Kerry F. Shampine, P.E.
Manager, Code Compliance
(503) 226-4211 Ext. 4340
FAX (503) 273-4822
kfs@nwnatural.com

NW Natural
220 NW 2ND AVENUE
PORTLAND OR 97209
TEL 503.226.4211
800.422.4012
www.nwnatural.com

September 7, 2011

Mr. David Lykken
Pipeline Safety Director
Washington Utilities and Transportation Commission
1300 South Evergreen Park Drive SW
P. O. Box 47250
Olympia, Washington 98504-7250

Subject: 2011 Natural Gas Standard Inspection, Columbia Gorge, Washington
Ref. No. Docket PG-110016

Dear Mr. Lykken:

The inspection of NW Natural's facilities in the Columbia Gorge, Washington, was conducted from June 13-16, 21 and 22, 2011 by Stephanie Zuehlke of the Washington Utilities and Transportation Commission (WUTC). In response to the findings of the inspection, dated August 3, 2011, NW Natural reports the following:

INSPECTION FINDINGS:

1. WAC-480-93-018 Records

1. *NWN failed to record the actual value of CGI reads taken during an investigation (by first responder employee D.W.) of a below ground leak on 12.23.10 at 541 El Camino Real, White Salmon.*

NW Natural Response:

NWN is proud of its leak management policies and procedures. NW Natural's practice is to utilize only a select number of subject matter experts (Leakage Inspectors) in the field to classify a leak and create the leak record within our compliance tracking system (Advantica). The leak record would include the associated map with corresponding readings and stationing used to determine the magnitude and location of the leak. These Leakage Inspectors commonly use both a F.I. and C.G.I. during the course of these investigations. It had become standard practice for these Inspectors to write "FI" at the boundary of the leak, denoting a zero reading. NWN understands that this may not meet the specific language of the regulation requiring that an actual CGI value be recorded, however, it meets the spirit of the regulation which would require the boundary of the leak be identified. Following the June inspection of The Columbia Gorge,

additional training was given to these Leakage Inspectors requiring that they document actual CGI values on their leak drawings, including a C.G.I. value of '0' at the boundary of the leak. In addition, NWN will review and revise its current written procedures to specify that an actual CGI value must be recorded and personnel will be retrained as appropriate.

2. *NWN did not have or did not provide records indicating the actual value of the residual gas reads taken on 04.14.09 after completion of a leak repair at 600 Washington St., White Salmon.*

NW Natural Response:

Please see response to 1.1.

2. WAC-480-93-018 Plans and procedures

NWN's Plans and Procedures language do not match NWN field practices. WAC 480-93-185, 186, and 18601 require leaks to be graded based upon location and/or magnitude of the leak. The following manual sections require responders to grade leaks as A, B, or C with no mention of a leakage inspector:

a) *SPW 603 (11.10.10),*
b) *SPW 709 (11.10.10), and*
c) *CFM 613 (03.04.11)*

However, the following Plan and Procedure and other documentation language state that responders other than the leakage inspector will document their non-hazardous leak findings but a leakage inspector will classify the leaks:

a) *Operating procedure (OQ procedure) OP-C-501-01 (10.27.10) 4.4 and*
b) *NWN memo dated 9,29.08 to the Manager of Gas Operations from the Leakage Supervisor on the subject of Leak Detection and Recordkeeping Programs Self Audit which states, in March of 2006, NWN made a change to its leak classification criteria, allowing only NWN leakage inspectors to grade leaks (A, B, C). NWN's OQ program was amended to reflect these changes. According to NWN's OQ Program, all other field personnel responding to leaks no (sic) classify leakage as hazardous or non-hazardous.*

NW Natural Response:

Northwest Natural acknowledges that there may be a misunderstanding about the consistency among the above listed reference materials, and would like to take this opportunity to clarify the purposes of these guides. Once this is understood, the consistency across NWN documentation is more readily apparent.

The NWN Standard Practices (SPs) are the company's policies and procedures for meeting state and federal pipeline safety regulations. (For an Introduction to NWN Standard Practices, see SPW 000 - Attachment 1.) These are intended for use as a guide for how NW Natural will procedurally meet the regulations, but may not contain the level of detail that addresses how tasks will be done or who will perform them. The Construction Field Manual (CFM) includes more detail about how tasks will be performed, and the Operator Qualifications Procedures Manual includes even greater detail. The three of these manuals work in conjunction with several other plans and procedures to create what NWN refers to as its Operations & Maintenance (O&M) Manual (see SPW 000).

Given that information, the Standard Practices listed in SPW 603, 709 and CFM 613-1 specify that leaks will be classified, but they do not indicate who is qualified to do so. Staff is correct that these documents do not identify that only a Leakage Inspector may classify leaks as A, B, or C, but this is not the level of detail expected in a Standard Practice. This detail is found in OQ Procedure OP-C-501-01. First responders are required to assess the leak (Hazardous or Non-hazardous) and make the site safe. Leakage Inspectors are OQ'd to classify a leak (A, B, or C)

3. WAC-480-93-185 Gas Leak Investigation

1. *NWN failed to assign a grade to a leak until 12 days after discovery. A below ground leak revealed during a leak investigation on 12.23.10 at 541 Camino Real, White Salmon, was not graded until the leakage inspector visited the site on 01.04.11. The leakage inspector determined the leak to be a Grade B leak.*

   NWN practice and procedures appear to identify that unless the first responder is their "leakage inspector" all leaks are classified as hazardous or nonhazardous. Staff finds that NWN's hazardous leak classification is equivalent to a Grade A leak. However, their non-hazardous leak classification can be either a Grade B or a Grade C leak.

NW Natural Response:

WAC 480-93-185 – Gas leak investigation – requires that where an investigation reveals a leak, the gas pipeline company must grade the leak in accordance with WAC 480-93-186. NW Natural believes there was no violation of code because the leak was graded and documented accordingly. The first responder determined the leak to be non-hazardous (meaning a B or C leak) on 12.23.10. Following that, a Leakage Inspector was sent out and graded the leak on 1.04.11. Admittedly, while a 12 day response is not ideal, the code does not indicate that a leak must be graded by the first responder, or how soon a leak must be graded.

As outlined in Staff Findings, first responders assess and evaluate a leak as either hazardous or non-hazardous, and act according to policies set forth in SPW 709 – Leak Classification and Repair (see Attachment 2). A hazardous leak is repaired or mitigated immediately. A non-hazardous leak is documented and a Leakage Inspector is dispatched to classify the leak. This generally occurs during the next business day.

NWN agrees that 12 days was an unusually long amount of time for a leak to be graded, but notes that this was a non-hazardous leak, as determined promptly at the time of the original investigation on 12.23.10. NWN has found that there appear to have been delays caused by the fact this leak occurred just prior to the Christmas and New Year's Holidays. Because there are processes in place that should prevent such a delay from occurring, NWN will review these processes with appropriate personnel to prevent similar occurrences in the future. In addition, as part of NW Natural's commitment to continued process improvement, a team is currently designing and implementing an enhanced electronic mobile work management system for its compliance activities that will automate what is now a paper process for leakage inspection referral. This will greatly reduce the opportunity for any future work orders to be delayed in the system.

2. *NWN did not retain or did not provide leak investigation records for:*

Leak Location	*Leak Detected*	*Grade*	*Active as of 5.20.11*
a 185 W. Jewett, White Salmon	*2003*	*C*	*Yes*
b. 7th St. & Oak St., White Salmon	*1983*	*C*	*Yes*
c. Franklin & Ash, Bingen	*1997*	*C*	*Yes*

NW Natural Response:

NW Natural acknowledges that there has been some difficulty in locating the original documents associated with these older 'C' leak records. These are paper records that were sent to off-site archives. NW Natural is continuing to search these archived records and will make every attempt to locate the original documents for the leaks as noted above. It should be noted that current practices have been improved by the implementation of our code compliance scheduling and tracking system (Advantica), which NWN began using in 2006 for leak management activities. This allows the company to track, store and retrieve leak histories electronically. The history of leaks being tracked since this implementation is readily available. The leaks, as noted above, are currently managed within this software application and are regularly rechecked on the required inspection cycle.

In addition, NWN is currently developing a long-term plan to reduce the backlog of active C leaks based upon the date of original discovery. NWN understands that an operator may carry a C leak indefinitely, assuming it has not been downgraded from an A or B leak, but as a prudent operator has decided that the elimination of these older leaks is the best course of action. NW Natural would be happy to share the specifics of this plan once the details are fully developed.

4. WAC-480-93-186 Leak evaluation

1. *NWN failed to determine and document the perimeter of a leak area for the following leaks:*

   a) 185 W. Jewett, White Salmon

b) 541 El Camino Real, White Salmon
c) 600 Washington St., #1, White Salmon (2 separate investigations by same employee on 03.31.09 neither leak map document a 360° perimeter.)

NW Natural Response:

NW Natural is committed to an effective leak management program, including complete and accurate leak documentation. The policies set forth in SPW 709 – Leak Classification and Repair (see Attachment 2) address these matters and the company is confident that its leaks are documented and tracked in a manner consistent with WAC 480-93-186, but agrees with Staff findings that the documentation could be improved. While the records produced do indicate that NWN Leakage Inspectors created maps of the leaks indicating the spread in the primary dimension, the company acknowledges that maps showing additional stationing would provide a more accurate representation of the leak boundaries.

NWN will develop and implement new procedures for more accurately representing leak pools, and will retrain appropriate personnel. Also please see response to 1.1.

2. *NWN did not have or did not provide records which identified a CGI had been used to determine the perimeter of a leak area for the following leaks:*

a) 185 W. Jewett, White Salmon
b) 541 El Camino Real, White Salmon

NW Natural Response:

Please see response to 1.1.

5. WAC-480-93-18601 Leak classification and action criteria – Grade – Definition – Priority of a leak repair

NWN did not have or did not provide records identifying that the following Grade C leaks were re-evaluated at intervals not to exceed 15 months:

a) 185 W. Jewett, White Salmon – No leak re-evaluation between 2003 and May 20, 2011. Leak identified in 2003 requires a minimum of 4 re-evaluations to have been completed.
b) 7th St. & Oak St., White Salmon – No leak re-evaluation between 4.20.87 and 05.04.89
c) Franklin & Ash, Bingen – No leak re-evaluation between 03.30.98 and 07.08.99.

NW Natural Response:

a) At the time of the inspection the Leakage team was completing the search for the associated leak documents for the address 185 W. Jewett. Attached are the documents as requested (see
Attachment 3). No inspections were missed.

b) and c) As previously stated, NW Natural's legacy leakage management system was primarily paper based. Current practices have been improved by the implementation of our code compliance scheduling system (Advantica), which NW Natural began using in 2006 for leak management activities. This application allows the company to store and retrieve leak histories electronically, as well as track and schedule leak re-inspection intervals automatically, dispatching this information to the appropriate field technicians. This scheduling system enables NWN personnel to consistently re-evaluate leaks prior to their required recheck date.

6. WAC-480-93-187 Gas leak records

1. *NWN failed to record a leak grade for a below ground leak revealed during an investigation (by second responder employee T.D.) on 12.23.10 at 541 El Camino Real, White Salmon. Leak was identified as a non-hazardous leak.*

NW Natural Response:

WAC 480-93-187 - Gas leak records – requires the gas pipeline company to prepare and maintain permanent gas leak records, and lists (13) elements that must be part of such records. NW Natural believes there was no violation of code because the leak was appropriately graded and reflected as a part of this asset's records. The first responder determined the leak to be non-hazardous (meaning a B or C leak) on 12.23.10. Following that, a Leakage Inspector was sent out and graded the leak on 1.04.11. While a 12 day response is not ideal (please see response to 3.1), the code does not indicate that a leak must be graded by the first responder. The WAC code requires the operator to promptly investigate any notification of a leak, which was the case in this instance.

2. *NWN failed to record the magnitude and/or location of CGI reads taken during an investigation at 541 El Camino Real, White Salmon on the following dates:*

a) 12.23.10
b) 01.04.11

NW Natural Response:

Please see response to 1.1.

7. WAC-480-93-188 Gas leak surveys

NWN did not have or did not provide leak survey maps for the following high occupancy structures:

a) 04.23.09 – 351 Hot Springs Rd., Carson – Carson Grade School (3 services)
b) 05.11.10 – 351 Hot Springs Rd., Carson – Carson Grade School (3 services)
c) 04.14.09 – 450 Main St. & Pool, White Salmon (2 services)
d) 05.11.10 – 450 Main St. & Pool, White Salmon (2 services)

NW Natural Response:

WAC 480-93-188 requires that survey records contain a "description of the system and area surveyed (including maps and survey logs)." NWN implemented our electronic code compliance scheduling system (Advantica) for leak management in 2006. Leakage Inspectors utilize two forms of information to complete these required surveys. These High Occupancy structures or areas (Special buildings) are defined within Advantica as an asset requiring a cyclical inspection. A description of this asset is stored within Advantica, providing general information about the location of the associated mains and services requiring inspection. Additionally, our mobile mapping application, FieldSmart, shows an icon at the appropriate map location identifying the site as one requiring a Special Building survey. Data about the required survey activities are tracked and stored within Advantica. Between these two systems, Advantica and Field Smart, NWN records do include the elements required by code, including both survey logs and maps.

8. 49 CFR §199.113 Employee assistance programs

NWN's Drug and Alcohol Policy, which is distributed to employees, identifies the Washington employee assistance program (EAP) contact number as 800.255.5255. This contact number is invalid and has been invalid for approximately 2 years due to a change in EAP providers. Staff notes the correct number is displayed on the employee bulletin board in the headquarters building.

NW Natural Response:

CFR §199.113 requires that education under each EAP include "at least the following elements; display and distribution of informational material; display and distribution of a community service hot-line telephone number for employee assistance; and display and distribution of the employer's policy regarding the use of prohibited drugs." NWN agrees with Staff notation that the Washington EAP contact number is displayed correctly on employee bulletin boards in the headquarters building, and would like to add that it is also appropriately displayed in all of the NWN service centers. In addition, the NWN intranet site used by employees has the correct number listed in the Human Resources section, which is easily accessible to all employees. These two methods would be the most common ways for employees to access such information, and NWN suggests these methods of "display and distribution" meet the requirements of the code.

NWN does acknowledge that the EAP number in the Human Resources Policy Manual is outdated due to a change in providers. Updating this number has been delayed by a larger update of the overall policy which must be negotiated with NWN union partners. This has been a very lengthy process, already in negotiation for over a year. The entire policy, including the corrected EAP number, is expected to be updated by the end of 2011.

9. 49 CFR §199.113 Employee assistance programs

NWN did not have or did not provide training certification records for the following supervisory personnel for this district:

a) Field Operations & Customer Field Services Supervisor – Y.R.
b) Field Supervisor of District Regulation – M.C.

NW Natural Response:

NWN has been doing reasonable cause EAP training for supervisors to recognize indicators of drug use for many years now, and as is sometimes the case, paper records are not always easy to obtain. There is a new electronic record-keeping system currently being implemented that will enable NWN to assure all supervisors have received training and that the certification of successful completion is easily accessible. All supervisors are receiving refresher training and will be given new certification which will become a part of their electronic record. This project is anticipated to be complete by the end of 2011.

10. 49 CFR §199.241 Training for supervisors

NWN did not have or did not provide training certification records for the following supervisory personnel for this district:

a) Field Operations & Customer Field Services Supervisor – Y.R.
b) Field Supervisor of District Regulation – M.C.

NW Natural Response:

Please see response to 9.

AREAS OF CONCERN:

1. WAC-480-93-018 Records

NWN needs to update the list of forms and databases they maintain, including examples where applicable, that specify what records the company maintains per WAC 480-93-018(3). Database records provided to staff were incomplete and did not contain all documentation from the original forms. If electronic records will be used, NWN needs to update their manual's list of forms to reflect this change – if other records will be used to supplement the database records these records should also be identified.

NW Natural Response:

NWN thanks Staff for this recommendation and, upon request, is happy to provide a list identifying which company records are available electronically and which are still in paper format. As Staff discovered, some NWN electronic reports cover a broad range of summary data but may not include all details, so as is often the case for companies in transition to enhanced data management systems, supplemental data in electronic format and/or actual

paper records may be required. As systems improve, and as the practice of relying on paper records fades, NW Natural plans on relying more heavily upon electronic reports understanding that, supplemental reports will always be required to review specifics.

2. WAC-480-93-018 Plans and procedures

NWN atmospheric corrosion remediation procedures do not identify painting standards and procedures for the application.

NW Natural Response:

NWN believes the painting standards and procedures are covered by Operating Procedures P-C-132-01 (Coating Pipeline Facilities) and OP-C-220-01 (Inspecting Atmospheric Corrosion). (see Attachments 4 & 5)

3. WAC-480-93-018 Plans and procedures

There is no mechanism in NWN Procedure SPW 483 (general corrosion/atmospheric corrosion) which ties it to the Construction Field Manual (CFM) 601.3 Pit Gauge Measurement (NWN Note: CFM 601.3 is Handling Standard – Steel; Pit Gauge CFM is 504.5). *In other words, field employees report a grade 2 & 3 corrosion issue to their Supervisor but there is no process for taking/completing the actual pit gauge measurement and equating it to a particular remediation. Additionally, pit gauge measurement tool training should be incorporated applicable field employees (sic).*

NW Natural Response:

NWN understands Staff's concerns with there not being a clear tie-in with pit gauge measurement and remediation. NW Natural procedures currently do not require the use of a pit gauge in evaluation of atmospheric corrosion. OQ procedures and Standard Practices have assessment criteria which rates atmospheric corrosion from 0 to 3 (no corrosion to major corrosion) based upon field training and observation and is unrelated specifically to wall loss. The CFM, section 504.5 Pit Gauge, contains information regarding the use of Pit gauges for field personnel, however, it is not directly correlated to atmospheric corrosion evaluation. Pit gauge training is covered with new hire trainings and all related refresher trainings conducted at NW Natural.

4. CFR §192.63 Marking of materials

Staff found several lengths of various sized unmarked FBE steel pipe stored on an unprotected pipe rack in NWN's The Dalles pipe yard. NWN is responsible for assuring a means to identify each pipeline component until it is installed. OPS Interpretation "...For coated pipe in short term storage or protected storage a marking on the coating or coating wrapper will normally remain legible until installation. For coated pipe in long term storage, marking is usually maintained by painting the pipe (identification) inside each end. Also, some operators paint a color code on pipe. It is an operator's responsibility to use markings that will identify material until it is installed. Section 192.63 does not require that markings be maintained after installation, but materials used in any segment of pipeline must be identifiable for the life of the facility to ensure proper operation and maintenance. This is accomplished by maintaining appropriate records."

NW Natural Response:

NW Natural has adopted an Engineering specification for steel pipe design and construction, 27-001 Steel Pipe (see Attachment 6). This specification allows for generally one standard, for each diameter, of pipe used throughout our system. Although we are confident we can identify the specification of each section of steel pipe, NW Natural recognizes staffs concern and will make efforts to have these sections of pipe removed and disposed of appropriately. Further, we will modify our inspection procedures at the outlying centers to assure pipe in storage will have the appropriate markings on them at all times prior to installation.

This report summarizes NW Natural's activities in response to the WUTC Natural Gas Standard Inspection of its facilities in the Columbia Gorge in June, 2011.

Sincerely,

Kerry F. Shampine, P.E.
Manager, Code Compliance

Enclosures (6)

dmd707

NW Natural

STANDARD PRACTICE – Washington
SPW 000

Title: Introduction

Revision: 10 (supersedes Rev. 09, 12/10/09) Approved: November 11, 2010
Signatures on file

Reviewed: Reviewed:

1. SCOPE

This section of the Standard Practices manual outlines the purpose and organization of the manual and identifies the requirements and responsibilities for maintaining standard practices.

2. POLICY

The following documents constitute the operations and maintenance (O&M) manual for NW Natural:

- Standard Practices manual,
- Construction Field Manual (CFM),
- Operator Qualifications (OQ) Procedures,
- Pipeline Public Awareness Plan,
- Transmission Pipeline Integrity Management Program Plan,
- Welding Procedures, and
- Emergency Response Plan.

The Standard Practices manual defines the company policies and procedures for meeting state and federal pipeline safety regulations. It also defines operational interactions between departments and assigns responsibilities to various departments in the company. All sections of 49 CFR, Parts 191 and 192 are incorporated by reference in the Standard Practices manual.

The manual must be reviewed at least once each calendar year, at intervals not to exceed 15 months, and will be updated as necessary for code compliance and appropriateness. The reviews are performed to determine the appropriateness and adequacy of the policies related to the design, construction, operation, and maintenance of NW Natural's pipelines and appurtenances.

Procedures used in the performance of covered operation and maintenance activities must be reviewed for adequacy and effectiveness by subject matter experts (SMEs) with in-depth knowledge of the work at least once every 3 years, at intervals not to exceed 39 months. The reviews include procedures for responding to abnormal operating conditions (AOCs) and the requisite corrective action that must be taken. The procedures will be modified as necessary if deficiencies are found.

3. PROCEDURE

3.1 Manual Organization

The Standard Practices manual contains the following parts:

1. Contents – Lists all of the standard practices contained within the manual.

2. Index – Lists key words and the standard practice(s) in which they are found.
3. Introduction – Describes the organization of the manual and the responsibilities for approving and issuing standard practices.
4. Definitions – Defines terms used in the Standard Practices manual.
5. Standard Practices – Individual documents that describe NW Natural policies and procedures to ensure compliance with applicable state and federal pipeline safety codes and regulations.

The individual standard practices are numbered to generally correspond to the numbering found in the Department of Transportation (DOT) 49 CFR, Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards.

3.2 Standard Practices Organization

Each standard practice is a document containing one or more of the following sections:

1. Scope – Briefly describes the subject of the standard practice.
2. Policy – Summarizes the strategy or approach the company will use to comply with the safety codes and regulations covered by the standard practice.
3. Procedure – Describes the company's basic procedure for accomplishing the stated policy.
4. Related Company Information – Lists other standard practices and company documents that may contribute to a further understanding of the standard practice.
5. Reference Codes and Standards – Lists the codes, standards, and guidelines addressed by the standard practice.
6. Departmental Responsibilities – Identifies each department affected by the standard practice and defines the specific actions for which it is responsible.
7. Attachments – Applicable forms, charts, technical illustrations, or other related information may be added to the individual standard practices as attachments.

3.3 Standard Practices Annual Review

1. The Standard Practices manual will be reviewed annually by the designated Standard Practices group, at intervals not to exceed 15 months.
2. Review the individual standard practices to ensure:
   - compliance with applicable federal and state regulations, and
   - the appropriateness and adequacy of the procedures used in normal operations, maintenance, and emergency response.
3. Each standard practice will be modified as needed. Any company employee may propose a new standard practice or the revision of a current one by submitting a draft of the proposal or revision to the Code Compliance staff. New or revised standard practices with significant changes will require a group review with a minimum of the lead plus two required signatures (see below).
   - The lead person assigned the standard practice

- Manager, Engineering (or designate)
- Principal Compliance Engineer
- Manager, Gas Operations (or designate)
- Manager, Operations Technical Services (or designate)
- Director, Deliver Gas (or designate)

4. To address immediate needs, the Code Compliance staff or other designated personnel may modify any standard practice requiring enhancements or revisions with input from representatives from Gas Operations, when appropriate. In such circumstances, one of the following must sign off as the "Approver" on the change(s) at the time of implementation:
   - Principal Compliance Engineer
   - Manager, Engineering (or designate)
   - Director, Deliver Gas (or designate)

   These changes must be subsequently reviewed and approved by the full Standard Practices group as outlined in 3. above.

4. RELATED COMPANY INFORMATION

Construction Field Manual (CFM)
Operator Qualifications (OQ) Procedures
Pipeline Public Awareness Plan
Transmission Pipeline Integrity Management Program Plan
Welding Procedures
Emergency Response Plan

5. REFERENCE CODES AND STANDARDS

49 CFR 192.605 – Procedural manual for operations, maintenance, and emergencies
WAC 480-93-180 – Plan of operations and maintenance procedures; emergency policy; reporting requirements

NW Natural

STANDARD PRACTICE – Washington
SPW 709

Title:	Leak Classification and Repair		
Revision:	13 (supersedes Rev. 12, 9/16/08)	Approved:	May 14, 2009 Signatures on File
Reviewed:	M. J. Lilly, 11/11/09	Reviewed:	M. J. Lilly, 11/10/10

1. SCOPE

This standard practice outlines the classification system for leaks within the area served by the company; specifies criteria for leak identification, recording, and repair; and defines the company policy for response to odor calls.

A leak is defined as an unintentional escape of gas from the pipeline, including that caused by excavation damages. A non-hazardous release that could be eliminated by lubrication, adjustment, or tightening, is not considered to be a leak.

2. POLICY

The company will maintain a program to locate, classify, and record gas leaks, and repair them as required by the classification standards. Company-qualified or company-approved personnel must classify all known leaks. Leaks discovered or reported to the company must be considered hazardous until classified and, thereafter, if warranted by their classifications.

Company personnel will respond promptly to reports of gas odor inside or near a building (refer to SPW 603, Odor Call Response). Gas indications or leaks on lines not maintained by the company (e.g., marsh gas, transmission lines owned by others, bypass pipelines, customer-owned piping) must be reported to owners, company officials, or government officials, as appropriate.

3. PROCEDURE

3.1 Identification of Leaks

Company operating and contract personnel locate and identify gas leaks using gas detection instruments by any or all methods which have proven to be effective, including but not necessarily limited to:

- Regulation-required leak surveys conducted in accordance with SPW 707.
- Promptly investigating any notification of a leak, explosion or fire involving gas facilities as reported by customers, other utilities, public authorities, or the general public.

3.2 Classification of Leaks

Classify identified underground leaks as Class A, B, or C based on present or potential hazard.

3.2.1 Class A Leaks

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

Response to a Grade A leak may require one or more of the following actions:

- Implementation of SPW 615, Basic Emergency Plan,

- Evacuating the premises,
- Blocking off an area,
- Rerouting traffic,
- Eliminating sources of ignition,
- Venting the area,
- Stopping the flow of gas by closing valves or other means, or
- Notifying the local police and/or fire department.

Grade A leaks requiring prompt action include, but are not limited to:

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

3.2.2 Class B Leaks

A Class B leak is non-hazardous at the time of detection but justifies scheduled repair based on potential future hazard.

1. Repair or clear Class B leaks within 15 months from the date the leak is reported. If the applicable segment of pipeline is under consideration for replacement, an additional 6 months may be added to the required repair completion time (for a total of 21 months). Consider the following criteria to determine repair priorities:
   - Amount and migration of gas,
   - Proximity of gas to buildings and subsurface structures,
   - Extent of pavement, and
   - Soil type and conditions, such as frost cap, moisture, and natural venting.
2. Based on the criteria, some Grade B leaks may require repair within 5 working days, others within 30 working days. Leakage personnel notify the leakage supervisor of Grade B leaks (if any) requiring repair prior to the 15-month routine schedule.
3. Reevaluate Class B leaks at least once every 6 months until cleared. Determine the frequency of reevaluation by the location and magnitude of the leakage condition.

Class B leaks requiring action within 6 months include, but are not limited to:

- In a wall-to-wall paved area that does not qualify as a Class A leak and where gas could potentially migrate to the outside wall of a building:
  - Any reading of 40% LEL or greater under a sidewalk
  - Any reading of 100% LEL or greater under a street
- Any reading less than 80% LEL in small substructures not associated with gas facilities and where gas could potentially migrate creating a probable future hazard,
- Any reading between 20% and 80% LEL in an enclosed space,
- Any reading on a pipeline operating at 30% SMYS or greater in Class 3 or 4 locations that does not qualify as a Class A leak, or
- Any leak that is of sufficient magnitude to justify scheduled repair.

3.2.3 Class C Leaks

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

Reevaluate Class C leaks during the next scheduled survey or within 15 months of the reporting date, whichever occurs first, until the leak is reclassified or no longer results in a reading.

Class C leaks requiring reevaluation at periodic intervals include, but are not limited to:

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

3.3 Concentration and Extent of Natural Gas Leak

When evaluating any leak, determine the concentration of gas and perimeter of the leak area using a combustible gas indicator (CGI), and document.

- If the perimeter of the leak extends to a building wall, extend the investigation inside the building.
- Where the reading is in an unvented, enclosed space, consider the rate of dissipation when the space is ventilated and the rate of accumulation when the space is resealed.

3.4 Repair of Leaks

- Class A – Immediately begin corrective action following identification and continue uninterrupted until repairs are completed or safe conditions are otherwise established. No repair is complete until the gas spread is noticeably diminishing.

  Do not downgrade an A leak to B classification until made safe and confirmed with a final check using a combustible gas indicator.

- Class B – Normally repair within 15 months of the original identification. May extend this interval an additional 6 months (maximum of 21-months total) if the pipeline segment is scheduled for replacement, subject to the approval of the Code Compliance Manager. If a B leak is caused by corrosion on coated steel, undertake further investigation by corrosion personnel.
- Class C – Repair is optional. Any accumulation of leakage in a small geographical area is cause for additional analysis.

Grade A and B leaks can only be downgraded once to a Grade C leak without a physical repair. After a leak has been downgraded once, the maximum repair time for that leak is 21 months.

3.5 Field Rechecks

Perform a follow-up inspection of all leak repairs with residual gas remaining in the ground as soon as practical but not later than 30 days following the repair.

3.6 Leakage Records

Prepare gas leak records on company Form F-8185, Individual Leak Inspection Report, and retain for the life of the pipe. Ensure the leak records contain sufficient data and information to permit the WUTC to assess the adequacy of NW Natural's leakage program including, at a minimum:

- Date and time the leak was detected, investigated, reported, and repaired, and the name of the employee(s) conducting the investigation;
- Location of the leak (sufficiently described to allow ready location by other qualified personnel),
- Leak grade,
- Pipeline classification (e.g., distribution, transmission, service),
- If reported by an outside party, the name and address of the reporting party,
- Component that leaked (e.g., pipe, tee, flange, valve),
- Size and material that leaked (e.g., steel, plastic, cast iron),
- Pipe condition,
- Type of repair,
- Leak cause,
- Date pipe installed (if known),
- Magnitude and location of CGI readings left, and
- Unique identification numbers (such as serial numbers) of leak detection equipment.

Effective June 2, 2005, retain records of the original leak, subsequent rechecks, repairs, and follow-up inspections for as long as the segment of pipe remains in service.

4. RELATED COMPANY INFORMATION

SPW 002 – Reporting Accidents and Incidents
SPW 603 – Odor Call Response
SPW 615 – Basic Emergency Plan
SPW 707 – Leakage Survey Program

5. REFERENCE CODES AND STANDARDS

49 CFR 191 – Sections on annual reports and incident reports
49 CFR 192.605 – Procedural manual for operations, maintenance, and emergencies
49 CFR 192.705 – Transmission lines: Patrolling
49 CFR 192.706 – Transmission lines: Leakage surveys
49 CFR 192.709 – Transmission lines: Record keeping
49 CFR 192.721 – Distribution systems: Patrolling
49 CFR 192.723 – Distribution systems: Leakage surveys and procedures
WAC 480-93-185 – Gas leak investigation
WAC 480-93-186 – Leak evaluation
WAC 480-93-18601 – Leak classification and action criteria – Grade – Definition – Priority of leak repair
WAC 480-93-187 – Gas leak records
WAC 480-93-188 – Gas leak surveys
WAC 480-93-200 – Reporting requirements for operators of gas facilities

DEPARTMENTAL RESPONSIBILITIES

Department	Responsibilities
Compliance Services, Construction Services, Gas Supply, and Customer Field Services	• Provide suitable training in leak classification methods and techniques for departmental personnel assigned to this work. • For gas indications or leaks on lines not maintained by the company, notify owners where possible with the assistance of the Risk Environment & Land department, and also notify Safety and Customer Field Services, as needed, when further notification for fire marshals or other local government officials appears prudent. • For houseline leaks, owner notification must be accomplished using Form No. 6016. For leaks on Northwest Pipeline facilities, see responsibilities for Engineering and Gas Supply, below.
Compliance Services	• Conduct leak surveys. • Conduct leakage rechecks as indicated in this standard practice. • Investigate B leaks on coated steel for possible corrosion. • Respond to leak and odor calls as indicated in this standard practice and assist other departments as needed in their responses to leak and odor calls. • Maintain records concerning leaks upstream of company meters for all operating departments and initiate work orders for repair. • Maintain a marsh gas file. • Notify Northwest Pipeline of leaks on its underground piping discovered in the course of company leak surveys or other field operations. • Notify appropriate government officials when hazardous substances are suspected in leakage not involving company gas. • Audit departmental training procedures and actual leak classification work for leaks upstream of meter outlets. • Maintain records of leak investigations and notification.

Construction Services	• Conduct leak surveys on transmission lines as specified in SP 707. • Accomplish emergency leak repairs and scheduled repairs as needed. • Initiate leak reports and/or repair records for leaks found or repaired in the course of field activities, and forward to Engineering. • Respond to after-hours leak and odor calls.
Gas Supply	• Repair leaks on district regulators, industrial meter sets, odorizers, and on station piping and fittings. • Monitor pressure and flow charts, and advise appropriate personnel of any unusual conditions which could indicate a leak or line break. • Analyze gas samples to determine origin as needed. • Notify Northwest Pipeline of leaks on its station piping discovered or reported to the company.
Customer Field Services	• Respond to leak and odor calls primarily on the downstream side of the meter set or within dwellings or other structures. • Initiate Form 6400/6500 for leaks upstream of company meters discovered and repaired by departmental personnel in the course of normal field activities and/or referred to the Construction Services for repair.
Risk, Environment and Land	• Provide written notification to appropriate governmental officials when advised by an Operations Supervisor of a hazard not involving company gas. • Maintain records of notification.

Leak Classification Guide—Classification Criteria (Effective 05/14/09)

Leakage Condition	Hazardous	Non-Hazardous	
	Class A	Class B	Class C
	A leak that represents an existing or probable hazard to persons or property and requires prompt action, immediate repair, or continuous action until conditions are no longer hazardous	A leak that is recognized as being non-hazardous at the time of detection but justifies scheduled repair based on potential future hazard	A leak that is non-hazardous at the time of detection and can reasonably be expected to remain non-hazardous
Action criteria	Requires prompt action[1] to protect life and property and continuous action until the conditions are no longer hazardous	Leaks must be repaired or cleared within 1 calendar year, but no later than 15 months from the date the leak was reported[2] May be reevaluated at intervals less than 90 days but must be reevaluated at least once every 6 months until cleared or reclassified[3]	Leaks should be reevaluated during the next scheduled survey, or within 15 months of the date reported, whichever occurs first, until the leak is reclassified or no longer results in a reading
Gas ignited unintentionally	Yes	N/A	N/A
Gas migrating into or under a building or into a tunnel	Any indication	N/A	N/A
Gas in vicinity of outside wall of building	Any reading at the outside wall of a building or where gas could potentially migrate to an outside wall of a building	• 2% absolute (40% LEL) or greater under a sidewalk in a wall-to-wall paved area and could potentially migrate to the outside wall of a building, or • Within 10 feet of, but not at, the outside wall of a building, or • Likely to migrate to outside wall of a building under frozen or other adverse soil conditions	Less than 2% absolute (40% LEL) under a sidewalk in a wall-to-wall paved area and not any closer than 10 feet to the building foundation
Gas in a utility or sewer manhole or any enclosed space	Any reading of 4% absolute (80% LEL), or greater, in an enclosed space	Any reading greater than 1% absolute (20% LEL) and less than 4% absolute (80% LEL) in an enclosed space	Any reading of less than or equal to 1% absolute (20% LEL) in an enclosed space
Gas in small substructure (other than gas-associated substructures)	Any reading of 4% absolute (80% LEL), or greater in small substructures from which gas could potentially migrate to the outside wall of a building	Any reading less than 4% absolute (80% LEL) in small substructure from which gas could potentially migrate creating a probable future hazard	Any reading less than 4% absolute (80% LEL) in small substructure from which gas would not likely migrate creating a probable future hazard

Leakage Condition	Hazardous	Non-Hazardous	
	Class A	Class B	Class C
Leak in a gas-associated substructure such as small meter boxes or gas valve boxes or company vaults	Leak can be seen, heard, or felt	Any reading of 4% absolute (80% LEL), or greater in gas-associated substructures that may create a probable future hazard.	Any reading less than 4% absolute (80% LEL) in small gas-associated substructures
Gas at major stations or on plant property	Any leak that can be seen, heard, or felt, and that is in a location that may endanger the general public or property	Moderate odor, and non-hazardous to personnel or property	Occasional or slight odor, and non-hazardous to personnel or property
Gas under street or wall to wall paved area	Any leak that can be seen, heard, or felt, and that is in a location that may endanger the general public or property	Any reading of 5% absolute (100% LEL) or greater under a street, in a wall-to-wall paved area where gas could potentially migrate to the outside wall of a building and does not qualify as a Grade A leak	• Any reading under a street in areas without wall-to-wall paving, where it is unlikely the gas could migrate to outside wall of a building • Any reading less than 100% LEL in a wall-to-wall paved area where gas is unlikely to migrate to the outside wall of a building
Leak on transmission line	A leak that represents an existing or probable hazard to persons or property. Any leak on gas carrier pipe	Any leak that is not on the gas carrier pipe and does not pose an immediate hazard	N/A
Gas affecting vegetation only	N/A	Moderate damage in congested area, e.g., residential area	Appreciable damage in remote area
Above ground indication[4]	Any leak that can be seen, heard, or felt, and that is in a location that may endanger the general public or property	N/A	N/A

1 Prompt action in some instances may require one or more of the following:
   a. Implementation of emergency plan.
   b. Evacuating premises.
   c. Blocking off an area.
   d. Rerouting traffic.
   e. Eliminating sources of ignition.
   f. Venting the area by removing manhole covers, barholing, installing vent holes, or other means.
   g. Stopping the flow of gas by closing valves or other means.
   h. Notifying police and fire departments.

2 In determining the repair priority for Class B leaks, 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.
   d. Soil type and soil conditions such as frost cap, moisture, and natural venting.

   Note: In Washington, if a Class B leak occurs in a segment of pipeline that is under consideration for replacement, an additional 6 months may be added to the 15 months maximum time for repair.

3 The frequency of reevaluation of Class B leaks should be determined by the location and magnitude of the leakage condition.

4 A non-hazardous release that could be eliminated by lubrication, adjustment, or tightening, is not considered to be a leak.

History of leakage inspections for 186 W. Jewett Blvd (Leak ID # 030183)

Asset ID	History ID	Inspection Type	End Date	User
- 030183 (Leak) (13)				
Inspection	8392158	"C" Repair Verification	8/2/2011	b2g
Inspection	8389409	"C" Recheck Inspection	7/13/2011	b2g
Inspection	8350504	"C" Recheck Inspection	12/3/2010	b2g
Inspection	8288613	"C" Recheck Inspection	10/6/2009	b2g
Inspection	8223121	"C" Recheck Inspection	7/10/2008	Medvec, Michael
Inspection	8158065	"C" Recheck Inspection	5/16/2007	Medvec, Michael
Inspection	2106433	"C" Recheck Inspection	3/14/2006	N.A.
Inspection	2106432	"C" Recheck Inspection	4/28/2005	N.A.
Inspection	2106431	"C" Recheck Inspection	3/11/2004	N.A.
Inspection	2106430	Initial Leak Inspection	5/5/2003	N.A.
Retired	8392203	"C" Recheck Inspection		slt
Retired	8392204	Initial Leak Inspection		slt
Retired	8392205	"C" Repair Verification		slt

NW Natural

OPERATING PROCEDURE			
Covered Task:	Coating Pipeline Facilities	Procedure Number:	OP-C-132-01 Construction Crews
Revision:	2.2	Date:	12.18.07

Signature: _____

OQ Program Administrator

SCOPE

Steel pipeline facilities are covered with protective coating to reduce corrosion. This procedure establishes the proper method for repairing damaged coating.

Section 1. Preparing the Pipe

Section 2. Primer and Tape

Section 3. Brown Wax Primer and Tape

Section 4. Epoxy Filler

Section 5. Paint

Section 6. Heat Shrink Sleeves

This procedure may be performed by a non-qualified worker when directed and observed by a Qualified Worker.

CONDITIONS AND PREREQUISITES

None

ABNORMAL OPERATING CONDITIONS

- AOC-C-01 Damaged, Non-Leaking Pipeline Facilities
- AOC-C-03 Escaping Gas or Fire from a Pipeline Facility
- AOC-C-06 Stray Current on a Pipeline Facility
- AOC-C-09 Unsatisfactory Customer Service Materials or Conditions
- AOC-C-10 Environmental Hazards

SPECIAL TOOLS AND EQUIPMENT

None

PROCEDURE

Section 1. Preparing the Pipe

1. Use wire brushes, cleaning rags or a combination of methods to clean the area where coating will be applied. If you are working on tar-coated pipe, be sure to wet the pipe down and do not use a wire brush or any tool that may create dust.
2. Dry the area where coating will be applied.
3. Coat the area with one of the replacement coatings in the following sections of this procedure.

Section 2. Primer and Tape

1. Apply primer to the uncoated area, ensuring that it overlaps onto the coated area.
2. After the primer has dried, start the tape wrap outside of the primered area by about ½ the tape width. Using a spiral motion, wrap the pipe with tape. The tape should overlap itself by about ½ the width of the tape.

Section 3. Brown Wax Primer and Tape

Note:	On Class C or higher pressure lines, brown wax primer and tape is only to be used on irregular surfaces.

1. Apply wax primer on the uncoated area, ensuring that it overlaps onto the coated area.
2. Using a spiral motion, wrap the pipe with wax tape. The tape should overlap itself and the existing coating on either side by about ½ the width of the tape. On fittings, wrap the tape to cover the entire surface.
3. Smooth coating to remove any wrinkles or air pockets.
4. On Class C or higher pressure lines, wrap the wax tape with Guard Wrap®.

Section 4. Epoxy Filler

1. Roughen the surface of the pipe.
2. Using a torch, heat the uncoated pipe and melt the epoxy filler stick onto the uncoated area. The epoxy takes about 5 minutes to set.

Section 5. Paint

1. Apply primer if needed.
2. Paint all exposed areas of pipe.

Section 6. Heat Shrink Sleeve

Follow the Raychem WPCT® manufacturer's instructions attached to this procedure.

Note:	If the attached manufacturer's instructions are not the most current, follow the latest instructions included in the heat shrink sleeve package.

Raychem

WPCT*

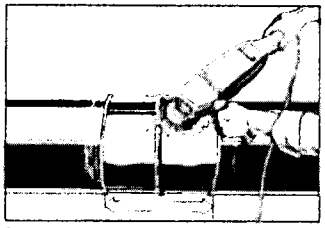
Wrap-around Pipe Sleeve with Thermal Indicator
Installation Instructions

WPCT-045/P/6-01/01

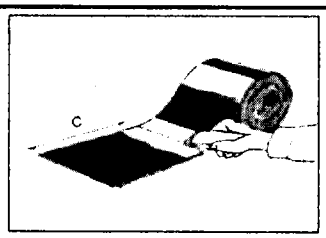
Materials and equipment
1 Appropriate size WPCT sleeve and WPCP IV closure patch
2. Raychem torch (or equivalent)
3 Propane gas tank, hose, regulator and gauge
4 Standard safety equipment such as gloves, goggles, hard hat, etc

Installation has to be done according to local government regulations and usual safety precautions

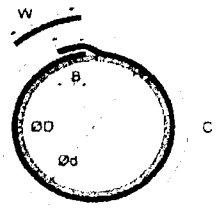
For proper selection of Tyco Adhesives joint protection materials, see Product Selection Guide or contact Tyco Adhesives.



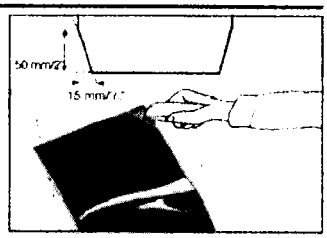
Sleeve application
1. Clean exposed steel and adjacent pipe coating to be covered by WPCT sleeve with a hand or power wire brush, to remove loose and foreign materials. Wiping may be necessary to remove the particles from cleaning.
Note:
Coal tar - remove outer paper wrap 5" (125 mm) to 6" (150 mm) adjacent to cut-back to expose coal tar.
Painted coatings - remove whitewash paint on the surface of coating to be covered by WPCT sleeve.



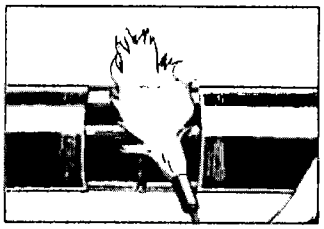
2. Cut the sleeve to the appropriate length according to below table.



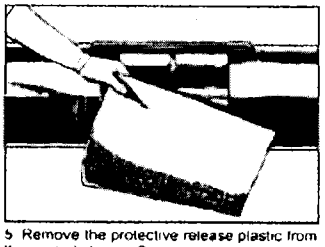
Ø D mils	Ø d	C	B	W
inches (0.001)	mm	inches/mm	in./mm	in./mm
2375	60	12/305	2/50	4/100
2875	85	13/330	2/50	4/100
3500	80	15/380	2/50	4/100
4000	90	18/460	2/50	4/100
4500	100	18/460	2/50	4/100
5563	125	21.5/550	2/50	4/100
6625	150	25/640	2/50	4/100
8625	200	31.5/800	2/50	4/100
10750	250	38.5/980	2/50	4/100
12750	300	45.5/1150	2/50	4/100
14000	350	49.5/1260	2/50	4/100
16000	400	56/1420	2/50	4/100
18000	450	62.5/1590	2/50	4/100
20000	500	69.5/1770	2/50	6/150
22000	550	77/1950	2/50	6/150
24000	600	83/2110	2/50	6/150
26000	650	89.5/2270	2/50	6/150
28000	700	95.5/2430	2/50	6/150
30000	750	102.5/2600	2/50	6/150
32000	800	108.5/2760	2/50	6/150
34000	850	115.5/2930	2/50	6/150
36000	900	122/3100	2/50	6/150



3. Cut the corners of the underlying end of the sleeve to approximately 1/2" x 2" (15 mm x 50 mm).

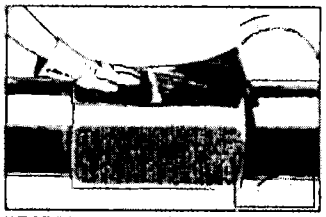


4. Preheat joint area until hot to the hand, approximately 140°F (60°C) minimum. Preheating reduces installation time and ensures proper bonding.
Note:
Two people working on opposite sides of the pipe are recommended for installing sleeves on pipe 16" (400 mm) in diameter and larger.

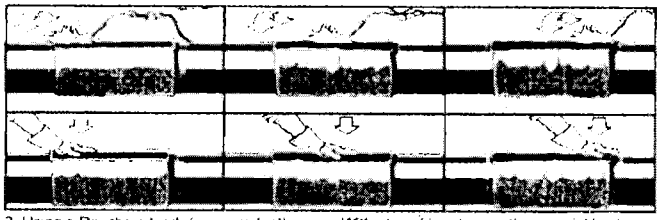


5. Remove the protective release plastic from the coated sleeve. Center sleeve over the weld so it is evenly overlapping adjacent pipe coating. Wrap loosely around pipe so that the Raychem logo runs around the pipe.
Note:
1) Clean overlap area of the sleeve to remove dirt and other foreign materials.
2) Edges of sleeve should extend 2" or more onto adjacent pipe coating.
3) Overlapping ends of sleeve should align evenly.
4) Position overlap to permit easy access for installing closure.

WPCT*

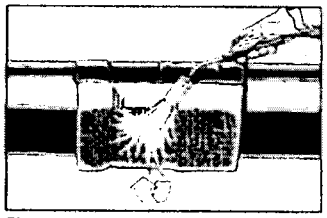


WPCP IV closure application
1. Press WPCPIV closure in position, centering over the exposed sheet end. (For UNISLEEVE products, the closure is pre-attached and already centered in position.)
The sheet should overlap the sheet (excluding closure) by 2" (50 mm) minimum.

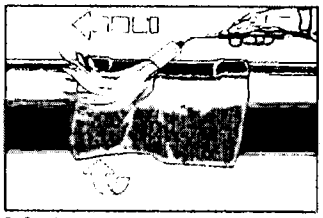


2. Using a Raychem torch (or equivalent), adjust flame length to approximately 20" (500 mm) to produce a blue tipped yellow flame. Using the yellow portion of the flame, heat the closure evenly until the pattern of the fabric reinforcement is visible

With gloved hand, smooth any wrinkles by working outward from the center.

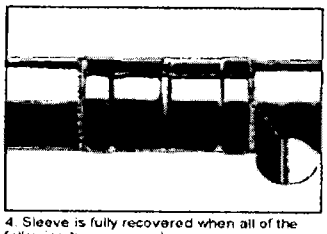


Sleeve recovery
1. Using the Raychem torch (or equivalent), begin at the center of the sleeve and heat circumferentially around the pipe, using a constant paintbrush motion, until the embossed pattern on the sheet surface has changed to a smooth surface.



2. Continue heating toward one end of the sleeve, followed by the other.
Note:
Sleeve may be recovered starting at one end and proceeding toward the opposite end, depending on conditions (i.e., wind).

3. During shrinkdown, occasionally check adhesive flow with a finger. Wrinkles should disappear automatically. Remember to wear gloves.
Note:
While sleeve is hot, press or roll overlap and closure area to remove any air voids.



4. Sleeve is fully recovered when all of the following have occured:
1) The WPCT sheet has a smooth surface.
2) There are no cold spots on the sleeve surface.
3) Weld bead profile can be seen through the sleeve.
4) After sleeve is cool, mastic flow is evident on both edges.
5) The sleeve has fully conformed to the pipe and adjacent coating.
6) The pattern on the backing has disappeared and the backing has a smooth surface.

* WPCT is a trademark of Tyco

Tyco Adhesives
Corrosion Protection Group
www.TycoAdhesives.com

Headquarters:
Tyco Adhesives
1400 Providence Hwy
Norwood, MA 02062 USA
Intl Tel: +1 781 440-6181
US Toll Free: +1 800 248-0149
Fax: +1 781 440-6271
E-mail: CPG@TycoAdhesives.com

In Europe, Middle East, Africa, Asia & Pacific:
Tyco Adhesives B.V.B.A.
Nieuwlandlaan B15
B-3200 Aarschot, Belgium
Tel: +32 16 55 36 00
Fax: +32 16 55 36 74
E-mail: CPGE@TycoAdhesives.com

In the Americas:
Tyco Adhesives L.P.
1675 Suite C Brandywine Avenue
Chula Vista, CA 91911 USA
Tel Mexico: +52 (66) 23-34-33
Tel US: +1 (619) 4 24 42 58
Fax Mexico: +52 (66) 23 64 63
Fax US: +1 (619) 4 24 42 58
E-mail: CPGTJ@TycoAdhesives.com

END OF PROCEDURE

NW Natural

OPERATING PROCEDURE			
Covered Task:	Inspecting Atmospheric Corrosion	Procedure Number:	OP-C-220-01 Construction Crews
Revision:	2.1	Date:	08.16.06

Signature: Melissa Rosenberry

OQ Program Administrator

SCOPE

This procedure establishes the steps to inspect for atmospheric corrosion on aboveground pipelines or facilities, and report conditions that require follow up inspection and/or maintenance.

This procedure applies to informal observations completed while performing other tasks.

This procedure may be performed by a non-qualified worker when directed and observed by a Qualified Worker.

CONDITIONS AND PREREQUISITES

None

ABNORMAL OPERATING CONDITIONS

- AOC-C-01 Damaged, Non-Leaking Pipeline Facilities
- AOC-C-03 Escaping Gas or Fire from a Pipeline Facility
- AOC-C-06 Stray Current on a Pipeline Facility
- AOC-C-09 Unsatisfactory Customer Service Materials or Conditions

SPECIAL TOOLS AND EQUIPMENT

None

PROCEDURE

1. If you find evidence of atmospheric corrosion, determine the level of corrosion.

   ⇒ See the Corrosion Criteria and Definitions in this procedure.

   1.1 Visually inspect all observable facilities.

   1.2 Feel for pipe surface anomalies on any sections of facilities that cannot be observed, if practical.

   1.3 Expose any aboveground equipment/facilities that have been covered by dirt, leaves, etc. and inspect for corrosion, if practical.

2. If level 2 or level 3 corrosion is detected, mitigate if possible or notify your supervisor.

   ⇒ See OP-C-132-01: Coating Pipeline Facilities

3. Complete documentation as required.

CORROSION CRITERIA AND DEFINITIONS

Code	Classification	Description
Non-Hazardous		
0	No corrosion	Surface has no or minimal signs of corrosion products.
1	Surface oxidation	Surface oxide that is smooth in appearance and discolored on greater than 50% of any individual gas-carrying pipe component.
2	Minor corrosion	Visible surface discontinuities (minor pitting, tubercles, blisters or scale*).
Potentially Hazardous		
3	Major corrosion	Visible corrosion with significant pipe-wall loss that could affect pipeline integrity.

*Pits – Localized reduction in wall thickness caused by corrosion.

Tubercles -- Outward accumulation of corrosion products that appear as mounds or bumps on pipe surface.

Blisters/Scale – Outward accumulation of corrosion products that is flake-like in appearance.

REFERENCES

- OP-C-132-01: Coating Pipeline Facilities

END OF PROCEDURE

NW Natural

ENGINEERING STANDARD
Standard 27-001

Section:	Class 27 – Pipe		
Subject:	Steel Pipe		
Revision:	09 (supersedes Rev. 08, 2/17/11)	Effective Date:	August 11, 2011
Approved:	S. E. Nelson, 8/11/11	Reviewed:	A. M. Fortier, 8/11/11

1. Purpose

This standard identifies the steel pipe that can be used in NW Natural's pipeline system or that can be purchased without special approval.

2. Requirements

Only the steel pipe included in the attached list is approved for use at NW Natural. The attached list of approved pipe is divided into two major sections:

- Steel pipe approved for use (0.5"–2"), (4"–8"), (10"–16"), (20"–30"), and
- Pre-tested steel pipe available for use (0.75"–10"), (12"–24").

Important: To add additional pipe to the stock list requires evaluation and approval by the MAETG committee.

3. Specifications

3.1 Material Specifications

All material specifications for pipe must meet the minimum requirements specified in either of the documents listed in section 4, References. The attached list of approved pipe includes the specific minimum requirements for each listed pipe.

3.2 Dimensional Specifications

All dimensional specifications for pipe are in accordance with those specified in either ASTM A-53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless or API 5L PSL 2 – Specification for Line Pipe.

3.3 Coating Specifications

All coating specifications for pipe (if applicable) must meet NW Natural's Engineering Specification 001 – Specification for Coating of Steel Pipe.

4. References

ASTM A-53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

API 5L – Specification for Line Pipe

Spec 001 – Specification for Coating of Steel Pipe

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
0.50	0.109	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102617	FT
0.75	0.113	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102618	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths FBE coating nominal 14-16 mils thick, 3" cutback	Specification ASTM A-53 Grade B	102624	FT
1.00	0.133	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102619	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths FBE coating[1] nominal 14-16 mils thick, 3" cutback	Specification ASTM A-53 Grade B	102625	FT
1.25	0.140	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102620	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths FBE coating[1] nominal 14-16 mils thick, 3" cutback	Specification ASTM A-53 Grade B	102626	FT
1.50	0.145	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102621	FT
2.00	0.154	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths	Specification ASTM A-53 Grade B	102622	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, single random lengths FBE coating[1] nominal 14-16 mils thick, 3" cutback	Specification ASTM A-53 Grade B	102627	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102653	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.

Steel Pipe Approved for Use

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
4.00	0.237	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-42	102631	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102640	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102654	FT
6.00	0.280	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-42	102632	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102641	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102655	FT
8.00	0.250	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-42	102633	FT
	0.250	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102642	FT
	0.375	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Heavy Wall Thickness Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102650	FT
	0.250	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-42	102656	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
10.00	0.307	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102634	FT
	0.307	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102644	FT
	0.500	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Heavy Wall Thickness Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102651	FT
	0.307	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-52	102657	FT
12.00	0.312	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102635	FT
	0.312	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102646	FT
	0.500	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Heavy Wall Thickness Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102652	FT
	0.312	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Direction Drill Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 6" cutback, with Valspar Pipeclad 2040 Abrasion-Resistant Overcoat, nominal 40 mils thick, 6" cutback	Specification API 5L PSL 2 Grade X-52	102658	FT
16.00	0.312	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102636	FT
	0.375	Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102647	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
20.00	0.375	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102637	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102648	FT
24.00	0.375	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102638	FT
		Coated with FBE	**Pipe, Steel, Coated, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths FBE coating[1] nominal 14-16 mils thick, 4" cutback	Specification API 5L PSL 2 Grade X-52	102649	FT
30.00	0.375	Bare	**Pipe, Steel, Black, Electric Resistance Weld (ERW)** Plain ends, beveled 30°, double random lengths	Specification API 5L PSL 2 Grade X-52	102639	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
0.75	0.113	Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, single random lengths	Specification ASTM A-53 Grade B	—	FT
1.0	0.133	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, single random lengths	Specification ASTM A-53 Grade B	—	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, single random lengths	Specification ASTM A-53 Grade B	—	FT
2.0	0.154	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, single random lengths	Specification ASTM A-53 Grade B	102764	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, single random lengths	Specification ASTM A-53 Grade B	102769	FT
4.0	0.237	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102770	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102776	FT
6.0	0.280	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102771	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102777	FT
8.0	0.250	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102772	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees Single or double random lengths	Specification API 5L PSL 2 Grade X-42	102778	FT
10.0	0.307	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102773	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102779	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.

Pre-Tested Steel Pipe Available for Use

Nominal Size (in.)	Wall Thickness (in.)	Coated*/ Bare (*see Note 1 below)	Description	Grade	Stock No.	UOM
12.0	0.312	Bare	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102774	FT
		Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102780	FT
16.0	0.375	Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102781	FT
20.0	0.375	Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102782	FT
24.0	0.375	Coated with FBE	**Pipe, Steel, Pretest –** Black Steel, ERW Plain ends, beveled 30 degrees, double random lengths	Specification API 5L PSL 2 Grade X-52	102783	FT

Note 1: Coated with 3M Scotchkote Green Fusion Bond Epoxy (FBE) Powder Coating 6233.