McCHORD PIPELINE

A Subsidiary of U.S. Oil & Refining Co.

September 28, 2009

Anne F. Soiza
Pipeline Safety Director
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Drive SW
PO Box 47250
Olympia, WA 98504-7250

Subject: Response to Integrity Management Field Inspection at 72nd/Waller Road

Anne,

This letter is in response to the integrity management field inspection at 72nd/Waller road (Docket PL-091410). These responses are a result of a WUTC field inspection on August 5-11.

Response to probable violation of not preparing a company qualified welding procedure (Item #1):
McChord Pipeline Company does not have qualified welding procedures. In accordance with the McChord Pipeline Maintenance Manual section B-3, a welding procedure is to be submitted by a contractor and reviewed by the Engineering Department. The union maintenance contractor submitted welding procedure 4900.1310 on August 3, and it was reviewed and approved the same day by the MPL Chief Pipeline Engineer. The welding procedure meets ASME B31.4 and API 1104 requirements for thickness limitations, material properties, and volt/amp ranges.
Welding procedure 4900.1310 was also brought on site August 11, 2009 during the welding activity; it was reviewed with the WUTC inspector. Since McChord Pipeline Company does not own welding procedures, the present policy is to have the contractor supply the appropriate documentation and the engineering department will review. McChord Pipeline is in full compliance of ASME B31.4, WAC 480-75-430 and CFR 195.402 requirements,
Please see Attachment 1 for documentation supporting the above statement.

Response to probable violation of not maintaining records (Item #2):
In order to meet regulatory requirements, radiographic testing was needed to verify tie-in weld integrity. The maintenance contractor hired a NDT company for this service. On August 7, 2009 the radiographic technicians were brought to our facility for covered task training. They were also asked to submit their qualifications at this time. The technician stated that they would be sent via e-mail from his office. The certificates were transmitted a day after the NDT services were performed. McChord Pipeline recognizes that the technician's certificate was out of date. The NDT company's QA Manager was contacted and a letter of explanation was provided. In short, the NDE company changed their recertification interval from three years to five years. The NDT company sent a letter documenting this and provided an updated certificate. McChord Pipeline Company acknowledges that the certificate was not available on site; however, given the time constraints for the repair work, the updated electronic copy was sufficient to meet the requirements of CFR 195.507.
Please see Attachment 2 for documentation supporting this.

Response to area of concern regarding cathodic protection interference:
McChord Pipeline recognizes the difficult geometry at the 72nd/Waller intersection with the 52" Tacoma water main. In order to have the required 36" of ground cover, the new section of pipeline was installed in approximately the same location as the original. (Re-routing of the pipeline in this busy intersection would not have been feasible.) Since the McChord Pipeline has cathodic protection, a fiberglass reinforced plastic shield was installed to act as an insulator and a mechanical barrier. Please note that the 52" water main is lined with concrete on the OD. This acts as another insulating barrier. A corrosion consultant was brought in to check interference between the two cathodic protection systems. In summary, the pipe-to-soil readings are not indicative of an electrical short. The readings recorded at test stations near the intersection are within 10% of annual survey readings dating back to 2001. A more detailed cooperative interference test will be done soon between Tacoma Water and McChord Pipeline. The McChord Pipeline Company performs close interval surveys and annual cathodic protection checks to meet regulatory requirements; there have not been any issues with this intersection in the past and we will continue to monitor using our current program.
Please see Attachment 3 for a detailed report.

McChord Pipeline takes pride in our Maintenance, and Integrity Management Planning and we take these potential violations and concerns very seriously. McChord Pipeline strives to keep an open relationship with the WUTC to improve pipeline safety and regulatory compliance. Please advise myself or Corey Herrick, Chief Engineer, if any further action is required on this item.

Sincerely,

Alan Cabodi

CC (w/o att): RWS, JPW
CC: CGH
Attachments: MPL MM B-3, ASME B31.4 (434.8.3), WPS 4900.1300, CFR 195.214, MPL MM G-2, Letter/Certificate PM Testing, MPL Covered Task 15, CP Testing Report NW Corrosion Engineering.

P.O. Box 2255/Tacoma, Washington 98401-2255
Telephone (253) 593-6085 Fax (253) 383-9970

STATE OF WASHINGTON

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

1300 S. Evergreen Park Dr. S.W., P.O. Box 47250 • Olympia, Washington 98504-7250
(360) 664-1160 • TTY (360) 586-8203

Ref. No. Docket PL-091410

CERTIFIED MAIL

September 3, 2009

Alan J. Cabodi, President
McChord Pipeline Company
3001 Marshall Avenue
Tacoma, Washington 98421

Dear Mr. Cabodi:

Subject: Integrity Management Field Inspection

We conducted a field inspection of McChord Pipeline (McChord) during the extraction of an in-line inspection tool on August 5-7, 2009. The tool was located at the intersection of East 72nd and Waller Road in Tacoma, WA. A pipe section approximately 18.5 linear feet was removed and a new section welded to the existing pipeline. The removed section of pipe was previously repaired in 2004 with a clock spring wrap at a dent/gouge located on the bottom section of the pipeline where it crossed over a 52-inch diameter water main. Our inspection indicates two probable violations and one area of concern as noted in the enclosed report.

Your response needed
Please review the attached report and respond in writing by October 2, 2009. The response should include how and when you plan to bring the probable violations into full compliance. We also request your response to our area of concern.

What happens after you respond to this letter?
The attached report presents staff's decision on probable violations and does not constitute a finding of violation by the commission at this time.

After you respond in writing to this letter, there are several possible actions the commission, in its discretion, may take with respect to this matter. For example, the commission may:

- Issue an administrative penalty under RCW 81.88.040, or
- Institute a complaint, seeking monetary penalties, changes in the company's, practices, or other relief authorized by law, and justified by the circumstances, or
- Consider the matter resolved without further commission action.

We have not yet decided whether to pursue a complaint or penalty in this matter. Should an administrative law judge decide to pursue a complaint or penalty; your company will have an opportunity to present its position directly to the commissioners.

If you have any questions, or if we may be of any assistance, please contact Al Jones at (360) 664-1321.

Sincerely,

for

Anne F. Soiza
Pipeline Safety Director

cc: Cory Herrick, McChord Pipeline

UTILITIES AND TRANSPORTATION COMMISSION
2009 Hazardous Liquid Pipeline Field Safety Inspection
McChord Pipeline Company

The following probable violations of Title 49, CFR Part 195 were noted as a result of the field inspection of the McChord Pipeline during the extraction of an in-line inspection tool on August 5-7, 2009 at the intersection of East 72nd and Waller Road in Tacoma, WA.

PROBABLE VIOLATIONS

1. **49 CFR §195.402 Procedural manual for operations, maintenance and emergencies.**

(a) General. Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies.

Charge(s):
McChord did not prepare and follow a qualified welding procedure.

Finding(s):
During the field inspection no company welding procedure was available. There was no evidence that the McChord's manuals contain a qualified welding procedure for maintenance activities.

2. **49 CFR §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.

Charge(s):
McChord did not maintain qualification records as required by this rule

Finding(s):
The McChord O&M Manual states, "The Company uses outside contractors to conduct nondestructive radiographic work. Contractor technicians must be certified in accordance with the recommendations of ASNT Recommended Practice SNT-TC-1A for the test method used". During the field inspection the radiographic technician did not have on-site

documentation of his certification. An electronic copy of the technician's certificate was made available to the commission, but the certificate was expired.

AREAS OF CONCERN

CFR §195.250 Clearance between pipe and underground structures.

Any pipe installed underground must have at least 12 inches of clearance between the outside of the pipe and the extremity on any other underground structure, ... However, where 12 inches of clearance is impracticable, the clearance may be reduced if adequate provisions are made for corrosion control.

Findings:

The McChord's pipeline crosses over a 52-inch water main at the East 72nd and Waller Road intersection with less than 2-inches of clearance. During the field inspection, staff was told no cathodic protection or monitoring devices were installed in proximity to the pipelines to mitigate potential interference between the two pipelines.

Please provide in your response how McChord will provide adequate assurance for corrosion control at this location and how it will monitor in the future.

ATTACHMENT 1

- **McChord Pipeline Maintenance Manual Section B-3**
- **ASME B31.4-2006 Section 434.8.3**
- **Welding Procedure Specification 4900.1300**
- **CFR 195.214**

1. Policy

Welding activities conducted on any Company-owned facility must be done by a qualified welder(s) using a qualified welding procedure, which will ensure that all weld metal is thoroughly fused to previously-deposited metal and to the parent metal to produce a joint at least as strong as the parent metal and free of imperfections that may allow the release of a hazardous material.

Welder qualifications and welding procedures prescribed herein shall be in conformance with the applicable sub-parts of the latest edition of D.O.T. "Hazardous Materials Regulations, Title 49 CFR, Part 195--Transportation of Hazardous Liquids by Pipeline," and applicable rules of the latest edition of Chapter 480-75 WAC and subject materials incorporated therein by reference, including but not limited to the following:

• API STD	1104	Welding of Pipelines and Related Facilities
• API STD	650	Welded Steel Tanks For Oil Storage
• API STD	653	Tank Inspection, Repair, Alteration, and Reconstruction
• ASME	B31.4	Pipeline Transportation Systems For Liquid Hydrocarbons and Other Liquids
• ASME	Section VIII Div. 1	Rules For Construction of Pressure Vessels
• ASME	Section IX	Welding and Brazing Qualifications

1.2 Any deviation from this specification shall require written approval by the Manager, Engineering Department.

1.3 Requirements contained herein apply whether the welding is being done by Company or contractor personnel. Welding procedures shall be qualified by destructive testing. Qualified welding procedures must be on site where welding is being performed. Copies of weld procedures actually used during work on the pipeline will be retained in the pipeline files.

1.3.1 Welders must carry appropriate I.D. and qualification cards showing:

- Name of Welder or Joiner.
- Qualifications.
- Date qualifications expires.
- Company whose procedures were followed for qualifications.

1.3.2 Each Welder's Qualification Test results must be recorded and kept for a period of five (5) years.

1.3.3 Welders qualifications shall be current within the last six months for each process that is used. In addition, the welder shall have had at least one weld tested and found acceptable under API 1104 Section 9 (current edition.)

1.3.4 When there is specific reason to question the welder's ability, the welding procedure qualification (WPQ) which supports the welding he is doing shall be retested. All other qualifications not questioned will remain in effect.

1.4 Welding activities conducted inside the Company's fenced facilities in areas other than a designated welding shop or at right-of-way locations where product or vapor may potentially be present are considered HOT WORK. Appropriate authorization must be obtained. (See Sections I.1 and I.2 of this manual.)

1.5 Welding shall not be undertaken if the quality of the completed weld may be impaired by weather conditions including rain, blowing sand, snow, and high winds.

1.6 All welding performed on the pipeline shall be performed using a qualified weld procedure specification (WPS). The Engineering Department shall review the weld procedure specification to ensure the essential variables are appropriate for the work to be performed. The WPS shall be qualified per the requirements of API Standard 1104 or ASME Section IX. The Engineering Department shall thoroughly review the WPS and corresponding Procedure Qualifications Record (PQR) to ensure consistency between the two documents. The Engineering Department shall verify that welders performing work on the pipeline have been qualified for the specific WPS in accordance with ASME Section IX or API Standard 1104.

1.7 The U.S. Oil & Refining Co. Mechanical Integrity Manual Section 22 entitled "Maintenance Welding Procedures" shall be used as a reference when evaluating weld procedure specifications for use on the McChord Pipeline.

2 Definitions and Terminology

Terms unique to welding activities and to specific procedural specifications include the following:

2.1 ***Arc-blow***—is a magnetism condition in the weldment that causes the arc to move in various directions. This condition is sometimes encountered in the proximity of high-voltage facilities such as power lines or substations. Magnetism can be controlled by moving the ground to another location or by wrapping one of the leads several times around the object being welded.

2.2 ***Arc-burn***—is the gouging effect imparted to the surface of the pipe whenever an electric arc is inadvertently struck, typically adjacent to a weld, when starting to weld or an improperly placed DC Negative (DC-) grounding clamp. The intense heat combined with the gouging effect of the arc may cause crack development and wall thinning. Repeated arc-buns by the same welder will be cause for disqualification of that welder. Pipe must be replaced when:

2.2.1 An arc-burn is classified as a pipeline defect. Each arc-burn must be evaluated and removed if limitations are exceeded as prescribed in Section E-2 of this manual for an operating pipeline. An arc-burn occurring during production welding shall be removed as a cylinder when the remaining wall thickness after repair is less than 87.5 percent of the pipe nominal wall thickness.

2.2.2 Any section of pipe containing more than one arc-burn within a distance equivalent to one-half (1/2) of the pipe diameter.

Table 434.6(a) Minimum Cover for Buried Pipelines (06)

Location	For Normal Excavation, in. (m)	For Rock Excavation Requiring Blasting or Removal by Equivalent Means, in. (m)
Cultivated, agricultural areas where plowing or subsurface ripping is common	48 (1.2) [Note (1)]	N/A
Industrial, commercial, and residential areas	48 (1.2)	30 (0.75)
River and stream crossings	48 (1.2)	18 (0.45)
Drainage ditches at roadways and railroads	48 (1.2)	30 (0.75)
All other areas	36 (0.9)	18 (0.45)

NOTE:
(1) Pipelines may require deeper burial to avoid damage from deep plowing; the designer is cautioned to account for this possibility.

shall be treated as indicated in Fig. 434.8.6(a)-(2) or use a transition nipple not less than one-half pipe diameter in length with acceptable joint designs as illustrated in Fig. 434.8.6(a)-(2).

434.8 Welding

434.8.1 General

(a) Scope. Welding herein applies to the arc and gas welding of pipe in both wrought and cast steel materials as applied in pipelines and connections to apparatus or equipment. This includes butt joints in the installation of pipe, valves, flanges, fittings, and other equipment, and fillet welded joints in pipe branches, slip-on flanges, etc. It does not apply to the welding of longitudinal or spiral joints in the manufacture of pipe, fittings, and valves, or to pressure vessels or assemblies manufactured in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 or 2.

(b) Welding Terms. Definitions pertaining to welding as used in this Code conform to the standard definitions established by the American Welding Society and contained in ANSI/AWS A3.0, Section IX of the ASME Boiler and Pressure Vessel Code, and API 1104.

(c) Safe Practices in Cutting and Welding. Prior to cutting and welding in areas in which the possible leakage or presence of vapor or flammable liquid constitutes a hazard of fire or explosion, a thorough check shall be made to determine the presence of a combustible gas mixture or flammable liquid. Cutting and welding shall begin only when safe conditions are indicated.

434.8.2 Welding Processes and Filler Metal

(a) Welding shall be performed by a manual, semiautomatic, or automatic process or combination of processes that have been demonstrated to produce sound welds.

(b) Unless otherwise specified by the operating company, welding electrodes and consumables shall comply with the following:

(1) Filler metal and consumables shall be selected so that the strength of the completed weldment will equal or exceed the specified minimum tensile strength of the materials being joined.

(2) If base metals of different tensile strengths are to be joined, the nominal tensile strength of the weld metal shall equal or exceed the tensile strength of the weaker of the two.

(3) When filler metals of different strenghts are used in a single weld, the proportions shall be such that the completed weldment equals the specified minimum tensile strength of the base metal.

(4) For alloy steels, the nominal chemical analysis of the weld metal shall be the same as the nominal chemical analysis of the base metal. If base metals of different chemical analysis are being joined, the weld metal shall be the same as eitehr base metal, or of intermediate composition, except as specified below.

(5) When austenitic steels are joined to ferritic steels, the weld metal shall have an austenitic structure.

434.8.3 Welder and Welding Procedure Qualifications

(a) Welder and welding procedure qualifications for cross country pipelines shall be performed in accordance with API 1104. Welder and welding procedure qualifications for alloy steel and for shop fabricated piping assemblies, and welding at stations and terminals shall be performed in accordance with API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code.

(b) Prior to any welding covered by this Code, a welding procedure specification shal be established and qualified by testing to demonstrate that welds having suitable mechanical properties and soundness can be produced. Welding procedure specifications shall be qualified as required by API 1104, or Section IX of the ASME Boiler and Pressure Vessel Code, whichever is appropriate for the locations, materials, and type of welding to be performed except as modified by the following: (06)

(1) Standard Welding Procedures. Standard Welding Procedure Specifications (SWPSs) published by the American Welding Society and listed in Appendix E of

ASME Section IX are permitted for code construction within the limitations established by Article V of ASME Section IX. The employer shall either demonstrate his ability to follow SWPSs as required by ASME Section IX or he shall qualify one welder or welding operator following each SWPS.

(2) Procedure Qualification by Others. In order to avoid duplication of effort and subject to the approval of the owner, WPSs qualified by a technically competent group or agency may be used provided the following are met:

(1) the WPSs meet the requirements of ASME Section IX or API 1104 and any additional qualification requirements of this Code

(2) the employer has qualified at least one welder or welding operator following each WPS

(3) the employer's business name shall be shown on each WPS and on each qualification record. In addition, qualification records shall be signed and dated by the employer, thereby accepting responsibility for the qualifications performed by others.

The welding procedure specification shall be adhered to during welding performed under this Code.

(c) The welding procedure specifications shall at a minimum include the information required by API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code. When materials, welding consumables, mechanical restraint, service conditions and/or weather conditions make more details necessary to produce a sound weld, such as preheat, interpass temperature, and postweld heat treatment, such details shall be provided. When joining materials with notch-toughness requirements, particularly for low temperature service, consideration shall be given to weld metal and heat-affected zone toughness requirements in the welding procedure specification. When applicable, the test method, temperature, specimen, and acceptance criteria shall be specified in the welding procedure specification.

(d) API 1104 and Section IX of the ASME Boiler and Pressure Vessel Code contain sections entitled "Essential Variables" applicable to welding procedure specifications, procedure qualification records, and welder qualifications. The classification of base materials and weld filler materials into groups does not imply that other materials within a particular group may be indiscriminately substituted for the base material or weld filler material used for the qualificaition test. Welding procedure qualification tests should be conducted with the highest strength base metal to be welded in the essential variable groups identified in the procedure specification.

(06) *(e)* Prior to any welding covered by this Code, each welder or welding operator shall be qualified as required by API 1104, or Section IX of the ASME Boiler and Pressure Vessel Code, whichever is appropriate for the locations, materials, and type of welding to be performed.

In order to avoid duplication of effort and subject to the approval of the owner, an employer may accept the performance qualification of a welder or welding operator made by a previous employer. This acceptance is limited to performance qualifications that were made on pipe or tube test coupons. The new employer shall have the WPS that was followed during qualification or an equivalent WPS that is within the limits of the essential variables. An employer accepting such qualification tests shall obtain a copy of the performance qualification test record from the previous employer. The record shall show the name of the employer by whom the welders or welding operator was qualified and the date of that qualification. A record showing use of the process or processes from the date of the welder's qualification shall be available. The new employer's business name shall be shown on the qualification record, and it shall be signed and dated by the employer thereby accepting responsibility for the qualifications performed by others.

Welder requalification tests are required if there is some specific reason to question a welder's ability or if the welder is not engaged in a given process of welding for a period of six months or more.

(f) The operating company shall be responsible for qualifications of procedures and welders. The preparation of welding procedure specifications and/or performance of welding qualification tests may be delegated to others; however, each company that performs welding activities is responsible for the welding activities performed by its employees and contractors.

(g) Qualification Records. The welding procedure followed during the qualifying tests shall be recorded in detail. Records of the tests that establish the qualification of a welding procedure specification shall be retained as long as that procedure is in use. A record of the welders qualified, showing the date and results of the tests, shall be retained during the construction involved and for six months thereafter. These records shall be available to the owner or the owner's agent and the inspector at the location where the welding is being done. (06)

434.8.4 Welding Standards. All the welding done under this Code shall be performed under a specification which embodies the minimum requirements of this Code and shall encompass the requirements of API 1104 except as provided in paras. 434.8.3(a) and (b).

434.8.5 Required Inspection and Acceptance Criteria

(a) Required Inspection

(1) The quality of welding shall be checked by visual inspection and supplemental nondestructive methods or by removing completed welds as selected and designated by the inspector for destructive testing.

(2) All welds shall be visually inspected.

(3) When the pipeline is to be operated at a hoop stress of more than 20% of the specified minimum yield strength of the pipe, the welds shall be inspected. A minimum of 10% of the girth welds and 10% of the other (06)

Description

This pipe welding procedure is for butt welding Grade X42 and below pipe that is 2-3/8″ thru 12-3/4″ in diameter, and has a wall thickness of 3/16″ (0.188″) thru 3/4″ (0.750″).

Essential Variables

Welding Process:	**Manual Shielded Metal Arc**
Pipe Material:	**API 5L Grade X42 and below**
Wall Thickness[a]:	**3/16″ (0.188″) thru 3/4″ (0.750″) W.T.**
Weld Joint Design:	**V-bevel Butt**
Filler Metal:	**Group 1 (E6010 Preferred) – Root pass** **Group 1 (E6010 Preferred) – All other passes**
Weld Position:	**All orientations (vert. to horiz.), fixed positions only**
Direction of Welding:	**Vertical downhill for horizontal pipe-fixed position** **Horizontal for vertical pipe-fixed position**
Speed of Travel:	**See "Welding Parameters and Electrical Characteristics" (page 3 of procedure)**
Time Lapse Between Passes:	**5 minutes max. between root/hot pass;** **remaining passes within 72 hours.**
Preheat Temperature:	**Above 40°F** / **None Required*** ; **40°F and below** / **150°F min. to 250°F max.** * Pipe shall be preheated as necessary to assure all traces of moisture are removed prior to welding.
Postheat Treatment:	**None Required**

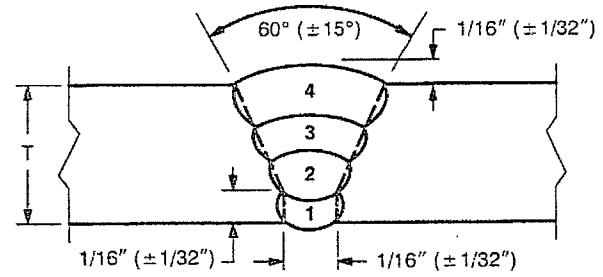
Other Variables

Pipe Diameter[a]:	**2-3/8″ thru 12-3/4″ O.D.**
Welding Technique:	**Stringer or Weave**
Weld Pass Requirements:	**See page 3 of procedure**
Welding Current & Polarity:	**Direct Current/Reverse Polarity**
Electrical Characteristics:	**See page 3 of procedure**
Number of Welders:	**1 minimum**

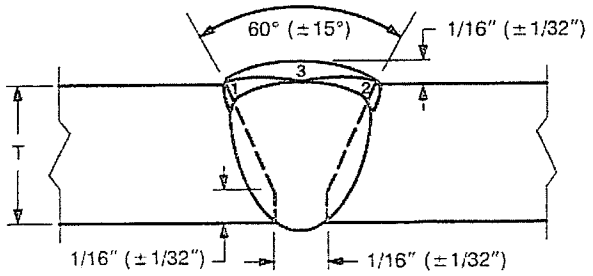
[a] *Note: Pipe diameter is not an essential variable for procedure, but is important for single procedure qualifications of a welder.*

Type of Lineup Clamp:	**External/Internal** Except when clamp is impractical due to dimensional differences such as flange to pipe, etc.
Removal of Lineup Clamp:	**After 50% of root pass completed with external clamp; after 100% with internal clamp.**
Method of Weld Cleaning:	**Power Brushing and Power Grinding**
Preheat Method:	**Fuel Gas – Propane or Oxyacetylene**
Preheat Temp. Control:	**Tempil Sticks or Contact Pyrometer**
Interpass Temperature:	**Above 40°F** — **40°F min. to 250°F max.** **40°F and below** — **100°F min. to 250°F max.** When welding is interrupted, preheat pipe as specified in the Essential Variables section of this procedure prior to finishing the weld. ***NOTE:*** It is recommended that when welding fitting to pipe or fitting to fitting, a preheat of 150°F min. to 250°F max. may be used.
Destructive Test Results:	**Available from the Standards Department upon request.**

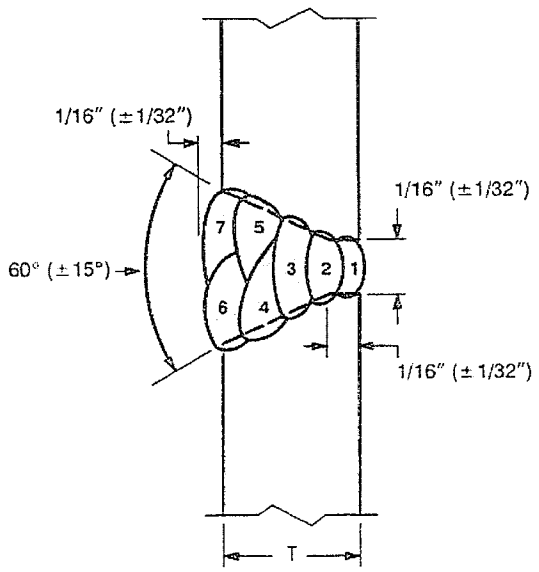
Weld Joint Designs



WEAVE



ALTERNATE CAP



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NOTE: Dimensions are for example only.

Preferred Weld Pass Requirements for Pipe Wall Thickness 3/16″ (0.188″) thru 3/4″ (0.750″)

Pipe Wall Thickness	Horizontal-Fixed Position	Vertical-Fixed Position
3/16″	3	3
1/4″	4	5
3/8″	5	7
1/2″	6	9
3/16″	7	11
3/4″	8	13

Welding Parameters and Electrical Characteristics

Horizontal - Fixed Position

Pass No.	Process	Filler Material		Welding Parameters (Electrical Characteristics)		Travel Speed (IPM)
		Size	Classification	Amperage Preferred Range* [Acceptable Range]	Voltage Preferred Range* [Acceptable Range]	
1	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18
2	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18
3	SMAW	3/16″	E6010	160–200* [110–225]	25–30* [18–35]	5–18
4	SMAW	3/16″	E6010	160–200* [110–225]	25–30* [18–35]	5–18
5–Rem	SMAW	3/16″	E6010	160–200* [110–225]	25–30* [18–35]	5–18

Vertical - Fixed Position

Pass No.	Process	Filler Material		Welding Parameters (Electrical Characteristics)		Travel Speed (IPM)
		Size	Classification	Amperage Preferred Range* [Acceptable Range]	Voltage Preferred Range* [Acceptable Range]	
1	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18
2	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18
3	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18
4–Rem	SMAW	5/32″	E6010	130–160* [90–200]	22–28* [18–35]	5–18

Approved Parameters for Optional Electrode Diameters
(Within the Nominal Size Limits of the Procedure)

NOTE: If necessary due to wall thickness changes or variations of the joint space, within the tolerance limits, a change from the above electrode size to one nominal size smaller or larger for each of the above passes is permissible. The approved welding parameters for optional electrode diameters (within the nominal size limits of the procedure) are shown below.

Electrode Diameter	Amperage Preferred Range* [Acceptable Range]	Voltage Preferred Range* [Acceptable Range]	Travel Speed (IPM)
3/32″	50–80* [30–100]	20–25* [16–30]	4–14
1/8″	90–120* [40–180]	22–28* [18–35]	5–15
5/32″	130–160* [90–200]	22–28* [16–30]	5–18
3/16″	160–200* [110–225]	25–30* [18–35]	5–18

Voltage is measured across the arc during procedure development. Add 1 to 3 volts to the above voltage depending on the length of welding cables if voltage is measured across the terminals of the welding machine.

Measured ranges may be determined with either a digital or analog ammeter or voltmeter.

This procedure was prepared in accordance with and meets the requirements of API 1104, Nineteenth Edition, and DOT Part 192.

RECEIVED JUL 15 2009

PUGET SOUND ENERGY

WELD TEST INSPECTION REPORT

NAME: Jake Zavackas EMPLOYED BY: Pilchuck

LOCATION OF TEST: Local 32

( ) ANNUAL ( ) QUALIFY NEW PROCEDURE CLASSIFICATION:
( ) QUALIFICATION ( ) PRODUCTION WELD ( ) ARC I ( ) ARC II
( ) REQUALIFICATION ( ) ARC III

WELD PROCEDURE DESCRIPTION:

Procedure (No. or new): 4900.130 / 4900.140 Test No: 1
Joint Design: Butt / Fillet Position: Fixed
Direction: Downhill Weld Time: Same Day
Type of Weld Machine: Polarity: RPDC
Pipe Grade: X-42 Pipe Size: 12 - 112
O.D.: 12 3/4 Wall Thickness (as measured): .250
Type of Line-up Clamp: — Removal of Line-up Clamp: —
Pre-Heat: — Time between Beads/Passed (max): 5 min

ARC (BUTT) WELD PASS REPORT:

Bead No.	Electrode Size	Electrode No.	Amperage (range)	Arc Voltage (range)	Speed of Travel	Cleaning
1	1/8	6010 5P+	82	27.1		Power Brush/Grinder
2	5/32	"	133	30.6		Power Brush
3	1/8	"	85	27.6		" "
4	5/32	"	110	32		" "

ARC (FILLET) WELD PASS REPORT:

Bead No.	Electrode Size	Electrode No.	Amperage (range)	Arc Voltage (range)	Speed of Travel	Cleaning
1	1/8	6010 5P+	81	25.4		Power Brush/Grinder
2	5/32	"	130	28.4		Power Brush
3	"	"	130	28.6		" "
4	"	"	120	29		" "
5	"		114	27.5		" "

COMMENTS:

WELD INSPECTOR:	DATE of TEST:	PASS	FAIL
T. Simons	7/13/09	☑	☐

DESTRUCTIVE TEST REPORT

Tensile Test 1.10 x .259 — 1.13 x .253

Coupon	Max. Load (lb.)	/	Area (sq. .)	=	Tensile Strength (psi)	pass	fail
1	~~21593~~ ~~76031~~	divided by	.284	equals	~~76031~~ 76031	✓	
2	21593	divided by	.285	equals	75764	✓	
3		divided by		equals			
4		divided by		equals			

Nick Break Test

Coupon	Remarks (penetration, gas pockets, slag inclusions)	Pass	Fail
1	no Defects	✓	
2	no Defects	✓	
3			
4			

Root Bend Test

Coupon	Remarks (penetration, gas pockets, slag inclusions)	Pass	Fail
1	no Defects	✓	
2	no Defects	✓	
3			
4			

Face Bend Test

Coupon	Remarks (penetration, gas pockets, slag inclusions)	Pass	Fail
1			
2			
3			
4			

Nick Break Test (four samples shall be taken along the branch or sleeve)

Coupon	Remarks (penetration, gas pockets, slag inclusions)	Pass	Fail
1	no Defects	✓	
2	no Defects	✓	
3	no Defects	✓	
4	no Defects	✓	

PUGET SOUND ENERGY

QUALIFICATION TEST REPORT

LAST NAME	FIRST NAME	MIDDLE INITIAL	EMPLOYED BY
Zourkos	Jake		Pilcher
TESTED BY	TEST LOCATION		EMPLOYEE # (PSE)
T. Smith	Local 32		

TEST FOR:
- ~~MANUAL FUSION~~
- ~~HYDRAULIC FUSION~~
- ~~ELECTROFUSION~~
- ~~BOA WELD~~
- ~~MECHANICAL JOINT (ALL)~~
- ~~HOT TAP~~ 7
- MECHANICAL JOINTS "In-Line Coupling" ONLY

TYPE OF TEST:
- QUALIFICATION
- PRODUCTION
- REQUALIFICATION
- ~~ANNUAL~~
- INSPECTOR

	PIPE DIAMETER	PIPE TYPE	JOINT DESIGN	POSITION	NUMBER OF SAMPLES	TEST RESULTS	DATE OF TEST
PEF 2401.02	(2) 2"	Steel	Butt	Fixed	4	PASS	5/18/09
PEF 2401.02	2 X 1	Steel	Fillet	Fixed	1	PASS	
PEF-Butt	5/8	PE	Butt	Fixed	1	PASS	
PEF-Butt	2"	PE	Butt	Fixed	4	PASS	
PEF-Butt	4"	PE	Butt	Fixed	4	PASS	
PEF-Side	(2) 2 X 5/8	PE	Tee	Fixed	2	PASS	
PEF-Elec	2"	PE	Socket	Fixed	2	PASS	
PEF-1003a	6"	PE	Butt	Fixed	4	PASS	
KNT-Hot			HT			PASS	
PEF-MECJ			MECJ			PASS	

d Lycoft

(a) Pipe must not have a wrinkle bend.

(b) Each field bend must comply with the following:

(1) A bend must not impair the serviceability of the pipe.

(2) Each bend must have a smooth contour and be free from buckling, cracks, or any other mechanical damage.

(3) On pipe containing a longitudinal weld, the longitudinal weld must be as near as practicable to the neutral axis of the bend unless—

(i) The bend is made with an internal bending mandrel; or

(ii) The pipe is 123/4in (324 mm) or less nominal outside diameter or has a diameter to wall thickness ratio less than 70.

(c) Each circumferential weld which is located where the stress during bending causes a permanent deformation in the pipe must be nondestructively tested either before or after the bending process.

[Amdt. 195–22, 46 FR 38360, July 27, 1981, as amended by Amdt. 195–52, 59 FR 33396, June 28, 1994; Amdt. 195–63, 63 FR 37506, July 13, 1998]

§ 195.214 Welding procedures.

top

(a) Welding must be performed by a qualified welder in accordance with welding procedures qualified under Section 5 of API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code (incorporated by reference, *see* §195.3) . The quality of the test welds used to qualify the welding procedure shall be determined by destructive testing.

(b) Each welding procedure must be recorded in detail, including the results of the qualifying tests. This record must be retained and followed whenever the procedure is used.

[Amdt. 195–38, 51 FR 20297, June 4, 1986, as amended at Amdt. 195–81, 69 FR 32897, June 14, 2004]

§ 195.216 Welding: Miter joints.

top

A miter joint is not permitted (not including deflections up to 3 degrees that are caused by misalignment).

§ 195.222 Welders: Qualification of welders.

top

(a) Each welder must be qualified in accordance with section 6 of API 1104 (incorporated by reference, *see* §195.3) or section IX of the ASME Boiler and Pressure Vessel Code, (incorporated by reference, *see* §195.3) except that a welder qualified under an earlier edition than listed in §195.3 may weld but may not re-qualify under that earlier edition.

(b) No welder may weld with a welding process unless, within the preceding 6 calendar months, the welder has—

ATTACHMENT 2

- **McChord Pipeline Maintenance Manual Section G-2**
- **Correspondence from PM Testing discussing change in recertification interval**
- **Updated training certificate for PM Testing**
- **McChord Pipeline covered task documents**

1. Policy

Any pipe that is uncovered for the purpose of tapping, relocation, or repair requires inspection by a qualified person experienced in the selection and use of nondestructive test methods.

2. Equipment

Inspection and evaluation of damages or defects necessitate the use and technical understanding of the following nondestructive testing equipment:

2.1 An "Ultrasonic Flaw Detector" is used to determine wall thickness and to locate the presence of flaws in the pipe wall and/or fillet welds.

2.1.1 A Straight Beam (dual element) Longitudinal Wave Transducer is used to determine wall thickness and locate laminations in the pipe.

2.1.2 An Angle Beam (single element) Shear Wave Transducer is used to locate flaws, especially to determine vertical flaws, in the pipe and/or fillet welds.

2.2 An "Optical Micrometer" or "Pit Gage" is used to determine depth of steel loss at a defect.

2.3 A Dye Penetrant application is used to determine the presence of microscopic surface cracks in pipe.

2.4 A 20% Ammonium Persulfate solution application is used to confirm surface removal of arc burns.

2.5 "Calipers" are used to determine irregularities in pipe roundness and to make defect measurements.

2.6 A "Magnetic Particle Flaw Detector" is used to locate flaws in a pipe wall.

2.7 Radiographic equipment is used to locate flaws in pipe welds. The Company uses outside contractors to conduct nondestructive radiographic work. Contractor technicians must be certified in accordance with the recommendations of ASNT Recommended Practice SNT-TC-1A for the test method used. (For additional information, refer to API Standard 1104--Welding of Pipelines and Related Facilities.)

Cory McGraw

PM Testing Laboratory
3921 Pacific Hwy East
Tacoma, WA 98424
Office: (253) 922-1321 Fax: (253)922-1329
CoryM@PM-Testing.com

Date: 8/13/09

Pages: 4 (Including cover)

To: Corey Herrick **Phone:** _____

Company: McChord Pipeline **Fax:** (253)680-3209

RE: Revised Cost for Wil Mace

☐ Urgent ☐ Reply ASAP ☐ Please Comment

☐ Please Review ☒ Per Your Request ☐ For Your Information

If any pages are not legible or you do not receive all of the intended pages, please call the number above.

4 Jun 2009

No: 09-LM0024

PM Testing Laboratory Inc
3921 Pacific Hwy East
Tacoma, WA 98424

Attn: Cory McGraw

Ref.: Extension of NDT certification intervals

Mr. McGraw:

As your responsible level 3, I recommend that all current NDT certifications that are on a three year interval be extended to five years. This extension is allowed as you have no customers that require a three year certification interval. The current and immediate past revision of NAS 410 allows a five year certification interval.

I recommend this extension also because we perform an annual performance review of all certified penetrant inspectors.

Please place a copy of this memo in each certified NDT inspectors file and change the re-certification date to reflect five years from last certification

Should you have any questions or comments, please feel free to contact me via e-mail at mlee@inspectionproducts.com or phone at 800-638-5535.

Sincerely,

Charles M. Lee
ASNT Level 3 # 58053

Wil Due 5/23/09
Now Due 5/23/11 Sharon Mack 6/5/09

PM TESTING LABORATORY, INC.
3921 PACIFIC HWY. EAST
TACOMA, WA 98424
253-922-1321

CERTIFICATE OF NDT TRAINING AND EXPERIENCE

AS OF MAY 23, 2006 LAST CERTIFICATION DATE
UPDATED JANUARY 2008

Employee Name William Mace Stamp # 2 SSN ON FILE

This NDT Inspection Certificate must be accompanied by the "NDT Personnel Certification History Record" (Form QC-16H). This person holds the following NDT Inspection Certifications.

INSPECT METHOD	LEVEL	TECHNIQUE	TRAIN HOURS	EXPERIENCE	CERT EXPIRES
Fluorescent Dye Penetrant	II	Type I and II	> 80 hours	> 10 years	05/23//2011
Fluorescent Magnetic Particle	II	Dry and Wet Particle	> 80 hours	> 10 years	05/23//2011
Radiographic	II	X-ray and Isotope	> 80 hours	> 10 years	05/23//2011

I hereby certify that this employee has sufficient enough training, technical and practical experience to meet the requirements of NADCAP AC 7114, NAS 410, BSS 7698 and ASNT-SNT-TC-1A.

Michael Lee Cory McGraw for Michael Lee — See attached letter dated 6/4/09

NDT Level III ASNT License Number 58053 expires July 2010.

Employee's current certifications, support examinations, training hours and experience hours, (since their employment with PM Testing Laboratory, Inc.), is updated annually, and available for review upon request.

Quality Manager verification of training, experience, examinations and certification records on file:

Cory McGraw
QA Manager
corym@pm-testing.com

PM TESTING / PIL CHUCK

McCHORD PIPELINE CO.

A Subsidiary of U.S. Oil & Refining Co.

Performance Evaluation Form

Qualification #: 15	**Evaluation Method:** ☐ JPD ☐ OD ☐ EP
Individual: WILLIAM MACE	**ID#:**
Evaluator: FORAKER	**Date:** 8-7-09

Covered Task(s): **Inspection Activities For Tie-Ins, Pipe Replacements And Other Components Connecting To An Existing Pipeline**

☐ 15.2.1.5 ☑ 15.2.4

Qualified for the following: ☐ 15.1 ☐ 15.2 ☐ 15.3 ☑ 15.4 ☐ 15.5

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.1 Identify and Evaluate: Perform visual inspection. Note: Individuals qualified to perform **Covered Task 6** will be automatically qualified for this subtask. Other individuals identified the following: 15.1.1 Visual inspection of the tie-point location, components and replacement pipe. 15.1.2 Visual inspection of pipeline exterior, components for physical damage including dents, dents with gouges, gouges and piping/weld cracks. 15.1.3 Document the inspection on the Field Inspection Report (FIR).	☐	☐	☐		

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.2 Identify and Evaluate: Perform non-destructive testing. Individuals must be qualified for **Covered Task 9** to be qualified for this task. The individual will also recognize the following inspection requirements: 15.2.1 NDT requirements found in Maintenance Manual Section G-2. 15.2.2 Examine piping at tie-point location for cracks, laminations or defects. 15.2.3 Verify piping wall thickness adequate to weld and matches atlas. 15.2.4 Record NDT inspection results.	☐ ☑ ☑	☐	☐		
Note: An individual meeting the certification requirements of Item 15.5 shall be considered qualified for Item 15.3. All Other individuals will be qualified by the following: **15.3 Perform: Verify materials specifications. Coordinate and inspect welding operations on the pipeline. Individual identified the following requirements:** 15.3.1 Verify replacement pipe markings per Section D-7 of the Maintenance Manual.	☐	☐	☐		

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.3 Perform: Verify materials specifications. Coordinate and inspect welding operations on the pipeline. (Cont'd). 15.3.2 Verify branch connection materials specified per Maintenance Manual Section E-5. 15.3.2.1 Valves tested in accordance with the Maintenance Manual Section G-5. 15.3.2.2 Connections 2" and larger must be Weld-o-lets, Saddle-o-lets or Thread-o-lets. 15.3.2.3 API 5L-X Grade pipe branch connection requirements. 15.3.2.4 Fittings and connection materials match material specs provided by engineer. 15.3.3 Pipeline welding operations requirements found in the Maintenance Manual Section B-3(5), E-3 and E-5. 15.3.3.1 Welding on pipe wall thickness less than .200" requires Engineering Manager approval.					

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.4 Recognize and react to Abnormal Operating Condition(s). The individual identified the following : 15.4.1 Abnormal operating condition(s) such as materials conflicting with specifications, defects or damage at the tie-point location, or the presence of hazardous liquid at the work area. 15.4.2 Proper reaction to the abnormal condition(s): 15.4.2.1 Initiating remedial action by informing his/her supervisor. 15.4.2.2 Immediately stopping activity until appropriate action has been taken.	☑	☐	☐		
15.5 Certification: An individual having the following education/certification shall be considered qualified to perform Item 15.3: 15.5.1 Bachelor's Degree in Engineering. 15.5.2 State registration as a Professional Engineer.	☐	☐	☐		

The Individual has successfully completed the Covered Task Evaluation Criteria.

	8/7/09
Evaluator	*Date*
	8-7-09
Individual	*Date*

PM TESTING / PILCHUCK

McCHORD PIPELINE CO.

A Subsidiary of U.S. Oil & Refining Co.

Performance Evaluation Form

Qualification #: 15	**Evaluation Method:** ☐ JPD ☐ OD ☐ EP
Individual: Andrew Thach	**ID#:**
Evaluator: Foraker	**Date:** 8/7/09

Covered Task(s): **Inspection Activities For Tie-Ins, Pipe Replacements And Other Components Connecting To An Existing Pipeline**

15.2.5 ☒ 15.2.4

Qualified for the following: ☐ 15.1 ☐ 15.2 ☐ 15.3 ☒ 15.4 ☐ 15.5

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD OD E/P
15.1 Identify and Evaluate: Perform visual inspection. Note: Individuals qualified to perform **Covered Task 6** will be automatically qualified for this subtask. Other individuals identified the following: 15.1.1 Visual inspection of the tie-point location, components and replacement pipe. 15.1.2 Visual inspection of pipeline exterior, components for physical damage including dents, dents with gouges, gouges and piping/weld cracks. 15.1.3 Document the inspection on the Field Inspection Report (FIR).	☐	☐	☐		OD

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.2 Identify and Evaluate: Perform non-destructive testing. Individuals must be qualified for **Covered Task 9** to be qualified for this task. The individual will also recognize the following inspection requirements: 15.2.1 NDT requirements found in Maintenance Manual Section G-2. 15.2.1.5 15.2.2 Examine piping at tie-point location for cracks, laminations or defects. 15.2.3 Verify piping wall thickness adequate to weld and matches atlas. 15.2.4 Record NDT inspection results.	❑ ✓ ✓	❑	❑		
Note: An individual meeting the certification requirements of Item 15.5 shall be considered qualified for Item 15.3. All Other individuals will be qualified by the following: **15.3 Perform: Verify materials specifications. Coordinate and inspect welding operations on the pipeline. Individual identified the following requirements:** 15.3.1 Verify replacement pipe markings per Section D-7 of the Maintenance Manual.	❑	❑	❑		

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.3 Perform: Verify materials specifications. Coordinate and inspect welding operations on the pipeline. (Cont'd). 15.3.2 Verify branch connection materials specified per Maintenance Manual Section E-5. 15.3.2.1 Valves tested in accordance with the Maintenance Manual Section G-5. 15.3.2.2 Connections 2" and larger must be Weld-o-lets, Saddle-o-lets or Thread-o-lets. 15.3.2.3 API 5L-X Grade pipe branch connection requirements. 15.3.2.4 Fittings and connection materials match material specs provided by engineer. 15.3.3 Pipeline welding operations requirements found in the Maintenance Manual Section B-3(5), E-3 and E-5. 15.3.3.1 Welding on pipe wall thickness less than .200" requires Engineering Manager approval.					

Steps	Satisfactory	Unsatisfactory	Satisfactory After Remedial Action	Comments	Evaluation Method JPD, OD, E/P
15.4 Recognize and react to Abnormal Operating Condition(s). The individual identified the following : 15.4.1 Abnormal operating condition(s) such as materials conflicting with specifications, defects or damage at the tie-point location, or the presence of hazardous liquid at the work area. 15.4.2 Proper reaction to the abnormal condition(s): 15.4.2.1 Initiating remedial action by informing his/her supervisor. 15.4.2.2 Immediately stopping activity until appropriate action has been taken.	❑ ✓	❑	❑		
15.5 Certification: An individual having the following education/certification shall be considered qualified to perform Item 15.3: 15.5.1 Bachelor's Degree in Engineering. 15.5.2 State registration as a Professional Engineer.	❑	❑	❑		

The Individual has successfully completed the Covered Task Evaluation Criteria.

_____	8/7/09
Evaluator	*Date*
_____	8/7/09
Individual	*Date*

ATTACHMENT 3

- **Report from Northwest Corrosion Engineering**

September 29, 2009

Northwest Corrosion Engineering

10995 Warfield Road, Sedro-Woolley, WA 98284
Phone: (360) 826-4570 Fax: (360) 826-6321

Corey Herrick, Chief Engineer – McChord Pipeline
McChord Pipeline Co.
3001 Marshall Avenue
Tacoma, WA 98421

SUBJ: McChord Pipeline / Tacoma Water Corrosion Interference Testing

Mr. Herrick,

Northwest Corrosion Engineering has competed preliminary corrosion control testing on the 6-inch diameter jet fuel McChord transmission pipeline near the intersection of Waller Road East and 72nd St East. The purpose of the testing was to determine if the corrosion control system associated with the McChord Pipeline is having a detrimental effect at a pipeline crossing with Tacoma Water. Likewise, preliminary examination of the Tacoma water cathodic protection system was completed to determine if it could affect the operational characteristics of the McChord Pipeline.

Recently, the McChord pipeline was exposed at the Waller/72nd St intersection to remove a pipeline in-line inspection tool. For the new replacement pipe, a dielectric FRP shield was placed between the two pipelines in order to avoid inadvertent contact between the two structures.

It was reported that the Tacoma water pipeline is a 52-inch diameter reinforced concrete cylinder pipeline. It was reported that, similar to the McChord pipeline, the Tacoma water pipeline utilizes an impressed current cathodic protection system for protection against external corrosion control. Because the two lines are in close proximity, it is important to ensure that the pipelines are not electrically continuous with each other and stray current interference is not occurring. Stray current is defined as current flow in unintended paths. If stray current is picked up by a structure it must be returned back to its source, often resulting in accelerated corrosion at the point of current discharge.

The preliminary testing involved cycling the McChord transformer rectifier off and on and recording pipe-to-soil potential data at nearby test stations and near the pipeline crossings. The established test stations along the McChord pipeline, approximately 500 feet on each side of the Tacoma water crossing, did not exhibit potentials that are indicative of an electrical short. The readings recorded at both test stations are within 10% of annual survey readings recorded at each site dating back to 2001. In addition, electrical potentials were recorded at ten foot intervals starting on the south side of Waller Road and extending to the south a distance of 50 feet. These readings were recorded to assess whether the potentials of the McChord pipeline were becoming more positive nearer the Tacoma water crossing, indicating that an electrical short is likely. Results of the testing did not indicate that the two pipelines are in electrical contact.

Table 1 – McChord Pipeline Electrical Potentials

Footage South of Pipeline Crossing	On, mV	Instant Off, mV
~ 50 ft	-1916	-1237
~ 60 ft	-1863	-1205
~ 70 ft	-1849	-1167
~ 80 ft	-1857	-1178
~ 90 ft	-1858	-1164

NOTES

1. Potentials measured in reference to a copper – copper sulfate reference electrode
2. Potential data indicates that the two pipelines are not electrically shorted
3. Testing was completed with the McChord pipeline rectifier cycling

An attempt was made to locate a protective current source for the Tacoma pipeline. An examination of the Tacoma water pipeline right-of-way approximately 1 mile on each side of the crossing did not reveal any anode groundbeds or corrosion control test stations. However, a steel portion of the pipeline was noted over a creek crossing approximately 1000 feet to the northwest. An electrical potential was taken on the exposed portion of the pipeline, measuring a value of -322 mV. This is an indication that little, if any, cathodic protection current is flowing to the Tacoma water pipeline.

It is probable that the operation of the McChord pipeline rectifier is not adversely affecting the Tacoma water pipeline and similarly, the operation of protective current sources associated with the Tacoma water pipeline is not affecting the McChord pipeline. However, it will be necessary to conduct cooperative interference testing between these two structures in the near future. Cooperative testing will include measuring both On and Instant Off pipe-to-soil potentials of both structures near the pipeline crossings, while alternately cycling all affecting current sources. This testing will most likely involve making contact with the soil directly over the pipeline crossing which will require inserting small diameter holes through the asphalt in order to access the soil.

We appreciate the opportunity to assist you with this preliminary testing. If you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Northwest Corrosion Engineering

Jeremy A. Hailey, P.E.