ program should communicate changes that affect covered tasks to the individuals who perform the tasks. At a minimum it is recommended to review the OQ plan along with the annual review of the operator's operations and maintenance manual.

Available Material/Information

None

Rule Requirement	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program.

ELEMENT 7
MAINTAIN PROGRAM RECORDS

Scope: This element addresses how the operator implements the rule requirements for retention of records and supporting documentation that establishes the qualification of individuals performing covered tasks and the covered tasks that individuals are qualified to perform.

Protocol #7.01	**Qualification "Trail" (i.e., covered task, individual performing, evaluation method(s),continuing performance evaluation, reevaluation interval, reevaluation records).**
Protocol Question	Does the operator maintain records in accordance with the requirements of 49 CFR Part 192, Subpart N, and 49 CFR Part 195, Subpart G, for all individuals performing covered tasks, including contractor individuals?
	Verify that qualification records for all individuals performing covered tasks include the information identified in the regulations. **[Enforceable]** Verify that the operator's program ensures the retention of records of prior qualification and records of individuals no longer performing covered tasks for at least five years. **[Enforceable]** Verify that the operator's program ensures the availability of qualification records of individuals (employees and contractors) currently performing covered tasks, or who have previously performed covered tasks. **[Enforceable]**

Guidance Topics

The rule requires certain information to be included in records of qualification for individuals performing covered tasks, and that these records be retained for at least five years. Although not identified specifically, records that are specified in the OQ plan and documentation that is required to demonstrate compliance with rule provisions should logically have retention requirements as part of the OQ program implementation. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Supporting documentation for implementation of the OQ program, including documentation of:
   a. The methodology for identifying covered tasks;
   b. The re-evaluation interval for each covered task and the basis for the re-evaluation interval chosen; and
   c. The approach used to select individuals for evaluation and qualification.
2. The operator has considered the need for periodic back-up of qualification database information, whether in-house databases or industry databases, to ensure continued availability of information required to meet rule provisions.
3. The operator has established provisions to ensure the continued presence and availability of contractor records for individuals currently performing, or who have previously performed, covered tasks for the operator.

Small Operator Guidance

The operator should be able to produce evaluation records demonstrating that each individual, employee and contractor, who performed a covered task on its system over the past 5 years (or October 28, 2002, whichever is later) was qualified at the time they performed the covered task. The 5-year record retention period for an evaluation begins the moment the individual ceases to perform the covered task for the operator (e.g., is transferred, retires, resigns, is fired or dies) or the individual is re-evaluated so that the older evaluation is no longer relied on for current qualification. For example, an evaluation passed in 2003 that is re-evaluated in 2006 must be retained until 2011. The operator should be able to provide dates that each individual passed each of the required evaluations and a copy of a sample evaluation for review.

Records may be kept by the operator, a contractor or a third party. If maintained offsite the operator should be able to produce the records within a reasonable time.

Available Material/Information 1. For each individual who performs covered tasks, written or electronic records of the date each individual completed each evaluation required for a task and the name of the person who administered the evaluation. 2. Samples of each evaluation listed in #1.	
Rule Requirement	§§ 192.807/195.507 Recordkeeping 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 the 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.

ELEMENT 8
MANAGE CHANGE

Scope: This element addresses how the operator manages changes to procedures, tools, standards and other changes to the OQ program and how these changes are incorporated into the qualification and evaluation methods for individuals performing covered tasks, and the methods employed to communicate changes to individuals performing covered tasks, whether operator employees or contractors.

Protocol #8.01	**Management of Changes (to Procedures, Tools, Standards, etc.)**
Protocol Question	Does the operator's OQ program identify how changes to procedures, tools standards and other elements used by individuals in performing covered tasks are communicated to the individuals, including contractor individuals, and how these changes are implemented in the evaluation method(s)?
	Verify that the operator's program identifies changes that affect covered tasks and how those changes are communicated, when appropriate, to affected individuals. **[Enforceable]** Verify that the operator's program identifies and incorporates changes that affect covered tasks. **[Enforceable]** Verify that the operator's program includes provisions for the communication of changes (e.g., who, what, when, where, why) in the qualification program to the affected individuals. **[Enforceable]** Verify that the operator incorporates changes into initial and subsequent evaluations. **[Enforceable]** Verify that contractors supplying individuals to perform covered tasks for the operator are notified of changes that affect task performance and thereby the qualification of these individuals. **[Enforceable]**

Guidance Topics

The rule requires that the operator communicate changes that affect covered tasks to individuals performing those covered tasks. In order to perform this effectively, the operator must have a change management methodology so that it knows when changes are occurring, what changes have an impact on covered task performance, the relative significance of the change and how it affects the continued qualification of individuals, and mechanisms to effectively communicate changes to qualified individuals. Investigation of the following characteristics is important to determine whether the requirements of the rule have been met:

1. Identification of the methods used to communicate changes to affected individuals.
2. Means of ensuring that affected personnel are kept up to date on current requirements of the OQ program.
3. Changes to the OQ plan and revisions to the plan are made and communicated to the appropriate individuals.

Small Operator Guidance
Operators must consider how changes to their O&M procedures, systems and equipment may affect their OQ plan.

The operator should periodically identify changes which need to be communicated to its workers and addressed in its OQ plan.

The operator should ensure the person responsible for managing the OQ program is:

- Aware of the need and the importance of ensuring qualified personnel are prepared for changed conditions,
- Changes affecting covered tasks are communicated to the individuals who perform the task,
- Fully aware of the written OQ plan provisions to address and manage changes to its systems.

If changes have occurred that trigger this provision, have the evaluations for affected tasks been adjusted to address the change?

Available Material/Information

1. Written OQ Plan, task list and evaluation requirements
2. If changes have occurred since the past inspection that triggered changes to any of the above, documentation of what changes were made and why should be reviewed, if available.

Rule Requirement	§§ 192.805/195.505 Qualification Program Each operator shall have and follow a written qualification program. The program shall include provisions to: (f) Communicate changes that affect covered tasks to individuals performing those covered tasks;

ELEMENT 9
FIELD INSPECTION OF OQ PROGRAM IMPLEMENTATION

Scope: This element is intended to be a comprehensive review and overview of the operator's OQ program application to O&M covered tasks conducted at pipeline facilities and field offices. It is directed towards objective evidence of task performance, qualification of individuals performing covered tasks, field supervisor knowledge of responsibilities assigned under the operator's OQ program, and similar factors.

Company:	**Field Location/Address:**
Date:	**System Information:**
Number of Company Employees Under OQ Program at This Location:	
Number of Contractor Personnel Under OQ Program at This Location:	
Inspection Team: 1. _____ 2. _____ 3. _____ 4. _____ 5.	**Company Personnel in Interview/Phone Numbers:** 1. _____ 2. _____ 3. _____ 4. _____ 5.

Area Inspected	Results Acceptable? Yes	No	N/A	N/I
1. Field/job supervisor responsibilities				
a. Is knowledgeable of OQ program responsibilities	☐	☐	☐	☐
b. Conducts frequent observation of covered task performance	☐	☐	☐	☐
c. Knows required actions to take when individual's performance of covered task may have contributed to incident/accident	☐	☐	☐	☐
d. Knows factors to consider and required actions to take when individual is identified that may no longer be qualified to perform covered task	☐	☐	☐	☐
e. Conducts verification of qualification status of individuals per OQ program requirements for employees and contractors	☐	☐	☐	☐
f. Ensures establishment of direct observation and control of unqualified individuals	☐	☐	☐	☐
g. Establishes span of control for unqualified individuals appropriate to task:knows company policy	☐	☐	☐	☐
2. Procedures for performance of covered tasks				
a. Procedures are present at field location for covered task performance	☐	☐	☐	☐
b. Procedures used are same (content, date issued) as approved O&M manual	☐	☐	☐	☐
c. Contractor procedures are approved by operator for use	☐	☐	☐	☐
d. Individuals are observed adhering to procedures when performing CTs	☐	☐	☐	☐
e. Proper tools, techniques, processes employed per procedures	☐	☐	☐	☐
3. Abnormal operating conditions				
a. Individuals performing covered tasks know how to recognize AOCs	☐	☐	☐	☐
b. Individuals performing covered tasks know how to react to AOCs	☐	☐	☐	☐
4. Management of change				
a. Supervisors are knowledgeable of communication process for changes in procedures, tools, techniques	☐	☐	☐	☐
b. Individuals performing covered tasks are knowledgeable of communication process for changes in procedures, tools, techniques	☐	☐	☐	☐
5. Evaluation processes				
a. Use of WPHR to evaluate employees/contractors consistent with OQ plan	☐	☐	☐	☐
b. Supervisor is involved in evaluation process consistent with OQ plan	☐	☐	☐	☐
6. Program improvement				

a. Problems experienced in field with OQ program implementation are fed back to OQ program management	☐	☐	☐	☐
b. Process for feedback of program improvement exists from field to HQ	☐	☐	☐	☐
c. Response provided by HQ to feedback from field	☐	☐	☐	☐
d. Field/job supervisor concerns with contractor qualifications identified	☐	☐	☐	☐
7. Consistency of implementation of OQ program requirements				
a. Implementation of program requirements consistent with Company policy (procedures/processes for performing covered tasks)	☐	☐	☐	☐
8. Third Party/Internal Audits or Inspections				
a. Field audits/inspections of covered task performance occur as specified in OQ program (frequency/feedback of results)	☐	☐	☐	☐

For "*No*" answers, use supplemental sheet to explain details and identify deficiencies that may require enforcement action. Ensure numbering is consistent with Field Inspection Protocol Checklist for OQ Inspection form. "*N/A*" means item is not applicable to the operator's OQ program. "*N/I*" indicates "not inspected."

1. Field/job supervisor responsibilities

The inspector should review the operator's OQ program to determine if there are any responsibilities that are not applicable (N/A). For each of the responsibilities listed, observe the performance of or discuss them with the field or job supervisor to determine the acceptability or deficiencies associated with each item.

a. Many operators identify the job supervisor, facility supervisor, project lead, team leader or other front-line supervisory position as the key field position responsible for ensuring the correct implementation of the OQ program. This item is designed to ensure that this individual is knowledgeable of his/her responsibilities.

b. Supervisors are also often tasked with observing the performance of individuals in their work group for use in the operator's performance appraisal program. This item is designed to determine how much of that performance observation is directed toward ensuring the correct performance of covered tasks without deficiencies in adherence to procedures, etc.

c. One consideration of the OQ requirements is the determination of the need for re-evaluation of an individual if it is believed that the individual's performance of a covered task has led to an incident or accident. This item investigates the role of the individual's supervisor in that process and the determination of whether or not this role is consistent with the program requirements.

d. Another consideration of the OQ requirements is determining whether an individual is no longer qualified to perform a covered task, and requires re-evaluation. This item investigates the role of the individual's supervisor in that process, his/her knowledge of the criteria (if any) that the operator has established to make that determination, and the determination of whether or not this role is consistent with the program requirements.

e. A covered task must be performed by a qualified individual, or by an unqualified individual who is directed and observed by a qualified individual. If possible, observe the method used to verify the qualifications of individuals, especially contractor individuals, performing covered tasks to see if it is consistent with OQ program requirements. The supervisor may also demonstrate the method used to accomplish this item. Also, confirm that hardcopy records of an individual's qualification are retained as part of the job/task information.

f. The OQ requirements allow a covered task to be performed by an unqualified individual who is directed and observed by a qualified individual. If possible, observe the method by which the

supervisor establishes the direction and control of unqualified individuals by a qualified individual. The supervisor may also describe the method employed to establish this requirement.

g. Depending on the complexity of the covered task, the span of control of unqualified individuals performing covered tasks by qualified individuals may be as low as one-on-one or as high as five-on-one. Most operators do not specify task-specific spans of control, but leave the determination to the field supervisor. The field supervisor should be requested to describe what criteria, formal or informal, are used to establish span of control.

2. Procedures for performance of covered tasks

a. The inspector should observe the performance of covered tasks during an operations or maintenance activity and determine if procedures prepared by the operator to conduct the task(s) are present in the field and are being used as necessary to perform the task(s).

b. The inspector should confirm that the procedures being used in the field are the same (content, revision number, and/or date issued) as the latest approved procedures in the operator's O&M manual.

c. The inspector should confirm that the procedures employed by contractor individuals performing covered tasks are those approved by the operator for the tasks being performed.

d. It is important to observe individuals actually performing covered tasks, to ensure that procedure adherence is accomplished and that "work-arounds" are not employed that would invalidate the evaluation and qualification that was performed for the individual in performance of the task.

e. Procedures list the tools, techniques, and processes employed to accomplish covered tasks. The inspection should determine if all of the tools and special equipment are present at the job site and are properly employed in the performance of the task, and if techniques and special processes are specified, that these are used and followed as described.

3. Abnormal operating conditions

a. The definition of a qualified individual in the OQ Rule includes the ability to recognize and react to AOCs. Operators differ in the ways AOCs are defined; some define only a set of "generic" AOCs that are applicable to all covered tasks, while others define generic and task-specific AOCs. The evaluation process for AOCs also differs, depending on whether the operator has developed a training module for AOCs, or simply defines AOCs as part of the evaluation process. This area is especially important for contractors, since those individuals who were qualified as part of an operator-recognized consortium such as NCCER, MEA, INGAA, OQSG or others may be qualified to a different set of AOCs than those that are applied to operator employees. Other operators may require that all contractors attend operator-specific AOC training prior to work. The inspection should focus on an individual's knowledge of the AOCs applicable to the covered task being performed and the ability to recognize those AOCs. The information gained during the inspection should be compared to the requirements for qualification applied during the evaluation process for the subject covered task. If possible, at least one employee individual and at least one contractor individual should be sampled.

b. As important as recognizing AOCs during the performance of a covered task, is the reaction of the qualified individual to the AOC once it occurs. Depending on the condition, reactions may vary from immediately turning a valve or shutting off an ignition source, to vacating an area and notifying supervisory personnel. Additionally, the required reaction may vary depending on whether the individual is an operator employee or is a contractor. The inspection should focus on

the required reactions for all of the AOCs for the covered task being performed, and noting these for comparison to the required reactions in procedures or training modules, if identified. As in a. above, if possible, at least one employee individual and at least one contractor individual should be sampled.

4. Management of change

a. One of the seven key elements of an OQ program must be the communication of changes that affect covered tasks to those individuals performing covered tasks. Changes may occur in procedures used to perform covered tasks, in equipment or tools used in task performance, or in techniques or special processes that improve pipeline safety. Often these changes are initiated at the headquarters level of the operator; changes may also result from feedback from the field locations where the tasks are actually performed. This inspection topic investigates the knowledge of field supervisors on the way changes are communicated, both to the supervisor from other locations and from the supervisor to other locations. Timeliness of communications should also be investigated to determine if the communication process impedes the timely dissemination of changes to field personnel.

b. Along with communication of changes to field supervisors, individuals who perform covered tasks should also understand how changes are communicated to them; from the supervisor, directly from the changing authority, etc. If there are contractors performing covered tasks during the field inspection, they should also be sampled concerning changes that affect the tasks they are hired to perform.

5. Evaluation processes

a. If an operator employed WPHR as a method of qualification of employees performing covered tasks prior to October 27, 1999 (transitional qualification in accordance with the rule), the inspector(s) should examine field records for several randomly selected individuals who were qualified in this manner to ensure that qualification requirements specified by the operator in its OQ program for WPHR were met satisfactorily. If there are contractor individuals performing covered tasks, they should be asked what evaluation method was used for their qualification. If WPHR was used for qualification of any contractor individuals, this should be noted for follow-up with the operator's OQ program coordinator.

b. Depending upon the operator's OQ program, the individual's supervisor may or may not be involved in the evaluation process for qualification of an individual to perform a covered task. If the program indicates the involvement of the supervisor, the inspector(s) should determine if the supervisor is performing the evaluation requirements specified in the program.

6. Program improvement

a.-d. This area investigates the communication of OQ program implementation problems and suggested improvements between the headquarters individual or committee established by the operator for OQ program management and the field individuals who actually have to make it work. The most important of these items is associated with the suitability of contractor qualifications, especially the identification and quick resolution of qualification issues.

7. Consistency of implementation of OQ program requirements

a. This area is applicable only if the inspection is broad enough in scope to cover more than one district of the operator's company or more than one subsidiary that is covered under an overall OQ program. The inspector should select several covered tasks and review the methods or

procedures for performing the tasks to determine if the requirements for task performance are the same. If there are differences, the reason for these differences should be discussed with the operator's representative.

In certain cases, the operator's plan allows for different OQ requirements between segments of its company, especially where a merger or acquisition has recently taken place. If this is the case, then the inspector should determine whether or not an individual from one district or subsidiary is qualified to perform a covered task in a different area of the company without reevaluation.

8. **Third-party/internal audits or inspections**

   a. If the operator's OQ program specifies that third-party or internal audits will be performed of field activities, the inspector should ask the operator representative if he/she is aware of the audit process and audit results, and determine if these results identify any problem areas with program implementation.

P-3 CONDUCT LEAK SURVEYS

Tasks:

a. Operating flame ionization unit
b. Operating combustible gas indicator (and/or any other leak detection equipment used on the facility)
c. Operating electronic gas detector
d. Knowing the different leak classifications (distinguish the difference)
e. Conducting bar-hole leak investigation

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
5.1	Leak Classification
5.2	Procedures for Leak Surveys and Patrols
5.3	Combustible gas indicators
5.4	Electronic gas detectors
5.5	Flame ionization
5.6	Bar Hole Testing and Purging

P-4 OPERATE LINE LOCATOR

Tasks:

a. Locating inductively
b. Locating conductively
c. Proper placement of ground
d. Proper marking of facilities

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
3.1, 3.2, and/or 3.3, and 3.5	Operating line locator

P-5 INSTALL MAINS

Tasks:

a. Mapping
b. Record keeping
c. Selecting proper welding and/or fusion procedures
d. Installing tracer wire for plastic pipe
e. Installing valves and fittings
f. Conducting pressure tests
g. Purging
h. Plastic pipe repair
i.

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.1	Documenting materials and installation records

FOREWORD

An industry-government small operator task force reviewed several model plans and concluded that the following model plan provides an excellent model that small operators can use as a model for their OQ compliance programs. This model written operator qualification plan is provided as an example for small operators of natural gas, LP, master meter, and hazardous liquid pipelines and of what the end result of the processes described in the "How to" guide might look like.

The Iowa Association of Municipal Utilities (IAMU) developed this plan following processes similar to those described in the "How to" guide and has graciously made it available for your use. Some noteworthy features of the plan are:

- Each of the 8 minimum requirements of regulation is addressed,
- A covered task list of most covered tasks performed on a typical natural gas distribution system is included,
- Examples of competencies and skills (equivalent to the knowledge, skills abilities and abnormal operating conditions in the "How to" guide) required for each covered task are included,
- Examples of evaluation method (written test or observation checklist) for each competency and skill are included,
- Examples of abnormal operating conditions for each task are addressed in the evaluations, and
- Training courses that may be used to provide the necessary competencies and skills to individuals that need training to become qualified are listed.

Note that this plan was developed for IAMU's members who are operators of natural gas distribution systems. Operators will need to modify it to fit their systems, which means removing those tasks and evaluations that are not applicable to their systems and adding covered tasks, competencies and evaluations for other covered tasks performed on master meter, LP, hazardous liquid and gas transmission pipelines that may not be included in this plan. Information on covered tasks, competencies and/or evaluations for master meter, LP, hazardous liquid and gas transmission pipelines may be available from trade associations or vendors.

Operators are not required to use this plan, however they may use as much or as little of it as desired. If operators choose to use all or part of this plan, they must ensure that it fits its unique system and procedures. Operators other than IAMU members using this plan will be responsible for all changes and updates required of this plan. **Intrastate operators should also check with their state pipeline safety regulators regarding additional requirements specific to the state in which they operate.**

- Operators should review the covered task list, deleting tasks that are not performed on their system and adding any activity that is performed on their system that is not currently listed. For example, operators of an all-plastic system will not perform cathodic protection tasks. Operators of gas transmission or hazardous liquid pipelines can contact trade associations or vendors for information on covered tasks.
- Operators should review the competencies and skills for each covered task that is performed on their system to ensure the competencies and skills and the evaluations for each addresses what an individual must know to perform each covered task according to their operating and maintenance procedures. Feel free to substitute other training and evaluations for any or all of those listed in the IAMU plan if you feel that other training and evaluations better suit your needs. For tasks identified that are not in the IAMU plan operators will have to assess the competencies and skills and develop or acquire appropriate evaluations.
- Operators should ensure that the recommended re-evaluation frequencies are appropriate for their system based on the factors described in the "How to" guide. January 2004

_____

Utility/Company

_____

Plan Administrator (Protocol 3.01 §192.805/195.505)

NATURAL GAS OPERATOR QUALIFICATION PROGRAM

Adopted _____

Date

NATURAL GAS OPERATOR QUALIFICATION PROGRAM

A Model Program from the

IOWA
ASSOCIATION OF MUNICIPAL
UTILITIES

1735 NE 70th Avenue
Ankeny, Iowa 50021-9353
515/289-1999

Disclaimer of Warranty and Limitation of Liability

This model program has been developed by the Iowa Association of Municipal Utilities (IAMU) in conjunction with Minnesota Municipal Utilities Association (MMUA), Iowa Utilities Board (IUB), Minnesota Office of Pipeline Safety (MOPS) and both of the Natural Gas Safety Committees of IAMU and MMUA to promote the safe operation of municipal gas systems and compliance with federal regulation of gas pipeline operators.

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is furnished with the understanding that neither the Association nor its licensed agent is engaged in rendering legal or other professional service. If legal advice or other professional or expert assistance is required, the services of a competent professional person should be sought. This publication is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality, performance, and accuracy of the manual is with the holder.

PREFACE

This program has been developed by the Iowa Association of Municipal Utilities (IAMU) in conjunction with the Minnesota Municipal Utilities Association (MMUA) and their Natural Gas Safety Committees, the Iowa Utilities Board, and the Minnesota Office of Pipeline Safety, and will continually be amended and updated as deemed necessary.

In an effort to promote employee and gas system safety, the creation of this important operator qualification program was developed to assist operators in fulfilling the regulations set by the Office of Pipeline Safety, U.S. Department of Transportations.

It is our intent to include all covered tasks, and procedures in this program. However, managers/supervisors are cautioned that some of the tasks that are performed on your system may be unique and therefore will have to be modified to your system.

It is the intent of this program that all persons in this OQ program are required to test for the fundamentals of natural gas, as a prerequisite to all competencies and skills. A training program for the fundamentals of natural gas must include: characteristics and hazards of natural gas, potential ignition sources: indoor and outdoor, recognizing emergency conditions and recognizing and reporting natural gas leaks.

Division 1 has sections that were intentionally left blank. These blanks are to be filled in by the Plan Administrator to customize the program to your system.

Division 7 is unique to this program and is intended for actual procedures and training materials used if different from the IAMU program; examples are the Fisher Regulator School and the American Meter School.

Updates, changes, and other modifications to this program, other than those made by the Plan Administrator, will be done at IAMU's office and forwarded to the operators as expediently as possible for IAMU and MMUA members only. Plan Administrator is responsible for implementation and modifications in this OQ program and is also responsible for all required documentation in support of this program. This would include documentation from outside contractors, mutual aid agreements and qualification.

(Protocols 1.01, 3.01, 5.02, 6.01, 8.01 §192.805/195.505)

If you wish to use Midwest Energy Association (MEA) training materials they may be obtained by contacting IAMU or directly to MEA at 952/832-9915, and using the code "SMOQ."

Questions about the IAMU program and training materials used in this program should be directed to the IAMU offices by contacting David Hraha at 515/289-1999.

NATURAL GAS OPERATOR QUALIFICATION PROGRAM
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INTRODUCTION

The gas operator qualification program is governed by the regulations of the U.S. DOT. Those regulations are found in 49-CFR-191 and 192.

Format of this Program

This program is separated into eight divisions:

Division 1. PURPOSE AND SCOPE

The first part of the program explains the purpose and scope of the program. It explains the different methods for qualification, re-evaluation, notices of changes, training, record keeping, mutual aid, and also the time frames for re-qualification.

Division 2. COVERED TASKS

This division explains the procedures required of the gas operator, and the covered tasks associated with the procedure.

Division 3. REQUIRED COMPETENCIES AND SKILLS

In this division is an outline of the required competencies and skills, the method for qualification, the time frames for re-qualification, and suggested training references, these are suggested training references, if other training material is used, the operator should list it, and give an outline of it in Division 7.

Division 4. RECORD KEEPING

This division contains both the individual summary, which belongs to the individual performing the covered tasks, and the group summary, which belongs to the system that owns the plan.

Division 5. HANDS-ON PERFORMANCE QUALIFICATION (Forms)

Division five contains evaluation forms used in the evaluation of the hands-on skills and other documentation processes.

Division 6. WRITTEN EVALUATION OF COMPETENCIES AND SKILLS

In this division is a copy of the written evaluations used to help determine knowledge retention.

Division 7. TRAINING MATERIALS

This division is a list of training materials that operators use other than those found in Division 8 that are used in the qualification process.

Division 8. COURSE DESCRIPTIONS

The eighth division contains an outline of Midwest Energy Association's (MEA) training modules, which is reproduced by the Iowa Association of Municipal Utilities through an Agreement by the two parties.

PROTOCOLS/RULE REQUIRMENTS

Protocol questions, found in Appendix 1, are utilized to inspect OQ programs. The tables below reference divisions of the IAMU plan where the protocols are addressed.

PROTOCOL	RULE REQUIRMENT	IAMU SECTION ADDRESSED IN
1.01	§192.805/195.505	Preface, 1.15, Divisions 2, 3
1.02	§192.803/195.503 §192.805/195.505	1.3
1.03	§192.803/195.503	1.14
1.04	§192.803/195.503 §192.805/195.505	Preface, 1.9, 1.11, 1.14 Division 7
1.05	§192.809/195.509 Amdt 192-90, 8-20-01	Division 3
2.01	§192.801/195.501 §192.805/195.505	1.2, 1.10, 1.15, Division 2
2.02	§192.803/195.503 §192.805/195.505	Division 3
3.01	§192.805/195.505 §192.807/195.507	Cover page, Preface, 1.3, 1.12, Divisions 4a, 4b
3.02	§192.805/195.505	1.8, Division 5
4.01	§192.803/195.503 §192.805/195.505 §192.809/195.509	1.1, 1.7, Divisions 3, 5
4.02	§192.803/195.503	1.3, 1.9, 1.11, 1.16, Division 8
5.01	§192.805/195.505 Incident 191 Accident 195	1.9
5.02	§192.805/195.505	Preface, 1.15, Division 3
6.01	§192.805/195.505	Preface, 1.17, Division 5
7.01	§192.807/195.507	1.3, 1.12
8.01	§192.805/195.505	Preface, 1.10, Division 5 & 7

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The basic content of the operator qualification program was developed by the Iowa Association of Municipal Utilities, Minnesota Municipal Utilities Association several operators and pipeline safety staff located in Iowa and Minnesota.
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Dan Morgan Owatonna Public Utilities
Bert Magstadt Watertown Municipal Utilities
SSOQ2 Government-Industry Taskforce

Endorsement: Midwest Energy Association (MEA), training, testing, evaluation and record keeping materials are compatible with the IAMU OQ plan.

NATURAL GAS OPERATOR QUALIFICATION PROGRAM

1.1 PURPOSE. This program is intended to meet the requirements, effective April 27, 2001, of the Office of Pipeline Safety, U.S. Department of Transportation, for natural gas operators (Reprinted below). By following the provisions in this written program, individuals will be able to meet the October 28, 2002 requirements as specified in 192.809.

Any persons performing covered tasks after October28, 2002 shall be qualified in accordance with this program. Work performance history review is not anticipated to be used as a qualification criteria, except it may be used for outside contractors performing certain covered tasks, that require separate documentation, as required by the O&M manual, for example; Leak surveys, cathodic protection, regulator inspection.

Work performance history may not be used as the sole evaluation after October 28, 2002. (Protocol 4.01 §192.809/195.509)

QUALIFICATION OF PIPELINE PERSONNEL
49CFR PART 192 Subpart N

192.801 SCOPE.

(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 the integrity of the pipeline.

192.803 DEFINITONS.

Abnormal operating condition (AOC) 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
(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
(e) Performance on the job
(f) On the job training

(g) Simulations
(h) Other forms of assessment.

Qualified means that an individual has been evaluated and can:

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

192.805 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 tasks
(g) Identify those covered tasks and the intervals at which evaluation of the individual's qualifications is needed.

192.807 RECORD KEEPING.

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 the 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.

192.809 GENERAL.

Operators must have a written qualification program by April 27, 2001. Operators must complete the qualification of individuals performing covered tasks by October 28, 2002. Work performance history review may be used as a sole evaluation method for individuals who were performing a covered task prior to August 27, 1999.

After October 28, 2002, work performance history may not be used as a sole evaluation method.

1.2 COVERED TASKS, COMPETENCIES AND SKILLS.

This qualification program is divided into specific covered tasks. There are several required competencies and skills for each covered task. Any person performing a covered task must be qualified in the competencies and skills required for that task. In addition, all affected persons, regardless of their performance of specific covered tasks, shall be required to demonstrate knowledge of the Fundamentals of Natural Gas.

(Protocol 2.01 §192.805/195.505)

METHOD USED FOR DETERMINING COVERED TASK LIST

_____
_____
_____
_____
_____

1.3 OUTSIDE CONTRACTORS.

Outside contractors performing a covered task shall qualify by one of the following methods:

1. May qualify through this program.
2. Shall perform the covered tasks under the direct supervision of a qualified individual.
3. Shall submit proof, prior to performing the task acceptable to the operator demonstrating acceptable qualification for the covered tasks by obtaining copies, as described in Section 1.12 of this Division, of the contractor's evaluations and ensure they address the same knowledge' skills' abilities and AOC's as your evaluations for the same tasks.

Outside contractors qualifications have to include the requirements as described in Section 1.16 of this Division.

The Plan Administrator will make sure the evaluations are documented e.g. test questions are written and observation evaluations include checklists indicating what is observed. List these evaluations in this OQ Program as evaluations you accept for these tasks.

(Protocols 1.02, 3.01, 4.02, 7.01, §§ 192.803/195.503, 192.805/195.505, 192.807/195.507)

(Example) Qualified under Southern Cross leak detection school.

Copies of the topics covered are on file.

1.4 QUALIFICATION BY WRITTEN / ORAL AND/OR HANDS-ON EVALUATION.

A written/oral and/or hands-on evaluation is required in each competency or skill. One hundred percent of all specified critical questions and not less than seventy percent of all other questions must be answered correctly to pass the evaluation (this percentage may vary, check with your state pipeline safety regulators.) All of the required competencies or skills must be passed or re-training and successful evaluation must be completed on those that are not passed.

1.5 QUALIFICATION BY PRE-TEST.

A general pre-test may be offered to establish specific knowledge areas. If the test is passed in all areas, at least seventy percent in each competency (this percentage may vary, check with your state pipeline safety regulators), then demonstration of proficiency through hands-on exercises may be used to establish qualification.

1.6 RE-QUALIFICATION.

Examinations for re-qualification must be passed and documented within the time frames specified in Division 3.

1.7 QUALIFICATION BY PERFORMANCE.

Qualification by work performance is defined as performing a covered task in a safe and effective manner for a period of at least five years. In other words, there have been no reportable gas-related accidents or incidents, (see definition, 1.9 of this Division), or AOCs as a direct result of the individual's work performance.

In the event that an employee is not qualified to perform a certain task, that person may become qualified by successfully performing the task under the direct supervision of an individual, selected by the Plan Administrator, whom is also qualified. The successful performance must be documented on the appropriate evaluation form (e.g. as contained in Division 5 of this program.)

Work performance history may not be used as sole evaluation method after October 28, 2002.

(Protocol 4.01, §§ 192.803/195.503, 192.805/195.505)

1.8 PERFORMING COVERED TASK UNDER DIRECT OBSERVATION OF QUALIFIED PERSON.

In the event that an employee is not qualified to perform a certain covered task, that person may perform the covered task if under direct observation of a person that is qualified.

Direct observation means, the observer must be in close enough proximity, in the immediate area, to be able to recognize, and react to an action that may create an abnormal operating condition or by not following proper practices, and take immediate action, to prevent it from occurring.

When performing direct observation the observer must appropriately document the observation, form "Direct Observation of Unqualified Person Performing Covered Task Under Direct Supervision of Qualified Individual" in Division 5 can be used to document the observation.

On-the-job training may not be used for fusion, welding, and tapping. Qualification for these covered tasks must be completed prior to performance on a system.

(Protocol 3.02, § 192.805/195.505)

1.9 RE-EVALUATION FOR CAUSE.

Re-evaluation of a person's qualification must be undertaken when his/her performance has created an unsafe environment, been the direct cause of personal injury, or if the Plan Administrator has reason to believe the person's performance of a covered task contributed to an *incident* defined in Part 191.

Incident means any of the following events:

1. An event that involves a release of gas from a pipeline or liquefied natural gas *(LNG)* or gas from an LNG facility and (i) A death, or personal injury necessitating in-patient hospitalization; or (ii) Estimated property damage, including cost of gas lost, of the operator or others, or both, of $50,000 or more.[1]
2. An event that results in an emergency shutdown of an LNG facility.
3. An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2).

If at anytime the Plan Administrator has reason to believe that an individual is no longer qualified to perform a covered task, then that individual will have to be re-qualified by hands-on and written and/or oral examination (to same criteria as initial qualifications.) Reasons an individual may no longer be qualified may include: injury or physical limitation, procedures seldom or rarely performed, observation of an error or incorrect procedure, an near-miss incident, evidence of an error or incorrect procedure, or any other evidence the individual may need to be re-evaluated and re-qualified.

(Protocols 1.04, 4.02, 5.01, §§192.803/195.503, 192.805/195.505)

[1] Incidents with lower property damage may need to be reported to state regulators. For example, Iowa defines a reportable incident as one with $15,000 of losses or more. These lower-threshold incidents require re-evaluation of qualification.

Re-Qualification will be determined by (the department head, the crew leader, or by a third party observer) as approved by the Plan Administrator.

1.10 NOTICE OF CHANGES.

Plan Administrator will communicate i.e. meeting, e-mail, with all affected individuals and contractors to make them aware of any material change, or changes made on the system that require a change of procedures, including changes in the O&M and/or the Emergency Procedures. This meeting will occur as soon after such changes are made as practical, and documented as to the context and attendees using Form "Notice of Change" in Division 5. This may include qualification and re-qualification procedures, equipment change and upgrades, new material specifications, O&M activity and new tasks and evaluations.

(Protocol 2.01, 8.01, §§ 192.801/195.501, 192.805/195.505)

1.11 TRAINING.

The above requirements are accomplished through an on-going training program. This program includes workshops, classroom activities, and various other training methods that are designed to address the different covered tasks performed by each individual.

All training and evaluation shall be conducted by or be in accordance with this training and qualification program.

All hands-on activities will be conducted at the operator's gas facility, a gas facility of similar design, the IAMU/MMUA training facilities, or at a workshop designated for the specific competencies and skills identified as covered tasks.

Any new or amended tasks addressed in Section 1.10 shall have appropriate training materials outlined in Division 7.

Retraining if qualifications are questioned will be conducted as per 1.9 of this Division "Reevaluation For Cause."

(Protocol 1.04, 4.02, §§ 192.803/195.503, 192.805/195.505)

1.12 PROGRAM RECORDKEEPING.

Section 4 of this manual contains an Individual Qualification Summary (4a) as well as a Group Qualification Summary (4b). These forms will identify each of the qualified individuals, the covered tasks that each individual is qualified to perform, the dates of current qualification for each task, and the qualification methods. Form 4a is to be maintained by and is the property of the individual. Form 4b is to be maintained by the facility administrator and is the property of the gas facility. If forms 4a and 4b are not used, other appropriate recordkeeping methods may also be acceptable, such as, computer databases and workshop documentation, etc.

Records of individual qualification method, completion of workshop evaluation training records that support qualified person qualifications shall be maintained while the individual is performing the covered task. Prior qualifications and of persons that are no longer performing covered tasks, shall be retained for the time period of five years after the qualification expires.

MMUA, and IAMU maintain an off-site back up of documentation for the OQ records.

(Protocols 3.01, 7.01, §192.807/195.507)

1.13 NEW CONSTRUCTION.

Will be regarded as an O&M activity i.e. pipe replacement, main additions regulator station upgrades

1.14 MUTUAL AID.

Both covered by this program, or onsite training will be given on assigned covered tasks, prior to performing these tasks, and individuals will be listed.

Individuals from other entities performing covered tasks on behalf of the operator must be evaluated and qualified consistent with the operator's qualification program requirements prior to being allowed to perform covered tasks on the operator's system.

(Protocols 1.03, 1.04, §192.803/195.503)

List task that are required for Mutual Aid responders and list tasks below:

1.15 QUALIFICATION METHODS.

Qualification methods and time frames required were established by a steering committee of system operators and regulatory personnel located in Iowa, and Minnesota. Due to the complexities and uniqueness of the tasks, some are knowledge based, and others are accomplished by performance.

Time frames used were determined in part by the frequencies the tasks are performed, the extent of AOC's that may be involved, and the difficulties in performing the tasks. The covered task list was partially derived from MEA training materials and IAMU and MMUA steering committees.

(Protocols 1.01, 2.01, 5.02, §§ 192.801/195.501, 192.805/195.505)

1.16 ABNORMAL OPERATING CONDITIONS

AOC's are included in the specific tasks, and how to recognize and respond to them are included in the qualification method as outlined in Division 8.

Other training materials/method/school/workshops etc., need to ensure they cover the AOC's required for the task(s) and then listed in Division 7.

(Protocol 4.02, §192.803/195.503)

1.17 PROGRAM PERFORMANCE, EFFECTIVENESS AND IMPROVEMENT

Plan Administrator is to evaluate the program as to performance, effectiveness and improvement.

Example: 1. Changing and or upgrading equipment procedures i.e. Notice of Change form in Division 5.

2. Recognize the need of re-qualification of employees.

Request for changes and/or additions to this plan should be documented by using the "Feedback Form" in Division 5. Copy to be filed at utility/company and original mailed to IAMU.

(Protocol 6.01, §192.805/195.505)

PROCEDURES WITH COVERED TASKS

The following activities would be considered "tasks" under 49 CFR 192. The competencies and/or skills listed as sections or subsections under each task are those identified in the operator qualification requirements of Division 3 of this program. Competency in fundamentals of natural gas is required for all covered tasks. (Protocols 1.01, 2.01, §192.805/195.505)

P-1 OPERATE VALVES, REGULATORS, AND RELIEF VALVES LOCATED AT TOWN BORDER STATION AND ALL DISTRICT REGULATOR STATIONS

Tasks:

a. Operating valves (open/close)
b. Changing pressure settings on regulators and relief valves

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.1	Operating valves (including emergency valves), regulators, and relief valves
12.2	Inspecting and maintaining pressure regulating and limiting stations

P-2 MAINTAIN REGULATOR STATIONS

Tasks:

a. Conducting shut down/Start up procedures
b. Operating by-pass
c. Performing lock-up
d. Stroking to full open
e. Adjusting to desired operating pressure
f. Inspecting gauges and/or chart recorders
g. Inspecting filters/valves/strainers
h. Inspecting for atmospheric corrosion
i. Inspecting for protection against third-party interference
j. Inspecting relief valve for damage
k. Checking relief set pressure
l. Checking capacity
m. Inspection of regulator relief valve, orifices, and seats

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.2	Inspecting and maintaining pressure regulating and limiting stations

P-3 CONDUCT LEAK SURVEYS

Tasks:

a. Operating flame ionization unit
b. Operating combustible gas indicator (and/or any other leak detection equipment used on the facility)
c. Operating electronic gas detector
d. Knowing the different leak classifications (distinguish the difference)
e. Conducting bar-hole leak investigation

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
5.1	Leak Classification
5.2	Procedures for Leak Surveys and Patrols
5.3	Combustible gas indicators
5.4	Electronic gas detectors
5.5	Flame ionization
5.6	Bar Hole Testing and Purging

P-4 OPERATE LINE LOCATOR

Tasks:

a. Locating inductively
b. Locating conductively
c. Proper placement of ground
d. Proper marking of facilities

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
3.1, 3.2, and/or 3.3, and 3.5	Operating line locator

P-5 INSTALL MAINS

Tasks:

a. Mapping
b. Record keeping
c. Selecting proper welding and/or fusion procedures
d. Installing tracer wire for plastic pipe
e. Installing valves and fittings
f. Conducting pressure tests
g. Purging
h. Plastic pipe repair
i.

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.1	Documenting materials and installation records

2.2	Documenting maximum allowable operating pressure (MAOP)
2.4	Investigating and documenting line failure
3.5	System mapping
4 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
8 (all)	The construction - heavy equipment competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-6 INSTALL SERVICE LINES / REINSTATING SERVICE LINES

Tasks:

a. Mapping
b. Record keeping
c. Selecting proper welding and/or fusion procedures
d. Installing tracer wire for plastic pipe
e. Installing valves, pipe, including excess flow valves, and fittings
f. Pressure testing
g. Purging
h. Selecting proper riser and meter set
i. Plastic pipe repair

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.1	Documenting materials and installation records
2.2	Documenting maximum allowable operating pressure (MAOP)
2.4	Investigating and documenting line failure
3.3	System mapping
4 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
8 (all)	The construction - heavy equipment competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-7 CONDUCT LEAK INVESTIGATIONS

Tasks:

Procedures specified in Operating and Maintenance Plan

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.4	Investigating and documenting line failure
2.5	Accident reporting
5 (all)	Fundamentals of gas leaks and skill in operating appropriate leak detection equipment.
6.1	Carbon monoxide (CO) testing
6.2	Investigating leaks (indoor and outdoor)

P-8 OPERATE ODORANT LEVEL TESTING EQUIPMENT

Tasks:

Selecting appropriate location

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
11.3	Testing odorant level

P-9 PERFORM LEAK SURVEYS AND PIPELINE PATROLS

Tasks:

a. Identifying building or construction near line
b. Identifying soil subsidence
c. Identifying abnormalities in vegetation growth

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.5	Soil Subsidence
5.2	Procedures for Leak Surveys and Patrols

P-10 FILL ODORANT SYSTEM

Tasks:

a. Closing valves to isolate system
b. De-pressurizing tank
c. Filling according to procedures (differential type or injector)
d. Recording amount of odorant used
e. Closing valves to atmosphere
f. Opening proper valves to restore to use

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas

11.1 or 11.2	Operating and maintaining differential odorant system Operating and maintaining injection odorant system

P-11 OPERATE BACKHOE

Tasks:

a. Loading and unloading
b. Conducting pre-operating inspection
c. Operating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
8.1	Operating backhoe

P-12 OPERATE TRENCHER

Tasks:

a. Loading and unloading
b. Conducting pre-operating inspection
c. Operating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
8.3	Operating trencher

P-13 JOIN PLASTIC PIPE BY FUSION

(By Approved Procedures Only)Tasks:

a. Performing butt fusion
b. Performing socket fusion
c. Performing saddle fusion
d. Performing electro fusion

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.11	Plastic pipe joining (fusion)

P-14 JOIN PLASTIC PIPE BY MECHANICAL COUPLING (By Approved Procedures Only)

Tasks:

a. Installing stab fittings
b. Installing compression fittings
c. Installing boltless couplings

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas

7.12	Plastic pipe joining (mechanical couplings)

P-15 VISUALLY INSPECT FUSION JOINTS (By Approved Procedures Only)
Tasks:
Following approved fusion procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.11	Plastic pipe joining (fusion)

P-16 JOIN STEEL PIPE BY WELDING
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-17 PROTECT WELDING FROM WEATHER
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-18 VISUALLY INSPECT COMPLETED WELD
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-19 TEST WELDERS
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-20 PREPARE WELD SURFACES (By Approved Welding Procedures Only)
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-21 JOIN STEEL PIPE BY MECHANICAL COUPLING (By Approved Procedures Only)
Tasks:
a. Installing bolted or boltless insulated couplings
b. Installing bolted or boltless non-insulating couplings

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.15	Steel pipe joining by mechanical couplings

P-22 INSPECT FOR INTERNAL CORROSION
TASKS:
a. Inspecting tapping coupons
b. Inspecting open ends

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.2	Internal corrosion

P-23 INSPECT FOR EXTERNAL CORROSION
Tasks:
a. Examining exposed pipelines
b. Examining coating for damage
c. Examining for pitting or scaling

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.3	External corrosion

P-24 INSPECT FOR ATMOSPHERIC CORROSION

Tasks:

a. Inspecting paint coverage
b. Inspecting for physical damage

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.4	Atmospheric corrosion

P-25 DETERMINE TYPE OF CORROSION (Localized Or Generalized)

Tasks:

a. Inspecting for pitting
b. Inspecting for flaking or scaling

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.1	Cathodic protection
10.5	Coatings
10.6	Holiday detection (coating inspection)
10.7	Painting and jacketing above ground facilities

P-26 APPLY COATINGS

Tasks:

a. Applying hot field coating
b. Applying cold field coatings
c. Applying hot melt compound
d. Applying petrolatum tape
e. Applying mastic compounds
f. Primers
g. Paints

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.5	Coatings
10.7	Painting and jacketing above ground facilities

P-27 CONDUCT HOLIDAY DETECTION (Coating Inspection)

Tasks:

a. Visually inspecting
b. Using fault detection equipment

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.6	Holiday detection (coating inspection)

P-28 TAKE PIPE-TO-SOIL READINGS

Tasks:

a. Properly placing half-cell
b. Using voltmeter

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.1	Cathodic protection

P-29 INSPECT FOR DETERIORATION AND DAMAGE

Tasks:

a. Inspecting new pipe and fittings
b. Inspecting coatings
c. Inspecting for dents
d. Identifying stress points

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.13	Recognition of defective material
7.16	Damage prevention
10 (all)	Corrosion control

P-30 INSPECT DITCHES AND BACKFILLS

Tasks:

a. Looking for rocks
b. Looking for sharp objects
c. Inspecting trench bottoms

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.17	Application of padding and shielding

P-31 APPLY PADDING AND SHIELDING

Tasks:

Remediating risks associated with rocks, sharp objects, and rough trench bottoms

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.17	Application of padding and shielding

P-32 PAINT AND JACKET ABOVE GROUND FACILITIES

Tasks:

a. Protecting dielectric fittings
b. Protecting identification tags
c. Protecting regulator vents
d. Applying proper protective coating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.7	Painting and jacketing above ground facilities

P-33 INSTALL CATHODIC PROTECTION (Sacrificial Anode System)

Tasks:

a. Attaching galvanic anode by thermite weld
b. Attaching galvanic anode by bolt-on-clamps
c. Attaching drive-in galvanic anode

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.8	Installation of cathodic protection (sacrificial anode system)

P-34 INSTALL IMPRESSED CURRENT SYSTEM

Tasks:

a. Installing rectifier
b. Installing anode bed
c. Connecting positive and negative leads to pipe and rectifier

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.9	Installation of impressed current system

P-35 VISUALLY INSPECT CATHODIC PROTECTION SYSTEM

Tasks:

a. Looking at test stations for physical damage
b. Looking at dielectric fittings
c. Looking for broken wires
d. Looking at rectifier units for damage

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-36 MONITOR CATHODIC PROTECTION SYSTEM

Tasks:

a. Recording pipe-to-soil readings
b. Testing for AC Drain
c. Inspecting dielectric spacers
d. Inspecting DC Interference bond
e. Testing soil resistivity
f. Establishing current requirements
g. Inspecting reverse current switch diodes
h. Recording IR Drops
i. Testing casings – (100 mv)

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-37 MAINTAINING CATHODIC PROTECTION SYSTEM

Tasks:

Remediating abnormalities found through visual inspection and monitoring

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection

P-38 ELECTRICALLY ISOLATE SYSTEM

Tasks:

a. Installing or maintaining flange gaskets
b. Installing or maintaining weld-in insulating fittings
c. Installing or maintaining insulated meter spuds
d. Installing or maintaining insulated gas cocks
e. Installing or maintaining cathodic protection system isolation

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.8	Installation of cathodic protection (sacrificial anode system)
10.9	Installation of impressed current system
10.10	Inspection, monitoring cathodic protection system

P-39 INSPECT FOR INTERFERENCE OR STRAY CURRENTS

Tasks:

a. Using current interrupter
b. Using power supply

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-40 TAPPING AND STOPPING STEEL PIPE

Tasks:

a. Installing tapping tees
b. Installing bottom-out fittings
c. Installing line stoppers
d. Installing bag stoppers
e. Installing expansion plugs

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.20 and/or 7.21	Tapping/Stopping steel pipe 1" through 4" Tapping/Stopping steel pipe 6" through 8"

P-41 TAPPING AND STOPPING POLYETHYLENE PIPE

Tasks:

a. Squeezing off
b. Performing hot-tap
c. Grounding

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.22	Tapping and stopping polyethylene pipe

P-42 INSPECT VAULT

Tasks:

a. Inspect physical integrity of vault
b. Inspecting integrity of steps
c. Inspecting for excess moisture and proper drainage
d. Inspecting ventilation equipment (vaults exceeding 200cf)

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.8	Confined Space Entry (Vaults, etc.)

P-43 ABANDON VAULTS

Tasks:

a. Installing line stops
b. Installing temporary bypass
c. Removing vault
d. Maintaining job site protection

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.9	Job site protection
4.11	Pressure testing
4.13	Excavation safety
4.8, 7.23 and 7.20, or 7.21, or 7.22	Confined space entry Vault abandonment Tapping/Stopping steel pipe 1" through 4" Tapping/Stopping steel pipe 6" through 8" Tapping and stopping polyethylene pipe
7.24	Vault abandonment

P-44 MAINTAIN KEY VALVES

Tasks:

a. Positioning valve key on valve
b. Closing and opening valve
c. Lubricating valve (determine correct amount required)
d. Valve mapping
e. Valve location
f. Verifying area of control (mapping)
g. Identifying valve material
h. Identifying valve size
i. Maintaining accessibility of valves

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.1	Operating valves (including key valves), regulators, and relief valves
12.3	Inspecting and maintaining key valves

P-45 INSPECT CUSTOMER METER SETS

Tasks:

a. Inspecting for proper location
b. Inspecting stop cock installation for easy access
c. Determining whether meter set insulated

d. Inspecting regulator installation for vent location/direction
e. Inspecting meter installation for flow direction
f. Checking for riser height and if meter set is level
g. Checking pressure and adjust (customer side)
h. Checking for lock-up
i. Testing for no-flow
j. Checking tracer wire, if poly pipe is used

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
6.7	Pressure Checks to Establish Gas Service
6.8	Establishing and Disconnecting Gas
10.4	Atmospheric corrosion

P-46 OPERATING PEAK SHAVING PLANT (Propane/Air Mixture/Injection)

Tasks:

a. Operating valves
b. Operating electric control panel
c. Adjusting temperature on vaporizer
d. Adjust injection pressure (Foxboro controller)
e. Operating compressor
f. Operating the specific gravity controller (Usually Ranarex controller)
g. Operate Bunson burner (If equipped)
h. Inspect gauges, charts for stabilization

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
13.1	Pre-start-up procedures
13.2	Start-up/operating procedures/shut down accordance with operators manual for specific equipment used

P-47 SYSTEM UPRATING (Increasing Pressure)

a. Inspecting meter sets (regulators, orifice size, internal relief)
b. Inspecting regulator/relief capacities
c. Leak survey
d. Bar hole testing

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.3/12.4	System uprating
2.2	Documenting MAOP
5.1	Leak classification
5.2	Procedures for leak surveys and patrols

5.3	Combustible gas indicators
5.4	Electronic gas detectors
5.5	Flame ionization
5.6	Bar hole testing and purging

REQUIRED COMPETENCIES AND SKILLS

(Protocols 1.05, 2.02, 4.01, 5.02 §§192.803/195.503, 192.805/195.505, 192.809/195.509)

	Competencies and Skills	Original Qualification Method	Re-Qualif. Method	Re-Qualif. Period	Suggested Training Reference[1]
Sec. 1	**Fundamentals of Natural Gas**				
1.1	Characteristics and hazards of natural gas	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-101
1.2	Potential ignition sources: indoor and outdoor	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-102
1.3	Recognizing emergency conditions	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-103
1.4	Recognizing and reporting natural gas leaks	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-104
Sec. 2	**Record keeping**				
2.1	Documenting materials and installation records	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's workshop, O&M Manual MEA-402
2.2	Documenting maximum allowable operating pressure (MAOP)	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual MEA-421
2.3	System up-rating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-521
2.4	Investigating and documenting line failure	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-462
2.5	Accident reporting	Written evaluation	Written evaluation	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-103
Sec. 3	**Marking and Mapping Facilities**				
3.1	Locating facilities using the conductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402

3.2	Locating facilities using the inductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.3	Locating facilities using the inductive method (two persons)	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.4	Determining depth through triangulation	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.5	System mapping	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop MEA-402
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**				
4.1	Personal protective equipment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-111
4.2	Power tool safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-121
4.3	Proper firefighting techniques	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Emergency Procedures Training, MEA-122
4.4	Controlling the accidental release of gas	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Emergency Procedures Training, MEA-131
4.5	Soil subsidence	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-201
4.6	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-202
4.7	Recognizing unsafe meter sets	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	MEA-211
4.8	Confined space entry (vaults, etc.)	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months	OSHA compliance manual and training, MEA-501
4.9	Job site protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Compliance manual and training, MEA- MEA-401
4.10	Purging safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39	Operator's Workshop, MEA-422

				months	
4.11	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-421
4.12	Abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471
4.13	Excavation safety	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months	OSHA compliance manual and training, MEA-404
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**				
5.1	Leak classification	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Emergency Procedures Training, Gas Fundamentals Training, MEA-221
5.2	Procedures for leak surveys and patrols	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-271
5.3	Combustible gas indicators	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures MEA-231
5.4	Electronic gas detectors	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures, MEA-231
5.5	Flame ionization	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures MEA-232
5.6	Bar hole testing and purging	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-261
Sec. 6	**Fundamentals of Customer Service**				
6.1	Carbon monoxide (CO) testing	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-241
6.2	Investigating leaks	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-272
6.3	Combustion and ventilation air requirements	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-301
6.4	Pilot light operation	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60	Operator's Workshop, MEA-311, 324

		evaluation	hands-on eval.	to exceed 60 months	MEA-311, 324
6.5	Gas-air adjustment	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-312
6.6	Appliance venting	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-313
6.7	Pressure checks to establish gas service	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-321
6.8	Establishing and disconnecting gas	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-322
Sec. 7	**Fundamentals of Construction**				
7.1	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-421
7.2	Procedures for abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471
7.3	Cathodic protection (general)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-431
7.4	Constructing facilities across streets, railroads, and waterways	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-453
7.5	Operating thermite welder	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures, MEA-431
7.6	Installing tracer wire	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, DOT Small Gas Operators Manual MEA-451, 452
7.7	Installing valves	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-451
7.8	Steel and cast iron repair fittings	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-461
7.9	Maintaining steel and cast iron mains	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-462
7.10	Reinforcing steel and plastic mains	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Fusion Workshop, MEA-463

7.11	Plastic pipe joining (fusion)	Hands-on evaluation	Hands-on evaluation	12 months, not to exceed 15 months	Fusion Workshop, MEA-411
7.12	Plastic pipe joining (mechanical couplings)	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, MEA-463
7.13	Recognition of defective material	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-411, 412, 421
7.14	Steel pipe joining by welding	Per approved welding procedures	Per approved welding procedures	12 months, not to exceed 12 months	Pipeline Welding Workshop, Qualified Welding Procedures
7.15	Steel pipe joining by mechanical couplings	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Operator's Workshop, MEA-412
7.16	Damage prevention	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-462
7.17	Application of padding and shielding	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-453
7.18	Replacing emergency valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-441, 511
7.19	Installing meter sets	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-211, 322, 452
7.20	Tapping and stopping steel pipe 1" through 4"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, MEA-441
7.21	Tapping and stopping steel pipe 6" through 8"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, Manufacture's Procedures
7.22	Tapping and stopping polyethylene pipe	Hands-on evaluation	Hands-on evaluation	60 months, not to exceed 60 months	Operator's Workshop, MEA-451, 452
7.23	Vault abandonment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471, 501

Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**				
8.1	Operating backhoe	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-403
8.2	Operating trencher	Hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures, MEA-403
8.3	Operating boring equipment	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures
8.4	Ditch and backfill inspection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-404
Sec. 9	**Fundamentals of Measurement and Control**				
9.1	Metering	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Metering Workshop
9.2	Odorization measurement and control	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-251
Sec. 10	**Corrosion Control**				
10.1	Cathodic protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.2	Internal corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.3	External corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.4	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-202
10.5	Coatings	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.6	Holiday detection (coating inspection)	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.7	Painting and jacketing above ground facilities	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Corrosion control workshop, MEA-202

				months	
10.8	Installation of cathodic protection (sacrificial anode system)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.9	Installation of impressed current system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.10	Inspection, monitoring cathodic protection system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
Sec. 11	**Odorization**				
11.1	Operating and maintaining differential odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
11.2	Operating and maintaining injection odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
11.3	Testing odorant level	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
Sec. 12	**Other Operating and Maintenance Skills**				
12.1	Operating valves (including emergency valves), regulators, and relief valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-244, 511, 512
12.2	Inspecting pressure regulating and limiting stations	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-512
12.3	Inspecting and maintaining key valves	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-511
12.4	System uprating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-521

Sec. 13	Operating Peak Shaving Plant (Propane/air mixture/injection)				
13.1	Pre-start-up procedures	Hands-on evaluation	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months	O&M Manual, Emergency shut down procedures
13.2	Start-up/operating procedures/shut down in accordance with operators manual for specific equipment	Hands-on evaluation	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months	O&M Manual, Emergency shut down procedures

[1] Reference to operator training refers to workshops conducted by state and regional associations, such as the Iowa Association of Municipal Utilities and the Midwest Energy Association (formerly known as Midwest Gas Association), manufacturers and distributors of gas industry products and equipment, state regulatory agencies, and other organizations. Specific references to MEA materials are to training modules in the Midwest Energy Association's Operator Qualification Training series.

See Appendix 2 for MEA's new training material cross-reference guide.

Division 4a of the Operator Qualification Program contains an Individual Qualification Summary. This form will identify the qualified individual, the covered tasks that each individual is qualified to perform, the dates of current qualification for each task, and the qualification methods. Form 4a is to be maintained by and is the property of the individual. If form 4a is not used, other appropriate recordkeeping methods may also be acceptable, such as, computer databases and workshop documentation, etc. Training records that support qualified person qualifications shall be maintained while the individual is performing the covered task and of persons that are no longer performing covered tasks shall be retained for the time period of five years.

INDIVIDUAL QUALIFICATION SUMMARY

For

_____

(Employee Name)

This table is used to record the progress of an individual in successfully demonstrating qualification in a competency or skill required to perform tasks necessary for the operation of a natural gas system. A certificate for each competency or skill, which verifies qualification by written evaluation or performance evaluation, must be attached. (Protocol 3.01, § 192.807/195.507)

	Competencies and Skills	Original Qualification Method	Re-Qualif. Method	Re-Qualif. Period	Original Date Qualified	Date Re-Qualified
Sec. 1	**Fundamentals of Natural Gas**					
1.1	Characteristics and hazards of natural gas	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.2	Potential ignition sources: indoor and outdoor	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.3	Recognizing emergency conditions	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.4	Recognizing and reporting natural gas leaks	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
Sec. 2	**Record keeping**					
2.1	Documenting materials and installation records	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

2.2	Documenting maximum allowable operating pressure (MAOP)	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
2.3	System up-rating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
2.4	Investigating and documenting line failure	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
2.5	Accident reporting	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
Sec. 3	**Marking and Mapping Facilities**					
3.1	Locating facilities using the conductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.2	Locating facilities using the inductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.3	Locating facilities using the inductive method (two persons)	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.4	Determining depth through triangulation	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.5	System mapping	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**					
4.1	Personal protective equipment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.2	Power tool safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.3	Proper firefighting techniques	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.4	Controlling the accidental release of gas	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		

4.5	Soil subsidence	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.6	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.7	Recognizing unsafe meter sets	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.8	Confined space entry (vaults, etc.)	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months		
4.9	Job site protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.10	Purging safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.11	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.12	Abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.13	Excavation safety	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months		
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**					
5.1	Leak classification	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
5.2	Procedures for leak surveys and patrols	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
5.3	Combustible gas indicators	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		

5.4	Electronic gas detectors	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		
5.5	Flame ionization	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		
5.6	Bar hole testing and purging	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 6	**Fundamentals of Customer Service**					
6.1	Carbon monoxide (CO) testing	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.2	Investigating leaks	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.3	Combustion and ventilation air requirements	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.4	Pilot light operation	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.5	Gas-air adjustment	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.6	Appliance venting	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.7	Pressure checks to establish gas service	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.8	Establishing and disconnecting gas	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

Sec. 7	Fundamentals of Construction					
7.1	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.2	Procedures for abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.3	Cathodic protection (general)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.4	Constructing facilities across streets, railroads, and waterways	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.5	Operating thermite welder	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.6	Installing tracer wire	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.7	Installing valves	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.8	Steel and cast iron repair fittings	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.9	Maintaining steel and cast iron Mains	Written Evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.10	Reinforcing steel and plastic mains	Written Evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.11	Plastic pipe joining (fusion)	Hands-on evaluation	Hands-on evaluation	12 months, not to exceed 15 months		
7.12	Plastic pipe joining (mechanical couplings)	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.13	Recognition of defective material	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.14	Steel pipe joining by welding	Per approved welding procedures	Per approved welding procedures	12 months, not to exceed 12 months		

7.15	Steel pipe joining by mechanical couplings	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.16	Damage prevention	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.17	Application of padding and shielding	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.18	Replacing emergency valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.19	Installing meter sets	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.20	Tapping and stopping steel pipe 1" through 4"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.21	Tapping and stopping steel pipe 6" through 8"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.22	Tapping and stopping polyethylene pipe	Hands-on evaluation	Hands-on evaluation	60 months, not to exceed 60 months		
7.23	Vault abandonment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**					
8.1	Operating backhoe	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
8.2	Operating trencher	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
8.3	Operating boring equipment	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
8.4	Ditch and backfill inspection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 9	**Fundamentals of Measurement and Control**					
9.1	Metering	Written evaluation	Written or hands-on	60 months, not to exceed 60		

			eval.	exceed 60 months		
9.2	Odorization measurement and control	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 10	**Corrosion Control**					
10.1	Cathodic protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.2	Internal corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.3	External corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.4	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.5	Coatings	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.6	Holiday detection (coating inspection)	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.7	Painting and jacketing above ground facilities	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
10.8	Installation of cathodic protection (sacrificial anode system)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.9	Installation of impressed current system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.10	Inspection, monitoring cathodic protection system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 11	**Odorization**					
11.1	Operating and maintaining differential odorant system	Written and hand-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
11.2	Operating and maintaining injection odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

11.3	Testing odorant level	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 12	**Other Operating and Maintenance Skills**					
12.1	Operating valves (including emergency valves), regulators, and relief valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.2	Inspecting pressure regulating and limiting stations	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.3	Inspecting and maintaining key valves	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.4	System uprating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 13	**Operating Peak Shaving Plant** (Propane/Air mixture/Injection)					
13.1	Pre-start-up procedure	Hands-on	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months		
13.2	Start-up/operating procedures/shut down	Hands-on	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months		
Sec. __	**Other**					

Division 4b of the Operator Qualification Program contains a Group Qualification Summary. This form will identify each of the qualified individuals, the covered tasks that each individual is qualified to perform, and the dates of current qualification for each task. Form 4b is to be maintained by the facility administrator and is the property of the gas facility. If form 4b are not used, other appropriate recordkeeping methods may also be acceptable, such as, computer databases and workshop documentation, etc. Training records that support qualified person qualifications shall be maintained while the individual is performing the covered task and of persons that are no longer performing covered tasks shall be retained for the time period of five years.

OPERATOR QUALIFICATION (GROUP) SUMMARY

For

_____

(Name of Utility/Organization)

Where the employer copy of individual qualification summaries and related written and hands-on performance evaluations are retained in individual employee records or elsewhere, this table may be used by the operator to summarize the individual qualifications of all or a group of individuals who perform tasks necessary for the operation of a natural gas system.
(Protocol 3.01, §192.807/195.507)

Competencies and Skills		(List date of current qualification for each individual)					
Sec. 1	**Fundamentals of Natural Gas**						
1.1	Characteristics and hazards of natural gas						
1.2	Potential ignition sources: indoor and outdoor						
1.3	Recognizing emergency conditions						
1.4	Recognizing and reporting natural gas leaks						
Sec. 2	**Record keeping**						
2.1	Documenting materials and installation records						
2.2	Documenting maximum allowable operating pressure (MAOP)						
2.3	System up-rating						
2.4	Investigating and documenting line failure						

2.5	Accident reporting						
Sec. 3	**Marking and Mapping Facilities**						
3.1	Locating facilities using the conductive method						
3.2	Locating facilities using the inductive method						
3.3	Locating facilities using the inductive method (two persons)						
3.4	Determining depth through triangulation						
3.5	System mapping						
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**						
4.1	Personal protective equipment						
4.2	Power tool safety						
4.3	Proper firefighting techniques						
4.4	Controlling the accidental release of gas						
4.5	Soil subsidence						
4.6	Atmospheric corrosion						
4.7	Recognizing unsafe meter sets						
4.8	Confined space entry (vaults, etc.)						
4.9	Job site protection						
4.10	Purging safety						
4.11	Pressure testing steel and plastic pipeline						
4.12	Abandoning facilities						
4.13	Excavation safety						
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**						
5.1	Leak classification						

5.2	Procedures for leak surveys and patrols						
5.3	Combustible gas indicators						
5.4	Electronic gas detectors						
5.5	Flame ionization						
5.6	Bar hole testing and purging						
Sec. 6	**Fundamentals of Customer Service**						
6.1	Carbon monoxide (CO) testing						
6.2	Investigating leaks						
6.3	Combustion and ventilation air requirements						
6.4	Pilot light operation						
6.5	Gas-air adjustment						
6.6	Appliance venting						
6.7	Pressure checks to establish gas service						
6.8	Establishing and disconnecting gas						
Sec. 7	**Fundamentals of Construction**						
7.1	Pressure testing steel and plastic pipeline						
7.2	Procedures for abandoning facilities						
7.3	Cathodic protection (general)						
7.4	Constructing facilities across streets, railroads, and waterways						
7.5	Operating thermite welder						
7.6	Installing tracer wire						
7.7	Installing valves						
7.8	Steel and cast iron repair fittings						
7.9	Maintaining steel and cast iron Mains						

7.10	Reinforcing steel and plastic mains						
7.11	Plastic pipe joining (fusion)						
7.12	Plastic pipe joining (mechanical couplings)						
7.13	Recognition of defective material						
7.14	Steel pipe joining by welding						
7.15	Steel pipe joining by mechanical couplings						
7.16	Damage prevention						
7.17	Application of padding and shielding						
7.18	Replacing emergency valves						
7.19	Installing meter sets						
7.20	Tapping and stopping steel pipe 1" through 4"						
7.21	Tapping and stopping steel pipe 6" through 8"						
7.22	Tapping and stopping polyethylene pipe						
7.23	Vault abandonment						
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**						
8.1	Operating backhoe						
8.2	Operating trencher						
8.3	Operating boring equipment						
8.4	Ditch and backfill inspection						
Sec. 9	Fundamentals of Measurement and Control						
9.1	Metering						
9.2	Odorization measurement and control						

Sec. 10	**Corrosion Control**						
10.1	Cathodic protection						
10.2	Internal corrosion						
10.3	External corrosion						
10.4	Atmospheric corrosion						
10.5	Coatings						
10.6	Holiday detection (coating inspection)						
10.7	Painting and jacketing above ground facilities						
10.8	Installation of cathodic protection (sacrificial anode system)						
10.9	Installation of impressed current system						
10.10	Inspection, monitoring cathodic protection system						
Sec. 11	**Odorization**						
11.1	Operating and maintaining differential odorant system						
11.2	Operating and maintaining injection odorant system						
11.3	Testing odorant level						
Sec. 12	**Other Operating and Maintenance Skills**						
12.1	Operating valves (including emergency valves), regulators, and relief valves						
12.2	Inspecting pressure regulating and limiting stations						
12.3	Inspecting and maintaining key valves						
12.4	System uprating						
Sec. 13	**Operating Peak Shaving Plant** (Propane/Air mixture/Injection)						
13.1	Pre-Start-up procedures						

13.2	Start-up/operating procedures/ shut down						
Sec. ___	**Other**						

EVALUATION OF HANDS-ON SKILLS

Division 5 of the Operator Qualification Program contains evaluating and qualifying hands-on demonstrations of skills necessary to perform tasks on gas systems. Operators may use the forms in Division 5 or attend appropriate workshops in obtaining qualification or re-evaluation. Appropriate documentation forms, attendance records, or manufacturer's procedures maybe used in lieu of the forms supplied in Division 5.

When performing direct observation the observer must appropriately document the observation, form "Direct Observation of Unqualified Person Performing Covered Task Under Direct Supervision of Qualified Individual" in Division 5 can be used to document the observation.

When communication of notice of change use form "Notice of Change."

When communicating a request for change and/or additions to this plan use form "Feedback Form."

(Protocols 3.02, 4.01, 8.01, 1.17, §§ 192.805/195.505, 192.803/195.503)

NOTICE OF CHANGE

This page may be reproduced as needed for recording changes to the Operator Qualification Program.

Utility/Company: _____

Date of Change: _____

Task(s) Impacted		O&M Procedure(s) Impacted		Regulations Impacted		Incidents, For Cause, Near Miss		Industry Accidents	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

What Communicated: (Attach any supporting documentation.)

_____

_____

_____

_____

How Communicated:

_____

_____

Tasks Impacted:

_____

_____

_____

Individuals Impacted:

Name of Individual(s) receiving the changes associated with the performance of covered tasks.	Place an "X" in the boxes below when communication is completed for that individual

Name and Position of Person Processing the Change:

_____

After completing this form file in Division 7.

FEEDBACK FORM

Utility/Company: _____

Address: _____

Phone: _____ **Date:** _____

Change or Addition Requested:

_____
_____
_____
_____
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Person Requesting Change:

_____

When form completed file copy in utility/company files and mail original copy to IAMU, 1735 NE 70th Avenue, Ankeny, IA 50021-9353, attention to Gas Services department.

IAMU Response:

_____
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_____

IAMU Gas Services representative and date:

_____

Competency/skill: Direct Observation of Unqualified Person Performing Covered Task Under Direct Supervision of Qualified Individual

DATE: _____

LOCATION:

_____

_____

_____

(Address and/or GPS Location)

TASK BEING PERFORMED:

_____

_____

_____

_____

_____

_____

PROCEDURES USED:

_____

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_____

Unqualified Individuals Name: _____ **I.D. Number:** _____
(Print)

Number of unqualified persons being observed at one time: _____

_____ _____

Qualified Observer Signature **Unqualified Individual Signature**

Competency/skill: 3.1 Locate facilities using the conductive method

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Connect the Transmitter			
1	Connect the transmitter cable to a metal riser pipe or locator wire, with the transmitter as far from the connection as the cable will allow.		
2	Insert the ground rod/plate to one side and away from the pipe, as far from the transmitter as the other connecting cable will allow.		
3	Pour a small amount of water at the ground site to increase conductivity.		
Locate the Pipe			
4	Set the receiver sensitivity control to the low range.		
5	Hold the receiver parallel with the pipe and in a vertical position.		
6	Sweep the receiver close to the ground using short, smooth moves without swinging or rocking.		
7	Find and mark the general location of the pipe by listening for the loudest signal.		
8	Hold the receiver face-up in a horizontal position.		
9	Adjust the sensitivity control to **medium** or **high**.		
10	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
11	Find the null and mark its location according to Company policy.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.2 Locate facilities using the inductive method (one person)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No
Position the Transmitter			
1	Place the transmitter over the pipe at a 45^0 angle to its length.		
2	Set the receiver range switch and start with the receiver and transmitter at least 30' apart.		
3	Holding the receiver parallel with the pipe and in a vertical position, walk toward the pipe from one side.		
4	When the **maximum signal** occurs, stop and mark the spot on the ground directly below the receiver.		
5	Move the transmitter and place it on the mark in a vertical position, parallel to and directly above the pipe.		
6	Take the receiver back down the pipeline at least 30 feet away from the transmitter.		
7	Sweep the receiver back and forth over the pipe close to the ground, using short, smooth moves with receiver parallel to transmitter and vertical.		
8	Move the transmitter to the second mark and return to the first mark.		
Locate the Pipe			
9	Sweep the receiver loose to the ground using short, smooth moves.		
10	Listen for the maximum signal to find the general location of the pipe.		
Pinpoint and Mark the Pipe			
11	Hold the receiver face-up in a horizontal position.		
12	Adjust the sensitivity control to **medium** or **high**.		
13	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
14	Find the null and mark its location according to Company policy.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.3 Locate facilities using the inductive method (two persons)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Position the Transmitter			
1	Start with the receiver and transmitter at least 30` apart.		
2	Keep the units parallel and walk toward the pipe.		
3	Set receiver down at the spot where the signal is the strongest and direct the second person to move transmitter back and forth to fine tune the signal.		
4	When the signal is strongest, place the transmitter on the ground in a vertical position parallel to and directly above the pipe.		
Locate the pipe			
5	Sweep the receiver back and forth over the pipe, close to ground, using short, smooth moves with receiver parallel to transmitter and vertical.		
6	Listen for the maximum volume of the signal.		
Pinpoint and mark the pipe			
7	Hold the receiver face-up in a horizontal position.		
8	Adjust the sensitivity control to **medium** or **high**.		
9	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
10	Find the null and mark its location according to Company policy.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.4 Determining depth through triangulation

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Triangulate the pipe			
1	Set the sensitivity control on the receiver to **medium** or **high**.		
2	Hold the receiver as close to the ground as possible at a 45^0 angle (check the depth level indicator on the receiver).		
3	Begin directly above the pipe and move the receiver slowly, at a right angle, away from the pipe.		
4	At the null, mark the spot directly below the center of the receiver.		
Calculate the depth			
5	Measure the distance from this mark to the mark for the pinpointed center of the pipe.		
6	Subtract the distance from the center of the receiver to the ground.		
7	Correctly state the approximate pipe depth.		
8	Document according to Company procedures.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.3 Combustible gas indicators

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Turn on power		
2	Warm up battery check		
3	Set zero in fresh air		
4	Test gas in L.E.L. mode		
5	Test gas in U.E.L. mode		
6	Clear machine in fresh air		
7	Shut down		
8	Store in proper manner		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.4 Electronic gas detectors

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Start Up / Shut Down			
1	Turn on power / Allow for warm up		
2	Check battery power		
3	Set zero in fresh air		
4	Test gas in L.E.L.. mode		
5	Test gas in U.E.L. mode		
6	Purge in fresh air		
7	Shut down		
8	Store in proper containment		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.5 Flame ionization

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Visual inspection and filter change			
1	Visually inspect the FI unit to detect any damage or flaws.		
2	Check the intake cone filter. Install a new filter so that it is properly seated according to manufacturers and Company specifications.		
3	Check the in-line filter. Install a new filter so that it is properly seated according to manufacturers and Company specifications.		
4	Check the probe. Clean if dirty.		
Refueling			
5	Connect the FI unit to the fuel supply tank.		
6	Fill the FI unit fuel tanks to the proper level.		
7	Safely disconnect the FI unit from the fuel supply, ensuring that all connections are appropriately closed.		
Calibrating			
8	Make sure that the FI unit has been tested for accuracy.		
9	Turn the FI unit **POWER** and the **IGNITION** to **ON**.		
10	Set the **SENSITIVITY** to **50 PPM**.		
11	Hold the sensor head (intake cone) over the test cup of the certified 50 ppm gas sample,		
12	Turn the 50 ppm gas sample **ON** at **MINIMUM** flow.		
13	Watch the needle on the FI unit for full deflection.		
14	If the needle does not reach full deflection in 3 seconds, report the unit according to Company policy.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.6 Bar hole testing and purging

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Make bar holes at 10' intervals		
2	Establish extent of leak		
3	Establish strongest reading		
4	Allow to vent / Re-test		
5	Locate approximate location of leak		
6	Document prior to digging		
7	Classify leak		
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.5 Operating thermite welder

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Preparing the pipe			
1	Place fire extinguisher upwind.		
2	Put on personal protective equipment including gloves and eye protection.		
3	Remove coating from 3" x 3" area at weld location.		
4	Use wire brush and file to clean pipe to shiny metal.		
Preparing the wire			
5	Strip 2" insulation from wire.		
6	Scrape, file, or sand the bare end clean.		
7	Crimp copper sleeve on wire.		
8	Wrap wire around pipe and twist it.		
9	Inspect mold for defects and correct size.		
10	Place steel disk in mold.		
11	Place welding and starting powder into the mold.		
Preparing the mold			
12	Place mold on pipe at prepared location.		
13	Insert wire in mold.		
14	Set the mold with wire parallel to the pipe.		
15	Hold mold firmly		
16	Ignite with sparking gun.		
17	Tape to test weld.		
Making the weld			
18	Repair coating.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.8 Steel and cast iron repair fittings

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Check atmosphere in bell hole.		
2	Check pipe condition for replacement.		
3	Clean coating and other foreign material adequately.		
4	Lubricate gasket material.		
5	Torque bolts in proper sequence.		
6	Check for leaks/other damage.		
7	Properly coat before backfilling.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.11 Plastic pipe joining (fusion)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Butt fusion / visual		
2	Side wall fusion / visual		
3	Butt fusion / strap test		
4	Sidewall fusion / strap test		
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.12 Plastic pipe joining (mechanical couplings)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Cut ends of pipe square		
2	Clean ends of pipe		
3	Measure ends of pipe for insertion		
4	Install locking collar and insert		
5	Install locking collar over insert		
6	Repeat steps 1 through 5		
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.15 Steel pipe joining by mechanical couplings

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Prepare coupling and pipe			
1	Disassemble, if necessary, and soap gaskets and pipe ends.		
2	Clean the pipe ends thoroughly. (Remove all wrapping, oil, loose scale, rust, cutter burrs and anything else that could prevent gasket seating.)		
3	Place end nuts, retainer cups, and soapy gaskets on the pipe ends. (Line up the pipe ends, leaving at least 1/4 " gap.)		
Install coupling			
4	Measure the coupling body to manufacturer's specifications. (Mark the measurement on one pipe end.)		
5	Place the coupling on pipe with the end of coupling body at the mark. (Make sure that the coupling body is clean.)		
6	Slide gaskets and retainer cups into place. (Slide the retainer cups against the gaskets.)		
7	Slide end nuts or caps into place. (Gradually tighten and torque to specification. If the coupling is hydraulic, inject grease or hydraulic fluid.)		
8	Check electrical continuity. (If using a non-insulated coupling, be sure there is continuity. If using an insulated coupling, be sure there is electrical isolation.)		
9	Clean away soap and other foreign material.		
10	Wrap the exposed coupling and pipe to ensure corrosion protection.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.20 Tapping and stopping steel pipe 1" through 4"

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Install fitting to pipe		
2	Set up tapping machine		
3	Install valve / tapping machine		
4	Make tap through pipe		
5	Remove machine / close valve		
6	Set up and install stop in machine		
7	Perform stop in pipe		
8	Remove stop		
9	Install completion plug and wrap pipe		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.21 Tapping and stopping steel pipe 6" through 8"

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Install fitting to pipe		
2	Set up tapping machine		
3	Install valve / tapping machine		
4	Make tap through pipe		
5	Remove machine / close valve		
6	Set up and install stop in machine		
7	Perform stop in pipe		
8	Remove stop		
9	Install completion plug and wrap pipe		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.22 Tapping and stopping polyethylene pipe

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Sidewall fusion		
2	Remove cap		
3	Turn Allen lead clockwise till bottoms out		
4	Turn counter-clockwise till 1 thread end from the top		
5	Replace cap on top of tee		
6	Test to manufacturers procedure		
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.1 Operating backhoe

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Check fluid levels		
2	Visual check of tires		
3	Visual check of outriggers		
4	Visual check of levers / controls		
5	Start up procedures		
6	Proper positioning of machine		
7	Operate control levers		
8	Proper placement of dirt		
9	Shut down procedures		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.2 Operating trenchers

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection		
2	Check fluid levels		
3	Check safety locks		
4	Start up procedures		
5	Proper placement of trencher		
6	Engage digger chain		
7	Lower boom to proper depth		
8	Engage forward motion		
9	Shut down procedures		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.3 Operating boring equipment

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection		
2	Check fluid levels		
3	Start up procedures		
4	Engage boring rod		
5	Proper angle of machine		
6	Proper rotation of bore rod		
7	Travel speed of bore rod		
8	Check rotational speed of rod		
9	Check location of bore rod		
10			
11			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 10.6 Holiday detection (coating inspection)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection of machine		
2	Check voltage settings		
3	Install proper spring collar		
4	Pipe properly grounded		
5	Placement of transmitter ground		
6	Turn machine on		
7	Travel speed		
8	Recognition of defects		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 10.7 Painting and jacketing above ground facilities

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Remove all loose paint and particles.		
2	Mask all regulator vents.		
3	Mask all di-electric fittings.		
4	Mask index glass.		
5	Mask all required identification tags.		
6	Paint all exposed metal.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.1 Operating and maintaining a differential odorant system

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Close valves in proper sequence.		
2	Bleed off pressure in appropriate manner.		
3	Refill odorant tank properly.		
4	Slowly open valves in proper sequence.		
5	Accurately document amount of odorant used.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.2 Operating and maintaining an injection odorant system

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Close valves in proper sequence.		
2	Refill odorant tank properly.		
3	Reopen valves in proper sequence.		
4	Check for air/lock.		
5	Accurately document amount of odorant used.		
6	Check for filter saturation.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.3 Testing odorant level

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Select appropriate test sites.		
2	Purge machine before use.		
3	Season machine.		
4	Test for odorant level in smooth controlled motions.		
5	Record readings accurately.		
6	Purge machine before turning off.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 12.2 Inspecting pressure regulating and limiting stations

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visually inspect regulator/relief/piping.		
2	Ensure all valves are operating properly.		
3	Test diaphragm assembly vent and all other pipes for leaks.		
4	Inspect all filters.		
5	Test to determine if regulator will lockup. (If lock-up is not achieved; physical inspection of orifice and seat will have to be performed and replaced if needed.)		
6	Test to ensure regulator will open full.		
7	If there is a monitor regulator check, set pressure. Check for lockup.		
8	If there is a relief valve, check for set pressure and test for operating performance.		
9	Ensure all valves are returned to normal operating positions.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 12.3 Inspecting and maintaining key valves

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Lubricating valves			
1	Correctly attach lubricating device to the valve.		
2	Apply lubrication without over lubricating.		
3	Correctly detach the lubricating device and clean the lubrication point.		
Operating valves			
4	Check to see if valve is open or closed.		
5	Aware of section valve controls.		
6	Check size of valve.		
7	Correctly attach wrench to valve.		
8	Turn valve correctly.		
9	Return valve to normal operating position.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 13.1 Operating peak shaving plant (propane/air mixture/injection): Pre-start-up procedures

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Operating valves		
2	Operating electric control panel		
3	Adjusting temperature on vaporizer		
4	Adjust injection pressure (Foxboro controller)		
5	Operating compressor		
6	Operating the specific gravity controller (Usually Ranarex controller)		
7	Operate Bunson burner (If equipped)		
8	Inspect gauges, charts for stabilization		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 13.2 Operating peak shaving plant (propane/air mixture/injection): Start-up/operating procedures/shut down

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Accordance with operators manual for specific equipment used			
1			
2			
3			
4			
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill:

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1			
2			
3			
4			
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

WRITTEN EVALUATION OF COMPETENCIES AND SKILLS

Division 6 of the Operator Qualification Program may contain copies of tests used in the written evaluation and qualification competencies and skills necessary to perform tasks on gas systems. Copies of examination instruments are generally not included, where qualification is certified by an outside training organization.

TRAINING MATERIALS

Division 7 of the Operator Qualification Program may contain attachments describing course descriptions or outlines, lesson plans, and other materials used to prepare personnel for qualification through this program. For example, a brochure describing a welder qualification workshop could be retained in this division to document the operator's efforts to provide training in required competencies and skills.

When communication of change, when using the "Notice of Change" form is completed, file in Division 7.

(Protocol 1.04, 8.01, §§ 192.803/195.503, 192.805/195.505)

COURSE DESCRIPTIONS AND PREREQUISITES FOR MIDWEST ENERGY TRAINING MODULES

The following is a copy of Appendix B of the Midwest Energy Association's (A.K.A. Midwest Gas Association) *Operator Qualification Training Program Course Management Plan.* The appendix describes the training modules offered by Midwest Energy Association. The Iowa Association of Municipal Utilities through an agreement with Midwest Energy Association reproduces the copyrighted material.

(Protocol 4.02, §192.803/195.503)

Module Number: 101 **Title:** Characteristics and Hazards of Natural Gas
Prerequisite: None
Description: General introduction to natural gas. Topics include: composition of natural gas; hydrocarbon chemistry; physical properties of natural gas; combustion of natural gas; the fire triangle and tetrahedron; upper and lower explosive limits of natural gas; carbon monoxide.

Module Number: 102 **Title:** Potential Ignition Sources: Indoor and Outdoor
Prerequisite: 101
Description: Introduction to ignition sources. Topics include: open flame ignition sources; electric spark sources - arcing and static electricity; sources resulting from work on piping.

Module Number: 103 **Title:** Recognizing Emergency Conditions
Prerequisite: 101, 102
Description: Recognizing conditions that could lead to emergency failure of the natural gas system or equipment. Topics include: potential consequences of failures; potential failure conditions including construction defects, corrosion, damage, line stress, mechanical failure, human error, and pipeline obstructions; corrective action.

Module Number: 104 **Title:** Recognizing and Reporting Natural Gas Leaks
Prerequisite: 101, l02, 103
Description: Recognizing and reporting leaks and potential leaks encountered during the normal course of daily activity. Topics include: recognizing leaks by sight, sound, and smell; recognizing leak conditions such as tampering and meter damage; reporting leaks according to whether or not they constitute an immediate danger; ensuring customer and employee safety.

Module Number: 111 **Title:** Personal Protective Equipment
Prerequisites: 101, 102, 103, 104
Description: Use retardant clothing and PPE. Topics include: requirements and procedures for wearing flame retardant clothing; fresh air breathing equipment and components; proper use and maintenance of breathing equipment.

Module Number: 121 **Title:** Power Tool Safety
Prerequisite: 101, 102, 103, 104, 111
Description: Basic safety practices for working with the five basic types of power tools. Topics include: personal protective equipment; safety principles for using and maintaining power tools; safety practices for electric, liquid-fuel, hydraulic, pneumatic, and powder-actuated power tools.

Module Number: 122 **Title:** Proper Firefighting Techniques
Prerequisite: 101, 102, 103, 104, 111
Description: Selection of firefighting equipment and proper methods of fighting natural gas fires. Topics include: review of the fire triangle and tetrahedron; classes of fires; types and selection of dry chemical fire extinguishers; fire extinguisher inspection and maintenance; fire fighting procedures.

Module Number: 131 **Title:** Controlling the Accidental Release of Gas
Prerequisite: 101, 102, 103, 104, 122
Description: Introduction to accidental natural gas release. Topics include: definition of accidental release; causes of accidental release; corrective actions; examples of accidental release situations outdoors including damage to above grade facilities serving customers, damage to one-way and two-way feed transmission/distribution lines, damage to above grade district regulator stations with multiple and isolated feeds, and mechanical failure of relief valve; accidental release of natural gas indoors.

Module Number: 201 **Title:** Soil Subsidence
Prerequisites: 101, 102, 103, 104
Description: Soil subsidence as a possible cause of pipeline leaks or failure. Topics include: causes of soil subsidence including settling, shifting, and erosion; recognition and analysis of soil subsidence using visible signs, company and other records; documentation.

Module Number: 202 **Title:** Atmospheric Corrosion
Prerequisites: 101, 102, 103, 104
Description: Atmospheric corrosion as a possible cause of pipeline leaks or failure. Topics include: definition, types, and causes of atmospheric corrosion; atmospheric corrosion surveys; corrective action.

Module Number: 211 **Title:** Recognizing Unsafe Meter Sets
Prerequisites: 101, 102, 103, 104, 201, 202
Description: Unsafe meter sets as a possible cause of leaks or failure. Topics include misaligned meter sets; improper location; burial and overbuilding; corrosion; physical damage.

Module Number: 221 **Title**: Leak Classification
Prerequisites: 101, 102, 103, 104
Description: DOT leak classification requirements. Topics include: definitions of Grade 1, 2, and 3 leaks; guidelines for assigning leak grades; response to leaks; follow-up; documentation.

Module Number: 231 **Title:** Operating the Combustible Gas Indicator
Prerequisite: 101, 102, 103, 104, 221
Description: Introduction to operation and maintenance of the CGI. Topics include: CGI unit parts and function; pre-operation tests of the CGI unit; operation of the CGI unit in the field; documentation.

Module Number: 232 **Title:** Operating the Flame Ionization Unit
Prerequisite: 101, 102, 103, 104, 221
Description: Introduction to operation and maintenance of the FI unit. Topics include FI unit parts and function; pre-operation inspection and testing of the FI unit; field operation of the FI unit for walking and mobile surveys; documentation.

Module Number: 241 **Title:** Carbon Monoxide (CO) Testing
Prerequisites: 101, 102, 103, 104
Description: Introduction to CO testing. Topics include: recognizing the effects of CO gas on human beings; identifying situations that require CO testing; CO testing using indicator tubes and electronic CO monitors; actions to take when CO is detected; documentation.

Module Number: 244 **Title:** Emergency Response and Restoration of Service
Prerequisites: 101, 102, 103, 104, 131, 221
Description: Basic responses to emergency situations and information about restoration of service. Topics include: Identifying company procedures for reporting to state/federal authorities. Identify components of an effective repair plan, system mapping and isolation points, repair plan, and methods for reestablishing service after shut down.

Module Number: 251 **Title:** Odorization
Prerequisites: 101, 102, 103, 104
Description: Requirements and procedures for odorizing gas and testing odorant levels. Topics include: factors affecting sufficient odorization; odorization equipment testing; odorization equipment maintenance; testing for odorization levels; documentation.

Module Number: 261 **Title:** Bar Hole Testing and Purging
Prerequisite: 101, 102, 103, 104, 231
Description: Use of bar test equipment and CGI to identify gas migration, pinpoint underground leaks, and exhaust underground gas. Topics include: natural

gas migration; factors affecting migration patterns and rates; safety hazards of gas migration; determining the spread area of underground leaks; finding the leak source; exhausting gas.

Module Number: 271 **Title:** Leak Surveys and Patrols
Prerequisite: 101, 102, 103, 104, 201, 202, 232, 251
Description: Requirements and procedures for systematic leak survey of the natural gas system. Topics include: causes of leaks; leak detection equipment; kinds of surveys; kinds of facilities that require surveys; DOT survey requirements; procedures for walking, mobile, and business district surveys; patrols; documentation.

Module Number: 272 **Title:** Customer Leak Investigation
Prerequisite: 101, 102, 103, 104, 241, 251, 261
Description: Responding to customer reports of leaks. Topics include: arrival and entry procedures; indoor and outdoor leak detection and location; identifying and responding to hazardous conditions; documentation.

Module Number: 301 **Title:** Combustion and Ventilation Air
Prerequisite: 101, 102, 103, 104
Description: Introduction to air requirements for combustion of natural gas. Topics include: combustion terminology; complete and incomplete combustion; problems that result from incomplete combustion; conditions allowing for adequate combustion air.

Module Number: 311 **Title:** Pilot Lights
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to pilot lights and other appliance ignition systems. Topics include: automatic and non-automatic pilots; flame sensors and safety shutoffs including thermocouples, bimetal and hydraulic or mercury vaporization sensors; electronic ignition systems; inspection procedures for electronic ignition systems.

Module Number: 312 **Title:** Gas-Air Adjustment
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to gas burners and adjustment. Topics include: types of gas burners including yellow flame and blue flame burners; typical burner components; flame characteristics and factors affecting them; burner problems caused by improper gas-air mixture including lifting, flashback, extinction pop, yellow tipping, floating, and rollout.

Module Number: 313 **Title:** Venting
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to the purpose of venting and recognizing proper and improper venting conditions. Topics include: purpose of venting; factors affecting venting system design and operation; types of vents; code

requirements for venting; recognizing proper vent and connector installation; testing vents for establishment of gas.

Module Number: 321 **Title:** Pressure Checks to Establish Gas Service
Prerequisites: 101, 102, 103, 104
Description: Establishing proper gas inlet pressure. Topics include: pressure measurement instruments, including bourdon tubes, manometers, and electronic gauges; procedure for checking inlet pressure; problems associated with under pressurization and over-pressurization; calculating desired and actual gas flow.

Module Number: 322 **Title:** Establishing and Disconnecting Gas
Prerequisites: 101, 102, 103, 104, 272, 311, 312, 313, 321
Description: Requirements and procedures for establishing and disconnecting customer gas service. Topics include: verification of requesting location; piping and appliance checks; meter and regulator checks including low-flow and shut-in tests; purging and light-up procedures; disconnection of service; read over or succession; meter removal; documentation.

Module Number: 324 **Title:** Lighting Appliances
Prerequisites: 101, 102, 103, 104, 311, 312, 313, 321
Description: Performing purging and lighting on all types of residential gas appliances. Topics include: purging process and conditions requiring its use; identifying the three types of purging methods.

Module Number: 401 **Title:** Job Site Protection
Prerequisites: 101, 102, 103, 104
Description: Protection of job site for public and employee safety. Topics include: types of traffic control and protection devices and signs; placement of job site protection devices.

Module Number: 402 **Title:** Locating and Marking Facilities
Prerequisite: 101, 102, 103, 104, 401
Description: Use of the pipe locator to find and mark underground facilities. Topics include: pipe locator parts and operation; equipment check-out; direct requests and the one-call system; field markings of gas and other facilities; conductive locating procedure: inductive locating procedure; pinpoint centering of pipe; triangulation of pipe depth; permanent and temporary signs and markers.

Module Number: 403 **Title:** Backhoe Safety
Prerequisite: 101, 102, 103, 104, 401
Description: Basic safety principles for working with or around backhoes. Topics include: safe back hoe service and maintenance; procedure for loading and unloading back hoe on or off trailer; safety procedures for working with backhoes at the job site.

Module Number: 404 **Title:** Excavation and Shoring Safety
Prerequisites: 101, 102, 103, 104, 402, 403
Description: Techniques and protection for safe excavation. Topics include: cave-in causes and results; cave-in prevention factors including soil classification, water, and other factors; cave-in protection measures including support systems, sloping, and shielding; additional excavation precautions.

Module Number: 411 **Title:** Plastic Pipe Fusion
Prerequisite: 101, 102, 103, 104, 121
Description: Methods and procedures for fusing plastic pipe. Topics include: minimizing hazards of static electricity; equipment and procedure for butt, sidewall, and socket fusion; butt end and sidewall electrofusion.

Module Number: 412 **Title:** Joining Steel Pipe
Prerequisite: 101, 102, 103, 104, 121
Description: Methods and procedures for joining steel pipe. Topics include: overview of welding; when to use compression couplings; kinds of compression couplings; flange types; flange installation procedure.

Module Number: 421 **Title:** Pressure Testing Steel and Plastic Pipeline
Prerequisites: 101, 102, 103, 104, 411, 412
Description: Requirements, equipment, and procedures for pressure testing steel and plastic pipe. Topics include: facilities requiring pressure testing; DOT pressure testing requirements for transmission and distribution lines; pressure testing equipment; pressure testing procedure; documentation.

Module Number: 422 **Title:** Purging Safety
Prerequisite: 101, 102, 103, 104, 421
Description: Requirements and procedures for purging gas pipelines. Topics include: purging safety; purging with air; purging with natural gas; discharge venting; testing for complete purge.

Module Number: 431 **Title:** Cathodic Protection
Prerequisite: 101, 102, 103, 104, 422
Description: Introduction to corrosion prevention by cathodic protection. Topics include: fundamentals of corrosion; corrosion prevention measures; purpose and types of anodes; selection of anodes using soil resistivity; pipe-to-soil voltage measurement; anode installation; rectifiers; test stations; thermite welding procedures.

Module Number: 441 **Title:** Tapping/Stopping: 1.25" - 4" Pipe
Prerequisite: 101, 102, 103, 104, 404
Description: Operation of general and specialized tapping and stopping equipment Topics include: operation of bagging and stopping equipment; operation of

T. D. Williamson and Mueller tapping equipment; operation of Rockford-Eclipse and Qualitech-Eclipse stopping equipment.

Module Number: 444 **Title:** Plastic Pipe Repair
Prerequisites: 101, 102, 103, 104, 111, 131, 401, 403, 404, 411, 422, 441
Description: Methods and procedures for repair of plastic pipe. Topics include: temporary repairs, squeeze tools, making permanent repairs, remove and replace damaged pipe.

Module Number: 451 **Title:** Installing Mains
Prerequisites: 101, 102, 103, 104, 431, 441
Description: Methods and procedures for installing steel and plastic pipe. Topics include: pipe handling and storage, trenching procedure, installing new mains by direct burial, plastic pipe insertion.

Module Number: 452 **Title:** Installing Service
Prerequisite: 101, 102, 103, 104, 451
Description: Methods and procedures for installing service lines. Topics include: review of service line terminology; service line materials; trenching; installing steel service lines; installing plastic service lines.

Module Number: 453 **Title:** Crossings
Prerequisite: 101, 102, 103, 104, 452
Description: Specific procedures for installing pipe across highway, rail, bridge, creek, and ravine crossings. Topics include: highway and railroad crossing procedures including licenses and permits, casings, boring, and depth of crossing; bridge crossing procedures including pipe expansion, support, and anchors; creek and ravine crossing procedures including trenching and protection.

Module Number: 461 **Title:** Steel and Cast Iron Repair Fittings
Prerequisite: 101, 102, 103, 104, 431
Description: Selecting and installing fittings. Topics include: selecting repair fittings for steel, cast iron, and plastic pipe; selecting main fittings for steel, cast iron, and plastic pipe; service fittings and techniques for connecting steel service to steel mains, steel service to cast iron mains, steel service to plastic mains, plastic service to plastic mains, plastic service to steel mains.

Module Number: 462 **Title:** Maintaining Steel & Cast Iron Mains
Prerequisites: 101, 102, 103, 104, 261, 453, 461
Description: Requirements and procedures for maintaining, repairing, and replacing steel or cast iron mains. Topics include: identifying areas of greatest potential hazard; repair and replacement criteria; pressure reduction and shutdown prior to repair; inspection procedures for exposed steel mains;

steel pipe repair methods; cast iron pipe repair methods; cast iron pipe protection.

Module Number: 463 **Title:** Reinforcing Steel & Plastic Mains
Prerequisite: 101, 102, 103, 104, 461
Description: Requirements and procedures for reinforcing mains. Topics include: identifying situations where reinforcement is required; kinds of reinforcement; procedures for reinforcing steel mains and plastic tie-ins to steel, cast iron, and plastic mains.

Module Number: 471 **Title:** Abandoning Facilities
Prerequisite: 101, 102, 103, 104, 462
Description: Procedures for deactivation of natural gas facilities. Topics include: reasons for deactivation; procedure for deactivating mains or service lines; discontinuing service; documentation.

Module Number: 501 **Title:** Safe Vault Entry
Prerequisite: 101, 102, 103, 104, 122
Description: Procedures for entering and working safely in vaults. Topics include: actions to take before entry; atmospheric testing; vault entry PPE; vault entry procedures; required rescue equipment and procedures.

Module Number: 511 **Title:** Inspecting and Maintaining Valves
Prerequisites: 101, 102, 103, 104
Description: Introduction to valves, and to the requirements and procedures for their inspection and maintenance. Topics include: valve designs and components; emergency and non-emergency valves; DOT inspection and maintenance requirements; valve inspection and maintenance procedure; documentation.

Module Number: 512 **Title:** Inspecting Pressure Regulating & Limiting Stations
Prerequisites: 101, 102, 103, 104, 131, 501, 511
Description: DOT requirements for inspecting pressure regulating and limiting stations, and vaults that house them. Topics include: MAOP; kinds of regulators and over pressure protection devices (OPPD); inspection requirements and procedures for regulators and OPPDs; vault inspection requirements and procedures; documentation.

Module Number: 521 **Title:** System Uprating
Prerequisites: 101, 102, 103, 104, 261, 271, 463, 512
Description: Requirements and procedures for increasing system operating pressure Topics include: Uprating terminology including MAOP and SMYS; pipe and components; uprating decision factors; field uprating procedures; documentation.

APPENDIX 1

The following training material cross-reference guide is to assist operators in referencing Midwest Energy Association (MEA) training materials that are available. MEA training materials are a suggested type of training materials available to operators and are not required under the IAMU program. If other training material is used, that material should be documented in Division 7.

MEA is a consortium of energy industry organizations that pursue operational excellence by providing training and information resources for themselves and other organizations to enhance employee safety, productivity, and positive customer relations. MEA accomplish this by:

1. Seeking opportunities that leverage the power of association.
2. Connecting members so needs are expressed, information is shared, and problems are solved.
3. Pooling expertise and dollars to create unique, high value services.
4. Sponsoring major operating conferences, workshops and classes.
5. Creating "distance" or packaged training and certification services such as computer, video and workbook programs; tests and evaluations.
6. Developing compliance tools to meet OSHA, EPA and DOT regulations.

VIDEOS *This program is no longer distributed as of Jan 2003.*
The OQTP was developed to help natural gas operators and other users train and re-qualify their employees in basic safety subjects.

This qualification training is designed to comply with U. S. Department of Transportation (DOT) standards mandated by the Pipeline Safety Act of 1992. Minimum Federal safety standards for natural gas pipelines are published by DOT in Title 49 of the Code of Federal Regulations, part 192 (49 CFR §192).

The OQTP is a "generic" training course that serves many audiences. The core of the program covers common procedures and requirements for complying with Federal regulations and maintaining safe work conditions. The modular structure of the program allows individual Companies to add information to tailor the instruction to their own regional, State, or corporate policies.

OQforAll
More than eight years of development and testing have produced OQ for all, OQ for all is designed to complement your current training program and apprenticeship practices, providing everything you need to successfully meet the DOT Operator Qualification (OQ) Regulation.

Q41
The Q41 evaluation materials were developed using a process to ensure the reliability and validity of the materials. The development process relied on input from subject matter experts. The materials are designed to evaluate an individual's ability to perform covered tasks in accordance with the requirements in Title 49, Code of Federal Regulations, Part 192. In addition, the materials are designed to evaluate an individual's ability to recognize and react to abnormal operating conditions as required by the 49 CFR 192, Subpart N, Qualification of Pipeline Personnel.

APPENDIX 1

MEA TRAINING MATERIAL CROSS-REFERENCE GUIDE

REQUIRED COMPETENCIES AND SKILLS

(Protocols 1.05, 2.02, 4.01, 5.02 §192.803/195.503, §192.805/195.505, §192.809/195.509 Amdt 192-90, 8-20-01)

	Competencies and Skills	Suggested Training Reference[1]	Q41 References	OQforAll References
Sec. 1	**Fundamentals of Natural Gas**			
1.1	Characteristics and hazards of natural gas	Gas Fundamentals Training, MEA-101	Abnormal Operating Conditions Test	192-0101 Characteristics and Hazards of Natural Gas
1.2	Potential ignition sources: indoor and outdoor	Gas Fundamentals Training, MEA-102	Abnormal Operating Conditions Test	192-102 192-2011 Prevention of Accidental Ignition
1.3	Recognizing emergency conditions	Gas Fundamentals Training, MEA-103	CTS-2011 Prevention of Accidental Ignition	Abnormal Operating Conditions Module
1.4	Recognizing and reporting natural gas leaks	Gas Fundamentals Training, MEA-104	CTS-1201 Leakage Survey: Distribution & Transmission	192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
Sec. 2	**Record keeping**			
2.1	Documenting materials and installation records	Operator's workshop, O&M Manual MEA-402	N/A	N/A
2.2	Documenting maximum allowable operating pressure (MAOP)	Operator's Workshop, O&M Manual MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance CTS-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS CTS-2302 Uprating Steel Pipelines to a Pressure that	192-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS 192-2302 Uprating Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS

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			will Produce a Hoop Stress Less than 30% SMYS	
2.3	System up-rating	Operator's Workshop, MEA-521	CTS-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead Ends CTS-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS CTS-2302 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS	192-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead-ends 192-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS 192-2302 Uprating Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS
2.4	Investigating and documenting line failure	Operator's Workshop, MEA-462	N/A	Abnormal Operating Conditions Module
2.5	Accident reporting	Operator's Workshop, O&M Manual, MEA-103	N/A	Abnormal Operating Conditions Module
Sec. 3	**Marking and Mapping Facilities**			
3.1	Locating facilities using the conductive method	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.2	Locating facilities using the inductive method	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.3	Locating facilities using the inductive method (two persons)	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.4	Determining depth through triangulation	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines CTS 1417 Protection When Minimum Cover Not Met	192-0801 Locating Pipelines 192-1417 Protection when Minimum Cover not Met
3.5	System mapping	Operator's Workshop MEA-402	CTS 0901 System Patrolling	192-0901 System Patrolling
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**			
4.1	Personal protective equipment	OSHA compliance manual and training, MEA-111	N/A	N/A
4.2	Power tool safety	OSHA compliance manual and training, MEA-121	N/A	N/A
4.3	Proper firefighting	Emergency Procedures Training, MEA-122		

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	techniques	Training, MEA-122	N/A	N/A
4.4	Controlling the accidental release of gas	Emergency Procedures Training, MEA-131	Abnormal Operating Conditions Test	Abnormal Operating Conditions Module
4.5	Soil subsidence	OSHA compliance manual and training, MEA-201	CTS 1402 Backfilling	192-1402 Backfilling
4.6	Atmospheric corrosion	Operator's Workshop, MEA-202	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
4.7	Recognizing unsafe meter sets	MEA-211	CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)	192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)
4.8	Confined space entry (vaults, etc.)	OSHA compliance manual and training, MEA-501	CTS 1802 Vault Maintenance	192-1802 Vault Maintenance
4.9	Job site protection	Compliance manual and training, MEA-MEA-401	N/A	N/A
4.10	Purging safety	Operator's Workshop, MEA-422	CTS 1418 Purging	192-1418 Purging
4.11	Pressure testing steel and plastic pipeline	Operator's Workshop, MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test - Service Lines, Mains, and Transmission Lines
4.12	Abandoning facilities	Operator's Workshop, MEA-471	CTS 1401 Abandonment or Inactivation of Facilities	192-1401 Abandonment or Inactivation of Facilities
4.13	Excavation safety	OSHA compliance manual and training, MEA-404	New CTS 12/03	N/A
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**			
5.1	Leak classification	Emergency Procedures Training, Gas Fundamentals Training, MEA-221	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.2	Procedures for leak surveys and patrols	Operator's Workshop, MEA-271	CTS 1201 Leakage Survey: Distribution & Transmission	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside

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			CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.3	Combustible gas indicators	Operator's Workshop, Manufacturer's Procedures MEA-231	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.4	Electronic gas detectors	Operator's Workshop, Manufacturer's Procedures, MEA-231	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.5	Flame ionization	Operator's Workshop, Manufacturer's Procedures MEA-232	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.6	Bar hole testing and purging	Operator's Workshop, MEA-261	CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
Sec. 6	**Fundamentals of Customer Service**			
6.1	Carbon monoxide (CO) testing	Operator's Workshop, MEA-241	N/A	192-0101 Characteristics and Hazards of Natural

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				Gas
6.2	Investigating leaks	Operator's Workshop, MEA-272	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
6.3	Combustion and ventilation air requirements	Operator's Workshop, MEA-301	N/A	N/A
6.4	Pilot light operation	Operator's Workshop, MEA-311, 324	N/A	N/A
6.5	Gas-air adjustment	Operator's Workshop, MEA-312	N/A	N/A
6.6	Appliance venting	Operator's Workshop, MEA-313	N/A	N/A
6.7	Pressure checks to establish gas service	Operator's Workshop, MEA-321	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines
6.8	Establishing and disconnecting gas	Operator's Workshop, MEA-322	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines CTS 2014 Service Lines Not In Use and Service Discontinuance	192-1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines 192-2014 Service Lines Not In Use and Service Discontinuance
Sec. 7	**Fundamentals of Construction**	Operator's Workshop, MEA-xxx	N/A	N/A
7.1	Pressure testing steel and plastic pipeline	Operator's Workshop, MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines
7.2	Procedures for abandoning facilities	Operator's Workshop, MEA-471	CTS 1401 Abandonment or Inactivation of Facilities	192-1401 Abandonment or Inactivation of Facilities
7.3	Cathodic protection (general)	Operator's Workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System

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				Testing
7.4	Constructing facilities across streets, railroads, and waterways	Operator's Workshop, MEA-453	CTS 1404 Casing Vents and Seals	192-1404 Casing Vents and Seals
7.5	Operating thermite welder	Operator's Workshop, Manufacturer's Procedures, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
7.6	Installing tracer wire	Operator's Workshop, DOT Small Gas Operators Manual MEA-451, 452	CTS 1408 Installation of Plastic Pipe CTS 1409 Installation of Steel Pipe	192-1408 Installation of plastic pipe 192-1409 Installation of Steel Pipe
7.7	Installing valves	Operator's Workshop, MEA-451	CTS 1427 Valve Maintenance	192-1427 Valve Maintenance
7.8	Steel and cast iron repair fittings	Operator's Workshop, Manufacturer's Procedures, MEA-461	CTS 1001 Cast Iron Joints - Sealing CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) CTS 1430 Internal Sealing - Cast Iron and Ductile Iron Segments	192-1001 Cast Iron Joints – Sealing 192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) 192-1430 Internal Sealing - Cast Iron and Ductile Iron Segments
7.9	Maintaining steel and cast iron mains	Operator's Workshop, MEA-462	CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines	192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)
7.10	Reinforcing steel and plastic mains	Fusion Workshop, MEA-463	CTS 1424 Support, Expansion Joints and Anchor Maintenance - Exposed Pipeline	192-1424 Support and Anchor Maintenance - Exposed Pipeline
7.11	Plastic pipe joining (fusion)	Fusion Workshop, MEA-411	CTS 1001 Cast Iron Joints - Sealing CTS 1002 Plastic Pipe – Electrofusion CTS 1003 Plastic Pipe - Butt Heat Fusion CTS 1004 Plastic Pipe – Sidewall Heat Fusion	192-1001 Cast Iron Joints– Sealing 192-1002 Plastic Pipe – Electrofusion 192-1003 Plastic Pipe - Butt Heat Fusion 192-1004 Plastic Pipe - Sidewall Heat Fusion
7.12	Plastic pipe joining (mechanical	Operator's Workshop, MEA-463	CTS 0803 Inspection for Damage	192-0803 Inspection for

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	(mechanical couplings)			Damage
7.13	Recognition of defective material	Operator's Workshop, MEA-411, 412, 421	CTS 1411 Inspection	192-1411 Inspection
7.14	Steel pipe joining by welding	Pipeline Welding Workshop, Qualified Welding Procedures	CTS 2401 Welding	192-2401 Welding
7.15	Steel pipe joining by mechanical couplings	Operator's Workshop, Operator's Workshop, MEA-412	CTS 1005 Mechanical Joints	192-1005 Mechanical Joints
7.16	Damage prevention	Operator's Workshop, MEA-462	CTS 0803 Inspection for Damage	192-0803 Inspection for Damage
7.17	Application of padding and shielding	Operator's Workshop, MEA-453	CTS 1402 Backfilling	192-1402 Backfilling
7.18	Replacing emergency valves	Operator's Workshop, MEA-441, 511	N/A	N/A
7.19	Installing meter sets	Operator's Workshop, MEA-211, 322, 452	CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-1803 Pressure Regulating, Limiting, and Relief Device -Operation and Maintenance
7.20	Tapping and stopping steel pipe 1" through 4"	Operator's Workshop, MEA-441	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.21	Tapping and stopping steel pipe 6" through 8"	Operator's Workshop, Manufacture's Procedures	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.22	Tapping and stopping polyethylene pipe	Operator's Workshop, MEA-451, 452	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.23	Vault abandonment	Operator's Workshop, MEA-471, 501	CTS 1802 Vault Maintenance	192-1802 Vault Maintenance
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**	Operator's Workshop, MEA-462, Operator's Workshop	CTS 0803 Inspection for Damage, CTS 1402 Backfilling	192-0803 Inspection for Damage, 192-1402 Backfilling
8.1	Operating backhoe	Operator's Workshop, MEA-403	N/A	N/A
8.2	Operating trencher	Operator's Workshop, Manufacturer's Procedures, MEA-403	N/A	N/A
8.3	Operating boring equipment	Operator's Workshop, Manufacturer's Procedures	N/A	N/A
8.4	Ditch and backfill inspection	Operator's Workshop, MEA-404	CTS 1402 Backfilling	192-1402 Backfilling
Sec. 9	**Fundamentals of Measurement and Control**	Operator's Workshop, Manufacturer's Procedures	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping

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9.1	Metering	Metering Workshop	N/A	N/A
9.2	Odorization measurement and control	Operator's Workshop, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
Sec. 10	**Corrosion Control**			
10.1	Cathodic protection	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance	192-0501 Cathodic Protection System Maintenance
10.2	Internal corrosion	Corrosion control workshop, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.3	External corrosion	Corrosion control workshop, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.4	Atmospheric corrosion	Corrosion control workshop, MEA-202	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.5	Coatings	Corrosion control workshop, MEA-431	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.6	Holiday detection (coating inspection)	Corrosion control workshop, MEA-431	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.7	Painting and jacketing above ground facilities	Corrosion control workshop, MEA-202	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.8	Installation of cathodic protection (sacrificial anode system)	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
10.9	Installation of impressed current system	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
10.10	Inspection, monitoring cathodic protection system	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic

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			Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
Sec. 11	**Odorization**			
11.1	Operating and maintaining differential odorant system	Operator's Workshop, O&M Manual, MEA-251	CTS 0501 Cathodic Protection System Maintenance	192-0501 Cathodic Protection System Maintenance
11.2	Operating and maintaining injection odorant system	Operator's Workshop, O&M Manual, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
11.3	Testing odorant level	Operator's Workshop, O&M Manual, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
Sec. 12	**Other Operating and Maintenance Skills**		Protection Systems	Protection Systems
12.1	Operating valves (including emergency valves), regulators, and relief valves	Operator's Workshop, O&M Manual, MEA-244, 511, 512	CTS 0701 Locating, Installing, and Protecting Customer Meters and Regulators CTS 0702 Customer Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-0701 Locating, Installing, and Protecting Customer Meters and Regulators 192-0702 Customer Pressure Regulating, Limiting, and Relief Devices - Operation and Maintenance
	Competencies and Skills	**Suggested Training Reference[1]**	**Q41 References**	**OQforAll References**
12.2	Inspecting pressure regulating and limiting stations	Operator's Workshop, O&M Manual, MEA-512	CTS 0701 Locating, Installing, and Protecting Customer Meters and Regulators CTS 0702 Customer Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-0701 Locating, Installing, and Protecting Customer Meters and Regulators 192-0702 Customer Pressure Regulating, Limiting, and Relief Devices - Operation and Maintenance

12.3	Inspecting and maintaining key valves	Operator's Workshop, O&M Manual, MEA-511	CTS 1427 Valve Maintenance	192-1427 Valve Maintenance
12.4	System uprating	Operator's Workshop, O&M Manual, MEA-521	CTS1419Uprating: Reinforce or Anchor Offsets, Bends, and Dead Ends	192-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead-ends
Sec. 13	**Operating Peak Shaving Plant (Propane/air mixture/injection)**			
13.1	Pre-start-up procedures	O&M Manual, Emergency shut down procedures	N/A	N/A
13.2	Start-up/operating procedures/shut down in accordance with operators manual for specific equipment	O&M Manual, Emergency shut down procedures	CTS 0301 Operating Gas Compressor Units CTS 0302 Shutting Down Gas Compressor Units	192-0301 Operating a Gas Compressor Unit 192-0302 Shutting Down a Gas Compressor Unit

[1]Reference to operator training refers to workshops conducted by state and regional associations, such as the Iowa Association of Municipal Utilities and the Midwest Energy Association (formerly known as Midwest Gas Association), manufacturers and distributors of gas industry products and equipment, state regulatory agencies, and other organizations. Specific references to MEA materials are to training modules in the Midwest Energy Association's Operator Qualification Training series.

1.17 PROGRAM PERFORMANCE, EFFECTIVENESS AND IMPROVEMENT

Plan Administrator is to evaluate the program as to performance, effectiveness and improvement.

Example: 1. Changing and or upgrading equipment procedures i.e. Notice of Change form in Division 5.

2. Recognize the need of re-qualification of employees.

Request for changes and/or additions to this plan should be documented by using the "Feedback Form" in Division 5. Copy to be filed at utility/company and original mailed to IAMU.

(Protocol 6.01, §192.805/195.505)

PROCEDURES WITH COVERED TASKS

The following activities would be considered "tasks" under 49 CFR 192. The competencies and/or skills listed as sections or subsections under each task are those identified in the operator qualification requirements of Division 3 of this program. Competency in fundamentals of natural gas is required for all covered tasks. (Protocols 1.01, 2.01, §192.805/195.505)

P-1 OPERATE VALVES, REGULATORS, AND RELIEF VALVES LOCATED AT TOWN BORDER STATION AND ALL DISTRICT REGULATOR STATIONS

Tasks:

a. Operating valves (open/close)
b. Changing pressure settings on regulators and relief valves

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.1	Operating valves (including emergency valves), regulators, and relief valves
12.2	Inspecting and maintaining pressure regulating and limiting stations

P-2 MAINTAIN REGULATOR STATIONS

Tasks:

a. Conducting shut down/Start up procedures
b. Operating by-pass
c. Performing lock-up
d. Stroking to full open
e. Adjusting to desired operating pressure
f. Inspecting gauges and/or chart recorders
g. Inspecting filters/valves/strainers
h. Inspecting for atmospheric corrosion
i. Inspecting for protection against third-party interference
j. Inspecting relief valve for damage
k. Checking relief set pressure
l. Checking capacity
m. Inspection of regulator relief valve, orifices, and seats

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.2	Inspecting and maintaining pressure regulating and limiting stations

2.2	Documenting maximum allowable operating pressure (MAOP)
2.4	Investigating and documenting line failure
3.5	System mapping
4 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
8 (all)	The construction - heavy equipment competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-6 INSTALL SERVICE LINES / REINSTATING SERVICE LINES

Tasks:

a. Mapping
b. Record keeping
c. Selecting proper welding and/or fusion procedures
d. Installing tracer wire for plastic pipe
e. Installing valves, pipe, including excess flow valves, and fittings
f. Pressure testing
g. Purging
h. Selecting proper riser and meter set
i. Plastic pipe repair

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.1	Documenting materials and installation records
2.2	Documenting maximum allowable operating pressure (MAOP)
2.4	Investigating and documenting line failure
3.3	System mapping
4 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.
8 (all)	The construction - heavy equipment competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-7 CONDUCT LEAK INVESTIGATIONS

Tasks:

Procedures specified in Operating and Maintenance Plan

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.4	Investigating and documenting line failure
2.5	Accident reporting
5 (all)	Fundamentals of gas leaks and skill in operating appropriate leak detection equipment.
6.1	Carbon monoxide (CO) testing
6.2	Investigating leaks (indoor and outdoor)

P-8 OPERATE ODORANT LEVEL TESTING EQUIPMENT

Tasks:

Selecting appropriate location

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
11.3	Testing odorant level

P-9 PERFORM LEAK SURVEYS AND PIPELINE PATROLS

Tasks:

a. Identifying building or construction near line
b. Identifying soil subsidence
c. Identifying abnormalities in vegetation growth

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.5	Soil Subsidence
5.2	Procedures for Leak Surveys and Patrols

P-10 FILL ODORANT SYSTEM

Tasks:

a. Closing valves to isolate system
b. De-pressurizing tank
c. Filling according to procedures (differential type or injector)
d. Recording amount of odorant used
e. Closing valves to atmosphere
f. Opening proper valves to restore to use

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas

11.1 or 11.2	Operating and maintaining differential odorant system Operating and maintaining injection odorant system

P-11 OPERATE BACKHOE

Tasks:

a. Loading and unloading
b. Conducting pre-operating inspection
c. Operating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
8.1	Operating backhoe

P-12 OPERATE TRENCHER

Tasks:

a. Loading and unloading
b. Conducting pre-operating inspection
c. Operating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
8.3	Operating trencher

P-13 JOIN PLASTIC PIPE BY FUSION

(By Approved Procedures Only)Tasks:

a. Performing butt fusion
b. Performing socket fusion
c. Performing saddle fusion
d. Performing electro fusion

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.11	Plastic pipe joining (fusion)

P-14 JOIN PLASTIC PIPE BY MECHANICAL COUPLING (By Approved Procedures Only)

Tasks:

a. Installing stab fittings
b. Installing compression fittings
c. Installing boltless couplings

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas

7.12	Plastic pipe joining (mechanical couplings)

P-15 VISUALLY INSPECT FUSION JOINTS (By Approved Procedures Only)
Tasks:
Following approved fusion procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.11	Plastic pipe joining (fusion)

P-16 JOIN STEEL PIPE BY WELDING
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding
7 (all)	The field safety competencies and skills required for this task depend on the type and size of materials, method of construction, and choice of equipment.

P-17 PROTECT WELDING FROM WEATHER
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-18 VISUALLY INSPECT COMPLETED WELD
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-19 TEST WELDERS
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-20 PREPARE WELD SURFACES (By Approved Welding Procedures Only)
Tasks:
Following approved welding procedures

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.14	Steel pipe joining by welding

P-21 JOIN STEEL PIPE BY MECHANICAL COUPLING (By Approved Procedures Only)
Tasks:
a. Installing bolted or boltless insulated couplings
b. Installing bolted or boltless non-insulating couplings

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.15	Steel pipe joining by mechanical couplings

P-22 INSPECT FOR INTERNAL CORROSION
TASKS:
a. Inspecting tapping coupons
b. Inspecting open ends

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.2	Internal corrosion

P-23 INSPECT FOR EXTERNAL CORROSION
Tasks:
a. Examining exposed pipelines
b. Examining coating for damage
c. Examining for pitting or scaling

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.3	External corrosion

P-24 INSPECT FOR ATMOSPHERIC CORROSION

Tasks:

a. Inspecting paint coverage
b. Inspecting for physical damage

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.4	Atmospheric corrosion

P-25 DETERMINE TYPE OF CORROSION (Localized Or Generalized)

Tasks:

a. Inspecting for pitting
b. Inspecting for flaking or scaling

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.1	Cathodic protection
10.5	Coatings
10.6	Holiday detection (coating inspection)
10.7	Painting and jacketing above ground facilities

P-26 APPLY COATINGS

Tasks:

a. Applying hot field coating
b. Applying cold field coatings
c. Applying hot melt compound
d. Applying petrolatum tape
e. Applying mastic compounds
f. Primers
g. Paints

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.5	Coatings
10.7	Painting and jacketing above ground facilities

P-27 CONDUCT HOLIDAY DETECTION (Coating Inspection)

Tasks:

a. Visually inspecting
b. Using fault detection equipment

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.6	Holiday detection (coating inspection)

P-28 TAKE PIPE-TO-SOIL READINGS

Tasks:

a. Properly placing half-cell
b. Using voltmeter

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.1	Cathodic protection

P-29 INSPECT FOR DETERIORATION AND DAMAGE

Tasks:

a. Inspecting new pipe and fittings
b. Inspecting coatings
c. Inspecting for dents
d. Identifying stress points

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.13	Recognition of defective material
7.16	Damage prevention
10 (all)	Corrosion control

P-30 INSPECT DITCHES AND BACKFILLS

Tasks:

a. Looking for rocks
b. Looking for sharp objects
c. Inspecting trench bottoms

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.17	Application of padding and shielding

P-31 APPLY PADDING AND SHIELDING

Tasks:

Remediating risks associated with rocks, sharp objects, and rough trench bottoms

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.17	Application of padding and shielding

P-32 PAINT AND JACKET ABOVE GROUND FACILITIES

Tasks:

a. Protecting dielectric fittings
b. Protecting identification tags
c. Protecting regulator vents
d. Applying proper protective coating

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.7	Painting and jacketing above ground facilities

P-33 INSTALL CATHODIC PROTECTION (Sacrificial Anode System)

Tasks:

a. Attaching galvanic anode by thermite weld
b. Attaching galvanic anode by bolt-on-clamps
c. Attaching drive-in galvanic anode

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.8	Installation of cathodic protection (sacrificial anode system)

P-34 INSTALL IMPRESSED CURRENT SYSTEM

Tasks:

a. Installing rectifier
b. Installing anode bed
c. Connecting positive and negative leads to pipe and rectifier

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.9	Installation of impressed current system

P-35 VISUALLY INSPECT CATHODIC PROTECTION SYSTEM

Tasks:

a. Looking at test stations for physical damage
b. Looking at dielectric fittings
c. Looking for broken wires
d. Looking at rectifier units for damage

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-36 MONITOR CATHODIC PROTECTION SYSTEM

Tasks:

a. Recording pipe-to-soil readings
b. Testing for AC Drain
c. Inspecting dielectric spacers
d. Inspecting DC Interference bond
e. Testing soil resistivity
f. Establishing current requirements
g. Inspecting reverse current switch diodes
h. Recording IR Drops
i. Testing casings – (100 mv)

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-37 MAINTAINING CATHODIC PROTECTION SYSTEM

Tasks:

Remediating abnormalities found through visual inspection and monitoring

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection

P-38 ELECTRICALLY ISOLATE SYSTEM

Tasks:

a. Installing or maintaining flange gaskets
b. Installing or maintaining weld-in insulating fittings
c. Installing or maintaining insulated meter spuds
d. Installing or maintaining insulated gas cocks
e. Installing or maintaining cathodic protection system isolation

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.8	Installation of cathodic protection (sacrificial anode system)
10.9	Installation of impressed current system
10.10	Inspection, monitoring cathodic protection system

P-39 INSPECT FOR INTERFERENCE OR STRAY CURRENTS

Tasks:

a. Using current interrupter
b. Using power supply

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
10.10	Inspection, monitoring cathodic protection system

P-40 TAPPING AND STOPPING STEEL PIPE

Tasks:

a. Installing tapping tees
b. Installing bottom-out fittings
c. Installing line stoppers
d. Installing bag stoppers
e. Installing expansion plugs

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.20 and/or 7.21	Tapping/Stopping steel pipe 1" through 4" Tapping/Stopping steel pipe 6" through 8"

P-41 TAPPING AND STOPPING POLYETHYLENE PIPE

Tasks:

a. Squeezing off
b. Performing hot-tap
c. Grounding

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
7.22	Tapping and stopping polyethylene pipe

P-42 INSPECT VAULT

Tasks:

a. Inspect physical integrity of vault
b. Inspecting integrity of steps
c. Inspecting for excess moisture and proper drainage
d. Inspecting ventilation equipment (vaults exceeding 200cf)

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.8	Confined Space Entry (Vaults, etc.)

P-43 ABANDON VAULTS

Tasks:

a. Installing line stops
b. Installing temporary bypass
c. Removing vault
d. Maintaining job site protection

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
4.9	Job site protection
4.11	Pressure testing
4.13	Excavation safety
4.8, 7.23 and 7.20, or 7.21, or 7.22	Confined space entry Vault abandonment Tapping/Stopping steel pipe 1" through 4" Tapping/Stopping steel pipe 6" through 8" Tapping and stopping polyethylene pipe
7.24	Vault abandonment

P-44 MAINTAIN KEY VALVES

Tasks:

a. Positioning valve key on valve
b. Closing and opening valve
c. Lubricating valve (determine correct amount required)
d. Valve mapping
e. Valve location
f. Verifying area of control (mapping)
g. Identifying valve material
h. Identifying valve size
i. Maintaining accessibility of valves

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
12.1	Operating valves (including key valves), regulators, and relief valves
12.3	Inspecting and maintaining key valves

P-45 INSPECT CUSTOMER METER SETS

Tasks:

a. Inspecting for proper location
b. Inspecting stop cock installation for easy access
c. Determining whether meter set insulated

d. Inspecting regulator installation for vent location/direction
e. Inspecting meter installation for flow direction
f. Checking for riser height and if meter set is level
g. Checking pressure and adjust (customer side)
h. Checking for lock-up
i. Testing for no-flow
j. Checking tracer wire, if poly pipe is used

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
6.7	Pressure Checks to Establish Gas Service
6.8	Establishing and Disconnecting Gas
10.4	Atmospheric corrosion

P-46 OPERATING PEAK SHAVING PLANT (Propane/Air Mixture/Injection)

Tasks:

a. Operating valves
b. Operating electric control panel
c. Adjusting temperature on vaporizer
d. Adjust injection pressure (Foxboro controller)
e. Operating compressor
f. Operating the specific gravity controller (Usually Ranarex controller)
g. Operate Bunson burner (If equipped)
h. Inspect gauges, charts for stabilization

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
13.1	Pre-start-up procedures
13.2	Start-up/operating procedures/shut down accordance with operators manual for specific equipment used

P-47 SYSTEM UPRATING (Increasing Pressure)

a. Inspecting meter sets (regulators, orifice size, internal relief)
b. Inspecting regulator/relief capacities
c. Leak survey
d. Bar hole testing

Required Competencies and Skills:

1 (all)	Fundamentals of natural gas
2.3/12.4	System uprating
2.2	Documenting MAOP
5.1	Leak classification
5.2	Procedures for leak surveys and patrols

5.3	Combustible gas indicators
5.4	Electronic gas detectors
5.5	Flame ionization
5.6	Bar hole testing and purging

REQUIRED COMPETENCIES AND SKILLS

(Protocols 1.05, 2.02, 4.01, 5.02 §§192.803/195.503, 192.805/195.505, 192.809/195.509)

	Competencies and Skills	Original Qualification Method	Re-Qualif. Method	Re-Qualif. Period	Suggested Training Reference[1]
Sec. 1	**Fundamentals of Natural Gas**				
1.1	Characteristics and hazards of natural gas	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-101
1.2	Potential ignition sources: indoor and outdoor	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-102
1.3	Recognizing emergency conditions	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-103
1.4	Recognizing and reporting natural gas leaks	Written evaluation	Written evaluation	Prerequisite, then 60 months, not to exceed 60 months	Gas Fundamentals Training, MEA-104
Sec. 2	**Record keeping**				
2.1	Documenting materials and installation records	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's workshop, O&M Manual MEA-402
2.2	Documenting maximum allowable operating pressure (MAOP)	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual MEA-421
2.3	System up-rating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-521
2.4	Investigating and documenting line failure	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-462
2.5	Accident reporting	Written evaluation	Written evaluation	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-103
Sec. 3	**Marking and Mapping Facilities**				
3.1	Locating facilities using the conductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402

3.2	Locating facilities using the inductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.3	Locating facilities using the inductive method (two persons)	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.4	Determining depth through triangulation	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-402
3.5	System mapping	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop MEA-402
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**				
4.1	Personal protective equipment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-111
4.2	Power tool safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-121
4.3	Proper firefighting techniques	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Emergency Procedures Training, MEA-122
4.4	Controlling the accidental release of gas	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Emergency Procedures Training, MEA-131
4.5	Soil subsidence	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	OSHA compliance manual and training, MEA-201
4.6	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-202
4.7	Recognizing unsafe meter sets	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	MEA-211
4.8	Confined space entry (vaults, etc.)	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months	OSHA compliance manual and training, MEA-501
4.9	Job site protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Compliance manual and training, MEA- MEA-401
4.10	Purging safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39	Operator's Workshop, MEA-422

				months	
4.11	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-421
4.12	Abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471
4.13	Excavation safety	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months	OSHA compliance manual and training, MEA-404
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**				
5.1	Leak classification	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Emergency Procedures Training, Gas Fundamentals Training, MEA-221
5.2	Procedures for leak surveys and patrols	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-271
5.3	Combustible gas indicators	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures MEA-231
5.4	Electronic gas detectors	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures, MEA-231
5.5	Flame ionization	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)	Operator's Workshop, Manufacturer's Procedures MEA-232
5.6	Bar hole testing and purging	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-261
Sec. 6	**Fundamentals of Customer Service**				
6.1	Carbon monoxide (CO) testing	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-241
6.2	Investigating leaks	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-272
6.3	Combustion and ventilation air requirements	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-301
6.4	Pilot light operation	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60	Operator's Workshop, MEA-311, 324

		evaluation	hands-on eval.	to exceed 60 months	MEA-311, 324
6.5	Gas-air adjustment	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-312
6.6	Appliance venting	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-313
6.7	Pressure checks to establish gas service	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-321
6.8	Establishing and disconnecting gas	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-322
Sec. 7	**Fundamentals of Construction**				
7.1	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-421
7.2	Procedures for abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471
7.3	Cathodic protection (general)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-431
7.4	Constructing facilities across streets, railroads, and waterways	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-453
7.5	Operating thermite welder	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures, MEA-431
7.6	Installing tracer wire	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, DOT Small Gas Operators Manual MEA-451, 452
7.7	Installing valves	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-451
7.8	Steel and cast iron repair fittings	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, Manufacturer's Procedures, MEA-461
7.9	Maintaining steel and cast iron mains	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-462
7.10	Reinforcing steel and plastic mains	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Fusion Workshop, MEA-463

7.11	Plastic pipe joining (fusion)	Hands-on evaluation	Hands-on evaluation	12 months, not to exceed 15 months	Fusion Workshop, MEA-411
7.12	Plastic pipe joining (mechanical couplings)	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, MEA-463
7.13	Recognition of defective material	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-411, 412, 421
7.14	Steel pipe joining by welding	Per approved welding procedures	Per approved welding procedures	12 months, not to exceed 12 months	Pipeline Welding Workshop, Qualified Welding Procedures
7.15	Steel pipe joining by mechanical couplings	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Operator's Workshop, MEA-412
7.16	Damage prevention	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-462
7.17	Application of padding and shielding	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-453
7.18	Replacing emergency valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-441, 511
7.19	Installing meter sets	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-211, 322, 452
7.20	Tapping and stopping steel pipe 1" through 4"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, MEA-441
7.21	Tapping and stopping steel pipe 6" through 8"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, Manufacture's Procedures
7.22	Tapping and stopping polyethylene pipe	Hands-on evaluation	Hands-on evaluation	60 months, not to exceed 60 months	Operator's Workshop, MEA-451, 452
7.23	Vault abandonment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-471, 501

Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**				
8.1	Operating backhoe	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-403
8.2	Operating trencher	Hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures, MEA-403
8.3	Operating boring equipment	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Operator's Workshop, Manufacturer's Procedures
8.4	Ditch and backfill inspection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Operator's Workshop, MEA-404
Sec. 9	**Fundamentals of Measurement and Control**				
9.1	Metering	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Metering Workshop
9.2	Odorization measurement and control	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, MEA-251
Sec. 10	**Corrosion Control**				
10.1	Cathodic protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.2	Internal corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.3	External corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.4	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-202
10.5	Coatings	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.6	Holiday detection (coating inspection)	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.7	Painting and jacketing above ground facilities	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months	Corrosion control workshop, MEA-202

				months	
10.8	Installation of cathodic protection (sacrificial anode system)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.9	Installation of impressed current system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
10.10	Inspection, monitoring cathodic protection system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months	Corrosion control workshop, MEA-431
Sec. 11	**Odorization**				
11.1	Operating and maintaining differential odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
11.2	Operating and maintaining injection odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
11.3	Testing odorant level	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-251
Sec. 12	**Other Operating and Maintenance Skills**				
12.1	Operating valves (including emergency valves), regulators, and relief valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-244, 511, 512
12.2	Inspecting pressure regulating and limiting stations	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-512
12.3	Inspecting and maintaining key valves	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-511
12.4	System uprating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months	Operator's Workshop, O&M Manual, MEA-521

Sec. 13	Operating Peak Shaving Plant (Propane/air mixture/injection)				
13.1	Pre-start-up procedures	Hands-on evaluation	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months	O&M Manual, Emergency shut down procedures
13.2	Start-up/operating procedures/shut down in accordance with operators manual for specific equipment	Hands-on evaluation	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months	O&M Manual, Emergency shut down procedures

[1] Reference to operator training refers to workshops conducted by state and regional associations, such as the Iowa Association of Municipal Utilities and the Midwest Energy Association (formerly known as Midwest Gas Association), manufacturers and distributors of gas industry products and equipment, state regulatory agencies, and other organizations. Specific references to MEA materials are to training modules in the Midwest Energy Association's Operator Qualification Training series.

See Appendix 2 for MEA's new training material cross-reference guide.

Division 4a of the Operator Qualification Program contains an Individual Qualification Summary. This form will identify the qualified individual, the covered tasks that each individual is qualified to perform, the dates of current qualification for each task, and the qualification methods. Form 4a is to be maintained by and is the property of the individual. If form 4a is not used, other appropriate recordkeeping methods may also be acceptable, such as, computer databases and workshop documentation, etc. Training records that support qualified person qualifications shall be maintained while the individual is performing the covered task and of persons that are no longer performing covered tasks shall be retained for the time period of five years.

INDIVIDUAL QUALIFICATION SUMMARY

For

_____

(Employee Name)

This table is used to record the progress of an individual in successfully demonstrating qualification in a competency or skill required to perform tasks necessary for the operation of a natural gas system. A certificate for each competency or skill, which verifies qualification by written evaluation or performance evaluation, must be attached. (Protocol 3.01, § 192.807/195.507)

	Competencies and Skills	Original Qualification Method	Re-Qualif. Method	Re-Qualif. Period	Original Date Qualified	Date Re-Qualified
Sec. 1	**Fundamentals of Natural Gas**					
1.1	Characteristics and hazards of natural gas	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.2	Potential ignition sources: indoor and outdoor	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.3	Recognizing emergency conditions	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
1.4	Recognizing and reporting natural gas leaks	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
Sec. 2	**Record keeping**					
2.1	Documenting materials and installation records	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

2.2	Documenting maximum allowable operating pressure (MAOP)	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
2.3	System up-rating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
2.4	Investigating and documenting line failure	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
2.5	Accident reporting	Written evaluation	Written evaluation	60 months, not to exceed 60 months		
Sec. 3	**Marking and Mapping Facilities**					
3.1	Locating facilities using the conductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.2	Locating facilities using the inductive method	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.3	Locating facilities using the inductive method (two persons)	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.4	Determining depth through triangulation	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
3.5	System mapping	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**					
4.1	Personal protective equipment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.2	Power tool safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.3	Proper firefighting techniques	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.4	Controlling the accidental release of gas	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		

4.5	Soil subsidence	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.6	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.7	Recognizing unsafe meter sets	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.8	Confined space entry (vaults, etc.)	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months		
4.9	Job site protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.10	Purging safety	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.11	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.12	Abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
4.13	Excavation safety	Written evaluation	Written or hands-on eval.	Initial, then 12 months, not to exceed 15 months		
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**					
5.1	Leak classification	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
5.2	Procedures for leak surveys and patrols	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
5.3	Combustible gas indicators	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		

5.4	Electronic gas detectors	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		
5.5	Flame ionization	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months (or new equip.)		
5.6	Bar hole testing and purging	Written or Hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 6	**Fundamentals of Customer Service**					
6.1	Carbon monoxide (CO) testing	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.2	Investigating leaks	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.3	Combustion and ventilation air requirements	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.4	Pilot light operation	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.5	Gas-air adjustment	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.6	Appliance venting	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.7	Pressure checks to establish gas service	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
6.8	Establishing and disconnecting gas	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

Sec. 7	Fundamentals of Construction					
7.1	Pressure testing steel and plastic pipeline	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.2	Procedures for abandoning facilities	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.3	Cathodic protection (general)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.4	Constructing facilities across streets, railroads, and waterways	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.5	Operating thermite welder	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.6	Installing tracer wire	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.7	Installing valves	Written Evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.8	Steel and cast iron repair fittings	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.9	Maintaining steel and cast iron Mains	Written Evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.10	Reinforcing steel and plastic mains	Written Evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.11	Plastic pipe joining (fusion)	Hands-on evaluation	Hands-on evaluation	12 months, not to exceed 15 months		
7.12	Plastic pipe joining (mechanical couplings)	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.13	Recognition of defective material	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.14	Steel pipe joining by welding	Per approved welding procedures	Per approved welding procedures	12 months, not to exceed 12 months		

7.15	Steel pipe joining by mechanical couplings	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.16	Damage prevention	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.17	Application of padding and shielding	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
7.18	Replacing emergency valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.19	Installing meter sets	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
7.20	Tapping and stopping steel pipe 1" through 4"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.21	Tapping and stopping steel pipe 6" through 8"	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
7.22	Tapping and stopping polyethylene pipe	Hands-on evaluation	Hands-on evaluation	60 months, not to exceed 60 months		
7.23	Vault abandonment	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**					
8.1	Operating backhoe	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
8.2	Operating trencher	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
8.3	Operating boring equipment	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
8.4	Ditch and backfill inspection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 9	**Fundamentals of Measurement and Control**					
9.1	Metering	Written evaluation	Written or hands-on	60 months, not to exceed 60		

			eval.	exceed 60 months		
9.2	Odorization measurement and control	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 10	**Corrosion Control**					
10.1	Cathodic protection	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.2	Internal corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.3	External corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.4	Atmospheric corrosion	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.5	Coatings	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.6	Holiday detection (coating inspection)	Written and hands-on evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.7	Painting and jacketing above ground facilities	Hands-on evaluation	Hands-on evaluation	36 months, not to exceed 39 months		
10.8	Installation of cathodic protection (sacrificial anode system)	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.9	Installation of impressed current system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
10.10	Inspection, monitoring cathodic protection system	Written evaluation	Written or hands-on eval.	36 months, not to exceed 39 months		
Sec. 11	**Odorization**					
11.1	Operating and maintaining differential odorant system	Written and hand-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
11.2	Operating and maintaining injection odorant system	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		

11.3	Testing odorant level	Written and hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 12	**Other Operating and Maintenance Skills**					
12.1	Operating valves (including emergency valves), regulators, and relief valves	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.2	Inspecting pressure regulating and limiting stations	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.3	Inspecting and maintaining key valves	Written or hands-on evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
12.4	System uprating	Written evaluation	Written or hands-on eval.	60 months, not to exceed 60 months		
Sec. 13	**Operating Peak Shaving Plant** (Propane/Air mixture/Injection)					
13.1	Pre-start-up procedure	Hands-on	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months		
13.2	Start-up/operating procedures/shut down	Hands-on	Hands-on evaluation	Initial, then 12 months, not to exceed 15 months		
Sec. __	**Other**					

Division 4b of the Operator Qualification Program contains a Group Qualification Summary. This form will identify each of the qualified individuals, the covered tasks that each individual is qualified to perform, and the dates of current qualification for each task. Form 4b is to be maintained by the facility administrator and is the property of the gas facility. If form 4b are not used, other appropriate recordkeeping methods may also be acceptable, such as, computer databases and workshop documentation, etc. Training records that support qualified person qualifications shall be maintained while the individual is performing the covered task and of persons that are no longer performing covered tasks shall be retained for the time period of five years.

OPERATOR QUALIFICATION (GROUP) SUMMARY

For

_____

(Name of Utility/Organization)

Where the employer copy of individual qualification summaries and related written and hands-on performance evaluations are retained in individual employee records or elsewhere, this table may be used by the operator to summarize the individual qualifications of all or a group of individuals who perform tasks necessary for the operation of a natural gas system.
(Protocol 3.01, §192.807/195.507)

Competencies and Skills		(List date of current qualification for each individual)					
Sec. 1	**Fundamentals of Natural Gas**						
1.1	Characteristics and hazards of natural gas						
1.2	Potential ignition sources: indoor and outdoor						
1.3	Recognizing emergency conditions						
1.4	Recognizing and reporting natural gas leaks						
Sec. 2	**Record keeping**						
2.1	Documenting materials and installation records						
2.2	Documenting maximum allowable operating pressure (MAOP)						
2.3	System up-rating						
2.4	Investigating and documenting line failure						

2.5	Accident reporting						
Sec. 3	**Marking and Mapping Facilities**						
3.1	Locating facilities using the conductive method						
3.2	Locating facilities using the inductive method						
3.3	Locating facilities using the inductive method (two persons)						
3.4	Determining depth through triangulation						
3.5	System mapping						
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**						
4.1	Personal protective equipment						
4.2	Power tool safety						
4.3	Proper firefighting techniques						
4.4	Controlling the accidental release of gas						
4.5	Soil subsidence						
4.6	Atmospheric corrosion						
4.7	Recognizing unsafe meter sets						
4.8	Confined space entry (vaults, etc.)						
4.9	Job site protection						
4.10	Purging safety						
4.11	Pressure testing steel and plastic pipeline						
4.12	Abandoning facilities						
4.13	Excavation safety						
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**						
5.1	Leak classification						

5.2	Procedures for leak surveys and patrols						
5.3	Combustible gas indicators						
5.4	Electronic gas detectors						
5.5	Flame ionization						
5.6	Bar hole testing and purging						
Sec. 6	**Fundamentals of Customer Service**						
6.1	Carbon monoxide (CO) testing						
6.2	Investigating leaks						
6.3	Combustion and ventilation air requirements						
6.4	Pilot light operation						
6.5	Gas-air adjustment						
6.6	Appliance venting						
6.7	Pressure checks to establish gas service						
6.8	Establishing and disconnecting gas						
Sec. 7	**Fundamentals of Construction**						
7.1	Pressure testing steel and plastic pipeline						
7.2	Procedures for abandoning facilities						
7.3	Cathodic protection (general)						
7.4	Constructing facilities across streets, railroads, and waterways						
7.5	Operating thermite welder						
7.6	Installing tracer wire						
7.7	Installing valves						
7.8	Steel and cast iron repair fittings						
7.9	Maintaining steel and cast iron Mains						

7.10	Reinforcing steel and plastic mains						
7.11	Plastic pipe joining (fusion)						
7.12	Plastic pipe joining (mechanical couplings)						
7.13	Recognition of defective material						
7.14	Steel pipe joining by welding						
7.15	Steel pipe joining by mechanical couplings						
7.16	Damage prevention						
7.17	Application of padding and shielding						
7.18	Replacing emergency valves						
7.19	Installing meter sets						
7.20	Tapping and stopping steel pipe 1" through 4"						
7.21	Tapping and stopping steel pipe 6" through 8"						
7.22	Tapping and stopping polyethylene pipe						
7.23	Vault abandonment						
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**						
8.1	Operating backhoe						
8.2	Operating trencher						
8.3	Operating boring equipment						
8.4	Ditch and backfill inspection						
Sec. 9	Fundamentals of Measurement and Control						
9.1	Metering						
9.2	Odorization measurement and control						

Sec. 10	**Corrosion Control**						
10.1	Cathodic protection						
10.2	Internal corrosion						
10.3	External corrosion						
10.4	Atmospheric corrosion						
10.5	Coatings						
10.6	Holiday detection (coating inspection)						
10.7	Painting and jacketing above ground facilities						
10.8	Installation of cathodic protection (sacrificial anode system)						
10.9	Installation of impressed current system						
10.10	Inspection, monitoring cathodic protection system						
Sec. 11	**Odorization**						
11.1	Operating and maintaining differential odorant system						
11.2	Operating and maintaining injection odorant system						
11.3	Testing odorant level						
Sec. 12	**Other Operating and Maintenance Skills**						
12.1	Operating valves (including emergency valves), regulators, and relief valves						
12.2	Inspecting pressure regulating and limiting stations						
12.3	Inspecting and maintaining key valves						
12.4	System uprating						
Sec. 13	**Operating Peak Shaving Plant** (Propane/Air mixture/Injection)						
13.1	Pre-Start-up procedures						

13.2	Start-up/operating procedures/ shut down						
Sec. __	**Other**						

EVALUATION OF HANDS-ON SKILLS

Division 5 of the Operator Qualification Program contains evaluating and qualifying hands-on demonstrations of skills necessary to perform tasks on gas systems. Operators may use the forms in Division 5 or attend appropriate workshops in obtaining qualification or re-evaluation. Appropriate documentation forms, attendance records, or manufacturer's procedures maybe used in lieu of the forms supplied in Division 5.

When performing direct observation the observer must appropriately document the observation, form "Direct Observation of Unqualified Person Performing Covered Task Under Direct Supervision of Qualified Individual" in Division 5 can be used to document the observation.

When communication of notice of change use form "Notice of Change."

When communicating a request for change and/or additions to this plan use form "Feedback Form."

(Protocols 3.02, 4.01, 8.01, 1.17, §§ 192.805/195.505, 192.803/195.503)

NOTICE OF CHANGE

This page may be reproduced as needed for recording changes to the Operator Qualification Program.

Utility/Company: _____

Date of Change: _____

Task(s) Impacted		O&M Procedure(s) Impacted		Regulations Impacted		Incidents, For Cause, Near Miss		Industry Accidents	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

What Communicated: (Attach any supporting documentation.)

_____

_____

_____

_____

How Communicated:

_____

_____

Tasks Impacted:

_____

_____

_____

Individuals Impacted:

Name of Individual(s) receiving the changes associated with the performance of covered tasks.	Place an "X" in the boxes below when communication is completed for that individual

Name and Position of Person Processing the Change:

_____

After completing this form file in Division 7.

FEEDBACK FORM

Utility/Company: _____

Address: _____

Phone: _____ **Date:** _____

Change or Addition Requested:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Person Requesting Change:

_____

When form completed file copy in utility/company files and mail original copy to IAMU, 1735 NE 70th Avenue, Ankeny, IA 50021-9353, attention to Gas Services department.

IAMU Response:

_____
_____
_____
_____
_____
_____
_____
_____

IAMU Gas Services representative and date:

_____

Competency/skill: Direct Observation of Unqualified Person Performing Covered Task Under Direct Supervision of Qualified Individual

DATE: _____

LOCATION:

_____

_____

_____

(Address and/or GPS Location)

TASK BEING PERFORMED:

_____

_____

_____

_____

_____

_____

PROCEDURES USED:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Unqualified Individuals Name: _____ **I.D. Number:** _____
(Print)

Number of unqualified persons being observed at one time: _____

_____ _____

Qualified Observer Signature **Unqualified Individual Signature**

Competency/skill: 3.1 Locate facilities using the conductive method

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Connect the Transmitter			
1	Connect the transmitter cable to a metal riser pipe or locator wire, with the transmitter as far from the connection as the cable will allow.		
2	Insert the ground rod/plate to one side and away from the pipe, as far from the transmitter as the other connecting cable will allow.		
3	Pour a small amount of water at the ground site to increase conductivity.		
Locate the Pipe			
4	Set the receiver sensitivity control to the low range.		
5	Hold the receiver parallel with the pipe and in a vertical position.		
6	Sweep the receiver close to the ground using short, smooth moves without swinging or rocking.		
7	Find and mark the general location of the pipe by listening for the loudest signal.		
8	Hold the receiver face-up in a horizontal position.		
9	Adjust the sensitivity control to **medium** or **high**.		
10	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
11	Find the null and mark its location according to Company policy.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.2 Locate facilities using the inductive method (one person)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No
Position the Transmitter			
1	Place the transmitter over the pipe at a 45^0 angle to its length.		
2	Set the receiver range switch and start with the receiver and transmitter at least 30' apart.		
3	Holding the receiver parallel with the pipe and in a vertical position, walk toward the pipe from one side.		
4	When the **maximum signal** occurs, stop and mark the spot on the ground directly below the receiver.		
5	Move the transmitter and place it on the mark in a vertical position, parallel to and directly above the pipe.		
6	Take the receiver back down the pipeline at least 30 feet away from the transmitter.		
7	Sweep the receiver back and forth over the pipe close to the ground, using short, smooth moves with receiver parallel to transmitter and vertical.		
8	Move the transmitter to the second mark and return to the first mark.		
Locate the Pipe			
9	Sweep the receiver loose to the ground using short, smooth moves.		
10	Listen for the maximum signal to find the general location of the pipe.		
Pinpoint and Mark the Pipe			
11	Hold the receiver face-up in a horizontal position.		
12	Adjust the sensitivity control to **medium** or **high**.		
13	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
14	Find the null and mark its location according to Company policy.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.3 Locate facilities using the inductive method (two persons)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Position the Transmitter			
1	Start with the receiver and transmitter at least 30` apart.		
2	Keep the units parallel and walk toward the pipe.		
3	Set receiver down at the spot where the signal is the strongest and direct the second person to move transmitter back and forth to fine tune the signal.		
4	When the signal is strongest, place the transmitter on the ground in a vertical position parallel to and directly above the pipe.		
Locate the pipe			
5	Sweep the receiver back and forth over the pipe, close to ground, using short, smooth moves with receiver parallel to transmitter and vertical.		
6	Listen for the maximum volume of the signal.		
Pinpoint and mark the pipe			
7	Hold the receiver face-up in a horizontal position.		
8	Adjust the sensitivity control to **medium** or **high**.		
9	Sweep the receiver back and forth over the general location, perpendicular to the pipe.		
10	Find the null and mark its location according to Company policy.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 3.4 Determining depth through triangulation

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Triangulate the pipe			
1	Set the sensitivity control on the receiver to **medium** or **high**.		
2	Hold the receiver as close to the ground as possible at a 45^0 angle (check the depth level indicator on the receiver).		
3	Begin directly above the pipe and move the receiver slowly, at a right angle, away from the pipe.		
4	At the null, mark the spot directly below the center of the receiver.		
Calculate the depth			
5	Measure the distance from this mark to the mark for the pinpointed center of the pipe.		
6	Subtract the distance from the center of the receiver to the ground.		
7	Correctly state the approximate pipe depth.		
8	Document according to Company procedures.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.3 Combustible gas indicators

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Turn on power		
2	Warm up battery check		
3	Set zero in fresh air		
4	Test gas in L.E.L. mode		
5	Test gas in U.E.L. mode		
6	Clear machine in fresh air		
7	Shut down		
8	Store in proper manner		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.4 Electronic gas detectors

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Start Up / Shut Down			
1	Turn on power / Allow for warm up		
2	Check battery power		
3	Set zero in fresh air		
4	Test gas in L.E.L. mode		
5	Test gas in U.E.L. mode		
6	Purge in fresh air		
7	Shut down		
8	Store in proper containment		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.5 Flame ionization

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Visual inspection and filter change			
1	Visually inspect the FI unit to detect any damage or flaws.		
2	Check the intake cone filter. Install a new filter so that it is properly seated according to manufacturers and Company specifications.		
3	Check the in-line filter. Install a new filter so that it is properly seated according to manufacturers and Company specifications.		
4	Check the probe. Clean if dirty.		
Refueling			
5	Connect the FI unit to the fuel supply tank.		
6	Fill the FI unit fuel tanks to the proper level.		
7	Safely disconnect the FI unit from the fuel supply, ensuring that all connections are appropriately closed.		
Calibrating			
8	Make sure that the FI unit has been tested for accuracy.		
9	Turn the FI unit **POWER** and the **IGNITION** to **ON**.		
10	Set the **SENSITIVITY** to **50 PPM**.		
11	Hold the sensor head (intake cone) over the test cup of the certified 50 ppm gas sample.		
12	Turn the 50 ppm gas sample **ON** at **MINIMUM** flow.		
13	Watch the needle on the FI unit for full deflection.		
14	If the needle does not reach full deflection in 3 seconds, report the unit according to Company policy.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 5.6 Bar hole testing and purging

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Make bar holes at 10' intervals		
2	Establish extent of leak		
3	Establish strongest reading		
4	Allow to vent / Re-test		
5	Locate approximate location of leak		
6	Document prior to digging		
7	Classify leak		
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.5 Operating thermite welder

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Preparing the pipe			
1	Place fire extinguisher upwind.		
2	Put on personal protective equipment including gloves and eye protection.		
3	Remove coating from 3" x 3" area at weld location.		
4	Use wire brush and file to clean pipe to shiny metal.		
Preparing the wire			
5	Strip 2" insulation from wire.		
6	Scrape, file, or sand the bare end clean.		
7	Crimp copper sleeve on wire.		
8	Wrap wire around pipe and twist it.		
9	Inspect mold for defects and correct size.		
10	Place steel disk in mold.		
11	Place welding and starting powder into the mold.		
Preparing the mold			
12	Place mold on pipe at prepared location.		
13	Insert wire in mold.		
14	Set the mold with wire parallel to the pipe.		
15	Hold mold firmly		
16	Ignite with sparking gun.		
17	Tape to test weld.		
Making the weld			
18	Repair coating.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.8 Steel and cast iron repair fittings

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Check atmosphere in bell hole.		
2	Check pipe condition for replacement.		
3	Clean coating and other foreign material adequately.		
4	Lubricate gasket material.		
5	Torque bolts in proper sequence.		
6	Check for leaks/other damage.		
7	Properly coat before backfilling.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.11 Plastic pipe joining (fusion)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Butt fusion / visual		
2	Side wall fusion / visual		
3	Butt fusion / strap test		
4	Sidewall fusion / strap test		
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.12 Plastic pipe joining (mechanical couplings)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Cut ends of pipe square		
2	Clean ends of pipe		
3	Measure ends of pipe for insertion		
4	Install locking collar and insert		
5	Install locking collar over insert		
6	Repeat steps 1 through 5		
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.15 Steel pipe joining by mechanical couplings

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Prepare coupling and pipe			
1	Disassemble, if necessary, and soap gaskets and pipe ends.		
2	Clean the pipe ends thoroughly. (Remove all wrapping, oil, loose scale, rust, cutter burrs and anything else that could prevent gasket seating.)		
3	Place end nuts, retainer cups, and soapy gaskets on the pipe ends. (Line up the pipe ends, leaving at least 1/4 " gap.)		
Install coupling			
4	Measure the coupling body to manufacturer's specifications. (Mark the measurement on one pipe end.)		
5	Place the coupling on pipe with the end of coupling body at the mark. (Make sure that the coupling body is clean.)		
6	Slide gaskets and retainer cups into place. (Slide the retainer cups against the gaskets.)		
7	Slide end nuts or caps into place. (Gradually tighten and torque to specification. If the coupling is hydraulic, inject grease or hydraulic fluid.)		
8	Check electrical continuity. (If using a non-insulated coupling, be sure there is continuity. If using an insulated coupling, be sure there is electrical isolation.)		
9	Clean away soap and other foreign material.		
10	Wrap the exposed coupling and pipe to ensure corrosion protection.		
Comments: (see reverse)			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.20 Tapping and stopping steel pipe 1" through 4"

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Install fitting to pipe		
2	Set up tapping machine		
3	Install valve / tapping machine		
4	Make tap through pipe		
5	Remove machine / close valve		
6	Set up and install stop in machine		
7	Perform stop in pipe		
8	Remove stop		
9	Install completion plug and wrap pipe		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.21 Tapping and stopping steel pipe 6" through 8"

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Install fitting to pipe		
2	Set up tapping machine		
3	Install valve / tapping machine		
4	Make tap through pipe		
5	Remove machine / close valve		
6	Set up and install stop in machine		
7	Perform stop in pipe		
8	Remove stop		
9	Install completion plug and wrap pipe		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 7.22 Tapping and stopping polyethylene pipe

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Sidewall fusion		
2	Remove cap		
3	Turn Allen lead clockwise till bottoms out		
4	Turn counter-clockwise till 1 thread end from the top		
5	Replace cap on top of tee		
6	Test to manufacturers procedure		
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.1 Operating backhoe

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Check fluid levels		
2	Visual check of tires		
3	Visual check of outriggers		
4	Visual check of levers / controls		
5	Start up procedures		
6	Proper positioning of machine		
7	Operate control levers		
8	Proper placement of dirt		
9	Shut down procedures		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.2 Operating trenchers

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection		
2	Check fluid levels		
3	Check safety locks		
4	Start up procedures		
5	Proper placement of trencher		
6	Engage digger chain		
7	Lower boom to proper depth		
8	Engage forward motion		
9	Shut down procedures		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 8.3 Operating boring equipment

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection		
2	Check fluid levels		
3	Start up procedures		
4	Engage boring rod		
5	Proper angle of machine		
6	Proper rotation of bore rod		
7	Travel speed of bore rod		
8	Check rotational speed of rod		
9	Check location of bore rod		
10			
11			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 10.6 Holiday detection (coating inspection)

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visual inspection of machine		
2	Check voltage settings		
3	Install proper spring collar		
4	Pipe properly grounded		
5	Placement of transmitter ground		
6	Turn machine on		
7	Travel speed		
8	Recognition of defects		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 10.7 Painting and jacketing above ground facilities

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Remove all loose paint and particles.		
2	Mask all regulator vents.		
3	Mask all di-electric fittings.		
4	Mask index glass.		
5	Mask all required identification tags.		
6	Paint all exposed metal.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.1 Operating and maintaining a differential odorant system

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Close valves in proper sequence.		
2	Bleed off pressure in appropriate manner.		
3	Refill odorant tank properly.		
4	Slowly open valves in proper sequence.		
5	Accurately document amount of odorant used.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.2 Operating and maintaining an injection odorant system

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Close valves in proper sequence.		
2	Refill odorant tank properly.		
3	Reopen valves in proper sequence.		
4	Check for air/lock.		
5	Accurately document amount of odorant used.		
6	Check for filter saturation.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 11.3 Testing odorant level

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Select appropriate test sites.		
2	Purge machine before use.		
3	Season machine.		
4	Test for odorant level in smooth controlled motions.		
5	Record readings accurately.		
6	Purge machine before turning off.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 12.2 Inspecting pressure regulating and limiting stations

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Visually inspect regulator/relief/piping.		
2	Ensure all valves are operating properly.		
3	Test diaphragm assembly vent and all other pipes for leaks.		
4	Inspect all filters.		
5	Test to determine if regulator will lockup. (If lock-up is not achieved; physical inspection of orifice and seat will have to be performed and replaced if needed.)		
6	Test to ensure regulator will open full.		
7	If there is a monitor regulator check, set pressure. Check for lockup.		
8	If there is a relief valve, check for set pressure and test for operating performance.		
9	Ensure all valves are returned to normal operating positions.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 12.3 Inspecting and maintaining key valves

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Lubricating valves			
1	Correctly attach lubricating device to the valve.		
2	Apply lubrication without over lubricating.		
3	Correctly detach the lubricating device and clean the lubrication point.		
Operating valves			
4	Check to see if valve is open or closed.		
5	Aware of section valve controls.		
6	Check size of valve.		
7	Correctly attach wrench to valve.		
8	Turn valve correctly.		
9	Return valve to normal operating position.		
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 13.1 Operating peak shaving plant (propane/air mixture/injection): Pre-start-up procedures

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1	Operating valves		
2	Operating electric control panel		
3	Adjusting temperature on vaporizer		
4	Adjust injection pressure (Foxboro controller)		
5	Operating compressor		
6	Operating the specific gravity controller (Usually Ranarex controller)		
7	Operate Bunson burner (If equipped)		
8	Inspect gauges, charts for stabilization		
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill: 13.2 Operating peak shaving plant (propane/air mixture/injection): Start-up/operating procedures/shut down

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
Accordance with operators manual for specific equipment used			
1			
2			
3			
4			
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

Competency/skill:

Qualified observer instructions:

1. For the performance steps below, observe the participant and check "Go" for successful completion of the step **or** "No Go" if remediation of the step is required.
2. A "No Go" rating on any of the steps constitutes a "No Go" for the entire performance skill. Performance skills must be completed with 100% accuracy.
3. Both the individual taking the performance evaluation and the qualified observer must sign this form upon completion of the evaluation.

Performance Step Analysis		Go	No Go
1			
2			
3			
4			
5			
6			
7			
8			
9			
Comments:			

Participant Name: _____ **I.D. Number:** _____

Test Date: _____ **Location:** _____

Evaluation: ☐ **Qualified** ☐ **Not Qualified**

_____ _____

Qualified Observer Signature Participant Signature

WRITTEN EVALUATION OF COMPETENCIES AND SKILLS

Division 6 of the Operator Qualification Program may contain copies of tests used in the written evaluation and qualification competencies and skills necessary to perform tasks on gas systems. Copies of examination instruments are generally not included, where qualification is certified by an outside training organization.

TRAINING MATERIALS

Division 7 of the Operator Qualification Program may contain attachments describing course descriptions or outlines, lesson plans, and other materials used to prepare personnel for qualification through this program. For example, a brochure describing a welder qualification workshop could be retained in this division to document the operator's efforts to provide training in required competencies and skills.

When communication of change, when using the "Notice of Change" form is completed, file in Division 7.

(Protocol 1.04, 8.01, §§ 192.803/195.503, 192.805/195.505)

COURSE DESCRIPTIONS AND PREREQUISITES FOR MIDWEST ENERGY TRAINING MODULES

The following is a copy of Appendix B of the Midwest Energy Association's (A.K.A. Midwest Gas Association) *Operator Qualification Training Program Course Management Plan.* The appendix describes the training modules offered by Midwest Energy Association. The Iowa Association of Municipal Utilities through an agreement with Midwest Energy Association reproduces the copyrighted material.

(Protocol 4.02, §192.803/195.503)

Module Number: 101 **Title:** Characteristics and Hazards of Natural Gas
Prerequisite: None
Description: General introduction to natural gas. Topics include: composition of natural gas; hydrocarbon chemistry; physical properties of natural gas; combustion of natural gas; the fire triangle and tetrahedron; upper and lower explosive limits of natural gas; carbon monoxide.

Module Number: 102 **Title:** Potential Ignition Sources: Indoor and Outdoor
Prerequisite: 101
Description: Introduction to ignition sources. Topics include: open flame ignition sources; electric spark sources - arcing and static electricity; sources resulting from work on piping.

Module Number: 103 **Title:** Recognizing Emergency Conditions
Prerequisite: 101, 102
Description: Recognizing conditions that could lead to emergency failure of the natural gas system or equipment. Topics include: potential consequences of failures; potential failure conditions including construction defects, corrosion, damage, line stress, mechanical failure, human error, and pipeline obstructions; corrective action.

Module Number: 104 **Title:** Recognizing and Reporting Natural Gas Leaks
Prerequisite: 101, l02, 103
Description: Recognizing and reporting leaks and potential leaks encountered during the normal course of daily activity. Topics include: recognizing leaks by sight, sound, and smell; recognizing leak conditions such as tampering and meter damage; reporting leaks according to whether or not they constitute an immediate danger; ensuring customer and employee safety.

Module Number: 111 **Title:** Personal Protective Equipment
Prerequisites: 101, 102, 103, 104
Description: Use retardant clothing and PPE. Topics include: requirements and procedures for wearing flame retardant clothing; fresh air breathing equipment and components; proper use and maintenance of breathing equipment.

Module Number: 121 **Title:** Power Tool Safety
Prerequisite: 101, 102, 103, 104, 111
Description: Basic safety practices for working with the five basic types of power tools. Topics include: personal protective equipment; safety principles for using and maintaining power tools; safety practices for electric, liquid-fuel, hydraulic, pneumatic, and powder-actuated power tools.

Module Number: 122 **Title:** Proper Firefighting Techniques
Prerequisite: 101, 102, 103, 104, 111
Description: Selection of firefighting equipment and proper methods of fighting natural gas fires. Topics include: review of the fire triangle and tetrahedron; classes of fires; types and selection of dry chemical fire extinguishers; fire extinguisher inspection and maintenance; fire fighting procedures.

Module Number: 131 **Title:** Controlling the Accidental Release of Gas
Prerequisite: 101, 102, 103, 104, 122
Description: Introduction to accidental natural gas release. Topics include: definition of accidental release; causes of accidental release; corrective actions; examples of accidental release situations outdoors including damage to above grade facilities serving customers, damage to one-way and two-way feed transmission/distribution lines, damage to above grade district regulator stations with multiple and isolated feeds, and mechanical failure of relief valve; accidental release of natural gas indoors.

Module Number: 201 **Title:** Soil Subsidence
Prerequisites: 101, 102, 103, 104
Description: Soil subsidence as a possible cause of pipeline leaks or failure. Topics include: causes of soil subsidence including settling, shifting, and erosion; recognition and analysis of soil subsidence using visible signs, company and other records; documentation.

Module Number: 202 **Title:** Atmospheric Corrosion
Prerequisites: 101, 102, 103, 104
Description: Atmospheric corrosion as a possible cause of pipeline leaks or failure. Topics include: definition, types, and causes of atmospheric corrosion; atmospheric corrosion surveys; corrective action.

Module Number: 211 **Title:** Recognizing Unsafe Meter Sets
Prerequisites: 101, 102, 103, 104, 201, 202
Description: Unsafe meter sets as a possible cause of leaks or failure. Topics include misaligned meter sets; improper location; burial and overbuilding; corrosion; physical damage.

Module Number: 221 **Title**: Leak Classification
Prerequisites: 101, 102, 103, 104
Description: DOT leak classification requirements. Topics include: definitions of Grade 1, 2, and 3 leaks; guidelines for assigning leak grades; response to leaks; follow-up; documentation.

Module Number: 231 **Title:** Operating the Combustible Gas Indicator
Prerequisite: 101, 102, 103, 104, 221
Description: Introduction to operation and maintenance of the CGI. Topics include: CGI unit parts and function; pre-operation tests of the CGI unit; operation of the CGI unit in the field; documentation.

Module Number: 232 **Title:** Operating the Flame Ionization Unit
Prerequisite: 101, 102, 103, 104, 221
Description: Introduction to operation and maintenance of the FI unit. Topics include FI unit parts and function; pre-operation inspection and testing of the FI unit; field operation of the FI unit for walking and mobile surveys; documentation.

Module Number: 241 **Title:** Carbon Monoxide (CO) Testing
Prerequisites: 101, 102, 103, 104
Description: Introduction to CO testing. Topics include: recognizing the effects of CO gas on human beings; identifying situations that require CO testing; CO testing using indicator tubes and electronic CO monitors; actions to take when CO is detected; documentation.

Module Number: 244 **Title:** Emergency Response and Restoration of Service
Prerequisites: 101, 102, 103, 104, 131, 221
Description: Basic responses to emergency situations and information about restoration of service. Topics include: Identifying company procedures for reporting to state/federal authorities. Identify components of an effective repair plan, system mapping and isolation points, repair plan, and methods for reestablishing service after shut down.

Module Number: 251 **Title:** Odorization
Prerequisites: 101, 102, 103, 104
Description: Requirements and procedures for odorizing gas and testing odorant levels. Topics include: factors affecting sufficient odorization; odorization equipment testing; odorization equipment maintenance; testing for odorization levels; documentation.

Module Number: 261 **Title:** Bar Hole Testing and Purging
Prerequisite: 101, 102, 103, 104, 231
Description: Use of bar test equipment and CGI to identify gas migration, pinpoint underground leaks, and exhaust underground gas. Topics include: natural

gas migration; factors affecting migration patterns and rates; safety hazards of gas migration; determining the spread area of underground leaks; finding the leak source; exhausting gas.

Module Number: 271 **Title:** Leak Surveys and Patrols
Prerequisite: 101, 102, 103, 104, 201, 202, 232, 251
Description: Requirements and procedures for systematic leak survey of the natural gas system. Topics include: causes of leaks; leak detection equipment; kinds of surveys; kinds of facilities that require surveys; DOT survey requirements; procedures for walking, mobile, and business district surveys; patrols; documentation.

Module Number: 272 **Title:** Customer Leak Investigation
Prerequisite: 101, 102, 103, 104, 241, 251, 261
Description: Responding to customer reports of leaks. Topics include: arrival and entry procedures; indoor and outdoor leak detection and location; identifying and responding to hazardous conditions; documentation.

Module Number: 301 **Title:** Combustion and Ventilation Air
Prerequisite: 101, 102, 103, 104
Description: Introduction to air requirements for combustion of natural gas. Topics include: combustion terminology; complete and incomplete combustion; problems that result from incomplete combustion; conditions allowing for adequate combustion air.

Module Number: 311 **Title:** Pilot Lights
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to pilot lights and other appliance ignition systems. Topics include: automatic and non-automatic pilots; flame sensors and safety shutoffs including thermocouples, bimetal and hydraulic or mercury vaporization sensors; electronic ignition systems; inspection procedures for electronic ignition systems.

Module Number: 312 **Title:** Gas-Air Adjustment
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to gas burners and adjustment. Topics include: types of gas burners including yellow flame and blue flame burners; typical burner components; flame characteristics and factors affecting them; burner problems caused by improper gas-air mixture including lifting, flashback, extinction pop, yellow tipping, floating, and rollout.

Module Number: 313 **Title:** Venting
Prerequisite: 101, 102, 103, 104, 301
Description: Introduction to the purpose of venting and recognizing proper and improper venting conditions. Topics include: purpose of venting; factors affecting venting system design and operation; types of vents; code

requirements for venting; recognizing proper vent and connector installation; testing vents for establishment of gas.

Module Number: 321 **Title:** Pressure Checks to Establish Gas Service
Prerequisites: 101, 102, 103, 104
Description: Establishing proper gas inlet pressure. Topics include: pressure measurement instruments, including bourdon tubes, manometers, and electronic gauges; procedure for checking inlet pressure; problems associated with under pressurization and over-pressurization; calculating desired and actual gas flow.

Module Number: 322 **Title:** Establishing and Disconnecting Gas
Prerequisites: 101, 102, 103, 104, 272, 311, 312, 313, 321
Description: Requirements and procedures for establishing and disconnecting customer gas service. Topics include: verification of requesting location; piping and appliance checks; meter and regulator checks including low-flow and shut-in tests; purging and light-up procedures; disconnection of service; read over or succession; meter removal; documentation.

Module Number: 324 **Title:** Lighting Appliances
Prerequisites: 101, 102, 103, 104, 311, 312, 313, 321
Description: Performing purging and lighting on all types of residential gas appliances. Topics include: purging process and conditions requiring its use; identifying the three types of purging methods.

Module Number: 401 **Title:** Job Site Protection
Prerequisites: 101, 102, 103, 104
Description: Protection of job site for public and employee safety. Topics include: types of traffic control and protection devices and signs; placement of job site protection devices.

Module Number: 402 **Title:** Locating and Marking Facilities
Prerequisite: 101, 102, 103, 104, 401
Description: Use of the pipe locator to find and mark underground facilities. Topics include: pipe locator parts and operation; equipment check-out; direct requests and the one-call system; field markings of gas and other facilities; conductive locating procedure: inductive locating procedure; pinpoint centering of pipe; triangulation of pipe depth; permanent and temporary signs and markers.

Module Number: 403 **Title:** Backhoe Safety
Prerequisite: 101, 102, 103, 104, 401
Description: Basic safety principles for working with or around backhoes. Topics include: safe back hoe service and maintenance; procedure for loading and unloading back hoe on or off trailer; safety procedures for working with backhoes at the job site.

Module Number: 404 **Title:** Excavation and Shoring Safety
Prerequisites: 101, 102, 103, 104, 402, 403
Description: Techniques and protection for safe excavation. Topics include: cave-in causes and results; cave-in prevention factors including soil classification, water, and other factors; cave-in protection measures including support systems, sloping, and shielding; additional excavation precautions.

Module Number: 411 **Title:** Plastic Pipe Fusion
Prerequisite: 101, 102, 103, 104, 121
Description: Methods and procedures for fusing plastic pipe. Topics include: minimizing hazards of static electricity; equipment and procedure for butt, sidewall, and socket fusion; butt end and sidewall electrofusion.

Module Number: 412 **Title:** Joining Steel Pipe
Prerequisite: 101, 102, 103, 104, 121
Description: Methods and procedures for joining steel pipe. Topics include: overview of welding; when to use compression couplings; kinds of compression couplings; flange types; flange installation procedure.

Module Number: 421 **Title:** Pressure Testing Steel and Plastic Pipeline
Prerequisites: 101, 102, 103, 104, 411, 412
Description: Requirements, equipment, and procedures for pressure testing steel and plastic pipe. Topics include: facilities requiring pressure testing; DOT pressure testing requirements for transmission and distribution lines; pressure testing equipment; pressure testing procedure; documentation.

Module Number: 422 **Title:** Purging Safety
Prerequisite: 101, 102, 103, 104, 421
Description: Requirements and procedures for purging gas pipelines. Topics include: purging safety; purging with air; purging with natural gas; discharge venting; testing for complete purge.

Module Number: 431 **Title:** Cathodic Protection
Prerequisite: 101, 102, 103, 104, 422
Description: Introduction to corrosion prevention by cathodic protection. Topics include: fundamentals of corrosion; corrosion prevention measures; purpose and types of anodes; selection of anodes using soil resistivity; pipe-to-soil voltage measurement; anode installation; rectifiers; test stations; thermite welding procedures.

Module Number: 441 **Title:** Tapping/Stopping: 1.25" - 4" Pipe
Prerequisite: 101, 102, 103, 104, 404
Description: Operation of general and specialized tapping and stopping equipment Topics include: operation of bagging and stopping equipment; operation of

T. D. Williamson and Mueller tapping equipment; operation of Rockford-Eclipse and Qualitech-Eclipse stopping equipment.

Module Number: 444 **Title:** Plastic Pipe Repair
Prerequisites: 101, 102, 103, 104, 111, 131, 401, 403, 404, 411, 422, 441
Description: Methods and procedures for repair of plastic pipe. Topics include: temporary repairs, squeeze tools, making permanent repairs, remove and replace damaged pipe.

Module Number: 451 **Title:** Installing Mains
Prerequisites: 101, 102, 103, 104, 431, 441
Description: Methods and procedures for installing steel and plastic pipe. Topics include: pipe handling and storage, trenching procedure, installing new mains by direct burial, plastic pipe insertion.

Module Number: 452 **Title:** Installing Service
Prerequisite: 101, 102, 103, 104, 451
Description: Methods and procedures for installing service lines. Topics include: review of service line terminology; service line materials; trenching; installing steel service lines; installing plastic service lines.

Module Number: 453 **Title:** Crossings
Prerequisite: 101, 102, 103, 104, 452
Description: Specific procedures for installing pipe across highway, rail, bridge, creek, and ravine crossings. Topics include: highway and railroad crossing procedures including licenses and permits, casings, boring, and depth of crossing; bridge crossing procedures including pipe expansion, support, and anchors; creek and ravine crossing procedures including trenching and protection.

Module Number: 461 **Title:** Steel and Cast Iron Repair Fittings
Prerequisite: 101, 102, 103, 104, 431
Description: Selecting and installing fittings. Topics include: selecting repair fittings for steel, cast iron, and plastic pipe; selecting main fittings for steel, cast iron, and plastic pipe; service fittings and techniques for connecting steel service to steel mains, steel service to cast iron mains, steel service to plastic mains, plastic service to plastic mains, plastic service to steel mains.

Module Number: 462 **Title:** Maintaining Steel & Cast Iron Mains
Prerequisites: 101, 102, 103, 104, 261, 453, 461
Description: Requirements and procedures for maintaining, repairing, and replacing steel or cast iron mains. Topics include: identifying areas of greatest potential hazard; repair and replacement criteria; pressure reduction and shutdown prior to repair; inspection procedures for exposed steel mains;

steel pipe repair methods; cast iron pipe repair methods; cast iron pipe protection.

Module Number: 463 **Title:** Reinforcing Steel & Plastic Mains
Prerequisite: 101, 102, 103, 104, 461
Description: Requirements and procedures for reinforcing mains. Topics include: identifying situations where reinforcement is required; kinds of reinforcement; procedures for reinforcing steel mains and plastic tie-ins to steel, cast iron, and plastic mains.

Module Number: 471 **Title:** Abandoning Facilities
Prerequisite: 101, 102, 103, 104, 462
Description: Procedures for deactivation of natural gas facilities. Topics include: reasons for deactivation; procedure for deactivating mains or service lines; discontinuing service; documentation.

Module Number: 501 **Title:** Safe Vault Entry
Prerequisite: 101, 102, 103, 104, 122
Description: Procedures for entering and working safely in vaults. Topics include: actions to take before entry; atmospheric testing; vault entry PPE; vault entry procedures; required rescue equipment and procedures.

Module Number: 511 **Title:** Inspecting and Maintaining Valves
Prerequisites: 101, 102, 103, 104
Description: Introduction to valves, and to the requirements and procedures for their inspection and maintenance. Topics include: valve designs and components; emergency and non-emergency valves; DOT inspection and maintenance requirements; valve inspection and maintenance procedure; documentation.

Module Number: 512 **Title:** Inspecting Pressure Regulating & Limiting Stations
Prerequisites: 101, 102, 103, 104, 131, 501, 511
Description: DOT requirements for inspecting pressure regulating and limiting stations, and vaults that house them. Topics include: MAOP; kinds of regulators and over pressure protection devices (OPPD); inspection requirements and procedures for regulators and OPPDs; vault inspection requirements and procedures; documentation.

Module Number: 521 **Title:** System Uprating
Prerequisites: 101, 102, 103, 104, 261, 271, 463, 512
Description: Requirements and procedures for increasing system operating pressure Topics include: Uprating terminology including MAOP and SMYS; pipe and components; uprating decision factors; field uprating procedures; documentation.

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The following training material cross-reference guide is to assist operators in referencing Midwest Energy Association (MEA) training materials that are available. MEA training materials are a suggested type of training materials available to operators and are not required under the IAMU program. If other training material is used, that material should be documented in Division 7.

MEA is a consortium of energy industry organizations that pursue operational excellence by providing training and information resources for themselves and other organizations to enhance employee safety, productivity, and positive customer relations. MEA accomplish this by:

1. Seeking opportunities that leverage the power of association.
2. Connecting members so needs are expressed, information is shared, and problems are solved.
3. Pooling expertise and dollars to create unique, high value services.
4. Sponsoring major operating conferences, workshops and classes.
5. Creating "distance" or packaged training and certification services such as computer, video and workbook programs; tests and evaluations.
6. Developing compliance tools to meet OSHA, EPA and DOT regulations.

VIDEOS *This program is no longer distributed as of Jan 2003.*
The OQTP was developed to help natural gas operators and other users train and re-qualify their employees in basic safety subjects.

This qualification training is designed to comply with U. S. Department of Transportation (DOT) standards mandated by the Pipeline Safety Act of 1992. Minimum Federal safety standards for natural gas pipelines are published by DOT in Title 49 of the Code of Federal Regulations, part 192 (49 CFR §192).

The OQTP is a "generic" training course that serves many audiences. The core of the program covers common procedures and requirements for complying with Federal regulations and maintaining safe work conditions. The modular structure of the program allows individual Companies to add information to tailor the instruction to their own regional, State, or corporate policies.

OQforAll
More than eight years of development and testing have produced OQ for all, OQ for all is designed to complement your current training program and apprenticeship practices, providing everything you need to successfully meet the DOT Operator Qualification (OQ) Regulation.

Q41
The Q41 evaluation materials were developed using a process to ensure the reliability and validity of the materials. The development process relied on input from subject matter experts. The materials are designed to evaluate an individual's ability to perform covered tasks in accordance with the requirements in Title 49, Code of Federal Regulations, Part 192. In addition, the materials are designed to evaluate an individual's ability to recognize and react to abnormal operating conditions as required by the 49 CFR 192, Subpart N, Qualification of Pipeline Personnel.

APPENDIX 1

MEA TRAINING MATERIAL CROSS-REFERENCE GUIDE

REQUIRED COMPETENCIES AND SKILLS

(Protocols 1.05, 2.02, 4.01, 5.02 §192.803/195.503, §192.805/195.505, §192.809/195.509 Amdt 192-90, 8-20-01)

	Competencies and Skills	Suggested Training Reference[1]	Q41 References	OQforAll References
Sec. 1	**Fundamentals of Natural Gas**			
1.1	Characteristics and hazards of natural gas	Gas Fundamentals Training, MEA-101	Abnormal Operating Conditions Test	192-0101 Characteristics and Hazards of Natural Gas
1.2	Potential ignition sources: indoor and outdoor	Gas Fundamentals Training, MEA-102	Abnormal Operating Conditions Test	192-102 192-2011 Prevention of Accidental Ignition
1.3	Recognizing emergency conditions	Gas Fundamentals Training, MEA-103	CTS-2011 Prevention of Accidental Ignition	Abnormal Operating Conditions Module
1.4	Recognizing and reporting natural gas leaks	Gas Fundamentals Training, MEA-104	CTS-1201 Leakage Survey: Distribution & Transmission	192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
Sec. 2	**Record keeping**			
2.1	Documenting materials and installation records	Operator's workshop, O&M Manual MEA-402	N/A	N/A
2.2	Documenting maximum allowable operating pressure (MAOP)	Operator's Workshop, O&M Manual MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance CTS-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS CTS-2302 Uprating Steel Pipelines to a Pressure that	192-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS 192-2302 Uprating Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS

			will Produce a Hoop Stress Less than 30% SMYS	
2.3	System up-rating	Operator's Workshop, MEA-521	CTS-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead Ends CTS-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS CTS-2302 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS	192-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead-ends 192-2301 Uprating Steel Pipelines to a Pressure that will Produce a Hoop Stress 30% or More of SMYS 192-2302 Uprating Pipelines to a Pressure that will Produce a Hoop Stress Less than 30% SMYS
2.4	Investigating and documenting line failure	Operator's Workshop, MEA-462	N/A	Abnormal Operating Conditions Module
2.5	Accident reporting	Operator's Workshop, O&M Manual, MEA-103	N/A	Abnormal Operating Conditions Module
Sec. 3	**Marking and Mapping Facilities**			
3.1	Locating facilities using the conductive method	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.2	Locating facilities using the inductive method	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.3	Locating facilities using the inductive method (two persons)	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines	192-0801 Locating Pipelines
3.4	Determining depth through triangulation	Operator's Workshop, Manufacturer's Procedures, MEA-402	CTS 0801 Locating Pipelines CTS 1417 Protection When Minimum Cover Not Met	192-0801 Locating Pipelines 192-1417 Protection when Minimum Cover not Met
3.5	System mapping	Operator's Workshop MEA-402	CTS 0901 System Patrolling	192-0901 System Patrolling
Sec. 4	**Fundamentals of Field Safety in Construction, Operation, and Maintenance**			
4.1	Personal protective equipment	OSHA compliance manual and training, MEA-111	N/A	N/A
4.2	Power tool safety	OSHA compliance manual and training, MEA-121	N/A	N/A
4.3	Proper firefighting	Emergency Procedures Training, MEA-122		

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	techniques	Training, MEA-122	N/A	N/A
4.4	Controlling the accidental release of gas	Emergency Procedures Training, MEA-131	Abnormal Operating Conditions Test	Abnormal Operating Conditions Module
4.5	Soil subsidence	OSHA compliance manual and training, MEA-201	CTS 1402 Backfilling	192-1402 Backfilling
4.6	Atmospheric corrosion	Operator's Workshop, MEA-202	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
4.7	Recognizing unsafe meter sets	MEA-211	CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)	192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)
4.8	Confined space entry (vaults, etc.)	OSHA compliance manual and training, MEA-501	CTS 1802 Vault Maintenance	192-1802 Vault Maintenance
4.9	Job site protection	Compliance manual and training, MEA-MEA-401	N/A	N/A
4.10	Purging safety	Operator's Workshop, MEA-422	CTS 1418 Purging	192-1418 Purging
4.11	Pressure testing steel and plastic pipeline	Operator's Workshop, MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test - Service Lines, Mains, and Transmission Lines
4.12	Abandoning facilities	Operator's Workshop, MEA-471	CTS 1401 Abandonment or Inactivation of Facilities	192-1401 Abandonment or Inactivation of Facilities
4.13	Excavation safety	OSHA compliance manual and training, MEA-404	New CTS 12/03	N/A
Sec. 5	**Fundamentals of Gas Leaks - Survey and Response**			
5.1	Leak classification	Emergency Procedures Training, Gas Fundamentals Training, MEA-221	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.2	Procedures for leak surveys and patrols	Operator's Workshop, MEA-271	CTS 1201 Leakage Survey: Distribution & Transmission	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside

			CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.3	Combustible gas indicators	Operator's Workshop, Manufacturer's Procedures MEA-231	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.4	Electronic gas detectors	Operator's Workshop, Manufacturer's Procedures, MEA-231	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.5	Flame ionization	Operator's Workshop, Manufacturer's Procedures MEA-232	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
5.6	Bar hole testing and purging	Operator's Workshop, MEA-261	CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
Sec. 6	**Fundamentals of Customer Service**			
6.1	Carbon monoxide (CO) testing	Operator's Workshop, MEA-241	N/A	192-0101 Characteristics and Hazards of Natural

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				Gas
6.2	Investigating leaks	Operator's Workshop, MEA-272	CTS 1201 Leakage Survey: Distribution & Transmission CTS 1202 Outside Leakage Investigation, Pinpointing, and Grading CTS 1203 Inside Gas Leakage Investigation	192-1201 Leakage Survey: Distribution and Transmission 192-1202 Outside Gas Leakage Investigation, Pinpointing, and Grading 192-1203 Inside Gas Leakage Investigation
6.3	Combustion and ventilation air requirements	Operator's Workshop, MEA-301	N/A	N/A
6.4	Pilot light operation	Operator's Workshop, MEA-311, 324	N/A	N/A
6.5	Gas-air adjustment	Operator's Workshop, MEA-312	N/A	N/A
6.6	Appliance venting	Operator's Workshop, MEA-313	N/A	N/A
6.7	Pressure checks to establish gas service	Operator's Workshop, MEA-321	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines
6.8	Establishing and disconnecting gas	Operator's Workshop, MEA-322	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines CTS 2014 Service Lines Not In Use and Service Discontinuance	192-1301 Leak and Strength Test -- Service Lines, Mains, and Transmission Lines 192-2014 Service Lines Not In Use and Service Discontinuance
Sec. 7	**Fundamentals of Construction**	Operator's Workshop, MEA-321	N/A	N/A
7.1	Pressure testing steel and plastic pipeline	Operator's Workshop, MEA-421	CTS 1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines	192-1301 Leak and Strength Test – Service Lines, Mains, and Transmission Lines
7.2	Procedures for abandoning facilities	Operator's Workshop, MEA-471	CTS 1401 Abandonment or Inactivation of Facilities	192-1401 Abandonment or Inactivation of Facilities
7.3	Cathodic protection (general)	Operator's Workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System

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				Testing
7.4	Constructing facilities across streets, railroads, and waterways	Operator's Workshop, MEA-453	CTS 1404 Casing Vents and Seals	192-1404 Casing Vents and Seals
7.5	Operating thermite welder	Operator's Workshop, Manufacturer's Procedures, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
7.6	Installing tracer wire	Operator's Workshop, DOT Small Gas Operators Manual MEA-451, 452	CTS 1408 Installation of Plastic Pipe CTS 1409 Installation of Steel Pipe	192-1408 Installation of plastic pipe 192-1409 Installation of Steel Pipe
7.7	Installing valves	Operator's Workshop, MEA-451	CTS 1427 Valve Maintenance	192-1427 Valve Maintenance
7.8	Steel and cast iron repair fittings	Operator's Workshop, Manufacturer's Procedures, MEA-461	CTS 1001 Cast Iron Joints - Sealing CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) CTS 1430 Internal Sealing - Cast Iron and Ductile Iron Segments	192-1001 Cast Iron Joints – Sealing 192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines) 192-1430 Internal Sealing - Cast Iron and Ductile Iron Segments
7.9	Maintaining steel and cast iron mains	Operator's Workshop, MEA-462	CTS 1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines	192-1422 Segment Repair, Replacement, Etc. (Service Lines, Mains and Transmission Lines)
7.10	Reinforcing steel and plastic mains	Fusion Workshop, MEA-463	CTS 1424 Support, Expansion Joints and Anchor Maintenance - Exposed Pipeline	192-1424 Support and Anchor Maintenance - Exposed Pipeline
7.11	Plastic pipe joining (fusion)	Fusion Workshop, MEA-411	CTS 1001 Cast Iron Joints - Sealing CTS 1002 Plastic Pipe – Electrofusion CTS 1003 Plastic Pipe - Butt Heat Fusion CTS 1004 Plastic Pipe – Sidewall Heat Fusion	192-1001 Cast Iron Joints– Sealing 192-1002 Plastic Pipe – Electrofusion 192-1003 Plastic Pipe - Butt Heat Fusion 192-1004 Plastic Pipe - Sidewall Heat Fusion
7.12	Plastic pipe joining (mechanical	Operator's Workshop, MEA-463	CTS 0803 Inspection for Damage	192-0803 Inspection for

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	(mechanical couplings)			Damage
7.13	Recognition of defective material	Operator's Workshop, MEA-411, 412, 421	CTS 1411 Inspection	192-1411 Inspection
7.14	Steel pipe joining by welding	Pipeline Welding Workshop, Qualified Welding Procedures	CTS 2401 Welding	192-2401 Welding
7.15	Steel pipe joining by mechanical couplings	Operator's Workshop, Operator's Workshop, MEA-412	CTS 1005 Mechanical Joints	192-1005 Mechanical Joints
7.16	Damage prevention	Operator's Workshop, MEA-462	CTS 0803 Inspection for Damage	192-0803 Inspection for Damage
7.17	Application of padding and shielding	Operator's Workshop, MEA-453	CTS 1402 Backfilling	192-1402 Backfilling
7.18	Replacing emergency valves	Operator's Workshop, MEA-441, 511	N/A	N/A
7.19	Installing meter sets	Operator's Workshop, MEA-211, 322, 452	CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-1803 Pressure Regulating, Limiting, and Relief Device -Operation and Maintenance
7.20	Tapping and stopping steel pipe 1" through 4"	Operator's Workshop, MEA-441	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.21	Tapping and stopping steel pipe 6" through 8"	Operator's Workshop, Manufacture's Procedures	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.22	Tapping and stopping polyethylene pipe	Operator's Workshop, MEA-451, 452	CTS 1426 Tapping Steel and Plastic Pipe	192-1426 Tapping Steel and Plastic Pipe
7.23	Vault abandonment	Operator's Workshop, MEA-471, 501	CTS 1802 Vault Maintenance	192-1802 Vault Maintenance
Sec. 8	**Fundamentals of Construction – Heavy Equipment Operation**	Operator's Workshop, MEA-462 Pipeline Welding Workshop	CTS 0803 Inspection for Damage CTS 1402 Backfilling	192-0803 Inspection for Damage 192-1402 Backfilling
8.1	Operating backhoe	Operator's Workshop, MEA-403	N/A	N/A
8.2	Operating trencher	Operator's Workshop, Manufacturer's Procedures, MEA-403	N/A	N/A
8.3	Operating boring equipment	Operator's Workshop, Manufacturer's Procedures	N/A	N/A
8.4	Ditch and backfill inspection	Operator's Workshop, MEA-404	CTS 1402 Backfilling	192-1402 Backfilling
Sec. 9	**Fundamentals of Measurement and Control**	Operator's Workshop, Manufacturer's Procedures	CTS 1803 Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-1803 Pressure Regulating, Limiting, and Relief Device -Operation and Maintenance

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9.1	Metering	Metering Workshop	N/A	N/A
9.2	Odorization measurement and control	Operator's Workshop, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
Sec. 10	**Corrosion Control**			
10.1	Cathodic protection	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance	192-0501 Cathodic Protection System Maintenance
10.2	Internal corrosion	Corrosion control workshop, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.3	External corrosion	Corrosion control workshop, MEA-431	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.4	Atmospheric corrosion	Corrosion control workshop, MEA-202	CTS 0401 Corrosion Monitoring – Atmospheric, External, and Internal	192-0401 Corrosion Monitoring - Atmospheric, External, and Internal
10.5	Coatings	Corrosion control workshop, MEA-431	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.6	Holiday detection (coating inspection)	Corrosion control workshop, MEA-431	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.7	Painting and jacketing above ground facilities	Corrosion control workshop, MEA-202	CTS 0402 Coating Maintenance	192-0402 Coating Maintenance
10.8	Installation of cathodic protection (sacrificial anode system)	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
10.9	Installation of impressed current system	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
10.10	Inspection, monitoring cathodic protection system	Corrosion control workshop, MEA-431	CTS 0501 Cathodic Protection System Maintenance CTS 0503 Cathodic	192-0501 Cathodic Protection System Maintenance 192-0503 Cathodic

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			Protection Systems - Electrical Connections CTS 0505 Cathodic Protection System Testing	Protection Systems - Electrical Connections 192-0505 Cathodic Protection System Testing
Sec. 11	**Odorization**			
11.1	Operating and maintaining differential odorant system	Operator's Workshop, O&M Manual, MEA-251	CTS 0501 Cathodic Protection System Maintenance	192-0501 Cathodic Protection System Maintenance
11.2	Operating and maintaining injection odorant system	Operator's Workshop, O&M Manual, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
11.3	Testing odorant level	Operator's Workshop, O&M Manual, MEA-251	CTS 1501 Odorization – Mains and Transmission Lines	192-1501 Odorization - Mains and Transmission Lines
Sec. 12	**Other Operating and Maintenance Skills**		Protection Systems -	Protection Systems
12.1	Operating valves (including emergency valves), regulators, and relief valves	Operator's Workshop, O&M Manual, MEA-244, 511, 512	CTS 0701 Locating, Installing, and Protecting Customer Meters and Regulators CTS 0702 Customer Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-0701 Locating, Installing, and Protecting Customer Meters and Regulators 192-0702 Customer Pressure Regulating, Limiting, and Relief Devices - Operation and Maintenance
	Competencies and Skills	**Suggested Training Reference[1]**	**Q41 References**	**OQforAll References**
12.2	Inspecting pressure regulating and limiting stations	Operator's Workshop, O&M Manual, MEA-512	CTS 0701 Locating, Installing, and Protecting Customer Meters and Regulators CTS 0702 Customer Pressure Regulating, Limiting, and Relief Device – Operation and Maintenance	192-0701 Locating, Installing, and Protecting Customer Meters and Regulators 192-0702 Customer Pressure Regulating, Limiting, and Relief Devices - Operation and Maintenance

12.3	Inspecting and maintaining key valves	Operator's Workshop, O&M Manual, MEA-511	CTS 1427 Valve Maintenance	192-1427 Valve Maintenance
12.4	System uprating	Operator's Workshop, O&M Manual, MEA-521	CTS 1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead Ends	192-1419 Uprating: Reinforce or Anchor Offsets, Bends, and Dead-ends
Sec. 13	**Operating Peak Shaving Plant (Propane/air mixture/injection)**			
13.1	Pre-start-up procedures	O&M Manual, Emergency shut down procedures	N/A	N/A
13.2	Start-up/operating procedures/shut down in accordance with operators manual for specific equipment	O&M Manual, Emergency shut down procedures	CTS 0301 Operating Gas Compressor Units CTS 0302 Shutting Down Gas Compressor Units	192-0301 Operating a Gas Compressor Unit 192-0302 Shutting Down a Gas Compressor Unit

[1]Reference to operator training refers to workshops conducted by state and regional associations, such as the Iowa Association of Municipal Utilities and the Midwest Energy Association (formerly known as Midwest Gas Association), manufacturers and distributors of gas industry products and equipment, state regulatory agencies, and other organizations. Specific references to MEA materials are to training modules in the Midwest Energy Association's Operator Qualification Training series.

Research and Special Programs Administration

Office of Pipeline Safety

MODEL ANTI-DRUG PLAN

DISCLAIMER: The information contained in the enclosed Research and Special Programs Administration model anti-drug plan is provided as written guidance to assist pipeline operators, contractors, consortium, and third-party providers in complying with the drug test provisions in 49 CFR 199 and 40.

This document may be utilized as a basic working tool to assist various entities in the development of a written anti-drug plan as required by §199.7(a). This document is not intended to require an operator/contractor to replace its current anti-drug plan. However, it can be used as a guide or template in developing specific language for inclusion in an anti-drug plan to satisfy the numerous drug inspection items.

This model plan contains numerous "Notes" on specific areas of the drug regulations and provides options for consideration and use by a company. A company should not merely copy this entire document and use it to satisfy the requirements set forth in 49 CFR Part 199 and Part 40 without addressing the various "Notes" listed throughout the document. One example of the "Notes" that has to be addressed concerns whether an operator terminates or offers an employee the opportunity for rehabilitation. A company must address what type of action(s) they will subject their employee to with regard to testing positive or refusing to submit to a test.

This page is for informational purposes only and is not intended for inclusion in the company's anti-drug plan.

MODEL ANTI-DRUG PLAN

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MODEL ANTI-DRUG PLAN

SECTION I. INTRODUCTION

A. Prohibited Drug Policy.

1. The company has a long-standing commitment to maintain the highest standards for employee safety and health and the use of controlled substances is contrary to these high standards.

2. This policy is also to bring the company into compliance with federal law. The purpose of the anti-drug plan is to reduce accidents that result from the use of controlled substances, thereby reducing fatalities, injuries, and property damage.

3. The presence in the body of prohibited substances is not condoned.

B. Implementation of Anti-Drug Plan.

1. The company has implemented the Research and Special Programs Administration, Drug Testing Regulations as set forth in 49 CFR Part 199 and the Department of Transportation, Procedures for Transportation Workplace Drug Testing Programs as set forth in 49 CFR Part 40.

2. Implementation of the anti-drug plan was effective on _____.

C. Background.

1. The catalyst for the anti-drug plan is Title 49 Code of Federal Regulations (CFR) Part 199 which requires the pipeline operators subject to 49 CFR Parts 192, 193, and 195, and their contractors to test their employees for prohibited drugs under the following work-related conditions:

   a. Pre-Employment

   b. Post-Accident

   c. Random

   d. Reasonable Cause

   e. Return-to-Duty

2. Title 49 CFR Part 40 specifies procedures which must be followed by the company when conducting drug testing pursuant to regulations issued by agencies of the Department of Transportation (DOT).

NOTE: Specific Definitions: An operator must address the definition of "accident" under § 191.3 and/or § 195.50 and the definition of a "Covered Employee." The remaining definitions listed in Section D are optional; however, they may provide further clarification for employees on a number of common terms used throughout this anti-drug plan.

D. Definitions.

For purposes of this anti-drug plan the following definitions apply:

1. Accident – an incident reportable under Part 191 involving gas pipeline facilities or LNG facilities or an accident reportable under Part 195 involving hazardous liquid or carbon dioxide pipeline facilities.

   a. **§ 191.3 – An accident on a gas pipeline or LNG facility is defined as an "incident," as follows:**

      (1) An event that involves a release of gas from a pipeline or of liquefied natural gas or gas from an LNG facility and:

         (a) A death, or personal injury necessitating inpatient hospitalization; or

         (b) Estimated property damage, including cost of gas lost, to the operator or others, or both, of $50,000 or more.

      (2) An event that results in an emergency shutdown of an LNG facility.

      (3) An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2).

   b. **§ 195.50 – An accident report is required for each failure in a pipeline system in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:**

      (1) Explosion or fire not intentionally set by the operator.

      (2) Loss of 50 or more barrels of hazardous liquid or carbon dioxide.

(3) Escape to the atmosphere of more than five barrels a day of highly volatile liquids.

(4) Death of any person.

(5) Bodily harm to any person resulting in one or more of the following:

(a) Loss of consciousness.

(b) Necessity to carry the person from the scene.

(c) Necessity for medical treatment.

(d) Disability which prevents the discharge of normal duties or the pursuit of normal activities beyond the day of the accident.

(6) Estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

2. Blind Sample – a urine specimen submitted to a laboratory for quality control testing purposes, with a fictitious identifier, so that the laboratory cannot distinguish it from employee specimens, and which is spiked with known quantities of specific drugs or which is blank, containing no drugs.

3. Chain-of-Custody – procedures to account for the integrity of each urine specimen by tracking its handling and storage from point of specimen collection to final disposition of the specimen. These procedures shall require that an appropriate drug testing custody form from a Department of Health and Human Services (DHHS) certified laboratory be used from time of collection to receipt by the laboratory.

4. Collection Site – a designated clinic/facility where applicants or employees may present themselves for the purpose of providing a specimen of their urine to be analyzed for the presence of drugs.

5. Collection Site Person – a person who instructs and assists applicants and employees through the specimen collection process.

6. Company – an organization or commercial enterprise that uses this anti-drug plan.

7. Confirmation Test – a second analytical procedure to identify the presence of a specific drug or metabolite that is independent of the initial test and which uses a different technique and chemical principle from that of the initial test in order to ensure reliability and accuracy. Gas chromatography/mass spectrometry (GC/MS) is the only authorized confirmation method for cocaine, marijuana, opiates, amphetamines, and phencyclidine (PCP).

8. Covered employee – any person who performs on a pipeline or LNG facility an operating, maintenance, or emergency response function regulated by Parts 192, 193, or 195. Such person may be employed directly by the operator, or by a contractor engaged by the operator. As applied in the regulations, "employee" and "applicant for employment" have the same meaning for the purpose of these requirements. Clerical, truck driving, accounting, or other job functions not covered by Parts 192, 193, and 195 are not subject to the regulations.

9. Covered Function (safety-sensitive function) – an operation, maintenance, or emergency-response function that is performed on a pipeline or LNG facility and the function is regulated by Parts 192, 193, or 195.

10. Fail a Drug Test or Test Positive – the confirmation test result shows positive evidence of the presence under DOT procedures of a prohibited drug in the employee's or applicant's system.

11. Initial Test – an immunoassay screen to eliminate "negative" urine specimens from further consideration.

12. Operator – an owner or operator of pipeline facilities.

13. Pass a Drug Test or Test Negative – that initial testing or confirmation testing under DOT procedures does not show evidence of the presence of a prohibited drug in the employee's or applicant's system.

14. Pipeline – all parts of the physical facilities through which product moves in transportation. This includes pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, delivery stations, holders, and fabricated assemblies.

15. Pipeline Facilities – includes new and existing pipeline, rights-of-way, and any equipment, facility, or building used in the transportation of products.

16. Prohibited Drug – marijuana, cocaine, opiates, phencyclidine, and amphetamines.

17. Refusal to Submit – refusal by an individual to provide a urine sample after receiving notice of the requirement to be tested in accordance with the company's anti-drug program.

18. SAMHSA – Substance Abuse and Mental Health Services Administration, formerly National Institute on Drug Abuse (NIDA), was established by the Department of Health and Human Services in 1986 to regulate laboratories performing analytical tests (drug tests) on human body fluids for employment purposes in the public sector.

19. Substance Abuse Professional (SAP) – a licensed physician (Medical Doctor or Doctor of Osteopathy), or a licensed or certified psychologist, social worker, or employee assistance professional; or an addiction counselor (certified by the National Association of Alcoholism and Drug Abuse Counselors Certification Commission or by the International Certification Reciprocity Consortium/Alcohol & Other Drug Abuse). All must have knowledge of and clinical experience in the diagnosis and treatment of alcohol and controlled substances-related disorders.

E. Company Responsibilities.

1. Drug Program Manager (DPM): Appendix A contains the name, address, and phone number of the responsible individual(s). The DPM or other company designated individual shall be responsible for the preparation of a drug testing anti-drug plan which complies with requirements of the Department of Transportation regulations as set forth in 49 CFR Parts 199 and 40. The DPM shall be responsible for providing oversight and evaluation on the plan; providing guidance and counseling; reviewing of all discipline applied under this plan for consistency and conformance to human resources policies and procedures; scheduling random drug testing and return-to-duty testing; maintaining a locked file system on drug testing results; and overseeing the employee assistance program (EAP) as it is defined in 49 CFR Part 199.19. The company shall ensure that all covered employees are aware of the provisions and coverage of the company's anti-drug plan.

2. Supervisors: Company individuals responsible for observing the performance and behavior of employees; observation/documentation of events suggestive of reasonable cause; responsible for requests of second supervisor for substantiation and concurrence for reasonable cause testing, if applicable.

3. Employees: Each employee has the responsibility to be knowledgeable of the requirements of the company's anti-drug plan and to fully comply with the provisions of the plan.

SECTION II. DRUG TESTING REQUIREMENTS

A. Applicability.

1. Individuals Subject to Drug Testing: Any applicant/employee who would perform on a pipeline, an operating, maintenance, or emergency response function regulated by Part 192, 193, or 195, would be subject to drug testing under this program. This does not include clerical, truck driving, accounting, or other functions not subject to Part 192, 193 or 195. The person may be employed by the operator, be a contractor engaged by the operator, or be employed by such a

contractor. Refer to Appendix B for specific employee titles subject to testing under this program.

2. Procedure for Notifying Employees: This anti-drug testing plan shall be included in the appropriate company manual. Upon receipt of the company's anti-drug plan, each manager shall post the plan in a prominent location that is readily accessible to all covered employees. All covered employees will be provided a complete copy of the anti-drug plan or a condensed/summarized version of the plan. This document must indicate where an employee may obtain the entire plan for review.

3. Substances for Which Testing Must Be Conducted: The company shall test each employee who performs a function listed in Appendix B for evidence of the following substances:

Marijuana, Cocaine, Opiates, Phencyclidine, and Amphetamines

NOTE: Under § 199.7(a) operators must provide procedures for notifying employees of the coverage and provisions of the plan. An operator may satisfy this requirement by either of the following methods: (1) Provide each employee with a copy of the company anti-drug plan; (2) Provide a summarized version of the anti-drug plan; or, (3) Display the anti-drug plan or summarized version on an employee bulletin board or in an employee break/locker room. If the entire plan is not provided to employees, then the summarized version shall indicate where a complete copy of the company's anti-drug plan is available for review by the employees.

B. Drug Tests Required.

1. Pre-Employment Testing. A pre-employment drug test must be conducted before an individual is hired or contracted and when an individual is transferred/promoted from a non-covered to a covered position. This includes when an individual switches back and forth from a covered position to a non-covered position and back again (i.e., going in and out of the random testing program). This also applies to employees returning from a leave of absence who have not been participating in the anti-drug plan and subject to the random selection process. A negative test result is required prior to performing covered functions

2. Post-Accident Testing.

   a. The company shall promptly determine if the employee's performance contributed to the "accident" or cannot be completely discounted as a contributing factor to the accident. Each of these employees shall be drug tested as soon as possible but no later than 32 hours after the accident. The company must take all reasonable steps to obtain a urine specimen

from an employee after an accident, as defined above, but any injury should be treated first.

b. The following steps will be used to guide the supervisor to a satisfactory outcome in a post-accident situation.

(1) Verify the post-accident decision. Does the definition of accident in Section I apply to the current situation. Does the possibility exist that the employee's performance contributed to the accident or cannot be completely discounted as a contributing factor to the accident? Anonymous tips must be taken seriously, but should not be the sole reason to initiate a request for a specimen. If witnesses saw a specific event or behavior, ask them to describe what they saw. How far away were they? Before proceeding further, obtain approval from the division manager/department head or designee to proceed with post-accident testing.

(2) Isolate and inform the employee. Remove the employee from the covered position or work place. Explain that you have reason to believe their performance contributed to the accident or cannot be completely discounted as a contributing factor to the accident.

(3) Transport the employee. The potentially affected employee will not be allowed to proceed alone to or from the collection site. In addition to the safety concerns for the employee, accompanying the employee also assures that there is no opportunity en route to the collection site for the employee to ingest anything that could affect the test result or to acquire "clean" urine from another person.

(4) Document the events. Record the activity performed that supports the determination to conduct a post-accident test. This documentation of the employee's activity should be prepared and signed by the supervisor within 24 hours of the accident or before the results of the tests are released, whichever is earlier, if possible.

(5) Denial should be an expected reaction. If a person knows they will test positive, they may give many explanations and protestations, wanting to avoid drug testing. If they are not under the influence or affected by a prohibited drug, vehement denial also would be expected. Listen to the employee and carefully evaluate the employee's explanation. Remember, a request for urine specimen is not an accusation; it is merely a request for additional objective data. To the employee it may feel like an accusation; so it is important to stress that this is merely a request for additional data.

(6) Following collection. After returning from the collection site, the employee should not be allowed to perform covered functions pending the results of the drug test.

3. Random Testing.

a. The primary purposes of random testing are to deter prohibited drug use and to ensure a drug free workforce. DOT regulations require that covered employees shall be subject to drug testing on an unannounced and random basis. The company shall conduct a number of tests equal to at least **25** percent of all covered employees each calendar year, spread reasonably over a 12-month period. The company will conduct random selection and testing on a _____ schedule. (Specify period - e.g., weekly, bi-monthly, monthly, quarterly).

b. The following is a discussion of the key aspects of the random testing selection process.

(1) Employees remain in the random selection pool at all times, regardless of whether or not they have been previously selected for testing.

(2) Employees shall be selected for testing by using a computer-based random number generator or equivalent random selection method that is matched with an employee's social security number or employee ID number.

(3) The process will be unannounced as well as random. Employees will be notified that they have been selected for testing after they have reported for duty on the day of collection.

(4) Employees will be selected for random testing based on the number of covered employees at the time and the necessary testing rate.

(5) Specimen collection will be conducted on different days of the week throughout the annual cycle to prevent employees from matching their drug use patterns to the schedule for collection.

c. Steps for random testing:

(1) The DPM (or designee), on a pre-determined date, shall use the random selection procedures to compile a list of covered employees selected for random testing during that testing cycle.

(2) The DPM (or designee) shall ensure that the list of social security numbers or employee identification numbers will identify the correct employees who are to be randomly tested during the testing cycle.

(3) It is the intent of this plan to notify employees of their selection for random testing after they have reported for duty.

(a) The list of employees to be tested will be provided to the appropriate division manager, department head, or supervisor.

(b) The list of employees selected will be retained by the DPM (or designee) in a secure location.

d. Notification of employees:

(1) The appropriate manager/supervisor will notify the employee to be tested to report to the manager/supervisor's office at a specified time.

(2) The employee will not be notified of the test until after reporting for duty.

(3) Employees shall report immediately to the collection site or to the collection site within 30 minutes, plus travel time, once notified by the appropriate company official.

4. Reasonable Cause Testing. Reasonable cause testing is designed to provide management with a tool (in conjunction with supervisor training on the signs and symptoms of drug use) to identify drug affected employees who may pose a danger to themselves and others in their job performance. Employees may be at work in a condition that raises concern regarding their safety or productivity. Supervisors must then make a decision as to whether there is reasonable cause to believe an employee is using or has used a prohibited drug.

a. The decision to test must be based on a reasonable and articulate belief that the employee is using a prohibited drug on the basis of specific, contemporaneous physical, behavioral, or performance indicators of probable drug use. At least two of the employee's supervisors, one of whom is trained in detection of the possible symptoms of drug use, shall substantiate and concur in the decision to test an employee. The concurrence by both supervisors can be accomplished by phone, by discussions a few hours later, or by having another supervisor travel to the job site, if only one supervisor is available at that particular job site.

NOTE: For small companies with 50 or fewer employees subject to testing only one supervisor of the employee trained in detecting possible drug use symptoms shall substantiate the decision to test.

b. In making a determination of reasonable cause, the factors to be considered include, but are not limited to the following:

(1) Adequately documented pattern of unsatisfactory work performance, for which no apparent non-impairment related reason exists, or a change in an employee's prior pattern of work performance, especially where there is some evidence of drug related behavior on or off the work site.

(2) Physical signs and symptoms consistent with substance abuse.

(3) Evidence of illegal substance use, possession, sale, or delivery while on duty.

(4) Occurrence of a serious or potentially serious accident that may have been caused by human error, or flagrant violations of established safety, security, or other operational procedures.

NOTE: This information is presented as guidance in determining whether reasonable cause exists to require an employee to submit to a drug test.

c. The following steps will be used to guide the supervisor to a satisfactory outcome in a reasonable cause situation.

(1) Verify the reasonable cause decision. Anonymous tips must be taken seriously, but should not be the sole reason to initiate a request for a specimen. Hearsay is not an acceptable basis for reasonable cause referral. If witnesses saw a specific event or behavior, ask them to describe what they saw. How far away were they? How long did they observe the person? What, if anything, caused them to believe it was substance abuse related? On what basis did they reach their conclusion? Before proceeding further, obtain approval from the division manager/department head or designee to proceed with reasonable cause testing.

(2) Isolate and inform the employee. Remove the employee from the work location. Explain that there is reasonable cause to believe the employee's performance is being affected by some substance. Ask the employee to explain the suspected behavior and to describe the events that took place from their perspective. Ask if there is any medication or physical condition that would explain the behavior. A persuasive explanation may or may not deter you from asking for a urine sample. If there is still a reasonable belief that drugs are a factor in the situation/incident, a request for testing should be

made; if no reasonable belief is determined then no request for testing should not be made. If the decision to test is made, inform the employee that they are being requested to accompany the appropriate official to the specimen collection site to provide a urine specimen. Inform the employee of the consequences of refusal to submit to testing.

(3) Review your findings. During the conversation, observe physical and mental symptoms. Be sure to document any characteristics that either support or contradict initial information. In all cases, a reasonable cause decision must be made by two of the employee's supervisors. This creates greater objectivity, provides additional observation, and generally strengthens the defensibility of the reasonable cause determination.

(4) Transport the employee. The potentially affected employee should not be allowed to proceed alone to or from the collection site. In addition to the safety concerns for the employee, accompanying the employee also assures that there is no opportunity en route to the collection site for the employee to ingest anything that could affect the test result or to acquire "clean" urine from another person.

(5) Document the events. Record the behavioral signs and symptoms that support the determination to conduct a reasonable cause test. This documentation of the employee's conduct should be prepared and signed by the witnesses within 24 hours of the observed behavior or before the results of the tests are released, whichever is earlier.

(6) Denial should be an expected reaction. If a person knows they will test positive, they may give many explanations and protestations, wanting to avoid drug testing. If they are not under the influence or affected by a prohibited drug, vehement denial also would be expected. Listen to the employee and carefully evaluate the employee's explanation. Remember, a request to provide a urine specimen is not an accusation; it is merely a request for additional objective data. To the employee it may feel like an accusation; so it is important to stress that this is merely a request for additional data.

(7) Following collection. After returning from the collection site, the employee shall not perform duties pending the receipt of the drug test results. The employee should make arrangements to be transported home. The employee should be instructed not to drive any motor vehicle due to the reasonable cause belief that they may

be under the influence of a drug. If the employee insists on driving, the proper local enforcement authority should be notified that an employee who we believe may be under the influence of a drug is leaving the company premises driving a motor vehicle.

5. Return-to-Duty Testing. A covered employee who refuses to take or fails a drug test may not return to duty until the employee passes a drug test and has a face-to-face evaluation by a substance abuse professional. An employee who returns to duty shall be subject to a reasonable program of follow-up drug testing, without prior notice, for up to 60 months after his or her return to duty.

6. Follow-up Testing. A covered employee who refuses to take or has a positive drug test shall be subject to unannounced follow-up drug testing administered by the operator following the covered employee's return to duty. The number and frequency of such follow-up testing shall be determined by a substance abuse professional, but shall consist of at least six tests in the first 12 months following the covered employee's return to duty. In addition, follow-up testing may include testing for alcohol as directed by the substance abuse professional, to be performed in accordance with 49 CFR part 40. Follow-up testing shall not exceed 60 months from the date of the covered employee's return to duty. The substance abuse professional may terminate the requirement for follow-up testing at any time after the first six tests have been administered, if the substance abuse professional determines that such testing is no longer necessary.

NOTE: Return-to-Duty testing and Follow-up testing are not an option under this plan if the company terminates an employee who has tested positive or refuses to test. A statement to this effect would appear under the return-to-duty testing section of the plan.

SECTION III. USE OF EMPLOYEE WHO FAILS OR REFUSES A DRUG TEST

A. General. Compliance with this drug testing plan is a condition of employment. Refusal to take a required drug test or failure of a drug test shall result in removal from performing covered functions. Additional disciplinary action up to and including termination may result.

B. Prohibitions On Use. The company shall not use, in a function covered by Part 199, anyone who:

1. Fails a drug test as verified by the MRO, or

2. Refuses to take a drug test required by this plan.

C. Options For Return-to-Duty. An employee will be given an opportunity to retain his or her employment, provided they first:

1. Have been evaluated face-to-face by a SAP, followed any recommendations for drug misuse assistance, if needed,

2. Pass a DOT drug test, and

3. Not failed a drug test required by Part 199 after returning to duty.

SECTION IV. SPECIMEN COLLECTION REQUIREMENTS

A. Scope.

1. The procedures contained herein and in Appendix C shall be complied with by the designated collection sites and all covered employees who report for drug testing. The company will ensure that collection sites utilized by its employees are aware of their responsibilities with regard to the specimen collection process. The collection site shall post or have readily available instructions that explain the specimen collection process. If information on collector, donor, and company representatives' responsibilities are provided under separate cover by the company or the collection site, then the above requirement is not required.

2. The procedures address the requirements contained in § 40.25.

B. General.

1. The collection site shall have all necessary personnel, materials, equipment, facilities, and supervision to provide for the collection, security, temporary storage, and shipping or transportation of urine specimens to a certified drug-testing laboratory designated by the company. An independent medical facility may also be utilized as a collection site provided the other applicable requirements of Appendix C are met.

2. A designated collection site shall be any suitable location where a specimen can be collected under conditions set forth in Appendix C, including a properly equipped mobile facility. A designated collection site shall have an enclosure within which private urination can occur, a toilet for completion of urination, and a suitable clean surface for writing. The site must also have a source of water for washing hands, which if practicable, should be external to the enclosure where urination occurs.

3. The company shall ensure that all collection site personnel have completed training on specimen collection procedures or are qualified as a licensed medical professional. If non-medical collection sites are utilized, then the company shall ensure that appropriate training requirements are documented.

4. The direct supervisor of a covered employee shall not serve as a collector in conducting any required drug test unless it is impracticable.

5. Detailed Specimen Collection Procedures are outlined in Appendix C. These collection procedures are to be provided to the medical collection site personnel.

6. A copy of the standard written instructions setting forth the donor's or employee representative's responsibilities during the specimen collection must be provided prior to the test being conducted.

SECTION V. DRUG TESTING LABORATORY

A. NIDA Laboratory.

1. The company shall use a drug testing laboratory certified under DHHS Mandatory Guidelines for Federal Workplace Drug Testing Programs; 53 FR 11970, April 11, 1988 and subsequent amendments.

2. The laboratory shall provide services in accordance with Part 40 and Part 199. The name and address of each NIDA laboratory used by the company is contained in Appendix A.

3. The laboratory shall permit inspections by the company, the RSPA Administrator, or if the company is subject to the jurisdiction of a state agency, a representative of the state agency.

B. Laboratory Procedures. These procedures are addressed in Appendix D.

SECTION VI. BLIND PERFORMANCE TEST PROCEDURES

A. General.

1. The company shall use blind testing quality control procedures as provided in this section.

2. The company shall submit three blind performance test specimens for each 100-employee specimens it submits, up to a maximum of 100 blind performance test specimens submitted per quarter. RSPA may increase this per quarter maximum number of samples if doing so is necessary to ensure adequate quality control of employers or consortiums with very large numbers of employees.

B. Covered Employees.

1. For companies with 2,000 or more covered employees, approximately 80 percent of the blind performance test samples shall be blank (i.e., containing no drugs or otherwise as approved by DOT) and the remaining samples shall be positive for one or more drugs per sample in a distribution such that all the drugs to be tested are included in approximately equal frequencies of challenge. The positive samples shall be spiked only with those drugs for which the employer is testing. This paragraph shall not be construed to prohibit spiking of other (potentially interfering) compounds, as technically appropriate, in order to verify the specificity of a particular assay.

2. Companies with fewer than 2,000 covered employees may submit blind performance test specimens as provided in the above paragraph. Such companies may also submit only blank samples or may submit two separately labeled portions of a specimen from the same non-covered employee.

NOTES:

(1) Each company shall determine whether they must comply with paragraph 1 or 2 above with regard to the total number of DOT covered employees.

(2) Consortiums shall be responsible for the submission of blind samples on behalf of their members. The blind sampling rate shall apply to the total number of samples submitted by the consortium for all DOT covered employees.

C. Investigations and False Positive.

1. RSPA shall investigate, or shall refer to DHHS for investigation, any unsatisfactory performance testing result and, based on this investigation, the laboratory shall take action to correct the cause of the unsatisfactory performance test result. A record shall be made of the investigative findings and the corrective action taken by the laboratory, and that record shall be dated and signed by the individual responsible for the day-to-day management and operation of the drug-testing laboratory. RSPA shall send the document to the company as a report of the unsatisfactory performance testing incident. RSPA shall ensure notification of the finding to DHHS.

2. Should a false positive error occur on a blind performance test specimen and the error is determined to be an administrative error (clerical, sample mix-up, etc.), the company shall promptly notify RSPA. RSPA and the company shall require the laboratory to take corrective action to minimize the occurrence of the particular error in the future, and, if there is reason to believe the error could have been systemic, RSPA may also require review and reanalysis of previously run specimens.

3. Should a false positive error occur on a blind performance test specimen and the error is determined to be a technical or methodological error, the company shall instruct the laboratory to submit all quality control data from the batch of specimens which included the false positive specimen to RSPA. In addition, the laboratory shall retest all specimens analyzed positive for that drug or metabolite from the time of final resolution of the error back to the time of the last satisfactory performance test cycle. This retesting shall be documented by a statement signed by the individual responsible for day-to-day management of the laboratory's urine drug testing. RSPA may require an on-site review of the laboratory that may be conducted unannounced during any hours of operation of the laboratory. DHHS has the option of revoking or suspending the laboratory's certification or recommending that no further action be taken if the case is one of less serious error in which corrective action has already been taken, thus reasonably assuring that the error will not occur again.

SECTION VII. REVIEW OF DRUG TESTING RESULTS

A. General.

1. The company shall have on staff or contract for the services of an MRO. The MRO shall be a licensed physician with knowledge of drug abuse disorders. The MRO shall review all negative and positive drug test results and interview individuals tested positive to verify the laboratory report before the company is notified. The review of a negative test may be an administrative process to ensure the chain-of-custody procedures were intact. The company once notified of a confirmed positive test result is then required to refer the individual to a SAP. The SAP will then evaluate the individual and make recommendations to the company whether and when an employee who refused to take or did not pass a drug test may return to work and schedule follow-up unannounced drug testing for a period of 60 months. The first six tests should be conducted within the first 12-month period.

2. The MRO and SAP has contracted with the company to provide the services of MRO and SAP for this drug testing policy in accordance with the requirements of Sections 40.33 and 199.15. A listing of the company MRO(s) and SAP(s) which includes their name(s) and address(es) is contained in Appendix A.

B. Reporting and Review of Results.

1. The MRO shall review confirmed positive results. An essential part of the drug testing program is the final review of confirmed positive results from the laboratory. A positive test result does not automatically identify an employee/applicant as having used drugs in violation of a DOT regulation. An individual with a detailed knowledge of possible alternate medical explanations is

essential to the review of results. This review shall be performed by the MRO prior to the transmission of results to company administrative officials. The MRO review shall include review of the chain-of-custody to ensure that it is complete and sufficient on its face.

2. The MRO is responsible for referring the individual tested to a personnel or administrative officer for further proceedings in accordance with the operator's anti-drug plan.

3. The duties of the MRO with respect to negative results are purely administrative.

C. Qualifications and Responsibilities.

1. The MRO shall be a licensed physician with knowledge of substance abuse disorders and may be an employee of the company or a private physician retained for this purpose. The MRO shall not be an employee of the laboratory conducting the drug test unless the laboratory establishes a clear separation of functions to prevent any appearance of a conflict of interest including assuring that the MRO has no responsibility for, and is not supervised by or the supervisor of, any persons who have responsibility for the drug testing or quality control operations of the laboratory.

2. Substance Abuse Professional (SAP) is a licensed physician (Medical Doctor or Doctor of Osteopathy), or a licensed or certified psychologist, social worker, or employee assistance professional; or an addiction counselor (certified by the National Association of Alcoholism and Drug Abuse Counselors Certification Commission or by the International Certification Reciprocity Consortium/Alcohol & Other Drug Abuse). All must have knowledge of and clinical experience in the diagnosis and treatment of alcohol and controlled substances-related disorders.

3. The role of the MRO is to review and interpret confirmed positive test results obtained through the company testing program. In carrying out this responsibility, the MRO shall examine alternate medical explanations for any positive test result. This action could include conducting a medical interview with the individual and review of the individual's medical history, or review of any other relevant biomedical factors. The MRO shall review all medical records made available by the tested individual when a confirmed positive test could have resulted from legally prescribed medication. The MRO shall not, however, consider the results of urine samples that are not obtained or processed in accordance with DOT regulations.

4. The MRO may require the original specimen be reanalyzed to determine the accuracy of the test result. The MRO may verify that the laboratory report and assessment are correct.

5. The role of the SAP is to perform a face-to-face evaluation of an individual who has either refused to take a drug test or who has a confirmed positive test result. The SAP will determine what treatment (inpatient/outpatient), if any, is needed in assisting the individual.

D. Positive Test Results.

1. Prior to making a final decision to verify a positive test result, the MRO shall give the individual an opportunity to discuss the test result with him/her.

2. The MRO shall contact the individual directly, on a confidential basis, to determine whether the employee wishes to discuss the test result. A staff person under the MRO's supervision may make the initial contact, and a medically licensed or certified staff person may gather information from the employee. Except as provided in paragraph 5 of this section, the MRO shall talk directly with the employee before verifying a test as positive.

3. If, after making all reasonable efforts and documenting them, the MRO is unable to reach the individual directly, the MRO shall contact a designated management official who shall direct the individual to contact the MRO as soon as possible. If it becomes necessary to reach the individual through the designated management official, such official shall employ procedures that ensure, to the maximum extent practicable, that the requirement of the employee to contact the MRO is held in confidence.

4. If, after making all reasonable efforts, the designated management official is unable to contact the employee, the company may place the employee on temporary medically unqualified status or medical leave.

5. The MRO may verify a test as positive without having communicated directly with the employee about the test in three circumstances:

   a. The employee expressly declines the opportunity to discuss the test.

   b. Neither the MRO nor the designated employer representative, after making all reasonable efforts, has been able to contact the employee within 14 days of the date of which the MRO receives the confirmed positive test result from the laboratory.

   c. The designated employer representative has successfully made and documented a contact with the employee and instructed the employee to contact the MRO, and more than five days have passed since the date the

employee was successfully contacted by the designated employer representative.

6. If a test is verified positive under the circumstances specified in paragraph 5.b. and 5.c. of this section, the employee may present to the MRO information documenting that serious illness, injury, or other circumstances unavoidably prevented the employee from being contacted by the MRO or designated employer representative or from contacting the MRO within the times provided. The MRO, on the basis of such information, may reopen the verification processing. This would allow the employee to present information concerning a legitimate explanation for the confirmed positive test. If the MRO concludes that there is a legitimate explanation, the MRO declares the test to be negative.

7. Following verification of a positive test result, the MRO shall, as provided in the company's policy, refer the case to the DPM (or designee) for action.

E. Verification for Opiates; Review for Prescription Medication.

1. Before the MRO verifies a confirmed positive result for opiates, the MRO shall determine that there is clinical evidence–in addition to the urine test–of unauthorized use of any opium, opiate, or opium derivative (e.g., morphine/codeine).

2. This requirement does not apply if the company's GC/MS confirmation testing for opiates confirms the presence of 6-monoacetylmorphine.

F. Reconfirmation Analysis Authorization.

1. Should any question arise as to the accuracy or validity of a positive test result, only the MRO is authorized to order a reconfirmation of the original sample and such retests are authorized only at laboratories certified by DHHS.

2. The MRO shall authorize a reconfirmation of the original sample if requested in writing by the employee within 60 days of the employee having received actual notice of the positive test.

3. If the retest is negative, the MRO shall cancel the test.

G. Results Consistent with Legal Drug Use. If the MRO determines there is a legitimate medical explanation for the positive test result, the MRO shall report the test result to the company as negative.

H. Results Scientifically Insufficient.

1. The MRO, based on review of inspection reports, quality control data, multiple samples, and other pertinent results, may determine that the result is scientifically insufficient for further action and declare the test specimen negative. In this situation the MRO may request reanalysis of the original sample before making this decision. The MRO may request that reanalysis be performed by the same laboratory or, as provided in paragraph F above, that an aliquot of the original specimen be sent for reanalysis to an alternate laboratory which is certified in accordance with the DHHS guidelines.

2. The laboratory shall assist in this review process as requested by the MRO by making available the individual responsible for day-to-day management of the urine drug testing laboratory or other employee who is a forensic toxicologist or who has equivalent forensic experience in urine drug testing, to provide specific consultation as required by the company. The company shall include in any required annual report to RSPA a summary of any negative findings based on scientific insufficiency but shall not include any personal identifying information in such reports.

I. Disclosure of Information.

1. Except as provided in this paragraph, the MRO or SAP shall not disclose to any third party medical information provided by the individual to the MRO or SAP as a part of the testing verification process.

2. The MRO or SAP may disclose such information to the company, DOT or other Federal safety agency, or a physician responsible for determining the medical qualification of the employee under the appropriate DOT regulation, as applicable, only if–

   a. An applicable DOT regulation permits or requires such disclosure;

   b. In the MRO's or SAP's reasonable medical judgment, the information could result in the employee being determined to be medically unqualified under an applicable DOT rule; or

   c. In the MRO's or SAP's reasonable medical judgment, in a situation in which there is no DOT rule establishing physical qualification standards applicable to the employee, the information indicates that continued performance by the employee of his or her covered function could pose a significant safety risk.

3. Before obtaining medical information from the employee as part of the verification process, the MRO or SAP shall inform the employee that information may be disclosed to third parties as provided in this paragraph and the identity of any parties to whom information may be disclosed.

SECTION VIII. RETENTION OF SAMPLES

A. General. Samples that yield positive results on confirmation must be retained by the laboratory in properly secured, long-term, frozen storage for at least 365 days.

B. Retention Period.

1. Within this 365 day period, the employee or designated representative, RSPA or other state agencies with jurisdiction, or the company may request in writing that the sample be retained for an additional period.

2. If the laboratory does not receive the request to retain the sample within the 365-day period, the sample may be discarded.

SECTION IX. RETESTING OF SAMPLES

A. General. An employee/applicant may request in writing to the MRO a retest of the sample within 60 days of notification of a positive test result from the MRO.

B. Retest Provisions. The employee may specify that the specimen be retested by the original laboratory or sent to another certified laboratory. The employee may be required to pay in advance for the cost of the shipment and reanalysis of the sample. The employee will be reimbursed for the costs incurred in the reanalysis if the retest of the specimen is negative. If the employee requests a retest at a second laboratory, then the original laboratory must follow the approved custody and control procedures in transferring a portion of the specimen.

C. Detection Levels. Because some analytes deteriorate or are lost during freezing and/or storage, quantitation for a retest is not subject to a specific cutoff requirement but must provide data sufficient to confirm the presence of the drug or metabolite.

SECTION X. EMPLOYEE ASSISTANCE PROGRAM (EAP)

A. Scope of Program.

The EAP will provide education and training on drug use to all employees. The education shall include:

1. Informational material displayed on bulletin boards, employee break rooms, locker rooms, etc., and distributed to employees.

2. A community service hot-line telephone number for employee assistance displayed on bulletin boards and distributed to employees, and

3. Distribution of the company's policy regarding the use of prohibited drugs to all new employees. The policy shall be displayed in prominent places throughout the company (i.e., employee bulletin board, break room, locker rooms).

B. Supervisor Training.

1. Supervisory personnel responsible for those employees covered under Part 199 will receive training under the anti-drug plan. The training shall include at least *one 60-minute period of training* on the specific, contemporaneous physical, behavioral, and performance indicators of probable drug use. This training shall be for supervisors who may determine whether an employee must be drug tested for reasonable cause.

SECTION XI. RECORDKEEPING PROCEDURES

A. General.

1. The DPM (or designee) shall maintain a locked file system that will contain drug test results. This file shall be maintained as Confidential. Employee files shall be handled on strict "need to know" basis.

2. Drug tests results shall not be included in personnel files. Information regarding an individual's drug testing result or rehabilitation may be released only upon written consent of the individual, except:

   a. Such information must be released regardless of consent to RSPA or other government agency as a part of an accident investigation;

   b. Such information may be disclosed regardless of consent in a lawsuit, grievance, or other proceeding initiated by or on behalf of the individual and arising from a verified positive drug test.

B. Statistical Data. Statistical data related to drug testing and rehabilitation that is non name-specified and training records may be released to RSPA or other governmental agency upon request.

C. Record Retention.

The records that must be maintained are:

1. Records that demonstrate the collection process conforms to § 40.25 shall be retained for a 3-year period.

2. Employee drug test results that show positive and test type (pre-employment test, random test, post-accident test, or post-rehabilitation test), and records that demonstrate rehabilitation (including the MRO's and SAP's determination). These records shall be retained for a 5-year period and must include the following information:

   a. Job classification and functions of employee.

   b. Prohibited drug(s) used.

   c. Disposition of employee (i.e., rehab, suspension, termination, etc.)

3. Employee drug tests that demonstrate negative results shall be retained for a period of 1 year.

4. A record indicating the total number of employees tested and the results of tests separated into categories shall be retained for a 5-year period.

5. Training records confirming that supervisors and employees have been trained as required under § 199.19, and copies of training material used shall be retained for a 3-year period.

SECTION XII. CONTRACTOR MONITORING

A. General. The company shall include a clause in the gas pipeline contracts that drug testing, education and training shall be addressed by the contractor in accordance with Part 199 and Part 40 for covered functions.

B. Records and Access. Contractors shall retain copies of appropriate records required by Part 199 and Part 40. The records and access to the contractor's property shall be readily accessible for inspection by the company, RSPA, and representatives of those state agencies under which jurisdiction the company operates.

C. Monitoring Procedures. Confirmation of contractor compliance - see Appendix E for Contractor Monitoring Procedures.

D. Contractor Coverage. The company can, as an alternative to the above guidance, provide coverage for the contractor's employees by including them in the company's drug testing program and random pool for the duration of the contract.

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APPENDIX A

DRUG PERSONNEL AND SERVICES

1. DRUG PROGRAM MANAGER (DPM)

2. MEDICAL REVIEW OFFICER (MRO)

3. NATIONAL INSTITUTE ON DRUG ABUSE (NIDA) LABORATORY

4. EMPLOYEE ASSISTANCE PROGRAM (EAP)

5. SUBSTANCE ABUSE PROFESSIONAL (SAP)

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APPENDIX B

EMPLOYEE/SUPERVISORY POSITIONS SUBJECT TO DRUG TESTING (JOB CLASSIFICATIONS/TITLES)

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APPENDIX C

SPECIMEN COLLECTION PROCEDURES

A. Scope.

1. The drug testing custody and control form is to be used as a permanent record on which identifying data on the employee and on the specimen collection and transfer process are retained. The drug-testing plan requires testing for marijuana, cocaine, opiates, amphetamines, and phencyclidine.

2. Urine specimens collected under this plan may be used only to test for controlled substances designated or approved for testing as described in this appendix and shall not be used to conduct any other analysis or test.

3. This plan does not prohibit procedures reasonably incident to analysis of the specimen for controlled substances (e.g., determination of pH or tests for specific gravity, creatinine concentration, or presence of adulterants).

B. Procedures.

1. The collection site person shall utilize the drug testing chain-of-custody (COC) form provided by company; this form must address the requirements as contained in § 40.23. The COC form must comply with the provisions as contained in 49 CFR Part 40 with regard to the information that must be contained on the form.

2. The drug testing custody and control form may include such additional information as may be required for billing or other legitimate purposes necessary to the collection, provided that personal identifying information on the donor (other than the social security number or employee identification number) may not be provided to the laboratory. Donor medical information may appear only on the copy provided to the donor.

NOTE: The new custody and control form is available and therefore, the specific instructions on how to complete the form have been deleted.

C. Security.

1. The purpose of this paragraph is to prevent unauthorized access, which could compromise the integrity of the collection process of the specimen.

2. The designated collection site is to be secure. If a collection site facility is dedicated solely to urine collection, it shall be secure at all times. If a facility cannot be dedicated solely to drug testing, the portion of the facility used for testing shall be secure during drug testing.

3. A facility normally used for other purposes, such as a public rest room or hospital examining room, may be secured by visual inspection to ensure other persons are not present and undetected access (e.g., through a rear door not in the view of the collection site person) is not possible. Security during collection may be maintained by effective restriction of access to collection materials and specimens. In the case of a public rest room, the facility must be posted against access during the entire collection procedure to avoid embarrassment to the employee or distraction of the collection site person.

4. If it is impractical to maintain continuous physical security of a collection site from the time the specimen is presented until the sealed mailer is transferred for shipment, the following minimum procedures shall apply:

   a. The specimen shall remain under the direct control of the collection site person from delivery to its being sealed in the mailer.

   b. The mailer shall be immediately mailed, maintained in secure storage, or remain until mailed under the personal control of the collection site person.

D. Chain-of-Custody.

1. The chain-of-custody block of the drug testing custody and control form shall be properly executed by authorized collection site personnel upon receipt of specimens.

2. Handling the transportation of urine specimens from one authorized individual or place to another shall always be accomplished through chain-of-custody procedures. Every effort shall be made to minimize the number of persons handling specimens.

E. Access to Authorized Personnel Only.

1. No unauthorized personnel shall be permitted in any part of the designated collection site when urine specimens are collected or stored. Only the collection site person may handle specimens prior to their securement in the mailing container or monitor or observe a specimen collection (under the conditions specified in this section).

2. To promote security of specimens, avoid distraction of the collection site person, and ensure against any confusion in the identification of specimens, the collection site person shall have only one donor under supervision at anytime.

3. For this purpose, a collection procedure is complete when the urine bottle has been sealed and initialed, the drug testing custody and control form has been executed, and the employee has departed the site (or, in the case of an employee who was unable to provide a complete specimen, has entered a waiting area).

F. Privacy.

1. Procedures for collecting urine specimens shall allow individual privacy unless there is a reason to believe that a particular individual may alter or substitute the specimen to be provided, as further described in this paragraph.

2. For purposes of this procedure, the following circumstances are the exclusive grounds constituting a reason to believe that the individual may alter or substitute the specimen:

a. The employee has presented a urine specimen that falls outside the normal temperature range (32° – 38°C/90° – 100°F), and

(1) the employee declines to provide a measurement of oral body temperature, as provided in paragraph G.14. of this section; or

(2) oral body temperature varies by more than 1°C/1.8°F from the temperature of the specimen.

b. The last urine specimen provided by the employee (i.e., on a previous occasion) was determined by the laboratory to have a specific gravity of less than 1.003 and a creatinine concentration below .2g/L.

c. The collection site person observes conduct clearly and unequivocally indicating an attempt to substitute or adulterate the sample (e.g., substitute urine in plain view, blue dye in specimen presented); or

d. The employee has previously been determined to have used a controlled substance without medical authorization and the particular test was being conducted under a DOT regulation providing for follow-up testing upon or after return to service.

3. A higher-level supervisor of the collection site person, or a designated employer representative, shall review and concur in advance with any decision by a collection site person to obtain a specimen under the direct observation of a same gender collection site person based upon the circumstances described in paragraph 2 above.

G. Integrity and Identity of Specimen. The collection site person shall take precautions to ensure that a urine specimen is not adulterated or diluted during the collection procedure and that information on the urine bottle and on the urine custody and control form can identify the individual from whom the specimen was collected. The following minimum precautions shall be taken to ensure that unadulterated specimens are obtained and correctly identified:

1. To deter the dilution of specimens at the collection site, toilet-bluing agents shall be placed in toilet tanks wherever possible, so that reservoir of water in the toilet bowl always remains blue. Where practicable, there shall be no other source of water (e.g., no shower or sink) in the enclosure where urination occurs. If there is another source of water in the enclosure, it shall be effectively secured or monitored to ensure it is not used as a source for diluting the specimen.

2. When an individual arrives at the collection site, the collection site person shall ensure that the individual is positively identified as the employee selected for testing (e.g., through presentation of photo identification or identification by the employer's representative). If the individual's identity cannot be established, the collection site person shall not proceed with the collection. If the employee requests, the collection site person shall show proper identification to the employee.

3. If the individual fails to arrive at the assigned time, the collection site person shall contact the appropriate authority to obtain guidance on the action to be taken.

4. The collection site person shall ask the individual to remove any unnecessary outer garments such as a coat or jacket that might conceal items or substances that could be used to tamper with or adulterate the individual's urine specimen. The collection site person shall ensure that all personal belongings such as a purse or briefcase remain with the outer garments. The individual may retain his or her wallet. If the employee requests it, the collection site person shall provide the employee a receipt for any personal belongings.

5. The individual shall be instructed to wash and dry his or her hands prior to urination.

6. After washing hands, the individual shall remain in the presence of the collection site person and shall not have access to any water fountain, faucet, soap dispenser, cleaning agent, or any other materials which could be used to adulterate the specimen.

7. The individual may provide their specimen in the privacy of a stall or otherwise partitioned area that allows for individual privacy. The collection site person shall provide the individual with a clean specimen bottle or collection container, if applicable, that is securely wrapped for this purpose.

8. The collection site person shall note any unusual behavior or appearance on the urine custody and control form.

9. In the exceptional event that an employer-designated collection site is not accessible and there is an immediate requirement for specimen collection (e.g., circumstances require a post-accident test), a public rest room may be used according to the following procedures: A collection site person of the same gender as the individual shall accompany the individual into the public rest room which shall be made secure during the collection procedure. If possible, a toilet-bluing agent shall be placed in the bowl and any accessible toilet tank. The collection site person shall remain in the rest room, but outside the stall, until the specimen is collected. If no bluing agent is available to deter specimen dilution, the collection site person shall instruct the individual not to flush the toilet until the specimen is delivered to the collection site person. After the collection site person has possession of the specimen, the individual will be instructed to flush the toilet and to participate with the collection site person in completing the chain-of-custody procedures.

10. If the company is using the single collection method then the following procedures shall be used:

    a. The collector may choose to direct the employee to urinate either directly into a specimen bottle or into a separate collection container.

    b. If a separate collection container is used, the collection site person shall pour at least 30 ml of the urine from the collection container into the specimen bottle in the presence of the employee.

11. Collection Methodology.

    a. In either collection methodology, upon receiving the specimen from the individual, the collection site person shall determine if the specimen has at

least 30 milliliters (ml) of urine for the primary or single specimen bottle and, where the split specimen collection method is used, an additional 15 ml of urine for the split specimen bottle.

If the individual is unable to provide such a quantity of urine, the specimen shall be discarded. The collection site person shall instruct the individual to drink up to 40 ounces of fluid, distributed reasonably through a period of up to three hours, or until the individual has provided a new urine specimen, whichever occurs first. If the employee refuses to drink fluids as directed or to provide a new urine specimen, the collection site person shall terminate the collection and notify the employer that the employee has refused to submit to testing.

If the employee has not provided a sufficient specimen within three hours of the first unsuccessful attempt, the collection site person shall discontinue the collection and notify the employer.

The employer shall direct the employee who does not provide a sufficient urine specimen to obtain, as soon as possible, an evaluation from a licensed physician who is acceptable to the employer concerning the employee's ability to provide an adequate amount of urine.

If the physician determines, in his/her medical judgment, that a medical condition has, or with a high degree of probability, could have, precluded the employee from providing an adequate urine specimen, the employee's failure to provide the specimen shall not be deemed a refusal to test.

Section 49 CFR Part 40.25(f)(10)(iv)(B)(1) defines what types of medical conditions would result in an employee being unable to provide an adequate specimen for testing.

If the physician, in his/her medical judgment, is unable to determine why the employee is unable to provide an adequate urine specimen, it will be deemed as a refusal to test. The physician shall provide to the MRO a brief written statement stating his/her conclusions and the basis for it, which shall include detailed information on the medical condition of the employee. Upon receipt of this statement the MRO shall report his/her conclusions to the employer in writing.

b. In pre-employment testing, if the company does not wish to hire the individual, the MRO is not required to make such a referral. Upon completion of the examination, the MRO shall report his her conclusion to the company in writing.

NOTE: The procedure below may be omitted if the company does not conduct split sample testing. Since split samples are not mandated by RSPA for pipeline operators, a company implementing these procedures does so based on their company policy, however, the collection procedures shall be conducted in accordance with the requirements of 49 CFR Part 40.

12. Employers using the split sample method of collection shall follow the procedures set forth below:

    a. The donor shall urinate into a collection container or specimen bottle capable of holding at least 60 ml.

    b. If a collection container is used, the collection site person, in the presence of the donor, pours the urine into two specimen bottles. Thirty (30) ml shall be poured into one bottle, to be used as the primary specimen. At least 15 ml shall be poured into the other bottle, to be used as the split specimen.

    c. If a single specimen bottle is included as a collection container, the collection site person shall pour 30 ml of urine from the specimen bottle into a second specimen bottle (to be used as the primary specimen) and retain the remainder (at least 15 ml) in the collection bottle (to be used as the split specimen).

    d. Both bottles shall be shipped in a single shipping container, together with copies 1, 2, and the split specimen copy of the chain-of-custody form, to the laboratory.

    e. If the test result of the primary specimen is positive, the employee may request that the MRO direct that the split specimen be tested in a different DHHS-certified laboratory for presence of the drug(s) for which a positive result was obtained in the test of the primary specimen. The MRO shall honor such a request if it is made within 72 hours of the employee having been notified of a verified positive test result.

    f. When the MRO informs the laboratory in writing that the employee has requested a test of the split specimen, the laboratory shall forward, to a different DHHS-approved laboratory, the split specimen bottle, with seal intact, a copy of the MRO request, and the split specimen copy of the chain-of-custody form with appropriate chain-of-custody entries.

    g. The result of the test of the split specimen is transmitted by the second laboratory to the MRO. If the analysis of the split specimen is reconfirmed by the second laboratory for the presence of the drug(s) or

drug metabolite(s), the MRO shall notify the employer of the results of the test.

h. Action required by DOT agency regulations as the result of a positive drug test (e.g., removal from performing a safety-sensitive function) is not stayed pending the result of the test of the split specimen.

i. If the result of the test of the split specimen fails to reconfirm the presence of the drug(s) or drug metabolite(s) found in the primary specimen, the MRO shall cancel the test, and report the cancellation and the reasons for it to the DOT, the employer, and the employee.

13. After the specimen has been provided and submitted to the collection site person, the individual shall be allowed to wash his or her hands.

14. Immediately after the specimen is collected, the collection site person shall measure the temperature of the specimen. The temperature-measuring device used must accurately reflect the temperature of the specimen and not contaminate the specimen. The time from urination to temperature measure is critical and in no case shall exceed 4 minutes.

15. A specimen temperature outside the range of 32°C – 38°C/90°F – 100°F, constitutes a reason to believe that the individual has altered or substituted the specimen (See Section F.2.a.). In such cases, the individual supplying the specimen may volunteer to have their temperature taken to provide evidence to counter the reason to believe the individual may have altered or substituted the specimen.

16. Immediately after the specimen is collected, the collection site person shall also inspect the specimen to determine its color and look for any signs of contaminants. Any unusual findings shall be noted on the urine custody and control form.

17. All specimens suspected of being adulterated shall be forwarded to the laboratory for testing.

18. Whenever there is reason to believe that a particular individual has altered or substituted the specimen as described in Section F.2.a. and c., a second specimen shall be obtained as soon as possible under the direct observation of a same gender collection site person.

19. Both the individual being tested and the collection site person shall keep the specimen in view at all times prior to its being sealed and labeled. As provided below, the specimen shall be sealed by placement of a tamper-proof seal over the bottle cap and down the sides of the bottle and labeled in the presence of the

employee. If the specimen is transferred to a second bottle, the collection site person shall request the individual to observe the transfer of the specimen and the placement of the tamper-proof seal over the bottle cap and down the sides of the bottle.

20. The collection site person and the employee shall be present at the same time during procedures outlined in items 21 through 24 of this section.

21. The collection site person shall place securely on the bottle an identification label that contains the date, the individual's specimen number, and any other identifying information provided or required by the employer. If separate from the label, the tamper-proof seal shall also be applied.

22. The individual shall initial the identification label on the specimen bottle for the purpose of certifying that it is the specimen collection from the donor.

23. The collection site person shall enter on the drug testing custody and control form all information identifying the specimen. The collection site person shall sign the drug testing custody and control form certifying that the collection was accomplished according to the applicable Federal requirements.

24. The individual shall be asked to read and sign a statement on the drug testing custody and control form that the specimen collected from him/her is in fact that specimen he/she provided.

25. The collection site person shall complete the chain-of-custody portion of the drug testing custody and control form to indicate receipt of the specimen from the employee and shall certify proper completion of the collection.

26. The urine specimen and chain-of-custody form are now ready for shipment. If the specimen is not immediately prepared for shipment, the collection site person shall ensure that it is appropriately safeguarded during temporary storage.

27. Control of Specimen

    a. While any part of the above chain-of-custody procedures is being performed, it is essential that the urine specimen and custody documents be under the control of the involved collection site person.

    b. If the involved collection site person leaves the workstation momentarily, the collection site person shall take the specimen and drug testing custody and control form with him/her or shall secure them. After the collection site person returns to the workstation, the custody process will continue. If the collection site person is leaving for an extended period of time, he/she shall package the specimen for mailing before leaving the site.

c. The collection site person shall not leave the collection site in the interval between presentation of the specimen by the employee and securement of the sample with an identifying label bearing the employee's specimen identification number and seal initialed by the employee. If it becomes necessary for the collection site person to leave the site during this interval, the collection shall be nullified and at the election of the company a new collection may be begun.

H. Collection Control. To the maximum extent possible, collection site personnel shall keep the individual's specimen bottle within sight both before and after the individual has urinated. After the specimen is collected, it shall be properly sealed and labeled.

I. Transportation to Laboratory. Collection site personnel shall arrange to ship the collected specimens to the drug-testing laboratory. The specimens shall be placed in shipping containers designed to minimize the possibility of damage during shipment (e.g., specimen boxes and/or padded mailers); and those containers shall be securely sealed to eliminate the possibility of undetected tampering. On the tape sealing the container, the collection site person shall sign and enter the date specimens were sealed in the containers for shipment. The collection site person shall ensure that the chain-of-custody documentation is attached to each container sealed for shipment to the drug-testing laboratory.

J. Failure to Cooperate. If the employee refuses to cooperate with the collection process, the collection site person shall inform the designated company representative and shall document the non-cooperation on the drug testing custody and control form.

K. Employee Requiring Medical Attention. If the sample is being collected from an employee in need of medical attention as part of a post-accident test given in an emergency medical facility, necessary medical attention shall not be delayed in order to collect the specimen.

L. Use of Chain-of-Custody Forms. A chain-of-custody form shall be used for maintaining control and accountability of each specimen from the point of collection to final disposition of the specimen. The date and purpose shall be documented on the form each time a specimen is handled or transferred and every individual in the chain shall be identified. Every effort shall be made to minimize the number of persons handling specimens.

APPENDIX D

LABORATORY PROCEDURES

A. Testing.

1. Initial Test - The initial test shall use an immunoassay that meets the requirement of the Food and Drug Administration for commercial distribution.

2. Confirmatory Test - All specimens identified as positive on the initial test shall be confirmed using gas chromatography/mass spectrometry (GC/MS) techniques at the cutoff values listed in this paragraph for each drug. All confirmations shall be by quantitative analysis. Concentrations that exceed the linear region of the standard curve shall be documented in the laboratory record as "greater than highest standard curve value."

B. Reporting Results.

1. The laboratory shall report test results to the company's MRO within an average of 5 working days after receipt of the specimen by the laboratory. Before any test result is reported (the results of initial tests, confirmatory tests, or quality control data), it shall be reviewed and the test certified as an accurate report by the responsible individual. The report shall identify the drugs/metabolites tested for, whether positive or negative, the specimen number assigned by the employer, and the drug testing laboratory specimen.

2. The laboratory shall report as negative all specimens that are negative on the initial test or negative on the confirmatory test. Only specimens confirmed positive shall be reported positive for a specific drug.

3. The MRO may request from the laboratory and the laboratory shall provide quantitation of test results. The MRO shall report whether the test is positive or negative and may report the drug(s) for which there was a positive test, but shall not disclose the quantitation of test results to the company. The MRO may reveal the quantitation of a positive test result to the company, the employee, or the decision-maker in a lawsuit, grievance, or other proceeding initiated by or on behalf of the employee and arising from a verified positive drug test.

4. The laboratory may transmit results to the MRO by various electronic means (e.g., teleprinter, facsimile, or computer) in a manner designed to ensure confidentiality of the information. Results may not be provided verbally by telephone. The

laboratory and employer must ensure the security of the data transmission and limit access to any data transmission, storage, and retrieval system.

5. The laboratory shall send only to the MRO the original or a certified true copy of the drug testing custody and control form (copy 1), which, in the case of a report positive for drug use, shall be signed (after the required certification block) by the individual responsible for day-to-day management of the drug testing laboratory or the individual responsible for attesting to the validity of the test reports, and attached to which shall be a copy of the test report.

6. The laboratory shall provide to the company official responsible for coordination of the drug testing program a quarterly statistical summary of urinalysis testing of the company's employees and shall not include in the summary any personal identifying information. Confirmation data shall be included from test results reported within that quarter. Normally this summary shall be forwarded not more than 14 calendar days after the end of the month covered by the summary. The summary shall contain the following information:

   a. Number of specimens received for testing;

   b. Number of specimens confirmed positive for:

      Marijuana metabolite
      Cocaine metabolite
      Morphine, codeine
      Phencyclidine
      Amphetamine
      Methamphetamine

   c. Number of specimens for which a test was not performed.

7. Quarterly reports shall not include data from which it is reasonably likely that information about individuals' tests can be readily inferred. If necessary, in order to prevent the disclosure of such data, the laboratory shall not send a report until data are sufficiently aggregated to make such an inference unlikely. In any quarter in which a report is withheld for this reason, the laboratory will so inform the employer in writing.

8. The laboratory shall make available copies of all analytical results for company drug testing programs when requested by DOT with regulatory authority over the company.

9. Unless otherwise instructed by the company in writing, all records pertaining to a given urine specimen shall be retained by the drug testing laboratory for a minimum of 2 years.

C. Long-Term Storage. Long-term frozen storage (-20°C or less) ensures that positive urine specimens will be available for any necessary retest during administrative or disciplinary proceedings. Drug testing laboratories shall retain and place in properly secured long-term frozen storage for a minimum of 1 year all specimens confirmed positive, in their original labeled specimen bottles. Within this 1-year period, an employer (or other person designated in a DOT agency regulation) may request the laboratory to retain the specimen for an additional period of time, but if no such request is received the laboratory may discard the specimen after the end of 1 year, except that the laboratory shall be required to maintain any specimens known to be under legal challenge for an indefinite period.

D. Retesting Specimens. Because some analytes deteriorate or are lost during freezing and/or storage, quantitation for a retest is not subject to a specific cutoff requirement but must provide data sufficient to confirm the presence of the drug or metabolite.

E. Subcontracting. Drug testing laboratories shall not subcontract and shall perform all work with their own personnel and equipment. The laboratory must be capable of performing forming testing for the five classes of drugs (marijuana, cocaine, opiates, phencyclidine, and amphetamines) using the initial immunoassay and confirmatory GC/MS methods specified in this appendix. This paragraph does not prohibit subcontracting of laboratory analysis if specimens are sent directly from the collection site to the subcontractor, the subcontractor is a laboratory certified by DHHS as required in this appendix, the subcontractor performs all analysis and provides storage required under this appendix, and the subcontractor is responsible to the company for compliance with this appendix and applicable DOT regulations as if it were the prime contractor.

F. Inspections. DOT, any company utilizing the laboratory, DHHS, or any organization performing laboratory certification on behalf of DHHS reserves the right to inspect the laboratory at any time. Company contracts with laboratories for drug testing, as well as contracts for collection site services, shall permit the company and the DOT of jurisdiction (directly or through an agency) to conduct unannounced inspections.

G. Documentation. The drug testing laboratories shall maintain and make available for at least 2 years documentation of all aspects of the testing process. This 2-year period may be extended upon written notification by DOT or by any company for which laboratory services are being provided. The required documentation shall include personnel files on all individuals authorized to have access to specimens; chain-of- custody documents; quality assurance/quality control records; procedure manuals; all test data (including calibration curves and any calculations used in determining test results); reports; records on performance testing; performance on certification inspections; and hard copies of computer-generated data. The laboratory shall maintain documents for any specimen known to be under legal challenge for an indefinite period.

H. Protection of Employee Records.

1. Employer contracts with laboratories shall require that the laboratory maintain employee test records in confidence, as provided in DOT regulations.

2. The contracts shall provide that the laboratory shall disclose information related to a positive drug test of an individual to the individual, the employer, or the decision-maker in a lawsuit, grievance, or other proceeding initiated by or on behalf of the individual and arising from a certified positive drug test.

APPENDIX E

CONTRACTOR MONITORING PROCEDURES

A. Objective.

In order to assure a contractor's compliance with DOT's regulations, the following procedures are to be followed in determining compliance with the drug testing regulations as set forth in 49 CFR Part 199 and Part 40.

B. Procedures for Determining Compliance.

1. Qualifying Potential Contractor: Qualifications of the potential contractor as it pertains to drug testing policies/procedures is assured by requesting the potential contractor to submit a copy of its anti-drug plan for review and compliance with RSPA/DOT regulations. After review of the anti-drug plan is completed, written correspondence to the contractor will advise it whether or not the plan is acceptable or in need of further additions, deletions, revisions or clarifying language. The review of the contractor plan shall be completed utilizing the criteria established in the RSPA Headquarters Drug Inspection form and the DOT Part 40 Drug Inspection forms. Addenda made to the contractor's plan shall be attached to the previously submitted plan. Upon approval of the addendums, a letter of acceptance is then sent to the contractor. The contractor is now eligible to bid on company contract work that would be covered under Part 199 and Part 40.

2. Monitoring Contractor's Compliance: The contractor may be required to provide information on his/her employees who will perform covered functions for the operator. This information may include the name and job title of the employees who will perform any work or functions covered by Part 199 under that contract. A list of each contractor's covered employees may be distributed to appropriate company field management.

3. All contractors will be required to submit drug testing statistical information on a periodical basis, which may be based on the duration of the contract. Typically, this requirement will be on a monthly or quarterly basis. The company may require a more frequent schedule for submission of drug testing data should they determine a need for such statistics.

4. The company shall maintain a complete file on each contractor's statistical drug testing reports. The company shall make available these reports when requested by the RSPA Administrator, agency designated representative, or representatives of those state agencies under which jurisdiction the company operates.

NOTE: This is only one method of "monitoring" the contractor's compliance with the requirements set forth in 49 CFR Part 199.21 Other methods and guidance materials will be published at a later date.

RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION

OFFICE OF PIPELINE SAFETY COMPLIANCE

MODEL ALCOHOL MISUSE PREVENTION PLAN

DISCLAIMER: The information contained in the enclosed Research and Special Programs Administration (RSPA) model alcohol misuse prevention plan (AMPP) is provided as written guidance to assist pipeline operators, and contractors in complying with the alcohol misuse testing regulations as set forth in 49 CFR Parts 199 and 40.

This document was developed for use as a basic working tool to assist various entities in the development of a written AMPP as required by §199.202. This document is not intended to require an operator/contractor to replace its current alcohol testing policy that may have been developed under their existing company authority. However, it can be used as a guide or template in developing specific language for inclusion in an AMPP to satisfy the numerous alcohol inspection items.

The model AMPP contains numerous "Notes" on specific areas of the alcohol regulations and provides options for consideration and use by a company. A company should not merely copy this entire document and use it to satisfy the requirements set forth in 49 CFR Part 199 and Part 40 without addressing the various "Notes" listed throughout the document. One example of the "Notes" that should be addressed concerns whether an operator terminates or offers an employee the opportunity for rehabilitation. A company must address the level(s) of disciplinary action(s) that their employees will be subjected to concerning violations of the AMPP and the Federal regulations.

This page is for informational purposes only and is not intended for inclusion in the company's alcohol misuse prevention plan.

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Alcohol Misuse Prevention Plan (AMPP)

SECTION I. INTRODUCTION

A. Alcohol Misuse Prevention Policy.

1. The company has a long standing commitment to maintain the highest standards for employee safety and health and to help prevent accidents/injuries resulting from the misuse of alcohol by employees who perform covered functions.

2. In addition, the company must comply with all DOT regulations and other regulations which require affirmative actions to eliminate the impact of the misuse of alcohol in the workplace. The purpose of the alcohol misuse prevention plan is to reduce accidents that result from the misuse of alcohol, thereby reducing fatalities, injuries, and property damage.

3. The Alcohol Misuse Prevention Plan contained herein sets forth the requirements of 49 CFR Part 199 and 40.

4. **The use or possession of alcoholic beverages while on company property, or in any company vehicle, or on company time, including breaks or lunch, paid or unpaid, on any shift, is strictly prohibited.**

5. **Those areas of the plan that appear in bold and underlined print reflect this company's independent authority to require additional provisions with regard to the alcohol testing procedures.**

B. Implementation of Alcohol Misuse Prevention Plan (AMPP).

1. The company has implemented the Research and Special Programs Administration, Alcohol Regulations as set forth in 49 CFR Part 199, Subpart B and the Department of Transportation, Procedures for Transportation Workplace Alcohol Testing Programs as set forth in 49 CFR Part 40, Subpart C.

2. The privacy/confidentiality of any covered employee subject to this plan must be maintained at all times.

3. Implementation of the alcohol misuse prevention plan was effective on _____.

NOTE: Alcohol materials supplied to covered employees may also include information on additional company mandated policies with respect to the use or possession of alcohol, including any consequences for an employee found to have a specified alcohol level, that are based on the company's authority independent of the federal regulations under 49 CFR Part 199 and 40.

C. Background.

1. The catalyst for the alcohol misuse plan is Title 49 Code of Federal Regulations (CFR) Part 199 Subpart B which requires pipeline operators subject to 49 CFR Parts 192, 193, and 195, and their contractors to test their employees for misuse of alcohol under the following work-related conditions:

   a. Post-Accident

   b. Reasonable Suspicion

   c. Return-to-duty

   d. Follow-up

2. Title 49 CFR Part 40 specifies procedures which must be followed by the company when conducting alcohol misuse testing pursuant to regulations issued by agencies of the Department of Transportation.

D. Preemption Provisions.

1. Except as provided in paragraph 2 of this section, Part 199 Subpart B preempts any state or local law, rule, regulation, or order to the extent that:

   a. Compliance with both the state or local requirement and this regulation is not possible;

   b. Compliance with the state or local requirement is an obstacle to the accomplishment and execution of any requirement as set forth in 49 CFR Part 199, Subpart B; or

   c. The state or local requirement is a pipeline safety standard applicable to interstate pipeline facilities.

2. This provision shall not be construed to preempt provisions of state criminal law that impose sanctions for reckless conduct leading to actual loss of life, injury, or damage to property, whether the provisions apply specifically to transportation employees or employers or to the general public.

E. Definitions. For purposes of this AMPP the following definitions apply:

1. Accident means an incident reportable under Part 191 involving gas pipeline facilities or LNG facilities or an accident reportable under Part 195 involving hazardous liquid pipeline facilities.

a. § 191.3 - An accident on a gas pipeline or LNG facility is defined as an "incident," as follows:

(1) An event that involves a release of gas from a pipeline or of liquefied natural gas or gas from an LNG facility and:

(a) A death, or personal injury necessitating inpatient hospitalization; or

(b) Estimated property damage, including cost of gas lost, to the operator or others, or both, of $50,000 or more.

(2) An event that results in an emergency shutdown of an LNG facility.

(3) An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2).

b. § 195.50 - An accident report is required for each failure in a pipeline system in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:

(1) Explosion or fire not intentionally set by the operator.

(2) Loss of 50 or more barrels of hazardous liquid or carbon dioxide.

(3) Escape to the atmosphere of more than five barrels a day of highly volatile liquids.

(4) Death of any person.

(5) Bodily harm to any person resulting in one or more of the following:

(a) Loss of consciousness.

(b) Necessity to carry the person from the scene.

(c) Necessity for medical treatment.

(d) Disability which prevents the discharge of normal duties or the pursuit of normal activities beyond the day of the accident.

(6) Estimated property damage, including cost of clean-up and recovery, value of lost product and damage to the property of the operator or others, or both, exceeding $50,000.

2. Air Blank means a reading by an evidential breath testing (EBT) device of ambient air containing no alcohol.

3. Alcohol means the intoxicating agent in beverage alcohol, ethyl alcohol or other low molecular weight alcohols including methyl or isopropyl alcohol.

4. Alcohol concentration means the alcohol in a volume of breath expressed in terms of grams of alcohol per 210 liters of breath as indicated by an evidential breath test conducted under the federal regulations.

5. Alcohol Use means the consumption of any beverage, mixture, or preparation, including any medication, containing alcohol.

6. Breath Alcohol Technician (BAT) means an individual who instructs and assists individuals in the alcohol testing process and operates an EBT.

7. Canceled or invalid test means a test that is deemed to be invalid as listed in Appendix C of the AMPP.

8. Confirmation Test means a second test following a screening test with a result of 0.02 or greater that provides quantitative data of alcohol concentration.

9. Covered employee means any person who performs on a pipeline or LNG facility an operating, maintenance, or emergency response function regulated by Parts 192, 193, or 195. Such persons may be employed directly by the company, or by a contractor engaged by the company. (A list of covered positions is attached.) Clerical, truck driving, accounting, or other job functions not covered by Parts 192, 193, and 195 are not subject to the regulations.

10. Covered Function (safety-sensitive function) means an operation, maintenance, or emergency-response function that is performed on a pipeline or LNG facility and the function is regulated by Parts 192, 193, or 195.

11. EBT (or evidential breath testing device) means an EBT approved by the National Highway Traffic Safety Administration (NHTSA) for the evidential testing of breath and placed on NHTSA's "Conforming Products List" (CPL) of evidential breath measurement devices.

12. Missed Tests means any test that is not administered within 8 hours time period. These tests must be reported to RSPA annually and must be submitted with the annual Management Information System (MIS) Data Collection forms.

13. Operator is defined as an owner or operator of pipeline facilities.

14. Performing (a covered function) is when a safety-sensitive function is being carried out by an employee. This would be considered any person who is actually carrying out the function, ready to carry out the function or immediately available to carry out the function.

15. Pipeline means all parts of the physical facilities through which a product moves in transportation. This includes pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, delivery stations, holders, and fabricated assemblies.

16. Pipeline Facilities means pipeline, rights-of-way, and any equipment, facility, or building used in the transportation of a product.

17. Prohibited Conduct means any one who has an alcohol concentration of 0.04 or greater, who has used alcohol within 4 hours of reporting for duty and anyone who has used alcohol on-duty.

18. Refusal to Submit (to an alcohol test) means that a covered employee fails to provide an adequate breath for testing without a valid medical explanation after receiving notice of the requirement to be tested in accordance with the provisions of 49 CFR Part 199 and the company's alcohol misuse prevention plan or engages in conduct that clearly obstructs the testing process.

19. Screening test (or initial test) means an analytic procedure to determine whether an employee may have a prohibited concentration of alcohol in a breath specimen.

20. Screening Test Technician (STT) means an individual who has successfully completed an approved Department of Transportation non-evidential training course and who will conduct alcohol screening tests in accordance with Part 199 and 40.

21. State Agency means an agency of any of the several states, the District of Columbia, or Puerto Rico that participates under Chapter 601, 49 United States Code.

22. Substance Abuse Professional (SAP) means a licensed physician (Medical Doctor or Doctor of Osteopathy), or a licensed or certified psychologist, social worker, or employee assistance professional; or an addiction counselor (certified by the National Association of Alcoholism and Drug Abuse Counselors Certification Commission or by the International Certification Reciprocity Consortium/Alcohol & Other Drug Abuse). All must have knowledge of and clinical experience in the diagnosis and treatment of alcohol and controlled substances-related disorders.

NOTE: A company may include additional definitions in its AMPP to further clarify or provide guidance to their employees about various aspects of the alcohol testing program.

F. Company Responsibilities.

1. Alcohol Program Manager (APM): Appendix A contains the name, address, and phone number of the responsible individual(s). The APM or other company designated individual shall be responsible for the preparation of an alcohol misuse plan which complies with requirements of the Department of Transportation regulations as set forth in 49 CFR Parts 199 Subpart B and 49 CFR Part 40 Subpart C. The APM shall be responsible for providing oversight and evaluation on the plan; providing guidance and counseling; reviewing of all discipline applied under this plan for consistency and conformance to human resources policies and procedures; scheduling for types of testing (return-to-duty, or follow-up, etc.); maintaining a locked file system on all alcohol test results; and overseeing the referral of employees for evaluation and treatment as it is defined in 49 CFR Part 199.243.

2. Supervisor(s): Company individuals responsible for observing the performance and behavior of employees; observation/documentation of events suggestive of reasonable suspicion; and post-accident testing if determined that it is applicable.

3. Employees: The company shall ensure that each employee is notified and aware of the provisions of the company AMPP and is knowledgeable of the requirements of the company's AMPP. Each employee must fully comply with the provisions of the plan.

SECTION II. EMPLOYEE/SUPERVISOR ALCOHOL TESTING PROVISIONS

Applicability.

A. Individuals Subject to Alcohol Testing – Any applicant/employee who performs on a pipeline, an operating, maintenance, or emergency response function regulated by Part 192, 193, or 195, is subject to alcohol testing under this program. This does not include clerical, truck driving, accounting, or other functions not subject to Part 192, 193 or 195. The person may be employed by the operator, be a contractor engaged by the operator, or be employed by such a contractor. Refer to Appendix B for specific employee titles/ job classifications subject to testing under this program.

B. Procedures for Notifying Covered Employees – This AMPP shall be included in the appropriate company manual. Upon receipt of the company's AMPP, each manager shall post the plan in a prominent location or indicate where a copy is readily accessible to all covered employees. All covered employees will be provided a complete copy of the

AMPP or a condensed/summarized version of the plan. The condensed document must indicate where the entire plan may be obtained for review by an employee.

C. Criteria for Employee Notification –

1. General Criteria. The company shall provide written educational materials explaining the alcohol misuse requirements and the company's policies and procedures on how they will comply with those requirements.

   a. The company will distribute to each covered employee a copy of the plan prior to the start of alcohol testing and to each person subsequently hired/transferred to perform covered functions.

   b. The company shall provide written notice to representatives of employee organizations on the availability of this written educational information.

NOTE: Although not required by the regulations, it is recommended that the company have all covered employees sign some form of an "Acknowledge/Receipt Form" attesting to the fact that they had received a copy of the below listed information. This process will provide documentation that the requirements for notification to all covered employees prior to the implementation of the company's alcohol misuse prevention plan and alcohol testing have been met.

2. Required Information. The company shall provide written materials to all covered employees who shall include detailed information and discussion of the following elements:

   a. Name of company representative designated to answer questions for covered employees about the alcohol regulations. See Appendix A.

   b. List of categories of covered employees who are subject to the alcohol regulations. See Appendix B for listing of employee/supervisor job classifications/titles.

   c. Information about covered functions which provides sufficient guidance on which portions of the work day the covered employee is required to be in compliance with the AMPP.

   d. Information concerning covered employee conduct which specifies what is prohibited by the AMPP.

e. Circumstances under which a covered employee will be tested for alcohol under the AMPP.

f. Procedures that cover:

(1) testing for presence of alcohol;

(2) protection of employee rights;

(3) integrity of breath testing process;

(4) safeguarding validity of test results; and,

(5) assignment of test results to proper employee.

g. Information concerning requirement for covered employee to submit to various types of alcohol tests.

h. Information detailing what constitutes a refusal and consequences of such refusal.

i. Information detailing consequences of covered employees who violate the prohibitions as set forth in the AMPP. It must address removal from performing covered functions and guidance on referral for evaluation and/or treatment.

j. Information detailing consequences of covered employees who test at an alcohol concentration of 0.02 or greater but less than 0.04.

k. Information detailing alcohol misuse and:

(1) how it impacts on an individual's health, work and personal life;

(2) detecting signs and symptoms of an alcohol problem; and,

(3) intervening, evaluating and resolving problems associated with alcohol misuse (suspicions, confrontation, referral to EAP and referral to management official).

NOTE: Under §§ 199.211 and 199.239 operators must provide procedures for notifying employees of the coverage and provisions of the plan. An operator may satisfy this requirement by either of the following methods: (1) Provide each employee with a complete copy of the company AMPP; (2) Provide a summarized version of the AMPP; or, (3) Display the AMPP or summarized version on an employee bulletin board or in an

employee break/locker room. If the entire plan is not provided to employees, then the summarized version shall indicate where a complete copy of the company's AMPP is available for review by the employees.

SECTION III. ALCOHOL TESTS REQUIRED

A. Post-Accident Testing.

1. The company shall promptly determine and test each surviving covered employee for alcohol if that employee's performance contributed to the accident or cannot be completely discounted as a contributing factor to the accident. The decision not to administer an alcohol test under this section shall be based on the company's determination, using the best available information at the time of the determination, that the employee's performance could have not have contributed to the accident.

2. Each employee shall be required to submit to an alcohol test within 2 hours of the accident. If a test is not administered within 2 hours, the company will prepare and maintain on file a record stating why the test was not administered. If a test is not administered within 8 hours following the accident the company shall cease all attempts to conduct an alcohol test and shall prepare and maintain on file written documentation indicating why the alcohol test was not conducted.

3. An employee who is subject to post-accident testing who fails to remain readily available for such testing, including notifying the company or company representative of his/her location if he/she leaves the scene of the accident prior to submission to such test, may be deemed by the company to have refused to submit to testing.

4. The employee must remain available for alcohol testing and may not consume any alcohol for 8 hours following the accident or until the alcohol test has been conducted. Notwithstanding the previous statement, employees should seek and obtain emergency medical care whenever necessary or a covered employee should not be prohibited from leaving the scene of an accident for the period necessary to obtain assistance in responding to the accident.

5. The following steps will be used to guide supervisor to a satisfactory outcome in a post-accident situation.

   a. Verify the post-accident decision. Does the definition of accident in Section I apply to the current situation? Does the possibility exist that the employee's performance contributed to the accident or cannot be completely discounted as a factor which contributed to the accident? Anonymous tips must be taken seriously, but should not be the sole reason to initiate a request for a specimen. If witnesses saw a specific event or behavior, ask them to describe what they saw. How far away were they? Before proceeding further, individual may need to obtain approval from the division manager/department head or designee to proceed with post-accident testing.

b. Isolate and inform the employee. Remove the employee from the work area. Explain that you have reason to believe his/her performance contributed to the accident or cannot be completely discounted as a contributing factor to the accident and therefore, they will be required to submit to an alcohol test.

c. Transport the employee. The potentially affected employee should not be allowed to proceed alone to or from the collection site (the collection site may be at the accident scene). In addition to the safety concerns for the employee, accompanying the employee also assures that there is no opportunity en route to the collection site for the employee to ingest anything that could affect the outcome of the alcohol test.

d. Document the events. Record the activity performed that supports the determination to conduct a post-accident alcohol test. This documentation of the employee's activity should be prepared and signed by the supervisor and remain on file.

e. Denial should be an expected reaction. If a person knows he/she will test positive, he/she may give many explanations and protestations, wanting to avoid submission to an alcohol test. If he/she is not under the influence of alcohol, vehement denial also would be expected. Listen to the employee and carefully evaluate the employee's explanation. Remember, a request for an alcohol test is not an accusation; it is merely a request for additional objective data.

f. Following administration of alcohol test. After returning from the collection site, the employee should not be allowed to return to performing any covered functions if their alcohol test result is positive and if any disciplinary action is pending.

B. Reasonable Suspicion Testing. Reasonable suspicion testing is designed to provide management with a tool (in conjunction with supervisor training on the signs and symptoms of alcohol misuse) to identify alcohol affected employees who may pose a danger to themselves and others in their job performance. Employees may be at work in a condition that raises concern regarding their safety or productivity. Supervisors must then make a decision as to whether there is reasonable suspicion to believe an employee is using or has used alcohol.

1. Supervisor Reasonable Suspicion Determinations:

a. The company's determination that reasonable suspicion exists to require a covered employee to undergo an alcohol test shall be based on specific, contemporaneous, articulable observations concerning the appearance,

behavior, speech, or body odors of the employee. The required observations shall be made by a supervisor who has received at least 60 minutes of training in detecting the symptoms of alcohol misuse.

b. The supervisor's observation must be made just before, during, or just after the employee is performing a covered function.

c. The supervisor who makes such a determination that reasonable suspicion exists shall not be authorized to conduct the breath alcohol test on that employee.

2. In making a determination of reasonable suspicion, the factors to be considered include, but are not limited to the following:

a. Adequately documented pattern of unsatisfactory work performance, for which no apparent non-impairment related reason exists, or a change in an employee's prior pattern of work performance, especially where there is some evidence of alcohol related behavior on or off the work site.

b. Physical signs and symptoms consistent with alcohol abuse.

c. Evidence of prohibited alcohol use, possession, sale, or delivery while on duty.

d. Occurrence of a serious or potentially serious accident that may have been caused by human error, or flagrant violations of established safety, security, or other operational procedures.

3. The following steps will be used to guide the supervisor to a satisfactory outcome in a reasonable suspicion situation.

a. Verify the reasonable suspicion decision. Anonymous tips must be taken seriously, but should not be the sole reason to initiate a request for a specimen. Hearsay is not an acceptable basis for reasonable suspicion referral. If witnesses saw a specific event or behavior, ask them to describe what they saw. How far away were they? How long did they observe the person? What, if anything, caused them to believe it was alcohol related? On what basis did they reach their conclusion? Before proceeding further, obtain concurrence or approval from the manager/department head or designee to proceed with reasonable suspicion alcohol testing.

b. Isolate and inform the employee. Remove the employee from the work location. Explain that there is reasonable suspicion to believe the employee's performance is being affected by alcohol. Ask the employee to

explain the suspected behavior and to describe the events that took place from his/her perspective. Ask if there is any medication or physical condition that would explain the behavior. A persuasive explanation may or may not deter you from asking for the employee to submit to an alcohol test. If there is still a reasonable suspicion that alcohol is a factor in the situation, a request for testing should be made; if no reasonable belief is determined then a request for testing should not be made. If the decision to test is made, inform the employee that they are being requested to accompany the appropriate company official or representative to the specimen collection site to conduct an alcohol test. Inform the employee of the consequences of refusal to submit to alcohol testing.

c. Review your findings. During the conversation, observe physical and mental symptoms. Be sure to document any characteristics that either support or contradict initial information. In all cases, a reasonable suspicion decision must be made by a supervisor who has received the required training. This creates greater objectivity, provides additional observation, and generally strengthens the defensibility of the reasonable suspicion determination.

d. Transport the employee. The potentially affected employee should not be allowed to proceed alone to or from the collection site. In addition to the safety concerns for the employee, accompanying the employee also assures that there is no opportunity en route to the collection site for the employee to ingest anything that could affect the alcohol test result.

e. Document the events. Record the behavioral signs and symptoms that support the determination to conduct a reasonable suspicion alcohol test. This documentation of the employee's conduct should be prepared and maintained on file to document the request for reasonable suspicion alcohol testing.

f. Denial should be an expected reaction. If a person knows he/she will test positive, he/she may give many explanations and protestations, wanting to avoid alcohol testing. If he/she is not under the influence or affected by alcohol, vehement denial also would be expected. Listen to the employee and carefully evaluate the employee's explanation. Remember, a request to submit to an alcohol test is not an accusation; it is merely a request for additional objective data.

g. Following administration of alcohol test. After returning from the collection site, the employee should not be allowed to return to performing any covered functions if their alcohol test result is positive. The employee should make arrangements to be transported home. The employee should

be instructed not to drive any motor vehicle due to the reasonable suspicion belief that he/she may be under the influence of alcohol.

If the employee insists on driving, the proper local enforcement authority may be notified that an employee who the company believes may be under the influence of alcohol is leaving the company premises driving a motor vehicle.

4. If a reasonable suspicion test is not administered within 2 hours following the determination, the company shall prepare and maintain on file a record stating the reasons why the test was not promptly administered. If the required test is not administered within 8 hours of the determination, the company shall cease all attempts to administer an alcohol test and shall state in the record the reasons for not administering the test. Upon request such records shall be made available to RSPA.

5. The company shall not permit a covered employee to report for duty or remain on duty requiring the performance of covered functions while the employee is under the influence of or impaired by alcohol, as shown by the behavioral, speech, or performance indicators of alcohol misuse, nor shall the employee be permitted to perform or continue to perform covered functions until:

   a. An alcohol test is administered and the employee's alcohol concentration measures less than 0.02; or

   b. The start of the employee's next regularly scheduled duty period, but not less than 8 hours following the determination that there is reasonable suspicion to believe that the employee has violated the prohibitions as contained in the AMPP.

6. Except as provided above, the company shall not take any action under 49 CFR Part 199 against a covered employee based solely on the employee's behavior and appearance in the absence of an alcohol test. However, this does not prohibit the company from taking any disciplinary action otherwise consistent with local and/or state laws.

C. Return-to-Duty Testing.

1. If the substance abuse professional makes a determination that some form of evaluation and/or treatment is required then the employee must comply with the recommended provisions in order to be considered eligible to return-to-duty.

2. The company shall ensure that before an employee may return-to-duty to perform covered functions after engaging in prohibited conduct that the employee shall

undergo a return-to-duty alcohol test with a result indicating an alcohol concentration of less than 0.02.

NOTE: Return-To-Duty testing in many companies may not be an option under this plan if the company removes the employee from performing covered functions and then according to company policy includes a provision that subjects the employee to termination for having an alcohol concentration of 0.02 or greater or refuses to submit to an alcohol test. A statement indicating that return-to-duty is not an option under the company's AMPP would be included in the return-to-duty testing provisions of the AMPP.

D. Follow-up Testing.

1. Following the determination that a covered employee is in need of assistance in resolving problems associated with alcohol misuse, the employee will be subject to unannounced follow-up alcohol testing as directed by a substance abuse professional. An employee who returns to duty shall be subject to a reasonable program of follow-up alcohol testing, without prior notice, for up to 60 months after his/her return to duty.

2. The employee shall be subject to at least six, unannounced alcohol follow-up tests during the first 12 months following his/her return to duty. The substance abuse professional may terminate the requirement for follow-up testing at any time after the initial six tests have been completed, if the substance abuse professional makes the determination that such testing is no longer warranted.

3. The company may require a covered employee to submit to drug follow-up testing when the substance abuse professional has reason to suspect drug involvement. The drug testing must comply with the requirements contained in 49 CFR Part 40, Subpart A.

4. Follow-up testing shall be conducted just before the employee is to perform, while an employee is performing or just after the employee has ceased performing a covered function.

E. Provisions Governing Retesting of Covered Employees.

1. A covered employee tested and found to have an alcohol concentration of 0.02 or greater but less than 0.04 shall not be permitted to perform or continue to perform covered functions until:

   a. The employee's alcohol concentration measures less than 0.02 in another alcohol test administered in compliance with this plan; or

b. The start of the employee's next regularly scheduled duty period, but not less than 8 hours following administration of the alcohol test.

2. Except as provided above, the company shall not take any action under 49 CFR Part 199 against a covered employee based solely on test results showing an alcohol concentration less than 0.04. However, this does not prohibit the company from taking any disciplinary action otherwise consistent with local and/or state law.

SECTION IV. ALCOHOL PROHIBITED CONDUCT

A. General. The company shall provide guidance to all covered employees regarding the various types of alcohol prohibited conducts. A covered employee who engages in prohibited conduct shall be advised of available resources to evaluate and resolve problems associated with alcohol misuse.

B. Alcohol Concentration. A covered employee shall be prohibited from reporting for duty or remaining on duty requiring the performance of covered functions while having an alcohol concentration of 0.04 or greater. If a company representative has actual knowledge that a covered employee has an alcohol concentration of 0.04 or greater, the employee shall not be permitted to perform or continue to perform covered functions.

C. Pre-Duty Use. The company shall prohibit a covered employee from using alcohol within 4 hours prior to performing covered functions, or, if an employee is called to duty to respond to an emergency, within the time period after the employee has been notified to report for duty. If the company has actual knowledge that a covered employee has used alcohol within 4 hours prior to performing covered functions or within the time period after the employee has been notified to report for duty, the employee shall not be permitted to perform or continue to perform covered functions.

D. On-Duty Use. The company shall prohibit a covered employee from using alcohol while performing covered functions. If a company representative has actual knowledge that a covered employee is using alcohol while performing covered functions, the employee shall not be permitted to perform or continue to perform covered functions.

SECTION V. USE OF EMPLOYEE WHO REFUSES ALCOHOL TEST

A. General. Refusal to submit to a post-accident, reasonable suspicion or follow-up alcohol test shall result in the covered employee not being allowed to perform or to continue to perform any covered functions.

B. **Additional Requirements. The company may impose such additional disciplinary actions as they deem appropriate. This may include removal from performing covered functions, suspension (with or without pay), and even termination. (Some examples of various types of disciplinary action are outlined in Section VI).**

SECTION VI. DISCIPLINARY ACTIONS

A. General. A covered employee who has engaged in prohibited conduct as described in §§ 199.215 through 199.223 (alcohol concentration, on-duty use, pre-duty use, use following an accident and refusal to submit to an alcohol test) shall not be permitted to perform covered functions or continue to perform covered functions.

B. Required Referrals and Evaluations.

1. No covered employee who has violated the rules on alcohol misuse or refuses to submit to testing can perform any covered function unless and until that employee has:

a. Been evaluated by a SAP to determine whether the employee is in need of assistance in resolving problems related to alcohol use.

b. Completed any treatment recommended by the SAP.

c. Been evaluated by a SAP to ensure that the employee has properly followed the treatment program.

d. **Entered into a company approved evaluation/rehabilitation program and successfully completed the program**.

e. Undergone a return-to-duty alcohol test with resulting alcohol concentration of less than 0.02.

NOTE: Rehabilitation is not mandated by DOT regulations and the below is based on individual company policy. The company may spell out the provisions for such evaluations/rehabilitation in the AMPP or may reference another company publication which would provide detailed information on its program.

C. Evaluation, treatment and rehabilitation may be provided by the operator, SAP under contract, or SAP not affiliated with the operator.

1. A SAP cannot refer an employee to that SAP's private practice, to a person or organization from which the SAP receives remuneration or in which the SAP has financial interests.

NOTE: The section below describes various disciplinary actions that a company may impose. This information is provided as guidance material only so that a company may determine what levels of disciplinary action could be developed for their particular company environment and situations. Many companies provide for rehabilitation and therefore offer employees a second chance if the employee completes some form of rehabilitation program. Some companies do not provide for rehabilitation and may elect to terminate an employee for a first offense. A company

should carefully select the appropriate levels of disciplinary action(s) that they intend to take against employees who fail to comply with the applicable alcohol testing regulations. The RSPA regulations do not mandate that an employee be terminated for failure to comply with the alcohol testing regulations.

D. Levels of Disciplinary Actions. Disciplinary action as set forth below will be taken under each of the described circumstances.

1. **Refusal to report for assessment with a substance abuse professional. If an employee refuses to report for assessment, evaluation, and/or referral for treatment with a substance abuse professional, he/she will be terminated.**

2. **Refusal to enter or successfully complete a rehabilitation program. If an employee, after assessment, is referred for rehabilitation and the employee refuses to enter or successfully complete such a rehabilitation assessment program, he/she will be terminated.**

3. **Repeat usage. In all cases of an employee having an alcohol concentration of 0.04 or greater, and who has tested a second time, at alcohol concentrations 0.04 or greater, will be terminated.**

4. **Refusal to submit to an alcohol test. An employee who refuses to provide an adequate breath for alcohol testing without a valid medical explanation after he/she has received notice of the requirement to be tested in accordance with the requirements of the AMPP, or who engages in conduct that clearly obstructs the testing procedure, will be terminated from the company.**

5. **On duty use of alcohol. On duty use or possession of alcohol on company time or on company premises will result in termination from the company.**

6. **Results of an alcohol (confirmation) test indicating an alcohol concentration of 0.04 or greater. When an employee has tested for alcohol in a concentration of 0.04 or greater, the employee will be removed from performing a covered function and shall be suspended for 10 working days with pay and shall be referred to a substance abuse professional who shall determine what assistance, if any, the employee needs in resolving problems associated with alcohol misuse.**

7. **Results of an alcohol (confirmation) test indicate an alcohol concentration of 0.02 or greater, but less than 0.04. When an employee has tested for alcohol in a concentration of 0.02 or greater, but less than 0.04, that employee will be removed from performing a covered function and suspended without pay for the remainder of his/her shift.**

8. **Results of a second alcohol (confirmation) test (specify an allotted amount of time) indicate an alcohol concentration of 0.02 or greater, but less than 0.04. When an employee has an alcohol test conducted and the alcohol concentration is 0.02 or greater, but less than 0.04, on a second test, the employee will be removed from performing covered functions and shall be suspended for five working days without pay and referred to a substance abuse professional, and must follow all the recommendations of the assessment. Any subsequent test at 0.02 or greater will result in termination from the company**.

9. **Results of a second alcohol (confirmation) test (specify an allotted amount of time) indicate alcohol concentration 0.02 or greater, but less than 0.04 after an alcohol test which had produced an alcohol concentration of 0.04 or greater. When an employee has an alcohol test conducted and the alcohol concentration is 0.02 or greater, but less than 0.04 after having had a prior alcohol concentration 0.04 or greater, then that employee will be removed from performing covered functions and shall be suspended for 20 working days and referred to the substance abuse professional and any subsequent alcohol concentration 0.02 or greater will result in immediate termination**.

SECTION VII. ALCOHOL TESTING REQUIREMENTS

A. Scope.

1. The alcohol testing procedures contained herein and in Appendix C shall be complied with by the designated alcohol testing sites.

2. These procedures address the requirements contained in 49 CFR Part 40 Subpart C.

B. General.

1. The alcohol testing site shall have all necessary personnel, materials, equipment, facilities, and supervision to provide for the testing and processing of alcohol test results. An independent medical facility may also be utilized as an alcohol testing site provided the other applicable requirements of Appendix C are met.

2. An alcohol testing site shall be any suitable location where a breath alcohol test can be collected under conditions set forth in Appendix C, including a properly equipped mobile facility. A designated alcohol testing site shall provide for privacy during the testing period and completion of all necessary record procedures.

3. Detailed alcohol testing procedures are outlined in Appendix C.

SECTION VIII. ALCOHOL TESTING EQUIPMENT

A. General. The company shall use only approved evidential breath testing devices and non-evidential devices for conducting the alcohol testing provisions required in the AMPP. These devices are listed on NHTSA's conforming products list (CPL).

B. Screening Devices.

1. The company shall utilize either non-evidential devices or EBTs listed on the CPL for screening tests.

C. Confirmation Devices. The company shall utilize an EBT listed on the CPL for confirmation testing that has the capabilities listed below. The EBT shall also be able to distinguish alcohol from acetone; be capable of testing an air blank prior to each collection of breath, and performing an external calibration.

1. Capable of being attached independently or by direct link to a separate printer, print a result in triplicate (or three consecutive identical copies) of each breath test;

2. Capable of assigning a unique and sequential number to each completed test so that the number can be read by the BAT and the employee before each test and be printed out on each copy of the result;

3. Capable of printing out the manufacturer's name of the device, serial number and time of the test.

D. NHTSA Conforming Products List. All devices that will be used by the company for alcohol testing are NHTSA approved evidential breath alcohol testing devices. NHTSA has model specifications for evidential breath testing devices. NHTSA periodically publishes an updated Conforming Products List, which states which devices have met NHTSA standards.

E. Quality Assurance Plans for Evidential Breath Testing Devices. Each EBT used shall have an approved quality assurance plan (QAP) to include the following:

1. Methods for conducting external calibration.

2. Minimum intervals for performing external calibrations

3. Tolerance on an external calibration check.

4. Inspection, maintenance, and calibration requirements.

Each QAP is submitted to NHTSA for approval. Records demonstrating that the EBTs are subject to required external calibration checks will be maintained. An EBT will be taken out of service if any external calibration check results in a reading outside the tolerance for the EBT set forth in the QAP. The EBT will not be used again until it has been serviced and has had an external calibration check resulting in a reading within the tolerance for the EBT.

This company will ensure that required inspections, maintenance and calibration checks are conducted by the manufacturer or maintenance representative. When the EBT is not being used it will be stored in a secure location.

F. Quality Assurance Plans for Non-Evidential Screening Devices. Each Non-Evidential Screening Device used shall have an approved quality assurance plan (QAP) to including the following:

1. The plan shall designate the method or methods to be used to perform quality control checks; the temperatures at which the non-evidential screening device shall be stored and used, as well as other environmental conditions (e.g., altitude, humidity) that may affect the performance of the device; and, where relevant, the shelf life of the device.

2. The QAP shall prohibit the use of any device that does not pass the specified quality control checks or that has passed its expiration date.

   a. The manufacturers' instructions on or included in the package for each saliva testing device shall include directions on the proper use of the device, the time frame within which the device must be read and the manner in which the reading is made

   b. The employer and its agents shall comply with the QAP and manufacturer's instructions for each non-evidential screening device it uses for alcohol screening tests.

SECTION IX. BREATH ALCOHOL TECHNICIAN AND SCREENING TEST TECHNICIAN GUIDANCE

A. Breath Alcohol Technician (BAT).

1. The BAT shall receive sufficient training and be certified to proficiency in the specific operation of the EBT device he/she uses in the required alcohol testing procedures as outlined in the AMPP. These procedures include the following:

   a. Each BAT used by the company shall be able to demonstrate by successful completion of a course of instruction which, at a minimum, provides training in the principles of EBT methodology, operation, and calibration

checks; the fundamentals of breath analysis for alcohol content; and the procedures required for obtaining a breath sample, and interpreting and recording EBT results.

b. The company shall ensure that only courses of instruction that are equivalent to the NHTSA, as amended, model course may be used to train BATs to proficiency. Upon request to NHTSA, they will review a BAT instruction to determine equivalency.

c. The company shall ensure that the course of instruction shall provide documentation that the BAT has demonstrated competence in the operation of the specific EBT(s) to be used by the company.

d. The company shall ensure that any BAT who will perform an external calibration check of an EBT shall be trained to proficiency in conducting the check on the particular model of the EBT to be used by the company. The BAT training shall also include practical experience and demonstrated competence in preparing the breath alcohol simulator or alcohol standard, and in the maintenance and calibration of the particular EBT.

e. The company shall ensure the BAT(s) receive sufficient additional training to ensure proficiency concerning any new or additional devices or changes in technology for equipment used by the company.

f. The company or its designated agent, who are involved in conducting alcohol testing, shall establish documentation regarding the training and proficiency testing of any BAT it uses to test employees. The documentation shall be maintained in accordance with the requirements of the AMPP.

2. The company may authorize a BAT qualified supervisor of an employee to conduct an alcohol test for that employee if another BAT in unavailable to perform the required test in a timely manner. However, the supervisor who makes a determination that reasonable suspicion exists shall not be authorized to conduct the alcohol test on that employee.

3. The company may permit law enforcement officers who have been certified by state or local governments to conduct alcohol tests if they are deemed to be qualified to perform as a BAT. In order for a test to be accepted under the DOT requirements, the officer must have been certified by a state or local government to use the EBT that was used for the appropriate test.

B. Screening Test Technician (STT).

1. The STT shall receive sufficient training and be certified to proficiency in the specific operation of the non-evidential screening device he/she uses in the required alcohol testing procedures as outlined in the AMPP. These procedures include the following:

   a. Each STT used by the company shall be able to demonstrate by successful completion of a course of instruction which is either the Department of Transportation's (DOT) model course or a course of instruction determined by the DOT to be equivalent.

   b. The non-evidential training must involve changes, contrasts, or other readings that are indicated on the device in terms of color. The STT shall, in order to be proficient, be able to discern correctly changes, contrasts, or readings.

   c. The STT shall receive additional training, as needed, to ensure proficiency, concerning new or additional devices or changes in technology that he or she will be using.

   d. The employer or its agent shall document the training and proficiency of each STT it uses to test employees and maintain the documentation.

   e. Anyone meeting the requirements of a BAT may act as a STT, provided that an individual has demonstrated proficiency in the operation of the non-evidential screening device he or she will be using.

SECTION X. DISCLOSURE OF ALCOHOL INFORMATION/RECORDS

A. General.

1. The company shall maintain all alcohol related testing information including all test results and other appropriate records in a secure manner to prevent the disclosure of such information to unauthorized personnel.

2. The APM or designee shall maintain a locked file system which will contain the alcohol testing information and records. This file shall be maintained as confidential. Employee files shall be handled on strict "need to know" basis.

3. Alcohol test results shall not be included in personnel files.

B. Disclosure Provisions.

1. The company shall not release covered employee information that is contained in records as required to be maintained by the provisions of the AMPP and in

accordance with federal requirements except as required by law or when expressly authorized or required by 49 CFR Parts 199 and 40.

2. A covered employee is entitled, upon written request, to obtain copies of any records pertaining to the employee's use of alcohol, including any records pertaining to his/her alcohol tests. The company shall promptly provide the requested records. Access to an employee's records shall not be contingent upon payment for records other than those specifically requested.

3. The company shall permit access to all facilities utilized in complying with the requirements of 49 CFR Parts 199 and 40 to the Secretary of Transportation or any DOT or state agency with regulatory authority over the company.

4. The company shall make available copies of all results for alcohol testing and any other information pertaining to the administrative process of the operator's AMPP as required by 49 CFR Parts 199 and 40 when requested by the Secretary of Transportation or any DOT or state agency with regulatory authority over the company. When specified by the agency the information shall include name-specific alcohol test results, records, and reports.

5. When requested by the National Transportation Safety Board as part of an accident investigation, the company shall disclose information related to its administration of any post-accident alcohol tests administered following the accident under investigation.

6. The company shall make records available to a subsequent employer upon receipt of the written request from the covered employee. Disclosure by the subsequent regulated employer is permitted only as expressly authorized by the terms of the employee's written request.

7. The company may disclose required information pertaining to a covered employee to the employee or the decision-maker in a lawsuit, grievance, or other proceeding initiated by or on behalf of the individual, and arising from the results of an alcohol test administered as required by the AMPP and the regulations set forth in 49 CFR Parts 199 and 40 or from the company's determination that the covered employee engaged in prohibited alcohol conduct including, but not limited to, a worker's compensation, unemployment compensation, or other proceeding relating to a benefit sought by the employee.

8. The company shall release information regarding a covered employee's records as directed by the specific, written consent of the employee authorizing release of the information to an identified person. Release of such information by a regulated entity receiving the information is permitted only in accordance with the terms of the employee's consent.

SECTION XI. EMPLOYEE ASSISTANCE PROGRAM (EAP)

A. Scope of Program.

The EAP will provide education and training on alcohol misuse to all employees. The education shall include:

1. Informational material displayed on bulletin boards, employee break rooms, locker rooms, etc., and distributed to employees.

2. A community service hot-line telephone number for employee assistance displayed on bulletin boards and distributed to employees, and,

3. Distribution of company's policy regarding the alcohol misuse to all employees. The policy shall be displayed in prominent places throughout the company (i.e., employee bulletin board, break room, locker rooms).

B. Supervisor Training.

1. Supervisory personnel responsible for those employees covered under Part 199 will receive training under the alcohol misuse prevention plan. The training shall include at least *one 60-minute period of training* on the specific, contemporaneous physical, behavioral, speech, and performance indicators of probable alcohol misuse. This training shall be for supervisors who may determine whether an employee must be alcohol tested for reasonable suspicion.

SECTION XII. RECORDKEEPING PROCEDURES

A. General. The company APM or designee shall maintain the alcohol testing records in accordance with the provisions set out in the AMPP. These records will be maintained in a secure location with controlled access. Records shall be maintained for the specified periods of time as required in 49 CFR Parts 199 and 40.

B. Record Retention Provisions.

1. The following types of records shall be maintained for a minimum period of 5 years.

   a. Records of employee alcohol test results with results indicating an alcohol concentration of 0.02 or greater.

   b. Documentation of refusals to take required alcohol tests.

   c. Calibration documentation of each EBT used in alcohol testing, including records of the results of external calibration checks.

d. Employee referrals and evaluations.

e. Management Information System (MIS) annual alcohol misuse report data.

f. Documents pertaining to "missed tests."

2. The following types of records shall be maintained for a minimum period of 2 years.

a. Records related to the collection process (except calibration of EBT devices).

b. Records related to training.

c. Records of the inspection and maintenance of each EBT used in employee testing.

d. Documentation of the company's compliance with the Quality Assurance Plan (QAP) for each EBT it uses for alcohol testing under the AMPP.

e. Records of the training and proficiency testing of each BAT/STT used in employee testing.

3. The following types of records shall be maintained for a minimum period of 1 year.

a. Records of all test results below 0.02.

C. Maintenance of Specific Types of Records.

1. The following types of records related to the collection process shall be maintained:

a. Calibration documentation for EBT devices.

b. Documentation of BAT/STT training.

c. Documents generated in connection with decisions to administer reasonable suspicion alcohol tests.

d. Documents generated in connection with decisions to administer post-accident alcohol tests.

e. Documents verifying existence of a medical explanation of the inability of a covered employee to provide adequate breath for alcohol testing.

2. The following types of records related to test results:

   a. Company's copy of the alcohol test form, including the results of the test.

   b. Documents related to the refusal of any covered employee to submit to a required alcohol test.

   c. Documents presented by a covered employee to dispute the result of an alcohol test administered under the AMPP.

3. Records related to other violations outlined in the AMPP.

4. The following types of records related to referrals and evaluations:

   a. Records pertaining to a determination by a SAP concerning a covered employee's need for assistance.

   b. Records concerning a covered employee's compliance with the recommendations of the SAP.

5. Records related to the company's MIS annual alcohol misuse testing data and "missed test" information. The company shall submit the required alcohol misuse MIS testing data and "missed test" information to RSPA as prescribed by the regulations.

6. The following types of records related to education and training of employees and supervisors:

   a. Materials on alcohol misuse awareness, including a copy of the company's policy on alcohol misuse.

   b. Documentation of compliance with the requirements of 199.231.

   c. Documentation of training provided to supervisors for the purposes of qualifying the supervisors to make a determination concerning the need for alcohol testing based on reasonable suspicion.

   d. Certification that any training conducted under the AMPP complies with the requirements of 40 CFR Part 199 and 40.

SECTION XIII. CONTRACTOR MONITORING

A. The company may (1) cover contractor employees under operator's plan or (2) may provide in contract that contractor must establish and implement alcohol breath testing, education, and training in accordance with Part 199 and Part 40 for covered functions.

B. Contractors shall retain copies of appropriate alcohol testing records as required by 49 CFR Part 199 and Part 40. The records and access to the contractor's property shall be readily accessible for inspection by the company, RSPA, and representatives of those state agencies under which jurisdiction the company operates.

C. Confirmation of contractor compliance/monitoring - Refer to Appendix D for specific guidance in how to develop an effective contractor compliance and monitoring program.

D. The company can, as an alternative to the above guidance provide coverage for the contractors employees by including them in the company's alcohol testing program for the duration of the contract or work project. When contractor employees are covered under the company's AMPP, the contractor shall ensure that their employees comply with all the provisions contained in the company's AMPP.

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APPENDIX A

ALCOHOL PERSONNEL AND SERVICES CONTACTS

1. ALCOHOL PROGRAM MANAGER (APM)

2. SUBSTANCE ABUSE PROFESSIONAL (SAP) OR THIRD PARTY PROVIDER NETWORK

3. BREATH ALCOHOL TECHNICIAN (BAT) OR SCREENING TEST TECHNICIAN (STT)

4. EMPLOYEE ASSISTANCE PROGRAM (EAP)

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APPENDIX B

INFORMATION FOR THIS APPENDIX
MUST BE
PROVIDED BY THE COMPANY.

DEVELOP A LIST OF ALL
EMPLOYEE AND SUPERVISORY POSITIONS
THAT ARE SUBJECT TO
THE ALCOHOL TESTING REQUIREMENTS.

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APPENDIX C

EVIDENTIAL BREATH TESTING AND NON-EVIDENTIAL COLLECTION PROCEDURES

A. Scope.

1. The evidential and non-evidential testing procedures set forth in this appendix address all the requirements as set forth in 49 CFR Part 40 and specifies the required form and disposition of such testing forms.

B. Alcohol Testing Form.

1. The BAT/STT shall utilize the Breath Alcohol Testing form provided by company. The alcohol testing form must comply with the provisions as contained in 49 CFR Part 40 with regard to the information that must be contained on the form. The form must address the specific requirements contained in § 40.59. The company may not modify or revise the form.

2. The company may utilize a DOT Breath Alcohol Testing form or a form that is directly generated by an EBT and may omit the space for affixing a separate printed result to the testing form. The form shall provide triplicate or three consecutive identical copies with copy 1 (white copy) being retained by the company, copy 2 (green copy) shall be provided to the employee, and copy 3 (blue copy) shall be retained by the BAT/STT.

3. The breath alcohol testing form may include such additional information as may be required for billing or other legitimate purposes necessary to the testing, provided that personal identifying information on the individual (other than the social security number or employee identification number) may not be provided.

C. Breath Testing Locations.

1. The company shall ensure that there are sufficient breath testing sites or the availability of BATs/STTs located within a reasonable proximity to each of the company's work locations.

2. The company shall conduct the testing in a location that affords visual and aural privacy to the employee being tested. All necessary equipment, personnel, and materials for conducting the alcohol testing shall be provided at the testing site.

3. A mobile collection facility, such a van that is equipped for alcohol testing, that meets the requirements set forth in the AMPP may be utilized.

4. No unauthorized persons shall be permitted access to the testing site when the EBT remains unsecured, or to prevent such individuals from seeing or hearing a test result.

5. In some circumstances the company may have to conduct such alcohol testing outdoors at the scene of an accident that does not meet the requirements as specified in post-accident provisions of the AMPP. In these situations the BAT/STT shall provide the necessary visual and aural privacy to the employee to the greatest extent practicable.

6. The BAT/STT shall supervise only one employee's use of the EBT at a time. The BAT/STT shall not leave the alcohol testing site while the testing process is in progress.

D. Breath Alcohol Testing Preparations.

1. When an employee arrives at the alcohol testing site, the BAT/STT shall ensure that the individual is positively identified as the employee selected for alcohol testing (e.g., through presentation of photo identification or identification by the company's representative). If the employee's identity cannot be established, the BAT/STT shall not proceed with the alcohol test. If the employee requests, the BAT/STT shall show proper identification to the employee.

2. The BAT/STT shall explain the alcohol testing process to the employee.

3. If the employee fails to arrive at the assigned time, the BAT/STT should contact the appropriate authority to obtain guidance on any action to be taken.

E. Screening Test Procedures for Evidential Breath Testing and Non-Evidential Breath Testing Devices.

1. The BAT shall begin the alcohol testing process by completing Step 1 on the Alcohol Breath Testing form. The employee shall then complete Step 2 by signing the certification. Refusal by the employee to sign the certification shall be regarded as a refusal to take the alcohol test.

2. The BAT shall select an individually-sealed mouthpiece and it shall be opened in full view of the employee and attach it to the EBT in accordance with the manufacturer's instructions.

3. The BAT shall instruct the employee to blow forcefully into the mouthpiece for at least 6 seconds or until the EBT instrument indicates that an adequate amount of breath has been obtained.

4. If the EBT does not meet the requirements listed under Section VIII of the AMPP, the BAT shall show the employee the result displayed on the EBT. The BAT shall record the displayed result, test number, testing device, serial number of the testing device, time and quantified result in Step 3 of the form.

5. If the EBT provides a printed result but does not print the results directly onto the form, the BAT shall show the employee the result displayed on the EBT. The BAT shall then affix the test result printout to the breath alcohol test form in the designated space. The result shall be secured in such a manner that will provide clear evidence of removal, such as the use of tamper-evident tape.

6. If the EBT prints the test result directly onto the alcohol form, then the BAT shall show the employee the result displayed on the EBT.

7. If the result of the screening alcohol test is a breath alcohol concentration of less than 0.02, the BAT shall date the form and sign the certification in Step 3 of the form. The employee shall then sign the certification and fill in the date in Step 4 of the form. If the employee does not sign the certification in Step 4, it shall not be considered a refusal to be tested. In this event, the BAT shall note the employee's failure to sign in the "Remarks" section of the form.

8. If a test result printed by the EBT does not match the displayed result, the BAT shall note the disparity in the "Remarks" section. Both the BAT and the employee shall initial or sign the notation. The alcohol test is invalid and the company representative and the employee shall be so advised.

9. At this point, no further testing is authorized. The BAT shall transmit the result of less than 0.02 to the APM or other appropriate company representative in a

confidential manner. The company shall receive and store the information so as to ensure that confidentiality is maintained as required in the AMPP.

10. If the result of the screening test is an alcohol concentration of 0.02 or greater, then the BAT shall perform a confirmation test. If the confirmation test will be conducted by a different BAT, then the BAT who conducts the screening test shall complete and sign the form and log entry. The BAT will upon completion of the alcohol test provide the employee with Copy 2 of the breath alcohol testing form.

F. Screening Test Procedures for Non-Evidential Saliva Devices.

1. STT will inform the employee of the procedures for the non-evidential testing. The STT shall begin the alcohol testing process by completing Step 1 on the Alcohol Breath Testing form. The employee shall then complete Step 2 by signing the certification. Refusal by the employee to sign the certification shall be regarded as a refusal to take the alcohol test.

2. The STT shall check the expiration date of the salvia testing device, show the date to the employee. In the event, the date has passed the device is not be used and a new device should be obtained for use.

3. The STT shall open an individually sealed package containing the device in the presence of the employee.

4. The STT shall offer the employee the opportunity to use the swab. If the employee chooses to use the swab, the STT shall instruct the employee to insert the absorbent end of the swab into the employee's mouth, moving it actively throughout the mouth for a sufficient time to ensure that it is completely saturated as provided in the manufacturer's instruction for the device.

5. If the employee chooses not to use the swab, or in all cases in which a new test is necessary because the device did not activate, the STT shall insert the absorbent end of the swab into the employee's mouth, moving it actively throughout the mouth for a sufficient time to ensure that it is completely saturated, as provided in the manufacturer's instruction for the device the STT shall wear a surgical grade glove while conducting the test.

6. The STT shall place the device on a flat surface or otherwise in a position in which the swab can be firmly placed into the opening provided in the device for this purpose. The STT shall insert the swab into this opening and maintain firm pressure on the device until the device indicates that it is activated.

7. If the procedures of steps 3 through 5 are not followed successfully (e.g., the swab breaks, the STT drops the swab on the floor or another surface, the swab is removed or falls from the device before the device activated), the STT shall discard the device and swab and conduct a new test using a new device The new device shall be one that has been under the control of the employer or STT prior to the test. The STT shall note in the remarks section of the form the reason for the new test. In this case, the STT shall offer the employee the choice of using the swab himself or herself or having the STT use the swab. If steps 3 through 5 are not successfully followed on the new test, the collection shall be terminated and an explanation provided in the remarks section of the form. A new test shall then be conducted, using an EBT for both the screening and confirmation tests.

8. If steps 3 through 5 are completed successfully, but the device is not activated, the STT shall discard the device and swab and conduct a new test, in the same manner as stated above. In this case, the STT shall place the swab into the employee's mouth to collect saliva for the new test.

9. The STT shall read the result displayed on the device two minutes after inserting the swab into the device. The STT shall show the device and its reading to the employee and enter the result on the form.

10. Devices, swabs gloves and other materials used in saliva testing shall not be reused, and shall be disposed of in a sanitary manner following their use.

11. In any case in which the result of the screening test is an alcohol concentration of less than 0.02 the STT shall date the form and sign the certification and fill in the date in Step 4 of the form.

12. If the employee does not sign the certification in Step 4 of the form it shall not be considered a refusal to be tested.

13. If the result of the screening test is an alcohol concentration of 0.02 or greater, a confirmation test shall be performed.

14. If the STT who performed the screening test is a different individual from that who will serve as the BAT during the confirmation test, then the STT will provide the employee with Copy 2 of the form and the BAT will follow the procedures for a confirmation test.

15. If the confirmation test will be conducted at a different site from the screening test the employer or its agent shall ensure that:

    a. The employee is advised not to eat, drink, put any object or substance in his/her mouth and to the extent possible not to belch during the waiting

period before the confirmation test. This time period begins with the completion of the screening test.

b. The employee is advised that he or she must not drive, perform a safety-sensitive duty or operate heavy equipment, as noted in block 4 of the alcohol testing form.

c. The employee is under observation of a BAT, STT, or other employer personnel while in transit from the screening test site to confirmation test site.

16. The STT shall enter, in the "Remarks" section of the form, a notation that the screening test was performed using a saliva device.

17. Following the completion of the screening test, the STT shall date the form and sign the certification in Step 3 of the form.

G. Confirmation Test Procedures.

1. When a BAT other than the one who conducted the screening test is required to conduct the confirmation test, the new BAT will require the employee to provide positive identification such as photo ID card or identification by a company representative. The BAT will, upon request of the employee being tested, provide such identification.

2. The BAT shall instruct the employee not to eat, drink, put any object or substance in his/she mouth and, to the extent possible, not belch during the waiting period just prior to the confirmation test being conducted. This waiting period shall begin with the completion of the screening test and shall not be less than 15 minutes, but must be within 30 minutes of the completion of the screening test. The time the employee spends in transit between the screening test and confirmation test, the employee is under direct observation, counts toward the mandatory 15 minute deprivation period. If the BAT conducts the confirmation test more than 30 minutes after the result of the screening test has been obtained the BAT shall note in the "Remarks" section of the form the time that elapsed between the screening and the confirmation test and the reason why the confirmation test could not be conducted within 30 minutes of the screening test. The BAT shall explain to the employee that the reason for this is to prevent any accumulation of mouth alcohol leading to an artificially high reading and that it is for the benefit of the employee to comply with these instructions. The BAT shall also explain that the test will be conducted at the end of the required waiting period, even if the employee has disregarded the instructions. Should the BAT become aware that the employee has not complied with the instructions as provided, the BAT shall note the observations in the "Remarks" section of the form.

3. When a BAT other than the one who conducted the screening test is required to conduct the confirmation test, the new BAT shall initiate a new Breath Alcohol Testing form. The BAT shall then complete step 1 on the form and the employee shall then complete Step 2 by signing the certification. If the employee should choose not to sign the certification, the BAT shall then make an appropriate notation in the "Remarks" section indicating the employee's refusal to take the alcohol test. The BAT shall note in the "Remarks" section that a different BAT conducted the screening test.

4. The BAT shall open, in the presence of the employee, a new individually-sealed mouthpiece and attach the mouthpiece to the EBT in accordance with the manufacturer's instructions. The BAT will then instruct the employee to blow forcefully into the mouthpiece for at least 6 seconds or until the EBT indicates that an adequate amount of breath has been obtained.

5. The BAT shall ensure, prior to the confirmation test being administered to the employee, that the EBT shall register 0.00 on an air blank. If the reading is greater, the BAT shall conduct one more air blank. Should the EBT again register greater than 0.00, the testing shall not proceed using that EBT. An EBT taken out of service because of failure to perform an air blank accurately shall not be used for testing until a check of external calibration is conducted and the EBT is found to be within the accepted tolerance limits. Alcohol testing using another EBT may proceed.

6. In the event that the screening and confirmation test results are not identical, the confirmation test result shall be deemed to be the final result on which any action by the company may be taken in order to comply with the requirements of the AMPP and any applicable federal requirements.

7. If the EBT provides a printed result but does not print the results directly onto the form, the BAT shall show the employee the result displayed on the EBT. The BAT shall then affix the test result printout to the breath alcohol test form in the designated space. The result shall be secured in such a manner that will provide clear evidence of removal, such as the use of tamper-evident tape.

8. If the EBT prints the test result directly onto the alcohol form, then the BAT shall show the employee the result displayed on the EBT.

9. After the confirmation test is completed, the BAT shall date the form and sign the certification in Step 3 of the form. The employee shall then be instructed to sign the certification and fill in the date in Step 4. If the employee should elect to not sign the certification or to provide his/her initials in the log book entry for the test conducted, it shall not be considered as a refusal to be tested. The BAT shall then

note the employee's failure to sign or initial the log book entry in the "Remarks" section of the testing form.

10. If a test result printed by the EBT does not match the displayed result, the BAT shall note the disparity in the "Remarks" section. Both the BAT and employee shall initial or sign the notation on the testing form. The test shall be considered "invalid" and the company representative and the employee shall be so advised.

11. The BAT shall transmit all alcohol testing results to the APM or other designated company representative in a confidential manner. All communications by BATs shall be to the APM or designee only and may be provided in writing, in person, or by telephone or electronic means. The BAT shall ensure that immediate transmission of test results to the company is conducted in order for the company to prevent the employee from performing any covered functions.

12. Should the initial transmission not be accomplished in writing, but via telephone notification, the APM or designee shall establish a mechanism to verify the identity of the BAT providing the information. The BAT shall follow the initial transmission by providing to the APM or designee the company's copy of the breath alcohol testing form. The test results shall be stored in such a manner so as to protect the confidentiality of the results and to eliminate the disclosure of information to unauthorized persons.

H. Refusals to Test and Uncompleted Tests.

1. Refusal by an employee to complete and sign Step 2 of the breath alcohol testing form, to provide breath or a saliva sample, to provide an adequate amount of breath, or otherwise to cooperate with the testing process in a way that prevents the completion of the test shall be noted by the BAT/STT in the "Remarks" section of the form. The testing process shall be terminated and the BAT/STT shall immediately notify the company APM or designee.

2. If a screening or confirmation test cannot be completed or if an event occurs to invalidate the test, the BAT/STT shall, if practicable, begin a new screening or confirmation test using a new breath alcohol testing form with a new sequential test number.

I. Inadequate Amount of Breath for EBTs and Non-EBT Devices.

1. If the employee is unable, or alleges that he/she is unable, to provide a sufficient amount of breath to permit a valid breath test because of a medical condition, the BAT or STT shall again instruct the employee to attempt to provide an adequate amount. If the employee refuses to make the attempt, the BAT or STT shall immediately inform the APM.

2. If the employee attempts and fails to provide an adequate amount of breath, the BAT or STT shall so note in the "Remarks" section of the testing form and shall immediately inform the APM. The APM shall direct the employee to obtain, as soon as practical after the attempt, an evaluation from a licensed physician who is

acceptable to the company concerning the employee's medical ability to provide an adequate amount of breath.

3. If the physician determines, in his/her reasonable medical judgment, that a medical condition has or could have precluded the employee from providing an adequate amount of breath, the employee's failure to provide an adequate amount of breath shall not be deemed as a refusal to take an alcohol test. The physician shall provide to the company APM a written statement of the basis of his/her conclusion.

4. If the physician, in his/her reasonable medical judgment, is unable to make the determination that a medical condition has precluded the employee from providing an adequate amount of breath, the employee's failure to provide an adequate amount of breath shall be regarded as a refusal to take a test. The physician shall provide a written statement of the basis for his/her conclusion to the company APM.

J. Inadequate Amount of Saliva for Non-Evidential Testing Devices.

1. If an employee is unable to provide sufficient saliva to complete a test on a saliva screening device (e.g. the employee does not provide sufficient saliva to activate the device) the STT shall conduct a new test using a new device as described in Section F "Screening Test Procedures for Non-Evidential Saliva Devices #7."

   a. If the employee refuses to complete the new test, the STT shall terminate testing and immediately inform the employer. This constitutes as a refusal to test.

2. If a new test is completed, but there is an insufficient amount of saliva to activate the device the STT shall immediately inform the employer, which shall then immediately initiate an alcohol test to be administered to the employee using an EBT.

K. Invalid Tests.

1. A breath alcohol test shall be invalid under the following circumstances:

   a. The EBT does not pass its next external calibration check. This invalidates all test results of 0.02 or greater on tests conducted since the

last valid external calibration test. This would not invalidate any negative tests conducted.

b. The BAT does not observe the minimum 15-minute waiting period prior to conducting the confirmation test.

c. The BAT does not perform an air blank of the EBT before a confirmation test, or an air blank does not result in a reading of 0.00 prior to the administration of an alcohol test.

d. The BAT does not sign the breath alcohol testing form.

e. The BAT fails to note in the remarks section of the form that the employee has failed or refused to sign the form following the recording or printing on or attachment to the form of the test results.

f. An EBT fails to print a confirmation test result.

g. The sequential test number or alcohol concentration displayed on the EBT is not the same as the sequential test number or alcohol concentration on the printed result.

2. An alcohol test using a non-evidential saliva screening device shall be invalid under the following circumstances:

a. The result is read before two minutes or after 15 minutes from the time the swab is inserted into the device.

b. The device does not activate.

c. The device is used for a test after the expiration date printed on its package.

d. The STT fails to note in the remarks section of the form that the screening test was conducted using a saliva device.

3. An alcohol test using a non-evidential alcohol testing device shall be invalid under the following circumstances:.

a. The STT has failed to note in the remarks section of the form that the employee has failed or refused to sign the form following the recording on the form of the test result.

APPENDIX D

CONTRACTOR ALCOHOL MONITORING PROCEDURES

A. Objective.

In order to assure a contractor's compliance with DOT's regulations, the following procedures are to be followed in determining compliance with the alcohol misuse testing regulations as set forth in 49 CFR Part 199 Subpart B and 49 CFR Part 40 Subpart C.

B. Procedures for Determining Compliance.

1. Qualifying Potential Contractors(s). Qualifications of the potential contractor as it pertains to alcohol testing policies/procedures is assured by requesting the potential contractor to submit a copy of its AMPP for review and compliance with RSPA/DOT regulations. **After review of the AMPP is completed, written correspondence to the contractor will advise it whether or not the AMPP plan is acceptable or in need of further additions, deletions, revisions or clarifying language**. The review of the contractor plan shall be completed utilizing the criteria established in the RSPA Alcohol Misuse Inspection form. Addenda made to the contractor's plan shall be attached to the previously submitted AMPP. Upon approval of the addendum, a letter of acceptance is then sent to the contractor. The contractor is now eligible to bid on company contract work that would be covered under Parts 199 and 40.

2. Monitoring Contractor's Compliance. The contractor may be required to provide information on their employees who will perform covered functions for the operator. This information may include the name and job title of its employees who will perform any work or functions covered by Part 199 under that contract. A list of each contractor's covered employees may be distributed to appropriate company field management personnel and job sites.

3. Statistical Submission. All contractors will be required to submit AMPP testing statistical information on a periodical basis which may be based on the duration of the contract. Typically this requirement will be conducted on a monthly or quarterly basis. The company may require a more frequent schedule for submission of data should they determine a need for such statistics.

4. Statistical Record Retention. The company shall maintain a complete file on each contractor's statistical drug testing data reports. The company shall make available these reports when requested by the RSPA Administrator, designated representative, or representatives of those state agencies under which jurisdiction the company operates.

Note: This is only one method of "monitoring" the contractor's compliance with the requirements set forth in 49 CFR 199.21. Other methods and guidance materials will be published at a later date.